

Eating Disorders: An Overview of Indian Research

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ABSTRACT

There has been sporadic research on eating disorders in India, with no published attempt to collate and summarize the literature landscape. Hence, the present narrative review aims to summarize Indian work related to eating disorders, discern current trends, and highlight gaps in research that will provide directions for future work in the area. Electronic search using the MEDLINE, Google Scholar, and PsycINFO databases was done to identify relevant peer-reviewed English language articles, in October 2018, using combinations of the following medical subject headings or free text terms: “eating disorders,” “anorexia nervosa,” “bulimia,” “treatment,” “epidemiology,” “co-morbidity,” “management,” “medications,” “behavioral intervention,” and “psychosocial intervention.” The data extracted from studies included details such as author names, year, from which of the states in India the work originated, type of intervention (for interventional studies), comparator (if any), and major outcomes. There is increasing research focused on eating disorders from India over the last decade, but it continues to be an under-researched area as evidenced by the relative paucity of original research. The cultural differences between east and west have contributed to variations in the presentation as well as challenges in the diagnosis. Hence, there is a need for the development of culturally sensitive instruments for diagnosis, as well as generating locally relevant epidemiological data about eating disorders from community and hospital settings.

Key words: *Anorexia nervosa, bulimia nervosa, eating disorder, India*

The earliest description of an eating disorder (ED)-like syndrome appears in a treatise by Morton (1694), under the section “Nervous Consumption,” where the author talks about two adolescents who presented with loss of appetite, extreme fasting, weight loss, and their treatment and outcome.^[1] Historical reports point to the existence of ED even in the 17th century, referred to as “holy anorexia.” However, one of the first scientific reports of this condition, in the late 19th century, was

by William Gull who is credited with coining the term anorexia nervosa (AN).^[2] In India, the occurrence of ED was not reported until the late 20th century.^[3] Perhaps, media-related glorification of “size zero” body type and culturally sanctioned drive for thinness, body shaming, and dissatisfaction have contributed to the recent upsurge of ED cases.^[4-6] Traditionally,

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these parameters have been less of a concern in India than other countries.^[4] Yet, another reason for the recent increase in the incidence of ED such as bulimia nervosa (BN) and binge eating disorder (BED) is more easy access to media outlets promoting unhealthy body types and higher socioeconomic status of people.^[7,8]

Notwithstanding its increasing prevalence rates, ED continues to be an area that is under-reported and under-researched. There are several reasons why ED must be given increasing focus in health care research and policy planning in today's scenario. AN, a prototype ED, has the highest mortality rate among mental health disorders.^[9,10] The economic and social impact of ED was estimated to be upwards of \$15 billion (INR 1057.8 billion) in 2012, which is comparable to the productivity impact of anxiety and depression, estimated at \$17.9 billion (INR 1262.3 billion) in 2010.^[9] Though, relatively rare in the general population, the individual impact of ED can be quite debilitating and long-term treatments are often expensive. ED have high rates of psychiatric and medical co-morbidity.^[9-12]

Though there has been sporadic research on ED in India, there has been no attempt to collate and summarize the literature landscape. We undertook the present narrative review with the objectives of summarizing Indian work related to ED, discern current trends, and highlight gaps in research that will provide directions for future work in the area. These would potentially answer key questions on the clinical presentation and trajectories of ED in our setting.

METHODOLOGY

Search strategy and study selection

Electronic search using the MEDLINE, Google Scholar, and PsycINFO to identify relevant peer-reviewed English language articles was carried out to include articles between April 1967 to October 2018. We used random combinations of the following medical subject headings or free text terms: "eating disorders," "anorexia nervosa," "bulimia," "treatment," "epidemiology," "co-morbidity," "management," "medications," "behavioral intervention," and "psychosocial intervention."

This being a narrative review and because research on ED in India is relatively sparse, we included all types of research reports, including case reports, to gain a true picture of the research landscape. The initial search yielded 84 articles. From the initial search, 39 articles were relevant and therefore selected for inclusion in the review. The full text of these articles was retrieved electronically. Additionally, the reference section of all

articles was manually screened to identify potentially relevant articles. We only selected articles describing research from India. There was no restriction on the date of publication. Citation indexing services and gray literature such as conference proceedings were not included in the present review.

Data extraction

The data extracted from studies included details such as author names, year, from which of the states in India the work originated, type of intervention (for interventional studies), comparator (if any), and major outcomes.

RESULTS

A major part of the literature on ED from India is derived from case reports and case series ($n = 24$). In comparison, there are 15 original studies summarized in Table 1.

The earliest reports of ED date back to 1966. The case was of AN in a 42-year-old female with episodes of compulsive fasting for 2 years. The patient was treated with 100 mg chlorpromazine, 100 ml of 25% glucose with vitamin C 500 mg intravenously, 10 injections of liver extract 2 ml intramuscularly biweekly, and 9 sessions of electroconvulsive treatment. After 46 days of intensive pharmacotherapy and supportive psychotherapy, she showed improvement and was kept in close follow up.^[3] Following this, there has been increasing reports of ED cases in the last two decades. Majority of the cases were of AN, especially restrictive subtype. The typical profile of cases described from India is of adolescent females,^[26-31] belonging to Hindu religion,^[29,31,32] and coming from an upper- or middle-socioeconomic background.^[26-29,31,33] In contrast, there are only four cases of male AN reported.^[27,34] There is a single case report of AN described in a pair of monozygotic twins too.^[35]

Cases of AN have been described in Indian adolescents belonging to Sikh religions, living in the United Kingdom.^[34] The symptoms of AN were found to flare up after being teased by peers about weight which was followed by concerns about weight gain, in the majority of cases.^[27,29] There is also a case of AN which had atypical features such as denial of fears of weight gain.^[36] One report of disordered eating described a young female, in whom "not eating" was conceptualized as a resistance to the patriarchal system and this highlights the role of Indian sociocultural factors for developing an ED.^[37]

Bradycardia, hypotension, anemia, and dyselectrolytemia have been reported at the time of presentation to a psychiatrist.^[27,28,38] Wernicke-Korsakoff syndrome

Table 1: Summary of original studies on eating disorders in India

Authors	Subjects	Study settings	Sampling type	Assessment tools	Methodology	Major findings
King and Bhugra, 1989 Yamuna Nagar ^[13]	574 school girls aged between 14-23 years	Two schools and two colleges	Quota sampling	Hindi version of EAT-26	Abnormal eating attitude and behavior was assessed by a score of more than 20 on EAT-26	About 29% ($n=167$) had disordered eating or probable eating disorder
Srinivasan <i>et al.</i> , 1995 Chennai ^[14]	Medical students Step 1: 602 Step 2: 210	Medical college	Convenient sampling	EAT-40 BITE DSM-III criteria	Two step procedure Step 1: Screening of probable cases. They were defined as : Scoring >30 on 40-item EAT Scoring >10 on 33-item BITE Step 2: Clinical assessment and diagnosis of eating disorder as per DSM-III in all probable subjects as well as 1/3 of screen negative subjects selected by random sampling	About 28 students had scored more than cut offs as per EAT or BITE in Step 1 None of the subjects had syndromal eating disorder diagnosis on clinical evaluation About 14.8% subjects ($n=31$) could be diagnosed with syndrome of EDS, subsyndromal eating disorder
Srinivasan <i>et al.</i> , 1998 Chennai ^[15]	Medical students Step 1: 210 Step 2: 146	Medical college	Convenient sampling	SQ-EDSSQ (-EDS) SRQ-20	Step 1: 15 item SQ-EDS was made based on the study by Srinivasan <i>et al.</i> , 1995 on 210 subjects Step 2: The questionnaire was validated in another set of 146 students against 20-item SRQ-20	Among 210 subjects assessed individually, no criterion-based diagnosis of AN or BN could be made. About 14.8% of subjects were identified as having EDS which did not fit into any of the standard diagnostic criteria for major eating disorders In Step 2, none of the subjects could be diagnosed with AN, BN, or partial syndrome of AN or BN. About 11% of subjects were diagnosed with EDS
Mammen <i>et al.</i> , 2007 Vellore ^[16]	Medical charts of 3274 patients attending child and adolescent psychiatry unit	Hospital child guidance clinic	Consecutive sampling	ICD-10	Retrospective chart review of patient records of consecutive children and adolescents availing. Child and Adolescent Psychiatry Unit services from 2000-2005. The case records diagnosed with eating disorder (F 50.0-50.9) as per the ICD-10 were reviewed by a psychiatrist	After chart review, 41 cases were identified. About 1.25% had an eating disorder. 85.4% (35 cases) had psychogenic vomiting. 14.6% (6 cases) had AN psychogenic vomiting (F: M=2:1.5) and AN (F: M=5:1) was predominantly seen in females. The mean age was around 11.2 (4.3) years. About 44% had psychiatric co-morbidity
Kurpad <i>et al.</i> , 2010 Bengaluru ^[17]	$n=73$ outpatients of psychosis (schizophrenia/psychosis NoS) on treatment	Hospital	Purposive sampling	Eating behavior questionnaire DSM-IV	Eating behavior questionnaire as well as DSM-IV criteria were used for diagnosing. BED in patients of psychosis	None of the patients had BED
Balhara <i>et al.</i> , 2012 New Delhi ^[18]	$n=97$ female nursing students	Government nursing college affiliated with tertiary care hospital	Quota sampling	EAT-26, BSQ	Disordered eating attitude and behavior was assessed by a score of more than 20 on EAT-26. BSQ was used to assess attitude regarding body shape	About 4% ($n=3$) had disordered eating or probable eating disorder. A significant correlation was obtained between EAT-26 and BSQ
Chellappa and Karunanidhi, 2013 Chennai ^[19]	$n=200$ undergraduate female students	Five premier colleges affiliated to the University of Madras	Convenience sampling	EAT-26, State Trait Anxiety Inventory BDI	Abnormal eating attitudes were assessed by EAT-26. Anxiety and depression were assessed by the State Trait Anxiety Inventory and BDI, respectively	30% of students had abnormal eating attitudes. Participants in the abnormal eating attitude category had exhibited higher scores on depression and anxiety when compared to those with normal eating attitudes
Jugale <i>et al.</i> , 2014 Bengaluru ^[20]	$n=117$ females aged between 20-25 years	Five professional college hostels	Convenience sampling	SCOFF	A score of 2 or more on the SCOFF questionnaire was used for diagnosing disordered eating. Score more than 2 on SCOFF signifies suspected eating disorder. Dental hygiene was assessed by dental professional	About 42.7% ($n=50$) had suspected eating disorders. They had a significantly higher prevalence of periomylolysis, dental caries, and tooth sensitivity

Contd...

Table 1: Contd...

Authors	Subjects	Study settings	Sampling type	Assessment tools	Methodology	Major findings
Upadhyah <i>et al.</i> , 2014 Meerut ^[21]	<i>n</i> =120 females aged between 13-17 years	School	Convenience sampling	EAT-26	Disordered eating attitude and behavior was assessed by a score of 20 or more on EAT-26	Nearly 26.67% (<i>n</i> =32) had disordered eating
Ramaiah, 2015 Bellur ^[22]	<i>n</i> =172 medical students	Tertiary care rural medical college	Convenience sampling	EAT-26 BSQ	Disordered eating attitude and behavior was assessed by a score of 20 or more on EAT-26. BSQ was used to assess attitude regarding body shape	About 16.9% (<i>n</i> =29) had disordered eating. A significant correlation was obtained between EAT-26 and BSQ
Lal <i>et al.</i> , 2015 New Delhi ^[4]	Indian patients of eating disorder=30 outpatient Australian patients of eating disorder (outpatients=30, inpatients=30) All patients were females of age range 16-26 years	Private mental health clinics in India and Australia	Convenience sampling	QOL EDs questionnaire DSM-IV	The diagnostic profiles and the quality of life was assessed by the QOL EDs questionnaire Eating disorder was diagnosed as per the DSM-IV	No significant difference was noted in global ED-QOL score. Indians compared to Australian patients had: Higher beliefs that they overeat more frequently Similar frequency of restriction of food, vomiting, use of laxatives Lesser frequency of beliefs of fears of loss of control over intake of food and having preoccupations with the body or food intake
Singh <i>et al.</i> , 2016 Manipal ^[6]	<i>n</i> =550 students	Pre-university colleges	Convenience sampling	EAT-26	The tendency to develop an eating disorder was assessed by a score of more than 20 on EAT-26	Nearly 31.09% (<i>n</i> =171) had affinity to develop eating disorder
Shashank <i>et al.</i> , 2016 Mandya ^[23]	<i>n</i> =134 medical students	Tertiary care medical college and hospital	Convenience sampling	EAT-26 SCOFF	EAT-26 and SCOFF questionnaire was used to assess disordered eating attitude and behavior. Disordered eating was determined by a cut-off of 20 and 2 on EAT-26 and SCOFF, respectively	29.2% and 17.2% of students had disordered eating behavior as per EAT-26 and SCOFF, respectively
Gupta <i>et al.</i> , 2017 Chandigarh ^[24]	<i>n</i> =250 medical students	Government Medical College	Convenience sampling	Hindi version of EAT-26 BSQ	Hindi version of 26 item EAT-26 BSQ was used to assess disordered eating attitudes and body shape attitude	Females scored significantly greater on dieting subscale of EAT-26 and BSQ. BSQ was found to be a significant predictor of eating disorder
Vijayalakshmi <i>et al.</i> , 2017 Bengaluru ^[25]	<i>n</i> =241 medical students <i>n</i> =213 nursing students	Medical college	Convenient sampling	EAT-26 SCOFF Patient health questionnaire	SCOFF questionnaire was used to assess disordered eating behaviors Score more than 2 signifies suspected eating disorder	Males (45.4%) scored higher on the cut-off for SCOFF questionnaire compared to female (31.1%). Males (16.5%) scored higher on the cut-off for EAT-26 compared to female (8.7%)

AN – Anorexia nervosa; BDI – Beck's Depression Inventory; BED – Binge eating disorder; BITE – Bulimia investigatory test; BSQ – Body shape questionnaire; BN – Bulimia nervosa; DSM-IV – Diagnostic and Statistical Manual of Mental Disorders Version IV; DSM-III – Diagnostic and Statistical Manual of Mental Disorders Version III; EAT – Eating attitudes test; EDS – Eating distress syndrome; ICD-10 – International Classification of Diseases; QOL EDs – Quality-of-life for eating disorders questionnaire; SCOFF – Sick, Control, One-stone (14 lbs/6.5 kg), Fat, Food; SRQ – Self-report questionnaire; SQ-EDS – Screening questionnaire for eating distress syndrome

was the presenting symptom for a 39-year-old female who had AN from adolescence.^[39] Surreptitious use of metformin, with episodes of hypoglycemia, was the presenting symptom in another case of AN in a 21-year-old female.^[33] Though the nature of psychiatric co-morbidity has not been described, psychiatric co-morbidity was noted in all the cases of a case series.^[27] Obsessive traits of symmetry and order,^[32] obsessive compulsive disorder (OCD),^[40] and major depressive disorder have been reported as co-morbidities.^[33] Menstrual abnormalities and poorly developed secondary sexual characteristics have been noted in the majority of cases.^[26-28,32,41]

There have been only five cases of BN reported till date.^[42-46] Two of the cases were females: one was a 22-year-old medical student, with the onset of symptoms around 13 years of age, with bingeing and purging with isabgol husk and consumption of orlistat.^[44,45] The other three cases were atypical, with an absence of concerns for body weight or body image, along with an absence of concurrent use of diuretics or laxatives in a 37-year-old male,^[46] 15-year-old female,^[43] and a 24-year-old female.^[42]

Cases of ED have been described occurring co-morbid to physical illnesses such as systemic lupus

erythematous^[26] and secondary to traumatic brain injury^[31] or due to an adverse drug reaction to zolpidem consumption termed as a nocturnal sleep-related ED.^[47] Further, AN has been found to mask physical illnesses such as carcinoma.^[48] Treatment described in these cases included comprehensive treatment involving mental health professionals and dieticians.^[26,27]

Majority of cases were managed in the in-patient setting.^[3,26,27] In AN, high-calorie high-protein diet has been advised, with careful monitoring for re-feeding syndrome.^[26,27] In the 1960s, chlorpromazine and modified insulin therapy were the treatment options used.^[3] Cyproheptadine in combination with chlorpromazine,^[26] combination of cyproheptadine and olanzapine,^[41] mirtazapine,^[27] risperidone,^[27] trazodone,^[27] citalopram,^[27] and fluoxetine at 20 mg/day^[28] have been used for treatment of AN. Combinations of olanzapine and fluvoxamine or olanzapine and fluoxetine have been used in cases of AN with obsessive traits and OCD, respectively.^[32,40] Sertraline^[42] and fluoxetine at low dose of 20 mg/day^[44] as well as at 80 mg/day^[42] has been described in the management of BN, with good response.

The non-pharmacological therapy of ED included family therapy, cognitive behavioral therapy (CBT), supportive psychotherapy, contingency management, hypnotherapy, and play therapy.^[26,27,29,31,42-44,49] High-frequency repetitive transcranial magnetic stimulation (rTMS) over the left dorsolateral prefrontal cortex was given as augmentation strategy in a 23-year-old female who earlier had only a partial response to antidepressants as well as atypical antipsychotics and CBT. rTMS was found to improve attitude toward body weight and body shape, with an improvement of weight.^[38]

DISCUSSION

This review attempted to summarize the Indian research on ED. The literature is largely comprised of case reports, as noted in the previous reviews.^[50,51] However, there has been an increase in the number of published original research articles over the last 5–6 years. There are no studies available which determined the prevalence of ED from the community setting. There is a single hospital-based retrospective review, which reported a prevalence of 1.25% for ED.^[16] Of them, almost 85% had psychogenic vomiting and about 15% had AN. This is in contrast to the international literature, wherein the frequency of occurrence of BN and BED is more common than that of AN. A meta-analysis of 15 studies from various settings reported that the estimated lifetime prevalence of any ED was 1.01%, and those of AN, BN, and BED were 0.21%, 0.81%, and 2.22%, respectively.^[52]

BED had the highest point prevalence of ED, followed by BN and AN, among young females across China, Japan, Africa, and Latin America.^[53] In comparison, in the Indian setting, there are no cases reported of BED, and only five cases have been reported of BN.^[42-46] Further, the two-step assessment (initial screening by self-rated questionnaire, followed by assessment by semi-structured or diagnostic interview) is the standard procedure followed globally. However, there is a single study using the two-step procedure and found no cases.^[14] Majority of the Indian studies used only the screening, self-rated assessment. The frequency of disordered eating/probable ED ranged from 4 to 45.4%.^[18,25]

It is possible that subsyndromal ED cases may not be captured by a self-rated assessment. Two studies reported the prevalence of eating distress syndrome (EDS) to be 11% and 14.8%.^[14,15] EDS refers to subsyndromal forms of AN or BN, with patients having distressing and conflicting thoughts about body shape and eating habits. EDS is characterized by strict dieting, and bingeing in a few cases, with no significant weight loss or behaviors such as resorting to severe measures of weight loss such as diet pills, starvation, purging, or vomiting.^[14] However, there has been practically no Indian research on EDS in the last 20 years.

There are several methodological issues in Indian studies which need to be addressed. Firstly, many of the studies have employed convenient sampling on medical and nursing students.^[14,15,18,22,24,25] This may lead to selection bias and such samples may not be truly representative of the population at large. However, this practice of studying medical students is popular worldwide. The rationale given to support this being the “stressful” nature of medical training, which could be a risk factor for ED.^[54-56] But this may also imply that the prevalence rates obtained in these studies may be an inflated figure.

Secondly, in the measurement of the frequency of disordered eating, it was found to be higher as per the Sick, Control, One-stone, Fat, Food questionnaire (SCOFF) compared to the Eating Attitudes Test-26 item (EAT-26) questionnaire.^[23,25] The frequency with SCOFF ranged from 17.2% in women to 45.4% in men, and the frequency with EAT-26 ranged from 4% to 31%.^[6,18,24,25] Thirdly, there are limitations in the translation and implementation of the questionnaires in a setting like India that has such linguistic diversity. Though the EAT-26 questionnaire has been translated into Hindi, the cut-off score for the Hindi version has not been defined.^[24] Also, the rationale for using the same cut-off of the English version in the Kannada version is not clear.^[6] Hence, due

to cultural differences between the western and Indian settings, there is a definite need for the development of culturally sensitive scales for screening ED.

Culture bears a strong influence on the presentation of ED in India. One unique point noted in the Indian presentations of ED is relative lack of concern for body fat/shape. This has been termed as “Non-fat phobic” variant of AN.^[50] This has been described in Hong Kong as well. In this form, food restriction is attributed to somatic complaints such as abdominal bloating, pain, and lack of appetite, rather than concern for body fat. Similar atypical features have been noted in cases of BN too from India. Also, the concept of EDS is in accordance with this concept.^[50,57] Further, food restriction is culturally sanctioned in Indian culture when one is unwell, for “cleansing the bowel.”^[36] However, several recent studies show an association between perception of body shape and higher scores on EAT-26.^[18,22,24] This could be explained by the ongoing rapid societal transitions in India and the increasing influence of western ideals.

At least 50% of patients with an ED are known to have a psychiatric co-morbidity, with depression being the most common.^[58,59] In contrast, a few cases had syndromal co-morbidity.^[27,40] The principles of management of ED adopted in India is similar to the west. Most reports of AN and BN describe using a combination of pharmacotherapy and psychotherapy. Selective serotonin reuptake inhibitors (SSRIs), second-generation antipsychotics, and cyproheptadine have been found to be effective for AN.^[60] Patients with BN were treated with 20–80 mg/day of fluoxetine in the case reports.^[42,44] In contrast, globally, a higher dose of SSRIs, especially fluoxetine, has been found to be effective in cases of BN.^[61] Psychotherapeutic approaches used in the Indian setting, such as family-based therapy and CBT, therapy match global practices.^[62]

To conclude, there is increasing research focus on ED from India over the last two decades. Lower prevalence of ED could be the reason for the relative paucity of studies. But, with the increasing impact of westernization of society, ED merit renewed focus. The cultural differences between east and west have contributed to variations in presentation as well as challenges in diagnosis. Hence, there is a need for the development of culturally sensitive instruments for diagnosis as well as generating locally relevant epidemiological data about ED from the community and hospital settings.

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Conflicts of interest

There are no conflicts of interest.

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