

## Review Article

# “THE INFLUENCES OF COVID-19 PANDEMIC ON EATING BEHAVIORS: A COMPREHENSIVE REVIEW OF SCIENTIFIC LITERATURES”

## ABSTRACT

**Introduction:** General physical consequences have garnered the greatest attention during the coronavirus pandemic lockdowns, and few studies have studied the link between the COVID-19 lockdown and pre-existing mental health difficulties such as eating disorders. Our main the goal for this comprehensive analysis was to assess the impact of the COVID-19 pandemic on individuals suffering from eating disorders.

**Method:** We searched the online databases PubMed, ScienceDirect, and Springer for scientific research published up to September 2022 that studied the impact of coronavirus lockdowns on eating disorder symptoms. The authors analyzed 76 publications and 40 of them satisfied the qualifying criteria, with the majority indicating an increase in eating disorders or disordered eating behaviors related to the COVID-19 pandemic.

**Results:** Many studies suggest that young adults and those with eating disorders are more prone to the COVID-19 pandemic's effects. Disruption of lifestyle routine, social isolation, restricted access to customary support networks, limited or no access to healthcare and mental health services, and social anxiety were all related with symptomatic worsening in ED patients during COVID-19 lockdowns.

**Discussion:** Pandemic lockdowns were associated to a rise in the severity of eating disorders in general. We identified a large increase in hospitalizations during the pandemic, as well as an increase in eating disorder symptoms and mental health concerns among ED patients. Despite the fact that some studies claimed recovery, most of the qualitative studies found that eating disorder symptoms worsened as a result of decreased access to care and treatment, changes in routine and lack of structure, negative media effect, and social isolation.

**Conclusion:** This extensive study, in particular, identifies children and adolescents, as well as adults with a history of an eating disorder, as particularly sensitive populations to the COVID-19 pandemic's effects. More research in understudied and minority populations is needed, as well as an examination of the long-term effects of the COVID-19 pandemic on eating disorders and disordered eating behaviors.

**Key Words:** Eating disorder, anorexia nervosa, bulimia nervosa, COVID-19, Coronavirus

# 1. INTRODUCTION

## *1.1 COVID 19 outbreak*

Coronaviridae is a family of viruses containing positive-sense RNA and an exterior viral coat which can only be revealed by an electron microscope a distinct corona surrounding it [1, 2]. This virus family mostly causes respiratory disorders in humans, such as the common cold and pneumonia, as well as respiratory infections [3]. Though the severe acute respiratory syndrome (SARS) outbreak brought additional attention to the coronavirus, it received very little attention before 2003 [4, 5]. Almost a decade later of the SARS pandemic, in 2012, there was a MERS (Middle East respiratory illness) epidemic caused by the MERS-CoV which started from China's Guangdong region [6, 7]. In December 2019, a new coronavirus (2019-nCoV) emerged in Wuhan, China, approximately seven years after the MERS 2012 pandemic [8-14]. On December 31, 2019, the World Health Organization (WHO) received some reports regarding some patients in Wuhan, China with pneumonia related symptoms and after that, the researchers found a new type coronavirus named 2019-nCoV caused those symptoms and WHO stated on 9 January 2020 that the patients affected by new virus should be kept in isolation from others [9, 10, 13, 15]. The World Health Organization claimed the outbreak to be a pandemic globally on 11<sup>th</sup> March, 2020 [10, 13, 14, 16].

## *1.2 COVID 19's limitations on our daily life*

The COVID-19 pandemic introduced some particular limitations on daily living and mostly it causes behavioral changes and mental trauma [17, 18]. Several protective moves were taken by almost all over the world such as country wide lockdown, closing every institution, keeping apart affected individuals, quarantining suspected cases, then confining conventional movements in conformity with minimize the viral instance transmission at the community level longevity [19, 20], and all of this affected our mental health and bring some change in our daily life like sleeping pattern and eating habits [9, 19-24].

## *1.3 Eating disorder (ED)*

An ingesting disorder is a mental disease defined through odd eating behaviors so much negatively have an effect on a person's physical and mental health [25, 26]. Only one consuming ailment may stand diagnosed at a addicted time [25]. Types concerning consuming issues encompass binge consuming disorder, the place the patient eats a substantial aggregation in a brief length on time; anorexia nervosa, the place the character has an strong worry regarding being ounce and restricts food or overexercises according to manage that fear; bulimia nervosa, where individuals devour a substantial quantity (binging) since try in imitation of launder themselves regarding the food (purging); pica, where the affected person eats non-food items; thought syndrome, where the patient regurgitates undigested yet minimally ripe food; avoidant/restrictive food consumption ailment (ARFID), the place humans have a decreased yet

selective food consumption due according to half psychological motives (see below); then a group regarding mean designated maintenance then eating disorders [25]. Anxiety disorders, despair then matter abuse are common among humans together with eating disorders [27]. People fast journey comorbidity within an ingesting disorder then OCD which is estimated 20-60% regarding sufferers together with an ED bear a history over OCD [28].

#### *1.4 COVID-19 pandemic's impact on eating behavior*

It is assumed that eating disorders are increased due to many COVID-19 control actions namely, lockdown measures and social limitations [29]. According to a recent study, it has been found out that the COVID-19 pandemic has affected the eating habits of general population. For instance, variation of food consumed, uncontrolled eating and less organized meals have worsened than they were before the pandemic [30]. About 9% global population are said to be impacted by eating disorders and it is believed to be one of the most dangerous mental conditions [31]. According to eating disorder specialists, it is said that the intensity of symptoms and the extent of recurrence both may be negatively affected in eating disorder patients because of corona virus pandemic [32-35]. Again, the pandemic is also responsible for unexpected effect for eating disorder patients. For instance, Interruption in daily routine such as absence from school and work, a rise in social isolation from people, mental trauma, and family distress and anxiety also elevated [30]. There are four different ways in which the COVID-19 lockdowns lead to the symptoms of eating disorder. Firstly, the change which occurs in life. Restrictions in accessing healthcare facilities, constraints in travel and distance from grocery outlets may changes in lifestyle of people with eating disorders [36]. It has been advised in several countries to restrict grocery trips to induce social isolation in public places. For this reason, people who have eating disorders tend to buy excessive amounts of food [35]. Second of all, usage of social media is increased. As there are limitations in outdoor activities and physical interactions, people depend on browsing internet. Social media might affect eating disorders by exposing inaccurate body images, false stories and unpleasant news [37]. Additionally, irregular eating habits get worsened due to easy access to food [24]. According to a food survey conducted in Denmark, the eating habits of people have been changes in this pandemic and they started preferring foods which are heavy in sugar and fat [23]. Since the beginning of pandemic, the average sales of frozen food, cakes, snacks and other foods have rocketed whereas the amount of consuming fresh vegetables and fruits decreased [23].

Last but not the least, the sudden lockdown and the negativity of corona virus are responsible for making people with eating disorders more stressed and changes in their appetite [37] Although there is a huge amount of evidence, no comprehensive assessment conducted on the topic called effects of corona virus pandemic on eating disorder patients on the basis of symptoms, body mass index and hospitalizations outcome [22]. A few numbers of studies which have been published on this topic and they are guided by particular inclusion and exclusion. As an example, these studies examine particular eating disorder namely anorexia nervosa and exclude people with disordered eating habits [38-40].

### *1.5 Aim of the study*

The aim and only objective of this study is to find a correlation between the protective measures taken due to COVID-19 pandemic and eating disorders by systemically reviewing the findings of various scientific literatures, also, analyze the factors responsible for changes in eating disorder rate due to corona virus pandemic. Data will be taken both quantitatively and qualitatively which is assumed that the results will help hospital management and government policy to prevent or stop the eating disorder symptoms from worsening and will assist in the procedure of upcoming pandemics.

## **2. METHODOLOGY**

### *2.1 Literature searching*

The stricture duration started in September 2022, yet was persisted with the aid of similarly timed updates in November 2022. For the review, describing the incidence of ingesting an illness into the COVID-19 pandemic was once beyond the reach of ternary famous databases like PubMed, ScienceDirect, and Springer. These databases had been selected due to the fact that they are probably in conformity with the occurrence of the just relevant effects because of the research subject and the determination criteria. The authors used synonyms and other related words of eating disorder were used to search literature from those databases.

### *2.2 Literature screening and data referencing*

EndNote 20.4 software is chronic because of bibliographic referencing, or MS Excel is ancient for screening the writing out of these databases. The facts gathered beyond the literature were assembled or examined in terms of the year of publication, authors, sample, country, and kind of study. The records had been incorporated into an MS Excel sheet by categories matching the number of demographic types. For the review, the pattern sizes, lousy discipline parameters, study design, outcomes, and accomplishment findings for each lesson have been retrieved.

### *2.3 Literature selection for review*

Electronic database searches recognized 850 records and after eliminating repeated and irrelevant records, literatures 76 literatures were retrieved and reviewed by all authors. Overall, 40 scientific literatures had been included in this systemic review.

## **3. RESULT**

### *3.1 Eating disorder assessment on general people*

The Eating Attitude Test 26 (EAT-26) was used by Trott et al. (2021) to examine the alteration in eating disorder during the lockdown period, and they found that addiction to exercise was

significantly lower, which significantly increased the symptoms of eating disorder during the post-COVID-19 lockdowns [41].

Additionally, Pre-COVID-19 and post-first lockdown food and exercise habits were compared. After COVID-19, the average score increased greatly which indicate that lockdown quarantine could have a great effect on morbid eating behaviors [41].

The 7-Item Binge-Eating Disorder Screener was used by Cecchetto and his team to investigate eating disorder psychopathology and the Dutch Eating Behavior Questionnaire was used to examine emotional eating during the lockdown of pandemic and their findings show that isolation and confinement have a detrimental impact on emotional well-being and, consequently, eating habits [42]. According to data from 365 Italian citizens analyzed by them, more emotional eating was predicted by higher sadness, anxiety, personal connection quality, and quality of life, whereas increased bingeing was indicated by higher stress [42]. Furthermore, they discovered that greater alexithymia scores were linked to increased emotional eating, whereas higher BMI scores were linked to both increased emotional eating and binge eating [42].

Again, Machado and his fellow colleagues were conducted a study during lockdown at Portugal on 2,028 female students to assess eating disorder symptoms by using “Eating Disorder Examination-Questionnaire” and also they arranged a oral examination on this assessment [43]. Machado and his teammates was found that 3.06% young females were prevalent of all eating disorders and 0.39% for anorexia nervosa, 0.30% for bulimia nervosa, 2.37% for eating disorders not otherwise specified (EDNOS) [43].

According to the findings of Branley-Bell, the epidemic is having a profoundly harmful influence on those who have experienced eating disorders which was assessed by a 5-point Likert Scale survey questions [44].

Participants in five trials emphasized the theme of isolation, and they indicated that loneliness, anxiety, and despair caused by remaining at home led to the exacerbation of ED symptoms [44-48].

### *3.2 Eating behavioral change after hospital admission*

Eleven research evaluated admittance discrepancies before and after the pandemic, with unique findings ranging from 0% to 123% [49-59]. Though the aggregated hospital admissions from the trials revealed a 48% increase in ED admissions during the pandemic compared to earlier timepoints, when comparing pediatric admissions to adult admissions, there was an average rise of 83% in pediatric admissions and only a 16% increase in adult admissions [50, 51, 55, 57]. According to Parsons and his colleagues, COVID-19 has had an influence on three major areas: the experience of persons with eating disorders, the experience of service providers, and the impact on the family situation [58]. Another researcher Gabriella Springall raise voice on COVID-19 restrictions and reported that it triggered eating disorder symptoms in 40.4% of patients who diagnosed with anorexia nervosa in 2020 [59]. Ayton and his teammates conducted a study on 351 referrals for admission, of which 97% were female and 95% were diagnosed with anorexia nervosa. Interestingly, the number of referrals with eating disorders has increased by

21% after the pandemic, which may indicate the relation between COVID-19 and eating disorders [54]. Miss Sara J Hansen also performed a study on referrals for admission and hospitably admitted individuals (n = 106) of New Zealand, by which she found that eating disordered patients significantly increased during countrywide lockdown [56]. Richardson et al. conducted a thematic analysis of instant chat communications with the National Eating Disorder Information Centre during the pandemic year and highlighted lack of access to treatment, increasing symptoms, feeling out of control, and a desire for support as major themes [60]. Individuals with EDs had both positive and negative attitudes toward telemedicine during the pandemic; the majority indicated satisfaction with telehealth/remote therapy, but others pointed out its limitations, such as technological obstacles or difficulty monitoring one's own weight [61-63].

### *3.3 COVID-19 exacerbation of eating disorder behavioral symptoms on adolescent*

Many scientific studies and systematic reviews among adult and adolescent have been conducted from 2021 to date on eating disorder exacerbations during the coronavirus disease pandemic of 2019, and the authors found mixed results from these studies.

Five studies conducted investigation through retrospective analysis to examine eating disorder condition in hospitals or in patient units where the COVID-19 pandemic was found to be connected with increasing number of young individuals immediate requiring medical attention [50-53, 64].

Touyz and his friends found that those who were unable to go to the gym due to the COVID pandemic had heightened concerns about gaining weight and anorexia nervosa (AN) [34]. Similarly, many athletes stayed at home for more time due to the quarantine period and consumed more food, which imbalanced the calorie level and caused weight gain because of less exercise, which resulted in bulimia nervosa (BN) for them [34]. Buckley et al. found an increase in disordered eating in their sample of current and past adult athletes, including 21.1% of those with a diagnosable eating disorder and 32.8% with self-reported worsened food interactions at this early stage of the pandemic [65]. The researchers also analyzed the data and concluded that inhibitory food control and binge eating were the primary causes of disordered eating [65]. In November 2021, Linardon and his colleagues performed a subsequent scoping review on some studies executed on some adult individuals in an at-risk population, including athletes with proven ED who were more vulnerable to pandemic symptom escalation [66]. COVID-19 had a rapid influence on adolescents with ED, causing an increase in symptoms and impairment and the need for prompt therapy. A study was conducted by Graell and his colleagues, who reported that the emergence of eating disorder symptoms in adolescents was higher than in children as of March 2020 [49]. They found that anorexia nervosa and restrictive eating disorders predominated among the adolescent and school-age patients, and about 41.9% of participants reported the recurrence of eating disorder symptoms during the lockdown period [49].

Spettigue and his fellow team members executed a comparison study from April 2020 to October 2020 on some teenage participants who reported for an eating disorder prior to the COVID

pandemic and those who resented during the COVID pandemic [53]. From this study, Spettigue and his fellow team members found that the adolescents who were reported with ED symptoms during the pandemic had lower percentages of target weights, greater rates of self-reported impairment, and were much more likely to be medically unstable and require hospitalization [53].

Haghshomar et al., in a meta-analysis of adolescent subjects with ages ranging from 13 to 70, found that 59.65% of the 7848 samples had a prevalence of binge eating exacerbation, food restriction, purging behaviors, and anxiety about food intake [67]. To the best of these authors' knowledge, no investigations on COVID-19 teenage athletes' worsening of ED behavioral symptoms have been done. Nonetheless, the available evidence implies that their symptoms will intensify as the pandemic persists.

Guanghai Wang and Hatice Ünver observed that, when the youngsters stay at home and restrict their outside activities, they may become less physically active; socially isolated from their customary surroundings and bereft of peer relationships; spend significantly more time viewing screens; have erratic sleep patterns and eating behavior [68, 69].

### *3.4 Impact of COVID 19 factors associated on eating behaviors*

The majority of the research reported that there is a connection between factors associated with COVID-19 pandemic and rising in eating disorder symptoms in which the main themes behind COVID-19 pandemic were uncontrolled over eating, restrictions to receiving professional treatment, recovery and worsening of symptoms, efforts to self-manage treatment, increase of anxiety and stress, benefits of lockdown such as less social pressure [70]. A common factor revealed by five studies that corresponded to negative experiences of patients with eating disorder during the pandemic was disruptions in routine or a lack of structure, as well as a loss of control [44-48]. Three studies found that triggering messages in the media were a factor in the worsening of eating disorder symptoms [44, 47, 48]. According to them, social media and mainstream media messaging typically focused on the general worry of gaining weight; topics such as exercising and eating healthily during the epidemic, as well as diet discourse, were identified as stressful and triggering for people with eating disorders [44, 47, 48]. In a study it was revealed by the participants, particularly the eating disorder patients, that the lockdown and quarantine procedures led to alteration in daily activities, surroundings and social context [71, 72]. Additionally, these extreme variations in daily life made the patients more sensitive to side effects namely, increased binge eating frequency [72]. The findings were confirmed by Machado et al., where majority of the participants thought that lockdown had a moderately significantly detrimental effect on their daily lives including problems with emotional regulation, restrictions in accessing healthcare services and worsening of eating disorder symptoms [43].

### *3.5 Impacts on eating disordered patients*

It was found in a study that patients with Anorexia Nervosa gradually gained weight as well as their eating disorder symptoms improved during lockdown period [73]. The study illustrated the

key ideas regarding COVID-19 pandemic in adolescent anorexic nervosa patients which showed both the worsening and improving of eating disorder symptoms in patients [73]. For instance, patients experienced an increase in anorexia nervosa-related cognitions and behaviors when they felt isolated at home and accompanied by family members [73]. In addition, it also highlighted how patients provided greater consideration to their “personal needs” because of less stress from attending school and socializing [62]. Moreover, bulimia nervosa patients contained less episodes of binge-eating during lockdown period which is found out in a survey [74].

### *3.6 Improvement in eating disorder symptoms*

In a study, majority participants (86.7%) experienced an increase in eating disorder symptoms, whereas only two patients claimed that their symptoms showed slight improvement during the lockdown while 25.7% said their symptoms got worsened [44]. There are four studies found that focused on the positive sides of COVID-19 pandemic, which allowed participants to consider and control their symptoms of eating disorder leading to improving their state [46, 48, 62, 63]. Graell et al. investigated that 80% children and adolescents of the total participants claimed that their family relationships have enhanced during the eight weeks of confinement stage and that is because of the reduction in the symptoms of anorexia nervosa [49]. There are six studies that showed positive outcomes where’s the individuals claimed that lockdown restrictions protected them from past trauma or triggers and they got time to take care of themselves and increased social support sometimes [44, 46, 48, 61-63]. According to two studies, there were no variations in eating disorders or disordered eating behaviors connected to COVID-19 pandemic [70, 75]. In a study, the symptoms of eating disorder patients were the same for all participants during the pandemic [70]. Again, as per two investigations, there were not any differences in the disordered eating behaviors namely, binge eating, purging or exercising during COVID-19 pandemic [75, 76].

## **4. DISCUSSION**

Eating disorders are defined as the disturbance of eating behavior associated with extreme concern about body weight which harms one’s physical or psychological health [77]. Anorexia nervosa, bulimia nervosa and atypical eating disorders are the three diagnostic classification of eating disorders [78, 79]. As the characteristics of these disorders are similar, patients often switch between the disorders. The factors behind eating disorders are sophisticated and poorly understood [78]. The restriction of nutritional intake in comparison to needs which leads to significantly low body weight is known as anorexia nervosa [79]. The characteristics of this eating disorder includes distorted body image, phobia of gaining weight and an inability to understand the severity of their disease [79]. Eating disorders may have detrimental impacts on many stage of life such as physical, mental, and social difficulties that can degrade quality of life (QOL) [80]. The effects of lockdown measures are correlated with the coronavirus pandemic and the purpose of our study to investigate the connection between eating disorders and lockdown of the COVID-19 pandemic. This study particularly aimed to examine whether the eating disorder

symptoms worsened during COVID-19 lockdown period. The study indicates that patients with eating disorders experienced worsening of symptoms during the lockdown period of COVID-19 as well as the disordered eating behavior exacerbated. Among these patients, the probability of recurrence or worsening of symptoms was increased due to changes in social and home environment, self-isolation and disturbance in accessing healthcare facilities [81]. Many people might find it hard to manage compensatory activities such as physical exercise because of lockdown measures and it has made their preoccupation with weight and shape worse and raised the symptoms of eating disorders [81].

Most importantly, we observed a positive effect on the increase of hospitalizations due to EDs after the epidemic began. The pooled average of 11 studies indicated a 48% increase in hospital admissions during the pandemic compared to the same time period the previous year, with pediatric and adult admissions increasing by 83% and 16%, respectively. This is very definitely an underestimation; for example, one study only looked at hospital admissions two months after the lockdown and found no difference when compared to the same period the previous year [49]. This little duration of follow-up may not have provided enough time to detect worsening ED symptoms. Other qualitative research cited factors such as limited access to health care and treatment transitions from in-person to virtual care as contributing to the considerable rise in hospitalizations [6, 44-47, 60-62, 71]. These barriers and gaps in care, along with "coronophobia," or dread of contracting the virus, may have resulted in further deterioration and admission for medical instability [55]. Changes in physical activity rates, restricted access to healthcare services, disturbance to routine and perceived control, changes in connection with food, greater exposure to triggering messages, and good results were highlighted as eight major themes by D. Branley-Bell and C. V. Talbot [44]. Their findings hint to negative impacts on psychological well-being, such as decreased feelings of control, greater social isolation, increased rumination over disordered eating, and low feelings of social support [44].

The COVID-19 epidemic intensified body and eating issues in transgender and non-binary people [45]. While participants experienced a loss of affirming venues during the COVID-19 epidemic, few identified new supportive spaces online, such as transgender and non-binary online eating disorder support groups [45].

Another research discovered regional disparities in video treatment uptake, with patients with BN in the United States and the Netherlands using more video therapy than those in Germany [61]. Many patients indicated pleasure with telehealth and remote therapy in qualitative research; nonetheless, other patients noted frustration with technical challenges or that self-monitoring one's symptoms and weight was unpleasant [61-63]. As virtual care is expected to play a role in patient care in the future, more study is needed to understand how to reduce obstacles and enhance its utilization.

Patients with eating disorders frequently reported worsening mental health symptoms such as sadness, anxiety, stress, and emotional dysregulation during the pandemic compared to prior time periods [50]. The COVID19 pandemic has had a substantial influence on the general population's mental health, including mood swings amid tougher lockdown measures, increased

suicide ideation, self-harm, and emergency department visits and hospitalizations for the same [50]. This supports the findings of one study, which found that those with BN had more severe COVID-19-related posttraumatic symptoms than healthy controls [73]. As a result, it's not surprising that the pandemic's additional stress and uncertainty, along with a loss of activities and social engagements, may be hurting the mental health of this vulnerable cohort, creating or aggravating an ED in some.

Only 8 of the 40 publications in this systematic review were about pediatric populations. As a result, it's unclear if the review's findings apply to the pediatric population with eating disorders. Nevertheless, Graell et al. discovered that over half of the pediatric participants had deteriorating ED and emotional symptoms, and a quarter had suicidal ideation [49]. Additional pediatric research found increasing eating behavior and depression/anxiety during the pandemic [62, 68]. In a case series of juvenile patients, all three patients lost large amounts of weight. This may reflect a broader pattern in which the pandemic's impacts on mental health appear to have been more severe in young individuals [68, 69]. This may reflect a broader pattern in which the pandemic's impacts on mental health appear to have been more severe in young individuals.

Although some individuals reported an improvement in their ED symptoms [43, 44, 62, 63, 82], the majority of the research found that those with eating disorders were more likely to have their symptoms deteriorate during the COVID-19 epidemic. Changes in social and home environments, as well as self-isolation and disruptions in access to healthcare, may have raised the likelihood of recurrence or exacerbation of symptoms for these populations. Individuals may have struggled to sustain compensatory activities such as excessive physical activity as a result of lockdown demands, aggravating weight and form concern and so intensifying eating disorder symptoms. The COVID-19 measure demonstrates a positive link with disordered eating behaviors in the general population, according to the majority of cross-sectional and longitudinal research reviewed. Our findings suggest that disordered eating patterns, such as binge eating, body image concerns, and uncontrollable eating, may have played an important part in coping during this time. Our study also showed that lockdown and quarantine restrictions during the COVID-19 pandemic made alteration in the daily activities of eating disorder patients including increased eating binge frequency, worsening of eating disorder symptoms, depression and anxiety. In case of adolescents, the eating disorder symptoms raised which was linked to the lockdown activities during the pandemic. However, some of the studies found out no significance difference in the eating disorder symptoms pre- or post-lockdown period.

Hunter and Gibson define this period as a "mixed bag" of pleasant and negative events for those suffering from an eating problem [46].

## **5. LIMITATIONS OF THE STUDY**

Despite the fact that the current study is a systematic analysis of several scientific literature results, it does have certain drawbacks. To begin with, our risk of bias evaluation revealed that the majority of the studies included in our study were of poor quality. In particular, most cross-sectional studies were assessed as being of low quality, but all qualitative studies were ranked as

being of high quality. The qualitative and mixed methods studies likewise featured varied populations in terms of age and diagnosis, and many lacked standardized questionnaires to measure symptoms, instead relying on qualitative themes gleaned from interviews or survey answers. Second, there was little pediatric data. More pediatric data would thus benefit academics and clinicians in understanding the unique challenges that children with eating disorders encountered during the pandemic. Finally, additional long-term study is needed to better understand the roots and connections that lead to pandemic fear, which will assist in guiding future epidemics and preparing for emergency circumstances; this is critical for future success. Follow-up research might help characterize future changes in population eating patterns.

## **6. CONCLUSION**

We identified a substantial increase in hospitalizations during the pandemic, as well as an increase in eating disorder symptoms, anxiety, sorrow, and BMI alterations in individuals with eating disorders. These changes, however, appeared to be age, diagnosis, and time dependent. This comprehensive study, in particular, highlights children and adolescents, as well as adults with a history of an eating disorder, as potentially vulnerable populations to the impacts of the COVID-19 pandemic. Many qualitative studies observed increased eating disorder symptoms due to decreased availability to treatment and therapy, changes in routine and lack of structure, negative media effect, and social isolation. Given the general low quality of the papers included in this review, high-quality research will be required in the future to determine the long-term effects of the COVID-19 pandemic on eating disorders and disordered eating behaviors.

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