RESEARCH ARTICLE

PREVALENCE OF EATING DISORDERS AMONG COLLEGE STUDENTS IN INDIA: A SYSTEMATIC REVIEW

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Manuscript Info	*Abstract*
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	Aim: To study the actual factors and prevalence behind the Eating disorder among college students because we know Eating disorder (ED) reported to be most increased among Young adult who are college students that face many challenges as they navigate with transitional life stage. **Objective:** 1. To assess the prevalence of eating disorder among Indian college students. 2. To assess the factors that is associated with the reported prevalence of eating disorders. **Methodology**: - This study used the Quantitative research approach and system review design. Data collection was based on the inclusive criteria: - studies on Indian College students with eating disorder .Data was searched From the PubMed, Pub psych, Google scholar and Medline plus, databases and finally 10 original articles which were added to the records. **Result:** Prevalence of EDs is traditionally considered to affect mainly women. In point prevalence of EDs was higher in women than in men. However, this finding varies according to the type of ED. Male subjects are usually considered to account for 10% of subjects with AN or BN .Factor associated to eating disorder also varied in the studies. Cultural activities association with ED, where as three studies had shown that attitude related to eating cause the problem, Past Disease Association with present hobbits of eating, Stress , social norms, Self esteem are also association with ED **Conclusion:** EDs are traditionally considered to affect mainly women. This review confirms the highest prevalence for AN followed by BN In point prevalence of EDs was higher in women than in men. There is need to focus on more research studies on eating disorder by using random sampling method .

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Introduction:-

Eating disorders are serious mental illness, not lifestyle choices."

- **Demi lovato**

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The multidimensional character of eating behaviour has evolved much interest in academic research during the last decade. Normal eating behaviour of an individual is pleasurable and flexible and rages according to his/her hunger and safety signals, feelings, social needs and cultural background. On other hand, fear and distrust about eating may contribute to the development of disordered eating[1].More precisely, disordered eating behaviour refer to a wide range of irregular eating habits. A number of factors like, family environment, peer pressure, media habits, concern over body image, socio cultural and economic context, gender, and age are associated with eating behaviours, both positive as well as negative ways. Students eating habits are a function of human and environmental impact. Individual influences are psychological as well as biological, whereas, environmental influences include immediate social environments such as family, friend, and peer networks and other factors such as major meals and fats food outlets. In addition, another important factor is social system or macro system which includes mass media, marketing and advertising, social and cultural norms of the society[2].Nowadays, behaviours like skipping of breakfast or major meals, reduction of food intake, snacking between meals and eating outside home are observed more frequently among college students. The prevalence of over weight based on centres for disease control and prevention growth charts among adolescent or college students has increased steadily over the past three decades[3]. About 15% of young people between the age 10 and 22 are overweight. On the other hand, eating disorders such as anorexia nervosa, bulimia nervosa, and binge eating affect a smaller percentage of college students (1-3%) but causes serious health consequences. Those who do not meet these criteria for either anorexia nervosa or bulimia nervosa are considered "eating disorder not otherwise specified. It affects much segments of college students with prevalence estimates as high as 15%[4].In India, college students accounted for 22.8% of the population and they face a series of serious nutritional challenges that it affects not only their growth and development , but also the lives of adults. According to National Eating Disorder Association, individuals with negative body image prescription convince themselves that only other individuals are attractive and that their body shape and size is asign of personal failure. People with poor physical condition are more likely to experience disability and eat less and are more likely to suffer from feelings of depression, isolation, low self esteem and obsession with weight loss (National Eating Disorder Association (NEDA, 2004)

There is no gold standard definition of eating disorders. However, it is said that eating disorder are defined by abnormal eating habits that negatively affect a person's physical or mental health. The following are definition of some of the types of eating disorders: 1.Anorexia Nervosa(AN):-It is considered to be an eating disorder, characterized by deliberate self-induced weight loss and amenorrhoea in association with a specific psychopathology whereby a fear of fatness and flabbiness of body shape persists(According to ICD 10,WHO 1992);2.Bulimia Nervosa(BN):It is a syndrome of repeated bouts of overeating, followed by repeated vomiting (According to ICD 10, WHO 1992); 3.Binge eating disorder(BED): In this type patient eat food in large amount as compare to a normal people in normal situation. Sometimes efforts to purge also found in these situation : 4. Restricting eating disorder: In this type the patient restrict the quantity of food which is eaten and also restrict the calorie intake; 5. Eating disorders and otherwise specified(EDNOS): This is a type of eating disorders which do not meet DSM-4 Criteria for any type of eating disorder:6.Compilsive overeating (COE): In this type of eating disorders the patient do not have binge eating episodes but has recurrent purging in the fear to gaining weight; 7. Pica: It is compulsive carving to eat non nutritious food like paint, chalk, plaster, soda, chips, etc. These patients are unable to differentiate between nutritious and non nutritious food.

Need of the study:
A systemic review is study of studies. It attempts to collect all existing evidences on a specific topic in order to answer a specific research questions. Systemic review and Meta analyses are essential to summarize evidence relating efficacy and safety of health care interventions accurately and reliable [5].Eating disorder is a complex illness that has complex impact on both physical and socio-emotional health of young people and contributes to significant morbidity[6]. Eating disorder (ED) reported to be most increased among Indians particularly among young adults[7] **.**Among Young adult who are college students face many challenges as they navigate with transitional life stage. This period known as "emerging adulthood" is characterized by self focus; identify exploration and major changes in home life and education situation[8].Socio-cultural expectations heavily influence body image perceptions, by promoting a degree of thinness attainable by few. This hope has been expanded through interactions with social media and friends. The pressure to avoid obesity and conform to certain 'standards' for beauty (i.e. thinness) may prompt disturbed eating behaviours directly and cause distorted body image perceptions[9]**.** Over the last decades, there have been many studies focusing on the Indian food crisis but it continued to be an under researched area as evidenced by the relative paucity of original research[10]**.** The shocking surprise of sp many young people with eating disorders underscores the need to facilitate research into the underlying cause of identifying low risk children who

need targeted treatment effectively. Hence, all these evidences show that there is need for more researches on eating disorder.

Methodology:-

Research Approach:
The research approach is a plan and procedure that consists of the steps of broad assumptions to detailed methods of data collection, analysis, and interpretation. It is, therefore, based on the nature of the research problem being addressed. In the view of the nature of the problem and to accomplish objective of the present study "Quantitative research approach" was considered to be the most appropriate.

Research Design:
The research design refers to the overall strategy that you choose to integrate the different components of the study in a coherent and logical way, thereby, ensuring you had effectively addressed the research problem; it constitutes the blueprint for the collection, measurement, and analysis of data. This study had used the systemic review design.

Study selection
From the PubMed, Pub psych, Google scholar and Research gate , databases, the research collected 363, 1152,1200,and 138 records (total = 2853 records), respectively, From the results of the initial search 795 studies were analysed , during screening 295 reviews were analysed based on the prevalence, Indian studies, nursing students, which allowed us to identify 93 articles which was screened for , finally 10 original articles which were added to the records based on the inclusion and exclusion criteria. The flowchart of the record collection is presented in Fig.1
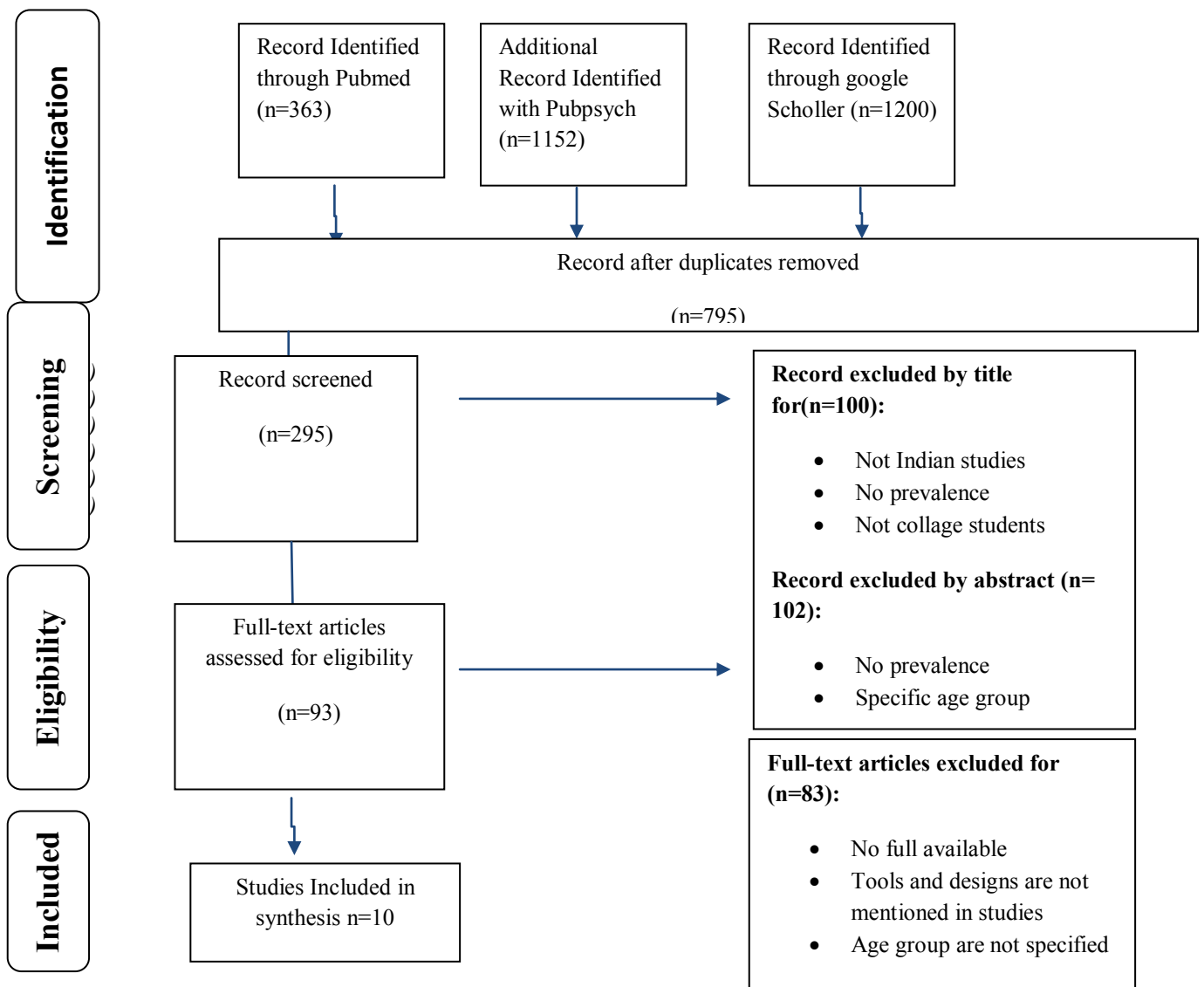
FIG 1:- flow diagram of the systematic literature searches ED, eating disorder,

The characteristics of the research were a priori precisely defined to allow the sorting of articles. Thus, only articles regarding the college student population (excluding populations with specific pathologies, e.g., type 1 diabetes) were included in this study. No limitations in the use of assessment and classification tools were imposed; there were no exclusion criteria based on sex and age. After exclusion of duplicates, 795 records remained in the analysis.

The articles were initially screened by title (72% excluded: 2058 of 2853), then by abstract (37% excluded: 295 of 795), and finally by text (68% excluded: 202 of 295). The main reasons for exclusion at these different steps were: study on adults, not Indian studies ,no prevalence data available ,study not on college students, no prevalence data available, no full text available, tool and design not mentioned ,age group not specified. Finally, 10 records were included in the present article. The whole process of the literature screening was conducted by the group, with double-checking by supervisors on randomly selected publications.

Data Extraction.
Data extraction was limited to findings relevant to the research topic. The following data were extracted: first author, year of publication, Geographical location, study design, sample size, instrument/tool and main findings of the reported prevalence population size according to ED and distribution (percentage women and man),and factors that is associated with eating disorder.

Data synthesis
To facilitate the understanding and integration of all available information, the studies have been divided into 2 categories and 2 comprehensive tables 1 and 2,3 and 4 (ordered according to the date of publication) by their characteristics, and the results of the publications were constructed for each category:

10 studies reported prevalence data with accurate diagnosis of EDs .Prevalence data were summarized in: -Point prevalence: proportion of EDs at specific point in time

In this review, all subjects under and over the age of 18yr were considered as "adults," respectively. Finally, little number of studies collected made it possible to display prevalence data according to age and gender and type of eating disorder. Meta analysis was not possible as this study had less number of studies and variability in the classification of eating disorder.

Result:-
The 10 articles with accurate ED diagnostics were selected for the review table 1,2and 3and 4 Among the articles, the diagnosis of ED was more or less precisely described, mainly depending on the classification used.

To assess the prevalence of eating disorder among Indian college students.

Table 1:-   N=10

Year of research	Prevalence of eating disorder	No. Of study on College students in India	Prevalence rate
2000-2005	No study significance	Nil	Nil
2006-2010	Eating disorder found more in female women in India then men	1	According to the study:- 30% women 15% men had ED disorder in India
2011-2015	6 study took place in different areas around India . Mean finding of the studies were that eating disorder were found more in adolescents and women in India due to various body	6	According to 1 study :- 13.5% women 3.6% men out of the taken subject were ED positive.

	image issues.		According to 2nd study:- 45% of the subject reported underweight 10% overweight and 1% obesity giving signs of ED. According to 3rd study:- 50% chances of having ED regarding both genders. According to 4th study :- 16.9% According to 5th study:- 12.6 % had eating attitude and 2.86 serious eating disorder.
2016-2020	3 studies show a findings that The eating disorder among the adults were less then they used to be in the early adolescence and the cause of eating disorder is either socio economic situation or body image	3	Moderate According to 1st study:- 39.2% of the given population had eating disorder. According to 2nd study :- Given population had a positive relationships between bulimia and food cravings . According to 3rd study :- 26.6% are prone to ED.

Table 1:- SHOWING THE EATING DISORDER PREVALENCE FROM 2000-2020 IN INDIA.

Table 1 shows the prevalence of eating disorder studied during the period of 2000 -2020.from the year 2000-2005 no studied were found on eating disorder among the college students. Year 2006- 2010 show one study

Shown that 30% women15% men had ED disorder in India. In the following year 2011-2015 six studies took place in different areas around India . Mean finding of the studies were that eating disorder were found more in adolescents and women in India due to various body image issues and out of that one study reveal that 50% chances of having ED in both the genders. From the year 2016-2020 only three studies were found as compared to the previous year study one had shown that 39.2% of the given population had eating disorder. According to 2nd study given population had positive relationships between bulimia and food cravings. According to 3[rd]study 26.6% are prone to ED.

Table 2:-

N=10

AUTHOR	COUNTRY	YEAR	TITLE	TYPE OF STUDY	ORIGIN OF POPULATION	POPULATION SIZE	AGE MEAN AGE(Y)	EVALUATION TOOL	EVALUATION METHOD

Daniel Eisenberg, Emily J. Nicklett, Kathryn Roeder, Nina E kriz	India	2011	Eating disorders symptoms among college students	Non responsive survey	India	753	22	EAT=SCOFF	Self report
YPS Balhara, S,Mathur,DK Kataria.	India	2011	Study on the body shape and eating attitude among female nursing students in India	Cross sectional	New Delhi	97	20	EAT=semi structured perfoma	Self report
Bushra Akram, Maryam Javed	India	2014	Eating disorders among university students	Explorat ory study	Gujrat	241	21	EAT=Two licked scale	Self report
P.V Jugale, M. Pramila, AK Murthy , S Rangath	India	2014	Oral manifestations of suspected eating disorders among women's of 20-25 years	Cross sectional	Bangal ore, India	128	20-25	EAT= SCOFF	Self report
Radha R. Ramaiah	India	2015	Eating disorders among medical students of rural teaching hospital	Cross sectional	Karnata ka	172	22	EAT=Attit ude test and questionna ire design	Self report
T Vetri Selvan, D Lalitha , CH Hiremath , JB Ghattargi	India	2015	A cross sectional study on eating disorders among college students	Cross sectional	Bagalk ot, India	489	18-23	EAT= Questionna ire	Self report

KJ Shashank, Praveen Gowda , TK Chethan .	India	2016	A cross sectional study to assess the eating disorder among female medical students in a rural medical college Karnataka state	Cross sectional	Karnata ka	134	21-23	EAT= SCOFF	Self report
Amandeeepk aur	India	2017	Eating disorders among college girls in Amritsar	Cross sectional	Amrits ar,Punj ab	80	18	EAT=self administer questionna ire	Self report
N.Nivedita, G Sreenivasa, TS Sathyanaraya na Rao , S Suttur Malini .	India	2018	Eating disorders in students population of mysore	Cross sectional	Mysore , south India	1600	18-25	EAT= standardize d questionna ire	Self report

Table 2:- Prevalence Studies According To Broad Categories Or Total Ed: General Characteristics.

Sample size
Selected studies had a highly variable population size finally included in the prevalence study: the sample size varied from 80 to 248, 1600 participants TABLE 2. About 10% of the studies had 1600 participants; ~20% included >489 participants. Thus, the majority of the articles selected for the present review had a sample size between 80 and 1600. In addition, the studies included mostly women: 6 studies included only women, whereas 4 were carried out both in men and women.

Tool Design
Ten article with accurate diagnosis.
The literature search of this review highlighted the diverse and heterogeneous tools used in the diagnosis and classification of EDs. Indeed, numerous questionnaires are available to identify EDs. The most commonly used are the self structured questionnaire, 2 studies used SCOFF Questionnaire evaluation of eating disorder was done by self report method in all the studies.(Table2)

Table 3:-   N=10

AUTHOR	YEA R	TYPE OF PREVALENC E	OVERALL EATING DISORDE R	AN	BN	BE D	BMI	FACTOR ASSOCIATIO N WITH ED

JP Sjostedt, JF Schumaker, SS Nathawat	2010							
		Point	India women had higher risk in have ED	Nil	Nil	Nil	Nil	Cultural activities association with ED
Daniel Eisenberg, Emily J. Nicklett, Kathryn Roeder, Nina E kriz	2011	Point	Out of 56% subject W= 13.5% M = 3.6% Positive	Nil	Nil	Nil	Nil	Past Disease Association with present hobbits of eating
YPS Balhara, S,Mathur,DK Kataria.	2011	Point	Nil	Nil	Nil	Nil	37% reported normal BMI 45% (severally underweight) 10% (overweight) 1% moderate obesity.	Psychology and perception related to body shape
Bushra Akram, Maryam Javed	2014	Point	50% chance of having a disorder	Nil	Nil	Nil	Nil	Self esteem association with ED
P.V Jugale, M. Pramila, AK Murthy , S Rangath	2014	Point	Nil	42.73 %	Nil	Nil	Nil	Poor eating attitude needs Early detection and specified treatment
Radha R. Ramaiah	2015	Point	16.9%	Nil	Nil	Nil	Over weight = 17.4% Obesity =6.4%	Distorted eating attitude and body dissatisfaction
T Vetri Selvan, D Lalitha , CH Hiremath , JB Ghattargi	2015	Point	12.6 % had eating attitude	0.14%	2.86 %	Nil	Nil	Distorted eating attitude
KJ Shashank, Praveen Gowda , TK Chethan .	2016	Point	W= 41.42% M = 28.57%	Nil	Nil	Nil	Nil	Stress , social norms
Amandeep kaur	2017	Point	W= 41.42% M= 28.5%	Nil	0.54 %	Nil	Overweight = 44% Obesity = 5 Class 3 obesity = 8	Self esteem and body shape
N.Nivedita, G Sreenivasa, TS Sathyanarayana Rao , S	2018	Point	W = 26.6% M = 0	Nil	W= 0.4%	Nil	Nil	Cultural sensitivity

Suttur Malini .									

Table 3:- Shows The Classification Of Eating Disorder Coverd Under The Systemic Review.

In addition, classifications of EDs were used in 50% of articles. Finally, the method of clinical investigation also varied between studies. The most frequently used method was self report.

Point prevalence of accurate EDs
All ten articles reported ED point prevalence (Table3). Among these studies, the weighted means of point ED prevalence were 25 for women and 20 for men table 3.The weighted means (ranges) of AN point prevalence were discussed in two studies was 21.43 and . For BN, the point mean prevalence was only 1.26. No study shows any prevalence of being eating disorder (BED).other disorder such as eating disorder not otherwise specified';' atypical anorexia nervosa', 'atypical bulimia nervosa' ,'psychogenic nervosa' (pathological vomiting) and pica were not covered in any of the studies.

To assess the factors that is associated with the reported prevalence of eating disorders.
Factor associated to eating disorder also varied in the studies. Two studies had shown that Cultural activities association with ED, where as three studies had shown that attitude related to eating cause the problem, Past Disease Association with present hobbits of eating, Stress , social norms, Self esteem are also association with ED.

Discussion:-
The majority of the articles selected for the present review had a sample size between 80 and 1600.

The literature search of this review highlighted the diverse and heterogeneous tools used in the diagnosis and classification of EDs. Indeed, numerous questionnaires are available to identify EDs. The most commonly used are the self structured questionnaire, 2 studies used SCOFF Questionnaire evaluation of eating disorder was done by self report method in all the studies.

Table 1 shows the prevalence of eating disorder studied during the period of 2000 -2020 . From the year 2000-2005 no studied were found on eating disorder among the college students. Year 2006- 2010 show one study Shown that 30% women15% men had ED disorder in India. In the following year 2011-2015 six studies took place in different areas around India. Mean finding of the studies were that eating disorder were found more in adolescents and women in India due to various body image issues and out of that one study reveal that 50% chances of having ED in both the genders. From the year 2016-2020 only three studies were found as compared to the previous year study one had shown that 39.2% of the given population had eating disorder.According to 2nd study given population had positive relationships between bulimia and food cravings. According to 3rd study 26.6% are prone to ED.

Factor associated to eating disorder
Factor associated to eating disorder also varied in the studies. Two studies had shown that Cultural activities association with ED, where as three studies had shown that attitude related to eating cause the problem, Past Disease Association with present hobbits of eating, Stress , social norms, Self esteem are also association with ED.

Conclusion:-
EDs are traditionally considered to affect mainly women. This review confirms the highest prevalence for AN followed by BN In point prevalence of EDs was higher in women than in men. However, this finding varies according to the type of ED Although EDs were classically thought to be confined to developed Western countries; this study also highlights the high prevalence of EDs in Indian college students. Moreover, the sex ratio (male: female) increased for AN and BN.

Factor associated to eating disorder also varied in the studies. Cultural activities , attitude related to eating cause the problem, Past Disease Association with present hobbits of eating, Stress , social norms, Self esteem are shows association with ED

Finally, some national studies strongly indicate an increase of the point prevalence of EDs over recent years. In order to facilitate reliable data over time in the future, there is a need for stabilization of diagnostic classification and

for consensus on the use of best standard tools for studies. There is need to focus on more research studies on eating disorder by using random sampling method to assess the precise data.

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