



## Review Article

## Yoga Therapy and Eating Disorders

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## ABSTRACT

**Background:** Eating disorders are one of the most common psychological/psychosomatic disorders that cause many problems for physical health, mental functioning and quality of life. Eating disorder is identified by severe chaotic eating behaviors and includes anorexia nervosa and bulimia nervosa. The use of complementary medicine, such as yoga, has always been of interest to researchers in clinical sciences and has been proposed as a new approach to the treatment of eating disorders. Yoga essentially means connectivity and continuity. Through mind- and body-based techniques, yoga can be effective in the achievement of therapy goals in feeding and eating patients.

**Methods:** The data for the present review study was collected through a search in electronic resources and databases as well as manual search of library resources. The search for relevant articles and studies was performed on the internet in relevant websites and scientific/ research journals using a number of keywords. This study will address yoga therapy and its relationship with and effects on eating disorders after a review of the definition, classification, epidemiology and pathophysiology of different types of eating disorders.

**Results:** The results showed that eating disorders are caused by emotional disorders and stress and, essentially, by subjective factors. Many people achieve relaxation and body, soul and mind balance with yoga. This practice makes it more possible to fight eating disorders.

**Conclusion:** Yoga creates self-confidence and a positive feeling about one's body and appearance. Yoga has a holistic attitude toward human-beings and provides different, continuous and simple techniques for humans' health, development, preparation and balance and is thus effective in improving nutrition and eating disorders.

**Keywords:** Breathing exercises, Eating disorder, Meditation, Nutrition disorders, Yoga

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## Introduction

Eating disorders are currently considered as one of the most noteworthy psychological/psychosomatic disorders. This group of disorders causes problems in physical health and psychological functioning and disrupts the quality of life in the affected individual and may also increase mortality. The main cause of these disorders is still not completely identified and their treatment is difficult, as many patients have no desire to use the available treatments (1, 2).

In the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), anorexia nervosa and bulimia nervosa were the two important eating disorders. In the fifth edition (DSM-V), in addition to these

two disorders, three childhood disorders, including pica, rumination disorder and feeding disorder of infancy or early childhood, and also a new disorder called bulimia were added to this group (3). In relation to eating disorders, the main change in the fifth edition (DSM-V) was the transfer of all eating disorders to a new category called eating and nutrition disorders, which also includes nutritional disorders in infancy. Although these two disorders are classified separately, they have common features, such as age at onset, higher prevalence in the female gender and, most importantly, severe fear of obesity (4). The chapter on nutrition and eating disorders in the fifth edition of DSM includes certain changes to better show the signs and

behaviors of patients who live with these signs in their life. Pica, rumination disorder, anorexia nervosa and bulimia nervosa are the most important disorders in this category. In addition, the name of this category was changed to reflect the inclusion of nutrition disorders (such as pica and rumination disorder) in the category, which are introduced in the DSM-V as disorders usually first diagnosed in infancy, childhood or adolescence. The present article reviewed the definition, classification, epidemiology and pathophysiology of different types of eating disorders and then defined yoga and yoga therapy and addresses their relationship and interactions with eating disorders.

## Methods

The present review study was conducted through the data collected by a search in databases including PubMed, Google Scholar and Science Direct using the Medical Subject Headings (MeSH) Keywords 'yoga', 'feeding and eating disorder', 'breathing exercises', 'relaxation therapy' and 'meditation', without imposing any time constraints, so as to find foreign studies published in English.

## Results

### *Types of eating disorders*

The definition provided by the American Psychology Association for eating disorders, which is also included in the DSM-V, is currently the most common definition. Eating disorders are categorized as Anorexia Nervosa, Bulimia Nervosa, Binge Eating Disorder and Feeding and Eating Disorders in Infancy or Early Childhood, namely Pica, Rumination Disorder and Feeding Disorder of Infancy or Early Childhood.

### *Anorexia Nervosa*

The term anorexia refers to the loss of appetite, and nervosa shows that anorexia has occurred for emotional reasons. This terminology is somewhat incorrect, since many people with anorexia nervosa do not lose their appetite or interest in food, rarely experience the loss of appetite, and even then, often in the advanced stages of their disorder. Anorexia is self-starvation and resistance against having the normal minimum weight. People with anorexia nervosa have mental preoccupations about food and exhibit depression and poor social relations. The main features of anorexia nervosa are: (1) Resistance against maintaining a minimum weight and a sustained energy intake limitation; (2) Phobia of obesity; and (3) A false belief about one's own body, such that even excessive slimness is considered obese. The main difference in the fifth edition of DSM over the fourth edition is that the cessation of menstruation (or amenorrhea) is no longer required for this diagnosis to be made (3). An impaired body image is the main feature of anorexia nervosa. The family members of people with this disorder suffer extensive disappointment. The main problem in people with this disorder is an intense psychological development crisis, and hatred is a very popular attitude among these individuals (5). DSM-V differentiates between two types of anorexia nervosa: 1) Restrictive, in which self-starvation is not accompanied by purging, and food intake is limited and exercise is relentless and obsessive for at least three months; 2) Binge eating/purging, in which the individual regularly

self-induces vomiting or takes laxatives, and these acts should last for at least three months (3).

### *Bulimia Nervosa*

In this disorder, the individual fears weight gain and has a distorted image of own body. The main feature of bulimia nervosa is regular and frequent periods of binge eating followed by periods of fasting or purging. The main cause of bulimia nervosa is concern about the weight and body, which may begin following a period of dieting. Bulimia nervosa is a type of disorder associated with western cultural ideals about a trimmed body and eating and nutrition patterns (3). According to DSM-V, the main features of bulimia nervosa are: (1) Periods of binge eating with a relatively high frequency (at least once a week) and lasting for at least three months; (2) Compensatory behaviors following binge eating to prevent weight gain (vomiting and misuse of laxatives or emetics; (3) Weight is as low as in anorexia nervosa; (4) The patient has a phobia of obesity and constantly desires a slimmer body or meets both of these items.

People with bulimia nervosa are divided into two types. The purging type forces themselves to throw up what they have just eaten by vomiting or taking laxatives or diuretics. The non-purging type tries to balance what they have eaten by excessive exercise or fasting. According to the DSM-V, two important features differentiate anorexia nervosa from bulimia nervosa. The first feature concerns body image. People with anorexia nervosa have a highly-distorted image of their body size and imagine themselves obese even when approaching chronic starvation. In contrast, people with bulimia nervosa have a precise image of their body, but they still worry about weight gain. The second feature concerns the amount of weight lost. People with anorexia nervosa weigh very much below their height and statue standard, while many people with bulimia nervosa have moderate or above-moderate weight.

### *Binge Eating Disorder (BED)*

Binge Eating Disorder (BED) refers to frequent episodes of binge eating. Overeating in one sitting is a feature of BED. This disorder is a milder version of bulimia nervosa, but unlike it, has no compensatory behaviors (purging, exercise and fasting), and the difference between this disorder and anorexia nervosa is that there is no weight loss in this one. Meanwhile, the main feature of all these three disorders is poor eating patterns (3). The criteria for BED include: (A) Frequent binge eating episodes, identified with (1) Eating on different occasions (for instance, every two hours); (2) The lack of control over eating during the episode. (B) Episodes of BED are associated with at least three of the following cases: (1) Abnormally fast eating; (2) Eating until feeling uncomfortably full; (3) Overeating when not feeling hungry; (4) Eating when alone out of embarrassment over the amount eaten. C) Being clearly upset about binge eating; (D) Binge eating at least once a week for three months (4).

### *Feeding and Eating Disorders of Infancy or Early Childhood*

These disorders include persistent symptoms of inadequate intake of food, frequent regurgitation, repeated mastication or swallowing non-food substances. The DSM-V refers to three feeding and eating disorders in this age group: Pica, Rumination Disorder and Feeding Disorder of Infancy or Early Childhood.

1. *Pica*: Pica is a continuous eating of non-nutritious items for at least one month. Eating non-food substances after the age of 18 months is usually considered abnormal. Pica usually begins at 12 to 24 months of age and its incidence reduces with age. Specifically, small children tend to eat paint, chalk, yarn, hair and cloth, while older children tend to eat soil, animal stool, stone and paper. The disorder may be clinically benign or dangerous depending on the type of substance eaten. The most serious complications of pica include lead poisoning, intestinal parasites, anemia, zinc deficiency and severe iron deficiency.

2. *Rumination Disorder*: According to the DSM-V, rumination disorder is the frequent regurgitation of foods already chewed in children or infants following a period of normal functioning. The signs should last for at least one month. This disorder generally begins after the age of three months, and the food may be re-swallowed or spat out after it is thrown up. Ruminating infants try to return the food into their mouth and appear to enjoy these efforts. Rumination is a rare disorder that seems to be more common between the ages of three months and one year and among mentally-challenged children and adults. Psychodynamic views on the etiology of rumination have proposed turmoil in the mother-child relationship as a potential cause of this disorder. The mothers of these infants are often immature and engaged in marital conflicts and do not pay much attention to their children. Behavioral interventions such as pouring a few drops of lemon juice in the infant's mouth during rumination may be effective in reducing this behavior. This method appears to be the quickest and most effective method for eliminating rumination within three to five days.

3. *Feeding Disorder*: According to the DSM-V, this disorder is the persistent inability to eat adequately, which leads to the lack of significant weight gain or a significant weight loss over one month. This disorder begins before the age of six years (6).

#### *Epidemiology*

The major effect of eating disorders on health has made the WHO include them in the list of the highest-priority psychiatric diseases in children and adolescents (7). Many patients with eating disorders insist on not using treatment by a professional team (8), and their failure to seek a proper treatment makes the epidemiological study of these disorders difficult (1). Eating disorders have been reported all over the world, including in developed and developing countries such as Brazil and China (9, 10).

In a study conducted on a large number of 9-14-year-old American children and adolescents, 7.1% of the boys and 13.4% of the girls showed the behavioral symptoms associated with eating disorders (11). Overall, women are more affected by eating disorders than men, and the prevalence of anorexia nervosa and bulimia nervosa in a lifetime is 0.9% and 1.5% in women and 0.3% and 0.5% in men (12). The incidence of anorexia nervosa is most common in women aged 15 to 19 years, and has increased steadily between 1935 and 1999 in women aged 15 to 24 years (13).

In assessing the prevalence of eating disorders in older people (aged 50 to 94 years), 88% were women, and anorexia nervosa was observed in 81% and bulimia nervosa

in 10%, and 60% had major depression as a comorbidity of eating disorders. Behavioral and medicinal interventions were successful in them, as 42% were successfully treated. Mortality from eating disorders was reported as a secondary disorder and its complications were reported as 21% (14). A study on eating disorders in women and men and the mortality from these disorders reported that anorexia nervosa is very common among women and has not reduced significantly compared to the past and there is still an increased risk for women aged 15 to 19 years. The incidence of bulimia nervosa may have been declining since the 1990s. All eating disorders pose a potential risk of mortality, and anorexia nervosa is the most unpleasant of them. Compared to other eating disorders, bulimia is more common among men and older adults (15). Although 60% of the patients with eating disorders presenting to clinics for out-patient services have an unspecified eating disorder, this type of eating disorder has less been studied than the other types (13). An unspecified eating disorder is a broad diagnosis that includes patients with symptoms similar to the symptoms of anorexia nervosa or bulimia nervosa but does not have all the diagnostic indicators of these two disorders (16). According to various studies, 40% to 70% of patients with an unspecified eating disorder seek treatment for their disorder (17, 18).

Very few studies have been conducted on eating disorders in Iran. In a study conducted on the female students of one of the universities in Tehran, the prevalence of eating disorders was 21.5%, and the prevalence of anorexia nervosa and bulimia nervosa was 1.8% and 7.8%, respectively (19). The prevalence of anorexia nervosa and bulimia nervosa in female high school students was reported as 1.7% and 1.7% in Kerman (20). In the first epidemiological study of eating disorders in Iran, the prevalence of anorexia nervosa and bulimia nervosa in 3100 second-year high school girls in Tehran was reported as 0.9% and 3.2%, respectively (21).

#### *Pathophysiology*

A) *Genetic perspective*: The female gender is the most important potential risk factor for developing eating disorders; however, it is still not exactly clear whether this relationship is due to biological or social factors. According to studies conducted on families and twins, anorexia nervosa, bulimia nervosa and BED seem to be complex genetic diseases with a hereditary risk factor of 50% to 80% (1, 22). The relatives of a person with eating disorders have been shown to be ten times more likely to develop eating disorders in their lifetime than the relatives of a healthy person (23).

B) *Biological perspective*: The biological perspective considers eating disorders a result of biochemical abnormalities with a potentially genetic connection. People with eating disorders suffer from abnormalities in their norepinephrine and serotonin neurotransmitter systems. Serotonin seems to have a role in regulating feelings of hunger or satiety. The lack of serotonin appears to be associated with feelings of hunger (leading to overeating) and its excess with satiety (leading to the loss of appetite). More than 20% of the calorie intake is consumed in the brain, and the brain is greatly dependent on glucose. The brain tissue is thus severely vulnerable to poor nutrition, and poor nutrition can thus adversely affect the brain functions

and appetite. Epidemiological studies have shown that most eating disorders emerge during adolescence, when the brain is in a very important developmental stage, and malnutrition can adversely affect the progress of these disorders significantly (22).

*C) Psychological perspective:* In the psychological perspective, eating disorders are caused by people's inner turmoil for self-management. Some people with bulimia nervosa have a history of sexual and physical abuse in childhood. Abuse is also associated with reduced cortisol levels (i.e. the stress hormone). People with eating disorders gradually fall into the trap of disease-like patterns due to their reluctance to change their thought processes. This group insists on negative thoughts, resists change, avoids problems and has hedonistic ideas. It seems that the personality trait of dependence is closely associated with obsession and the symptoms of overeating (9).

*D) Environmental factors:* The environment has a major role in the development of certain eating disorders. Some environmental factors associated with eating disorders include public harms, such as being ignored by others, physical or sexual abuse and harmful experiences associated with food and weight, such as family's dieting, childhood or parental obesity, family's or others' criticisms of the person's eating and body form or job-related pressures to be slim (1). In western countries, harmful experiences associated with food and weight work to sensitize individuals to their body form and encourage dieting. These experiences mostly affect women, since the environmental and social pressures for being slim are greater for this gender (10).

#### *Definition of Yoga*

Yoga is the art of living and a knowledge that should become an integral part of everyday life for all people, since it has significant effects on all aspects of life, including the physical, psychological and mental aspects. Yoga is composed of the term "Yog", meaning "unity and integration". In spiritual terms in Sanskrit language, this unity means the alliance of pure personal knowledge with the cosmic soul. Yoga creates harmony and balance between the body, mind and soul. The scientific-practical system of Yoga creates this balance through physical exercise, Pranayama, Mudra and Bandha, Shatkarma, and Meditation. These exercises enable the individual to find the real truth of their body (24). Swami Sivananda, the father of the modern scientific Yoga, states: "Yoga is the union and harmony of thought, words, actions and deeds, or the harmony of the head, heart and hands, which is achieved through yoga exercises". As a system, yoga develops a union between the physical, mental and emotional aspects of human existence and reveals how each aspect affects the other and also their conflicts with each other, and eventually, this knowledge leads to a subtle understanding of the truth and existence. Yoga has a tendency toward inner knowledge. Yoga is a technique of direct, immediate, accurate and clear thinking. The entire yoga system is directed toward connecting our nature, thoughts, life and existence (25).

#### *Yoga Therapy*

The combination of yoga with other sciences creates a tool to rebalance bodily disorders. It is the duty of skilled experts to test out effective combinations of yoga and medical sciences (25).

One of the main achievements of yoga is the treatment of the body and the soul. Its most important and influential effect is creating a strong harmony and union between the body and the soul. Yoga techniques and exercises are currently used for the definitive treatment of diseases such as asthma, diabetes, hypertension, arthritis, gastrointestinal diseases and certain psychosomatic diseases in which modern medicine has failed. According to medical reports, yoga therapy is one of the most successful treatment methods, because yoga creates the harmony needed between the nervous system and the endocrines, which directly affects the internal systems of the body and its organs. In this stressful world, yoga has become the easiest way for most people to achieve health and happiness. Asanas relieve much of the daily fatigue caused by work activities such as sitting behind the desk or the effects of karmas. In addition, yoga techniques are often relaxing for the mind and psyche. Regardless of personal needs, yoga is a means of fighting anxiety and social restlessness (25).

When yoga concepts are combined with the available psychoanalysis, psychotherapy and psychological treatments for managing psychological abnormalities, a highly powerful tool is created for awakening the mental powers. Yoga is described as a technique for controlling the thought or mind waves. Yoga is a systematic approach to uniting with existence and a school of mind meditation that encourages people and helps them achieve their highest potentials and put them into action. The term "yoga" means connecting; that is, connecting the body, mind and soul. Our mind is constantly active and its positive and negative waves can affect our body and soul. The aim of yoga is to balance the human body, mind and soul. When we accept the human-being as a single entity consisting of the body, mind and soul, then we will deal with diseases in a different way. For instance, in dealing with a patient with backache, in addition to the physical factors (muscle weakness, mechanical pressures, wrong ways of sitting and standing), we will also consider mental (anxiety, concern, false ideations, etc.) and psychological (depression, etc.) factors, which is exactly what holistic medicine does (25).

Yoga therapy is a branch of holistic medicine. Patients treated with this method find out that, in addition to the main complaint which has been the reason for their visit, their other complaints will also be gradually abated. Yoga therapy uses different yoga exercises, such as Asanas, relaxation techniques, breathing exercises and meditation, which help people with a wide range of physical and mental health conditions. Yoga therapy can complement medical care or, in certain cases, even replace traditional approaches such as medication therapy or surgery. Yoga therapy often does the job of individual counseling. This method is similar to other medical care measures. Yoga therapy can also be used for a group of participants with similar conditions who seek similar treatment outcomes. In individual assessments, a certain level of detail can be gathered that contributes to planning an appropriate course of treatment for the patient. In group yoga therapy, however, the assessment is generally limited and the treatment plan is less individualized (26).

Mankind can be studied and assessed in three basic and interdependent dimensions, namely the physical, psychological and social dimensions. The physical dimension involves all the physical and organic features and

attributes of human-being. The psychological dimension is concerned with mental processes, such as thoughts, perception, deduction, logic, analytical power, judgment, emotions, excitability, emotional states, etc. The social relations dimension deals with how the person relates to others and his social adaptability, social functioning, etc. These three dimensions have interactive and complex effects on each other, and disruption in one affects the others as well. People's physical, psychological and social health is determined by the proper functioning of all these three dimensions. With this knowledge, psychologists and researchers have tried to find ways to protect people against the flood of problems. Certain trainings can make humans physically stronger, more powerful and healthier and psychologically tougher and more resilient and adaptable. Psychological resilience training includes wide and varied lessons, such as techniques for strengthening the body and mind and making them healthy, techniques for coping with stress or adapting to them and lessons for effective social communications. As a method of well-being, yoga protects human health by its various dimensions. The physical benefits of Asanas and the breathing techniques of yoga can be summarized in the following themes: (1) The removal of excess body fat, body fitness and the strengthening of the body organs and systems, and generally, improving physical strength; (2) Facilitating blood circulation and nervous system flow in the body; (3) Regulating and balancing the body hormones and the exocrine and endocrine functions; (4) Relieving fatigue, muscle spasm and causing the flexibility of the joints and muscles; and (5) Strengthening the immune system. The benefits of yoga include the following cases: (1) Recognizing one's mental processes, such as thoughts, emotions, perceptions, contemplation, mental mechanisms, expectations, motivations, desires, etc.; (2) Control over mental processes; (3) Concentration of mental forces; (4) A sense of peace, relief and liberation; and (5) Mental flourishing and transcendence (27).

Fear, worry and chronic mental pressures may present as loss of appetite and thereby weight loss. Food is tasteless when the mind is toiling with many preoccupations. Mental pressures and anxiety may present as concern about being slim, which often leads to more pressure, a loss of appetite and further slimness. On the other hand, concern about obesity also leads to anorexia nervosa. Refusing to eat turns into a prolonged fasting state, and the desire for food is lost in this state and severe hunger develops, but for fear of obesity, the person still refuses to take food (28).

The principles of yoga provide psychological relaxation and a balance and harmony of the pillars of the human psyche and promise significant improvement in physical and mental well-being (29). The relaxation exercises of yoga reduce the symptoms of depression and anxiety in patients with psychological problems (30). The students' participation in yoga classes offers psychological benefits by inducing changes in the body self-concept and components including flexibility, physical activity, endurance and self-esteem (31). Yoga classes increase compatibility and convergence between the perceived self and the idealized self-image (32). Reviews have shown that yoga has positive effects on cognitive and emotional functions. These exercises lead to reductions in the activity of the central and autonomic

nervous systems in all stressful situations, and also seem to be able to reduce the plasma catecholamine level and decrease the activity of the sympathetic nervous system significantly (33). Yoga exercises can affect a feeling of general health by increasing the adaptability of the mental, nervous, immune and cognitive systems, moderating the autonomic nervous system, increasing physical endurance and body resistance and moderating the immune system (33). A study conducted to review three articles on the efficacy of yoga therapy interventions in eating disorders and seeking to answer the question of whether yoga is an effective strategy for the management of eating disorders showed that yoga exercises, including the asana, pranayama and relaxation exercises, can reduce the severity of eating and related disorders. Nevertheless, there is no evidence to show that yoga is an effective primary treatment for eating disorders, even though its results are very promising as a complementary medicine in conjunction to psychological and psychiatric techniques (34). In assessing the role of body awareness and mindfulness in exercise and eating behaviors, the results regarding the amount of food intake and eating disorders showed that, for clinically-ill patients and those at risk of eating disorders, the body awareness offered by various forms of exercise, including yoga, can be even more beneficial than changing the amount of food intake and food regimen in the general population (35).

Along with these results, a study conducted to investigate mindful eating and its relationship with BMI, BED and anxiety and its negative effects showed that people who are less mindful of their eating behaviors are more obese and anxious and show more negative effects and have less control over their eating habits, and these variables can be predictors of eating disorders (36).

One study showed that yoga-practicing women have better bodies and are happier with their body and tend to use healthier and more appropriate weight control techniques, while obese women who only do yoga under certain circumstances, use unpleasant methods such as smoking and drinking alcohol for weight control (37). A systematic review study on the effectiveness of yoga exercises on eating disorders confirmed the positive effects of yoga, and although these effects were small, yoga did not seem to harm patients with eating disorders (38). Another study on BED and yoga showed that weekly yoga exercises at home are very effective in the treatment BED (39).

### Discussion and Conclusion

A great amount of attention has been paid to eating disorders in recent years; however, further studies may still be required for understanding the factors affecting the creation, persistence and treatment of these disorders. Moreover, a lot of interest has been raised in complementary medicine on the side of other methods such as yoga and meditation, especially mindful eating, which have fairly favorable effects on eating disorders and their comorbidities, including depression and anxiety, by exerting concurrent effects on the body and mind and leading to self-confidence and positive feelings about the body and appearance. Yoga therapy is recommended to be further considered and used for its holistic approach to humans and the specific techniques if offers for human health,

development and preparation at any stage of life and in all its dimensions.

#### Ethical consideration

Not applicable.

#### Conflicts of interests

Authors declared no conflict of interest.

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