

# Prevalence of eating disorder risk and its association factors among medical students in Mysuru: A Cross Sectional Study

Anubhav Gupta<sup>1</sup>, Tanvitha Golla<sup>1</sup>, Jay Gohri<sup>2</sup>, Saurish Hegde<sup>2</sup>, Sunil Kumar Doddaiah<sup>3</sup>

## ABSTRACT

### Introduction

Eating disorders still remains unresearched and demand attention. Various factors influence the development of these disorders such as socioeconomic status, stress, and media exposure. Early diagnosis is key to understanding eating disorders. With a paucity of studies and thus, the objective of this study is to estimate the prevalence of eating disorders.

### Methodology

It is a cross sectional study in 94 medical students in a medical college in Mysuru. EAT-26 questionnaire and Cohens Perceived Stress scale was used to assess the eating pattern and stress among the students.. Association was done using Mann Whitney test.

### Results

The prevalence of eating disorder risk was determined as 17.02%. The prevalence of eating disorder risk in obese respondents was 18.9%, while the prevalence in non-obese respondents was 21.95%. A higher perceived stress score scores are significantly associated with an increased risk of eating disorders.

### Discussions:

Our study shows that students do have a high prevalence of eating disorders and especially medical students. There is also significant association between stress and eating disorders which can be attributed to their lifestyle and many other factors.

### Conclusion:

In conclusion, as per this study, the prevalence of Eating disorder risk in students of a medical college in Mysore was found to be high. It was found that Eating disorder risk was associated with high psychological stress. Overall, this study shall help plan some definitive preventive measures against Eating disorder risk.

**Keywords:** eating disorder, medical, students, stress, adolescent

**GJMEDPH 2024; Vol. 13, issue 2 | OPEN ACCESS**

**2\*Corresponding author:** Saurish Hegde, Senior Resident, Department of Community Medicine, KVG Medical college and Hospital, Sullia, Karnataka, mail id: [saurish.hegde@gmail.com](mailto:saurish.hegde@gmail.com); 1.Anubhav Gupta, Tanvitha Golla, Jay Gohri, Intern, JSS Medical College, JSS Academy of Higher Education and Research, Mysuru.; 3.Sunil Kumar Doddaiah, Professor and Head, Department of Community Medicine, JSS Medical College, JSS Academy of Higher Education and Research, Mysuru.

Conflict of Interest—none | Funding—none

© 2024 The Authors | Open Access article under CC BY-NC-ND 4.0



## INTRODUCTION

Mental health, an area of medicine that has gained recognition in recent years, remains under-recognized in India. According to a report by the World Health Organization (WHO), approximately 7.5% of the Indian population experiences some form of mental disorder. Surprisingly, mental illnesses constitute a significant proportion of all health-related disorders, accounting for one-sixth of the total burden in India, encompassing mental, neurological, and substance abuse disorders.<sup>1-2</sup> Among the various mental health concerns, eating disorders remain a poorly researched topic in India. Eating disorders refer to a range of conditions characterized by either inadequate or excessive food intake, which detrimentally affects an individual's physical and emotional well-being. While binge eating disorder, bulimia nervosa, and anorexia nervosa are recognized as common forms of eating disorders globally, their presentation in India is less well-defined.<sup>3-5</sup> Primarily observed among adolescents and students, eating disorders are serious health issues that demand attention. The Multi-Service Eating Disorders Association (MEDA) reports that nearly 15% of women between the ages of 17 and 24 in India experience some type of eating disorder. Previously thought to be limited to Western societies, eating disorders are now seen across diverse racial and socioeconomic groups, with over 75% of cases originating during adolescence<sup>6-10</sup>. These psychiatric illnesses have a significant impact on morbidity and mortality rates. Eating disorders primarily manifest as mental preoccupation with body weight, shape, and diet. Various factors influence the development of these disorders, such as socioeconomic status, stress, and media exposure, although their impact on the Indian population is not yet thoroughly understood. Moreover, eating disorders often coexist with other psychiatric conditions, such as depression and anxiety, making them even more harmful and potentially life-threatening. Unfortunately, the diagnosis of eating disorders can be challenging, and more than half of all cases go undetected. In India, a lack of awareness and poorly defined diagnostic methods further contribute to this issue.<sup>10-15</sup> In this context, implementing comprehensive screening programs becomes crucial for early detection and prevention of severe complications associated with advanced

eating disorders. While the accurate diagnosis of eating disorders requires the expertise of trained psychiatrists, regular screening through questionnaires and interviews, followed by referral to psychiatric professionals, can facilitate early identification and treatment of these illnesses. Additionally, raising awareness about eating disorder symptoms and their presentation among young individuals can play a significant role in both primary and secondary prevention efforts. The Eating Attitudes Test (EAT26), developed by Garner et al., is widely employed as a screening tool for eating disorders. Stress, which is pervasive and amplified in high-pressure environments like the medical field, is often assessed using the Perceived Stress Scale (PSS) developed by Cohen<sup>16-20</sup>. Early diagnosis is key to reducing the prevalence and complications associated with eating disorders. Unfortunately, there is a paucity of studies exploring eating disorders and their related risk factors specifically within the Indian population. Thus, the objective of this study is to estimate the prevalence of eating disorders and investigate associated risk factors such as psychological stress, gender, and obesity among students from various disciplines in a medical college hospital<sup>21</sup>.

### Objectives:

1. To assess the incidence of eating disorder risk among medical students in Mysuru.
2. To examine the contributing factors associated with eating disorder risk, including gender, obesity, and psychological stress.

### Methodology:

- a) **Study Design:** Cross sectional study was conducted in a target population after taking informed consent from the subjects.
- b) **Study population:** Students of JSS MEDICAL COLLEGE, MYSURU
- c) **Study duration:** 1 month (June-July 2023)
- d) **Sample size:** A sample size of 94 was arbitrarily chosen for the purpose of this study.
- e) **Sampling method:** Subjects were chosen using Convenient sampling.

- f) **Inclusion criteria:** Subjects of study were students of medical college in Mysuru, JSS Medical college and who consented to participate in this study
- g) **Exclusion criteria:** Refusal to participate in study

### Method of collection of data

The data was gathered by distributing a URL to an online self-administered questionnaire, created using Google Forms. The questionnaire included items on demographic factors such as age and sex. To assess the participants' risk for eating disorders, the study employed the EAT-26 questionnaire. In this study, individuals who scored above 20 points were identified as being at risk for eating disorders. Furthermore, psychological stress was evaluated using Cohen's Perceived Stress Scale, which consisted of 10 items.

### Data analysis

The data collected was entered into MS Excel and analyzed using SPSS v22, which was licensed to JSSAHER. Missing data or incomplete data was not included in the study. To determine the statistical significance of associations between eating disorder risk and factors like sex and obesity, the chi-square

test was employed. The statistical testing of the association between psychological stress and eating disorder risk involved comparing the median scores of the Cohen's Perceived Stress Scale between respondents with and without eating disorder risk, using the Mann-Whitney U test. A significance level of  $p < 0.05$  was considered statistically significant in this study.

## Results

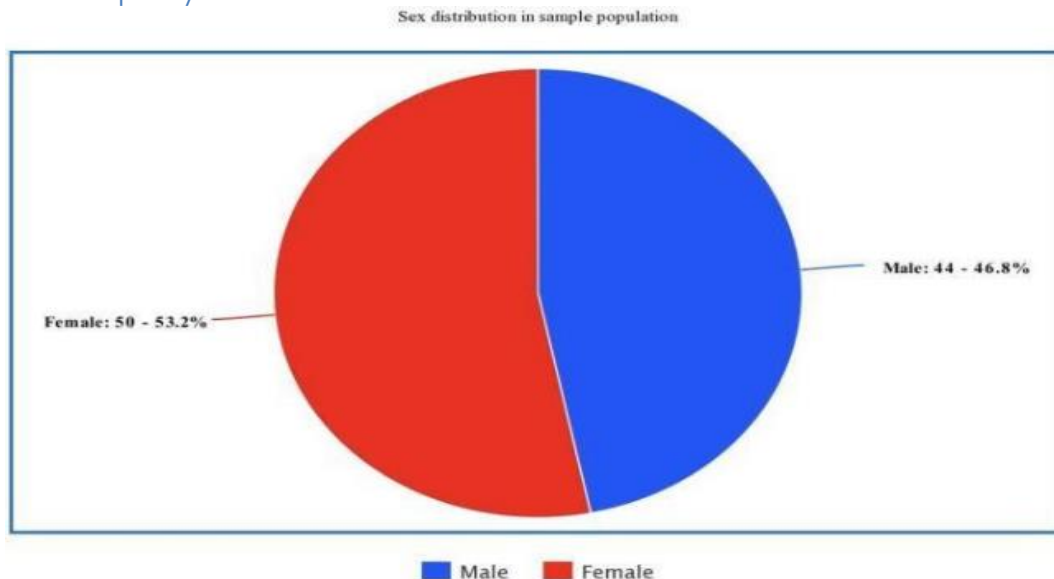
### 1) Demographic details of study population

For this study, a total of 100 responses were collected from the study population. After removing incomplete or incorrect responses, 94 responses were included in the analysis. The self-administered questionnaire was used to collect and record the data. The observations regarding the age and gender distribution of the sampled population are outlined below.

#### 1.1) Gender

Among the 94 responses obtained, 44 individuals, accounting for 46.8% of the sample, identified themselves as male, while 50 individuals, representing 53.2% of the sample, identified themselves as female.

Graph 1: Gender frequency

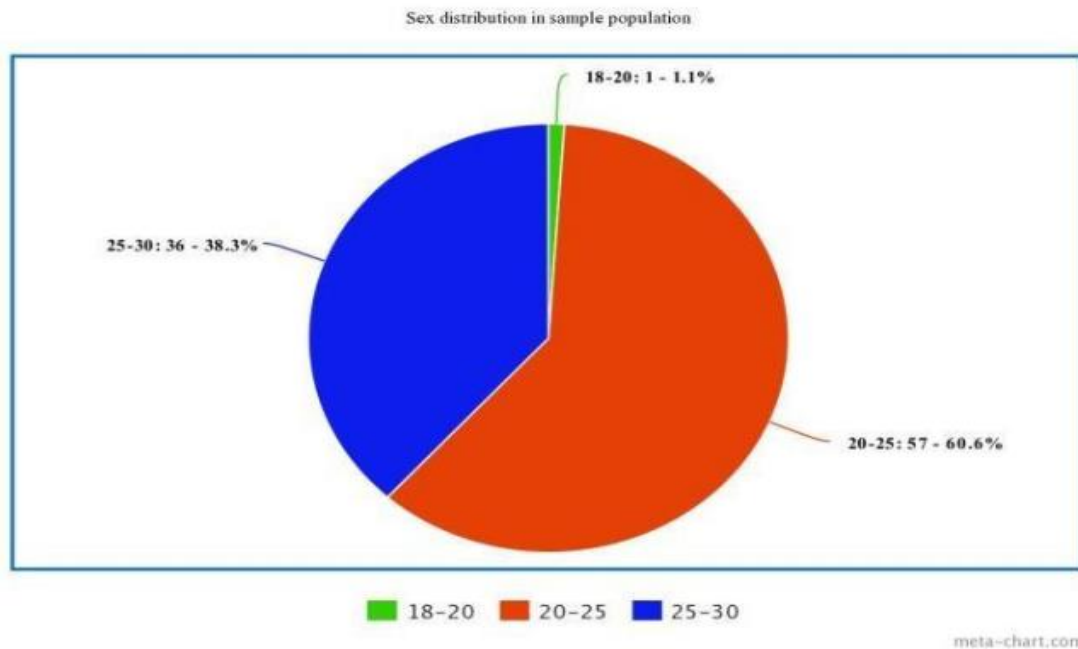


#### 1.2) Age

The age of the respondents was categorized into three groups: 18-20, 20-25, and 25-30. Out of the 94 responses obtained, 1 subject, representing 1.06% of

the sample, belonged to the age group of 18-20. 57 subjects, accounting for 60.63% of the sample, belonged to the age group of 20-25. Additionally, 36 subjects, comprising 38.29% of the sample, belonged to the age group of 25-30.

Graph 2: Age frequency

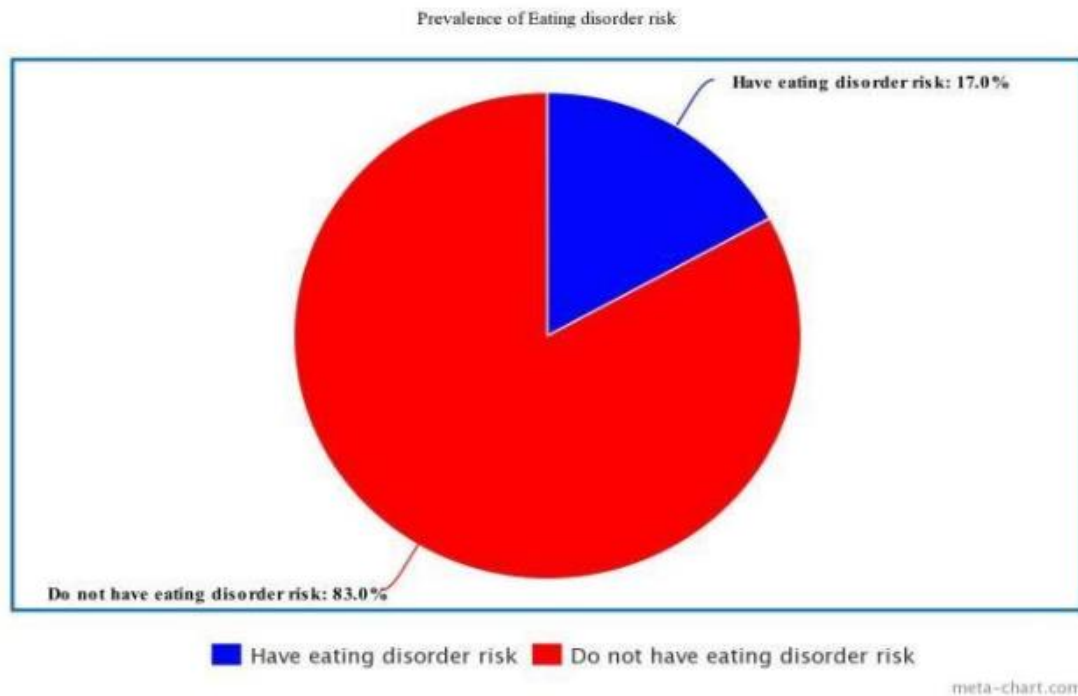


## 2) Prevalence of Eating disorder risk in the study population.

In the study population, the prevalence of eating disorder risk was determined to be 17.02%. This

means that out of the 94 respondents, 16 individuals were identified as having eating disorder risk.

Graph 3: Prevalence of eating risk of study population.



## 3) Association of Eating disorder risk and Gender.

Among the 44 male respondents, 6 individuals (13.64%) were identified to have eating disorder risk, while among the 50 female respondents, 10

individuals (25%) had eating disorder risk. To assess the association between gender and eating disorder risk, a chi-square test was conducted.

Table 1: Association between Gender and Eating disorder risk (ED)

	Have Eating Disorder risk	Do not have Eating Disorder risk	df	pvalue
Male	6	38	1	0.412 (>0.05)
Female	10	40		

The statistical analysis yielded a p-value of 0.412, indicating that the association between eating disorder risk and gender/sex was not statistically

significant. Therefore, based on this study, no significant association was found between eating disorder risk and gender/sex

#### 4) Association of Eating disorder risk and Obesity.

Among the 94 respondents, 46.8% (44 individuals) were identified as obese, while 53.2% (50 individuals) were not obese. Of the 44 respondents with obesity,

15.9% (7 individuals) exhibited eating disorder risk, whereas among the 50 non-obese respondents, 18% (9 individuals) showed eating disorder risk.

Table 2: Association between Obesity and Eating disorder risk (ED)

	Have Eating Disorder risk	Do not have Eating Disorder risk	p-value
Obese	7	37	0.78 (>0.05)
Non-obese	9	41	

The prevalence of eating disorder risk in obese respondents was 18.9%, while the prevalence in non-obese respondents was 21.95%. The statistical analysis yielded a p-value of 0.0724, indicating that

the association between obesity and eating disorder risk is not statistically significant. Thus, no significant association between obesity and eating disorder risk was observed in this study.

#### 5) Association between Psychological stress and Eating disorder risk.

The respondents with eating disorder risk had a median Perceived Stress Scale (PSS) score of 21.5, while the median PSS score of respondents without eating disorder risk was found to be 19. To evaluate

the statistical significance of the difference between these two medians, a Mann-Whitney U-test was conducted.

Table 2: Relation between PSS score and Eating disorder risk(ED)

	Median PSS Score	p-value
ED	21.5	0.0436
Do not have ED	19	

A Mann-Whitney U test was conducted to compare the two medians, and the results showed that the median Perceived Stress Scale (PSS) score was significantly higher in individuals with eating disorder risk compared to those without it (U value = 453.5, p-value = 0.0436). This indicates that higher PSS scores are associated with an increased risk of eating disorders.

## DISCUSSION

The study conducted in a medical college in Mysore revealed a prevalence of 17.02% for eating disorder risk among the students (refer to Fig. 1). The prevalence was determined through a self-administered questionnaire based on the EAT-26 scoring system. However, it is important to acknowledge that the obtained prevalence might be underestimated since some respondents may not have recognized their own risk of having an eating disorder. When compared to previous studies conducted by Ramaiah et al. , Iyer S et al., and N. Nivedita et al , which reported prevalence rates of 16.9%, 13%, and 26.06% respectively, differences can be attributed to variations in demographics, study locations, inclusion and exclusion criteria, sample sizes, sampling techniques, and various environmental and social factors across different regions<sup>1-3</sup>. In terms of the association between psychological stress and eating disorder risk, the study demonstrated a significant correlation, with a higher prevalence of eating disorder risk observed among individuals with higher Psychological Stress Scale (PSS) scores (refer to Table 3). Previous studies conducted by Epel et al, Smith et al. , Kandiah et al. , Stice et al., and Engelberg et al. have similarly indicated that individuals experiencing high levels of stress are more prone to developing eating disorders, particularly binge eating disorder and emotional eating. Psychological stress can trigger the release of cortisol, a hormone that increases appetite and may lead to overeating. Additionally, stress can contribute to negative emotions such as anxiety, depression, and low self-esteem, which can further contribute to the development of disordered eating behaviors. On the other hand, individuals with eating disorders may experience heightened levels of stress and anxiety associated with their disordered eating behaviors, exacerbating their condition<sup>4-8</sup>.

The study did not find a significant association

between gender and eating disorder risk (refer to Table 1), as evaluated using a chi-square test. Previous studies conducted by Striegel-Moore et al., Wade et al. , Raevuori et al. , Allen et al. , and Kornstein et al. have reported a higher prevalence of eating disorders in females compared to males, with a male-to-female ratio of approximately 1:3. However, it is crucial to note that eating disorders can affect individuals of all genders, ages, races, and backgrounds. Research suggests that gender differences in eating disorder prevalence may be influenced by cultural and social factors that shape body image ideals and expectations. For example, in Western societies, there is often a strong emphasis on thinness as the beauty standard for females, potentially contributing to the development of eating disorders in women who feel pressure to conform. Additionally, differences in the expression of eating disorder symptoms have been observed between genders, with men more likely to engage in excessive exercise or use anabolic steroids to build muscle, while women may be more inclined towards restrictive eating or purging behaviors. It is important to recognize that eating disorders require professional help and can affect individuals of any gender<sup>9-13</sup>.

Similarly, the study did not find a significant association between obesity and eating disorder risk (refer to Table 2). Previous studies conducted by Fairborn et al. , Stice et al. , Yanovski et al., and Grilo et al. have explored the relationship between obesity and the risk of developing an eating disorder. For instance, individuals who are overweight or obese may be more prone to body dissatisfaction, which can lead to disordered eating behaviors such as binge eating or restrictive eating. Furthermore, individuals with a history of dieting or weight cycling may be at an increased risk of developing an eating disorder. Conversely, individuals with eating disorders may also be at an increased risk of developing obesity. Binge eating disorder, characterized by recurrent episodes of binge eating, can result in weight gain and obesity. Additionally, individuals with anorexia nervosa or bulimia nervosa may engage in compensatory behaviors such as purging or excessive exercise that can lead to weight gain over time. The relationship between obesity and eating disorders is complex and bidirectional, with each condition potentially increasing the risk for the

other. It is crucial to recognize that both obesity and eating disorders are serious health concerns that require appropriate assessment and treatment.<sup>14-17</sup> Further, further studies in this area would enhance the overall clinical practise of the doctor community. Better eating habits, would mean that doctors would be healthier in their approach to treat patients and their treatment modules will be more accurate.

#### LIMITATION

- a. Potential for recall bias: It is important to acknowledge that this study may be influenced by recall bias. Since the prevalence of eating disorder risk was determined based on self-reported responses, participants' ability to accurately recall and report their experiences may vary, which could introduce bias and affect the reliability of the findings.
- b. Limitations of EAT-26 as an indicator: It is important to note that the EAT-26 serves as a proxy measure for eating disorder risk and does not provide a definitive diagnosis. People scoring below 20 on the EAT-26 can still be suffering from a serious eating disorder. To obtain a conclusive diagnosis, it is necessary to consult a qualified healthcare professional who can conduct a comprehensive evaluation using appropriate diagnostic criteria and methods.
- c. Limited scope of associations: This study focused on examining associations between eating disorder risk and factors such as sex, obesity, and

psychological stress. However, it is crucial to note that assessing causal relationships between EAT-26 scores and these factors requires further investigation using larger-scale studies with robust study designs. Such research would provide more comprehensive insights into the potential causal links between eating disorder risk and these associated factors.

#### CONCLUSION

In conclusion, as per this study, the prevalence of Eating disorder risk in students of a medical college in Mysore was found to be 17.02%. It was found that ED was associated with high psychological stress. However, no relation or association was found between Gender and Obesity. Further studies should be done with appropriate sample size and study methods to check the relation between Eating disorder risk and these variables. More studies in this area are needed as it would include doctors from various ethnic backgrounds and different work patterns. Studies on doctors health, have been very less, and on their eating patterns is less analysed. Better eating among doctors would mean that it would raise the efficiency of doctors in community in their practise and therefore better treatment rates. Overall, this study shall help plan some definitive preventive measures against Eating disorder risk.



## REFERENCES

- 1) Prevalence of Eating disorders and its associated risk factors in students of medical college [hospital in south India - Iyer S, Shriram V \[cited January 26, 2021\]available from:https://www.cureus.com/articles/38634-prevalence-of-eating-disorders-and-its-associated-risk-factors-in-students-of-a-medical-college-hospital-in-south-india#!](#)
- 2) Eating disorder: Prevalence in the student population of Mysore, South India - N Nivedita, G. Sreenivasa, T.S. Sathyanarayana Rao, and S. Suttu Malini[cited 2018, October]availablefrom: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6278223/>
- 3) Eating disorder among [medical students of a rural teaching hospital-Ramaiah,Radha](#) R. Available from: <https://pesquisa.bvsalud.org/portal/resource/pt/sea-175463>
- 4) Epel, E. S., McEwen, B., Seeman, T., Matthews, K., Castellazzo, G., Brownell, K. D, Ickovics, J. R. (2000). Stress and body shape: stress-induced cortisol secretion is consistently greater among women with central fat. *Psychosomatic Medicine*, 62(5), 623-632.
- 5) Smith, K. E., Mason, T. B., Johnson, J. S., Lavender, J. M., & Wonderlich, S. A. (2018). Stress and eating disorder behavior: A systematic review and synthesis of qualitative research. *International Journal of Eating Disorders*, 51(11), 1205-1220.
- 6) Kandiah, J., Yake, M., & Willett, J. (2006). Psychological stress and food intake. *Nutrition*, 22(5), 516-520.
- 7) Stice, E., Marti, C. N., & Rohde, P. (2013). Prevalence, incidence, impairment, and course of the proposed DSM-5 eating disorder diagnoses in an 8-year prospective community study of young women. *Journal of abnormal psychology*, 122(2), 445-457.
- 8) Engelberg, M. J., Steiger, H., Gauvin, L., Wonderlich, S. A., & Bégin, C. (2018). Psychological stress, cortisol, and eating behaviors. *International Journal of Eating Disorders*, 51(9), 778-788.
- 9) Striegel-Moore, R. H., Silberstein, L. R., & Rodin, J. (1986). Toward an understanding of risk factors for bulimia. *American Psychologist*, 41(3), 246-263.
- 10) Wade, T. D., Keski-Rahkonen, A., & Hudson, J. I. (2011). Epidemiology of eating disorders. In M. Tsuang & M. Tohen (Eds.), *Textbook of psychiatric epidemiology* (pp. 343-360). John Wiley & Sons.
- 11) Raevuori, A., Keski-Rahkonen, A., & Hoek, H. W. (2014). A review of eating disorders in males. *Current Opinion in Psychiatry*, 27(6), 426-430.
- 12) Allen, K. L., Byrne, S. M., Oddy, W. H., & Crosby, R. D. (2013). DSM-IV-TR and DSM-5 eating disorders in adolescents: Prevalence, stability, and psychosocial correlates in a population-based sample of male and female adolescents. *Journal of Abnormal Psychology*, 122(3), 720-732.
- 13) Kornstein, S. G., & Burt, V. K. (2002). A review of gender differences in mood disorders. *Depression and Anxiety*, 16(1), 1-11.
- 14) Fairburn, C. G., Cooper, Z., Doll, H. A., & Norman, P. (2000). The natural course of bulimia nervosa and binge eating disorder in young women *Archives of General Psychiatry*, 57(7),659-665.
- 15) Stice, E., & Shaw, H. E. (2002). Role of body dissatisfaction in the onset and maintenance of eating pathology: A synthesis of research findings. *Journal of Psychosomatic Research*, 53(5), 985-993.
- 16) Yanovski, S. Z., & Yanovski, J. A. (2014). Toward a science of obesity management. *Journal of the American Medical Association*, 312(9), 887-888.
- 17) Grilo, C. M. Masheb, R. M., & White, M. A. (2010). Significance of overvaluation of shape/weight in binge eating disorder: Comparative study with overweight and bulimia nervosa. *Obesity*, 18(9), 1878-1881.
- 18) Hudson, J. I., Lalonde, J. K., Coit, C. E. Tsuang, M. T., & McElroy, S. L. (2010). Longitudinal study of the diagnosis of components of the metabolic syndrome in individuals with binge-eating disorder. *Obesity*, 18(2), 385-390.
- 19) American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 4th ed, Washington, DC: APA; 2000.
- 20) Striegel-Moore RH Smolak L, eds. *Eating Disorders: Innovative Directions in Research and Practice*. 1st ed. Washington, DC: American Psychological Association; 2001.