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COVID-19 AND EATING DISORDERS: HOW COVID-19 INCREASED THE
PREVALENCE AND SEVERITY OF EATING DISORDERS, AND THE LASTING
IMPLICATIONS

A Thesis Project Presented in Partial Fulfillment
of the Requirements for the Degree Bachelor of Science in Nursing
with Mahurin Honors College Graduate Distinction
at Western Kentucky University

By

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September 2022

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ABSTRACT

COVID-19 brought on a whirlwind of changes that were impossible to have foreseen. The impacts on individuals have left lasting impressions, the natures of which continue to be unearthed even now- 4 years later. This thesis will outline the impacts of COVID-19 on those suffering from eating disorders and disordered eating habits, as well as ideas for how to support and care for these individuals through their continued hardships which have been set in motion by the pandemic.

The research conducted on this topic utilized peer reviewed articles found through databases such as CINAHL, PubMed, and Cochrane Library. The findings indicate the various effects of COVID-19 on eating disorders such as increased isolation, decreased access to care, and food shortages. These are just a few examples of the areas that majorly impacted eating disorder development and recovery. For individuals recovering from eating disorders, routine and comfort are vital in the rehabilitation process and so any occurrence that impacts the care of the patient can be detrimental to recovery (Baenas, 2020). Through identifying the specific effects of these challenges, goals for improvement are identified. For example, utilizing telehealth and socially distanced meetings with healthcare providers are ways to tackle the issues related to access to care.

The research conducted found that eating disorder severity and prevalence were both increased as a result of the COVID-19 pandemic. Increased social isolation, increased social media use, and toxic stress levels all contributed to disordered eating habits and the development of eating disorders. The future of eating disorder treatment has been impacted greatly, as the effects of COVID-19 on treatment and care for

individuals with eating disorders has been shown to be majorly flawed. Improvement of the systems responsible for the care and keeping of these individuals is vital to the future of effective eating disorder treatment, screening, and prevention.

I dedicate this thesis to my parents, Michael and Leah Rogers, who are a great inspiration to me. Also, I dedicate this work to the individuals who experienced the contents of this thesis firsthand, you are braver than you know.

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I want to thank my nursing friends: Amanda, Tessa, Meredith, and Matilda for encouraging me to not give up. Without your friendship, I don't know where I would be. You all amaze me every day, and I am beyond blessed to call you my friends.

^ Last, but certainly not least, I want to thank Holden Schroeder. Your constant support and guiding light have helped me to grow into the person I am today. Without you, I would be far different. I love you, my dear, and I thank you for all that you do for me.

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SECTION ONE: BACKGROUND

The prevalence of eating disorders appears to be increasing as time goes on (Smink, 2012). It is important to understand that the knowledge on the long-term effects of eating disorders is largely unknown, as research documenting the long term effects are hard to come by (Smink, 2012). The causes of eating disorders remain enigmatic, and are subject to ongoing studies aimed at identifying risk factors and genetic predispositions. Having knowledge on what can lead someone to develop an eating disorder may aid in identifying at-risk individuals through the ability to create more enhanced screening opportunities. Cultural and environmental factors have been identified as potential influencers on the development of eating disorders, as well as the potential susceptibility of those who already suffer from a mental illness such as anxiety or depression (Smink, 2012). Comorbidities are seen often in cases of those with eating disorders, and their role in severity of eating disorder symptoms is in the process of being researched.

The research that is available for review is largely narrow in its subject field, as a majority of research done on eating disorders is centered on their severity and prevalence within groups of caucasian young adult women (Smink, 2012). Due to the narrow window of knowledge of eating disorders, it is difficult to curate treatment for different types of people. The largest challenge within the eating disorder community is unmet treatment, and having limited knowledge on the scope of eating disorders further aggregates the need for knowledge on how to help people who do not fit into the mold of being a caucasian female.

The impacts of COVID-19 on eating disorders are significant due to the knowledge that many eating disorders stem from emotion-regulation difficulties and childhood trauma (Brustenghi, 2019). The increase in mental strain and environmental stressors on the human body have the potential to negatively affect the healthiest of people, and so being vigilant in monitoring the effects on those who suffer from the inability to appropriately deal with emotions is extremely important, especially in the midst of quarantine during a global pandemic.

Table 1. *Specific Risk Factors to Eating Disorder Development.*

Eating-disorder specific risk factors	
Food access	Real or perceived food scarcity Reduced access to food and/or specific food preferences Food abundance due to reduced grocery trips Greater demand on food stamp programs Increased eating-related guilt
Media and media messaging	Exposure to distressing media coverage of COVID-19 Social media comparisons Increase in fatphobic messaging (e.g., "Quarantine 15")
Exercise limitations	Limited avenues for exercise engagement and social exercise Restrictive or restrained eating to compensate for exercise abstinence or general reductions in daily physical activity Increased psychological distress Potential for withdrawal symptoms from exercise
Restricted healthcare access	Inability to access higher levels of care Telehealth restrictions Lack of insurance coverage for telehealth, state regulations
Exacerbated risk factors in light of the COVID-19 pandemic	
Stressful life events	Major changes to life circumstances Bereavement Gender-related differences Impacts on healthcare workers and individuals with COVID-19
Anxiety	Increased uncertainty Increased use of ED behaviors as coping mechanisms Hypervigilance of internal bodily states
Social isolation and decreased social support	Separation from support systems Solitary self-isolation Specific LGBTQIA+ concerns
Trauma and abuse	Increased possibility of domestic violence Increased likelihood of household conflict
Perfectionistic expectations	Normalization of perfectionism Blurred work-life boundaries Pressure to focus on "self-improvement"

(Cooper et al 2020)

SECTION TWO: INCREASE IN THE SEVERITY OF EATING DISORDERS

Eating disorders and their severity have been impacted through the isolation and quarantine enforced by the government, as well as by the heightened levels of stress presented due to the hectic nature of the COVID-19 global pandemic. According to an editorial from Wiley, many of the worsening conditions can be attributed to different aspects of the responses to the pandemic (Weissman et al., 2020). As seen in Table 1, with the onset of quarantine and isolation, specific risk factors have been made more prevalent for some eating disorders. By way of the increase in news coverage and viewing, those who are predisposed to suffer from stress related disorders see a heightening in anxious behaviors as a result of daily news reports broadcasting the number of infections and deaths in the midst of COVID-19 (Weissman et al., 2020). In addition to the coverage on COVID-19 related deaths and infections, the media has also seen an increase in coverage on the trends in grocery shopping (Weissman et al., 2020). Pervasive news coverage over the threats of food shortages, state of food safety, and decline in accessibility are seen to cause an increase in stress, particularly for those suffering from eating disorders (Weissman et al., 2020). Increases in food-related guilt due to food shortages leads to an increase in severity, as well as the development of new symptoms. For an individual who previously engaged in binge-eating, a shift to a more

restrictive diet can be seen as a direct result of exposure to media coverage of food access (Cooper et al, 2020).

As a result of quarantine and isolation, an emphasis on health and fitness in the media can also be found. A large number of online articles are found to be centered around “losing the quarantine 15” and “how to look your best on a webcam”, which emphasize at-home workout challenges to obtain a “quarantine glow-up” (Weissman et al., 2020). Through the pervading coverage on weight and physical appearance, the media may be inadvertently reinforcing cognitions and behaviors that reflect those of eating disorder mentalities (Weissman et al., 2020). While emphasizing the importance of remaining active during quarantine is not inherently negative, lack of access to means to exercise has the potential to cause individuals to feel the need to restrict their diet in order to combat inactivity (Cooper et al., 2020).

In addition to the toxic topics perpetuated in the media, stay-at-home orders offer a means to continue to engage in restricting behaviors (Weissman et al., 2020). The enforcement of isolation in quarantine and limited food selections available in stores have the potential to offer individuals a way to rationalize engaging in restrictive behaviors, such as excessive calorie-counting and skipping meals (Cooper et al., 2020). The pandemic has thus exacerbated pre-existing restrictive tendencies by allowing individuals the opportunity to engage in restrictive behaviors without supervision and oversight.

Since many individuals who suffer from eating disorders are experiencing them in tandem with psychiatric disorders such as anxiety and depression, the COVID-19

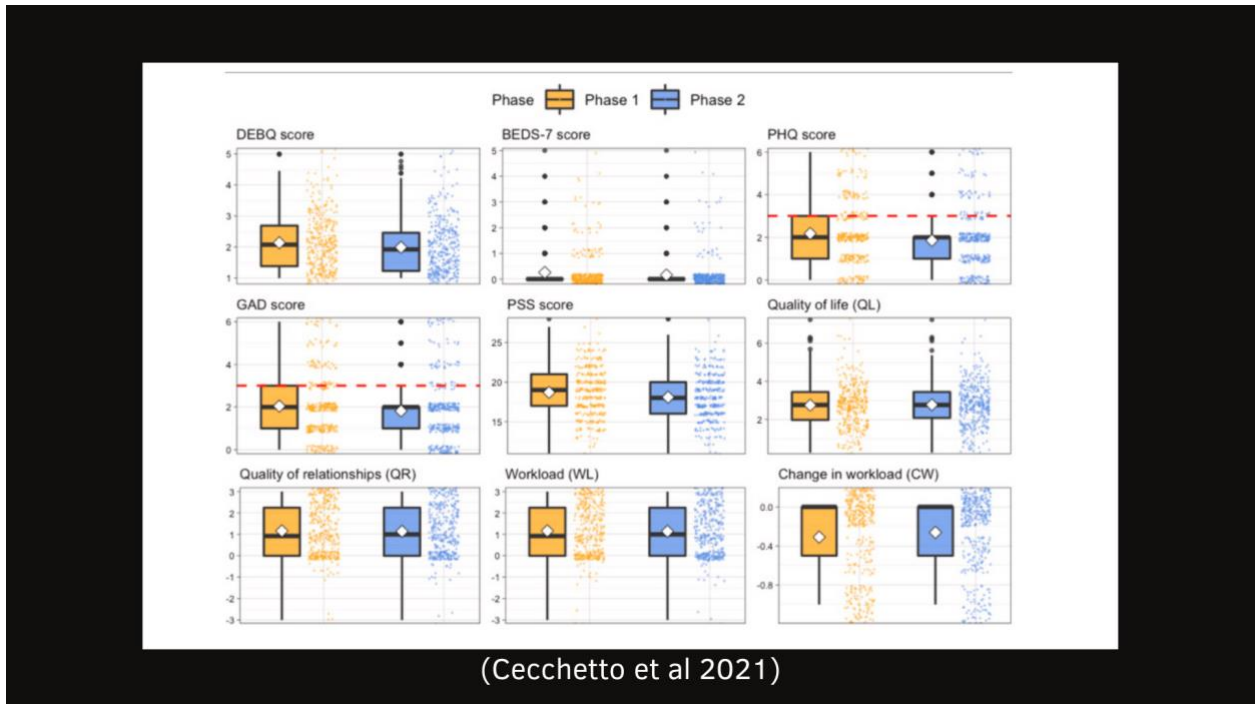
pandemic has only worsened the mental health of these individuals by compounding the emotional strain they are experiencing as a result of the pandemic with unmet needs due to social distancing requirements and the closing of non-essential businesses (Termorshuizen et al., 2020). When faced with heightened levels of anxiety in quarantine, individuals are more likely to return to restricting behaviors in order to find some relief in a coping mechanism (Cooper et al., 2020).

As mentioned previously, lack of access to treatment for eating disorders has been one of the largest issues since the acknowledgement of them as a mental illness. COVID-19 has further increased the number of individuals who are not actively receiving treatment for their symptoms due to telehealth restrictions and COVID-19 social distancing guidelines (Cooper et al., 2020). Due to job loss and lack of insurance coverage, many individuals were faced with having to stop receiving care for their eating disorder (Cooper et al., 2020). Not only has COVID-19 impeded advancements towards recovery, but has also caused many individuals to relapse into more severe cases of eating disorders and backtrack in their path to recovery (Cooper et al., 2020). The quality of treatment in quarantine has also been affected, and many studies have shown that patients who marked a decline in the quality of their care during COVID-19 also showed a worsening and increase in occurrences of dietary restrictions and compensatory behaviors (Termorshuizen et al., 2020).

SECTION THREE: INCREASE IN THE DEVELOPMENT OF EATING DISORDERS

Similarly to the increases in the severity of eating disorders, COVID-19 also has the potential to have caused an increase in the number of people who suffer from eating disorders (Fernández-Aranda et al., 2020). Due to the isolative nature of COVID-19 and the stressful environments perpetuated by the lack of guidance during this pandemic, the implications on the future of eating disorders is severe (Fernández-Aranda et al., 2020). While things like lack of accessibility to mental health professionals and an emphasis on physical appearance in the light of quarantine contributed to a worsening in symptomatology of eating disorder patients, they also caused an environment ripe for the development of eating disorders to be created (Fernández-Aranda et al., 2020). For many individuals, the reliance on social media to form connections further increased their exposure to harmful media content, which caused them to develop extremely negative views of their body image (Weissman et al., 2020).

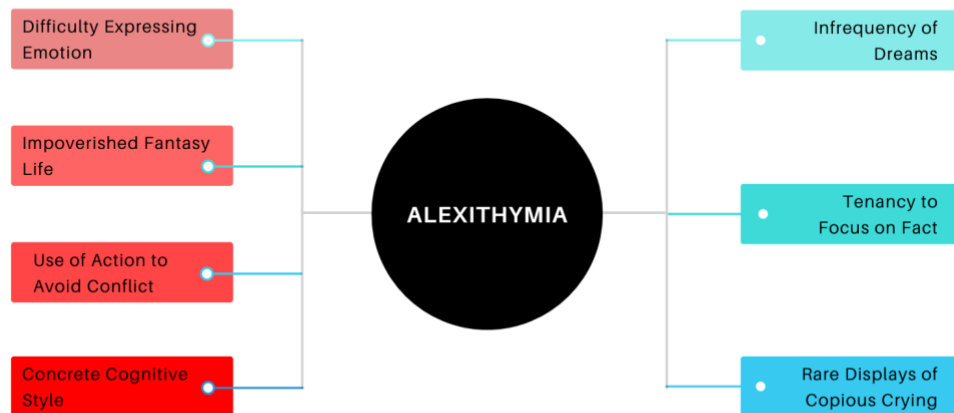
Figure 1. *Influences on Emotional Eating*



The increase in instances of emotional eating is also seen to have a direct correlation with the development of eating disorders in quarantine, as the utilization of food consumption as a coping mechanism has increased in occurrence since the COVID-19 pandemic began in 2019. The type of emotional eating is also seen to be influenced by external factors, and helps to show how emotional eating can develop into a full fledged eating disorder (Cecchetto et al., 2021). A study conducted during quarantine aimed to identify the effects of COVID-19 on emotional eating in Italians. The findings of the study, reflected in Figure 1 above, show that instances of increased levels of depression and anxiety, as well as a decrease in the quality of relationships and quality of life, are linked to higher levels of emotional eating (Cecchetto et al., 2021).

Along with these findings, an increase in stress levels was associated with higher levels of bingeing (Cecchetto et al., 2021). A similar study conducted in the United Kingdom had the same results, and this study went a step further and found a linkage between emotional eating and emotion dysregulation (McAtamney et al., 2021). The link between the onset of emotional eating in individuals who have no history with restrictive eating shows that there is a clear path to the development of eating disorders as a result of increased stress levels, which shows how disastrous the onset of a global pandemic and isolation can have on the prevalence of eating disorders (McAtamney et al., 2021).

Figure 2. *Alexithymia Presentation*

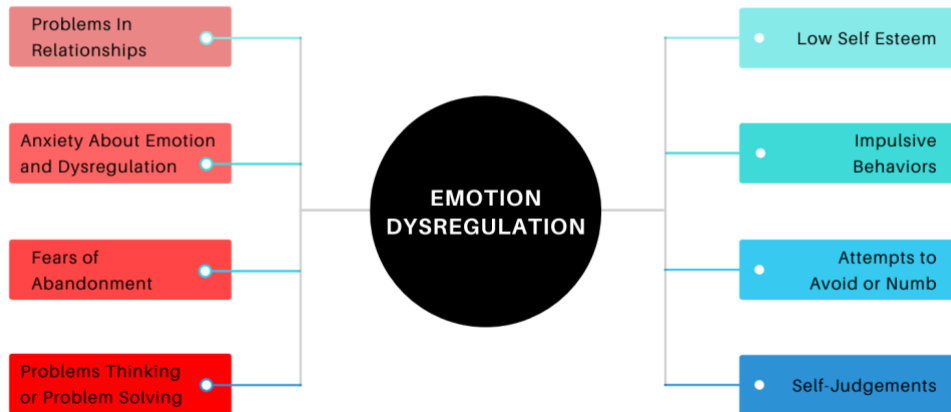


A similar study conducted in the United Kingdom sought to identify changes in eating behavior within the population (McAtamney et al., 2021). Data from the study aimed to explore perceived changes in eating behaviors within citizens in the United Kingdom in relation to self-reported negative affect during the pandemic, and to examine

direct and indirect effects of alexithymia on emotional eating (McAtamney et al., 2021). The online questionnaire measures the constructs in the general population of the United Kingdom in a sample size of 136 (McAtamney et al., 2021). The study distinguishes emotional dysregulation from alexithymia, and aimed to isolate the effects of alexithymia on the development of emotional eating. Alexithymia can be defined as the inability to recognize or describe one's own emotions. In contrast, emotional dysregulation refers to a poor ability to manage emotional responses or to keep them within an acceptable range of typical emotional reactions. While these two disorders are similar in their effects on the human body, it is important to distinguish them in order to fully understand how they influence the development of emotional eating occurrence. When compounded with quarantine and isolation, the impact of alexithymia and emotional dysregulation can be seen and combated in the most effective ways possible.

As seen in Figures 2 and 3, the outward expressions of alexithymia and emotional dysregulation present themselves very differently. It is evident that emotional dysregulation has a tendency to more negatively impact relationships with others, while alexithymia impacts the inward reflection of the individual. The disconnectedness exhibited in cases of alexithymia results in the lack of self-awareness and ability for the individual to feel the emotions taking place, which only leads to more issues later on (McAtamney et al., 2021).

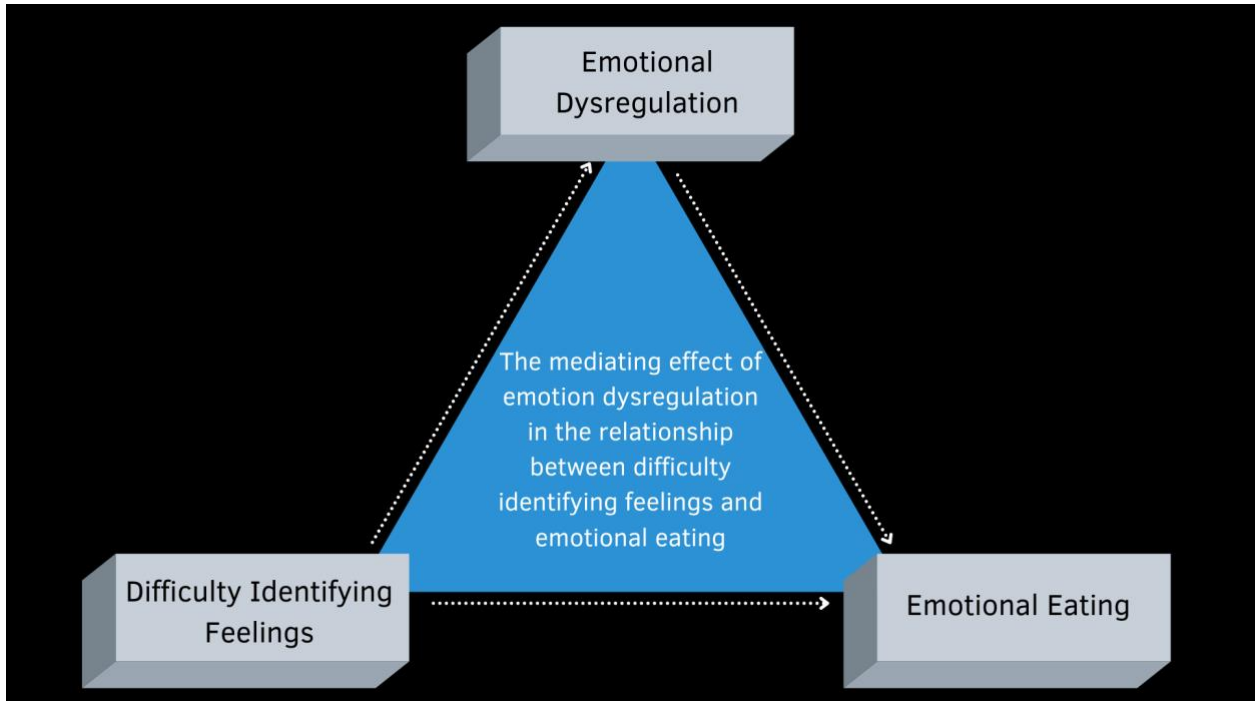
Figure 3. *Emotional Dysregulation Presentation*



Now that the differences between alexithymia and emotion dysregulation have been explained, the findings of the study can be adequately expressed. The study performed in the United Kingdom found that emotional eating is related to emotion dysregulation and alexithymia (McAtamney et al., 2021). One quarter of the participants of the study reported eating more than usual during COVID-19, and one third of the participants reported eating less healthfully than usual (McAtamney et al., 2021). A majority of the participants reported not currently dieting (at 82.4%). The participants who reported an alteration in eating behaviors, both increase and decrease, came to be 41.9% (McAtamney et al., 2021). The group that reported an alteration in eating

behaviors also reported significantly greater instances of alexithymia and depression during the same time frame (McAtamney et al., 2021).

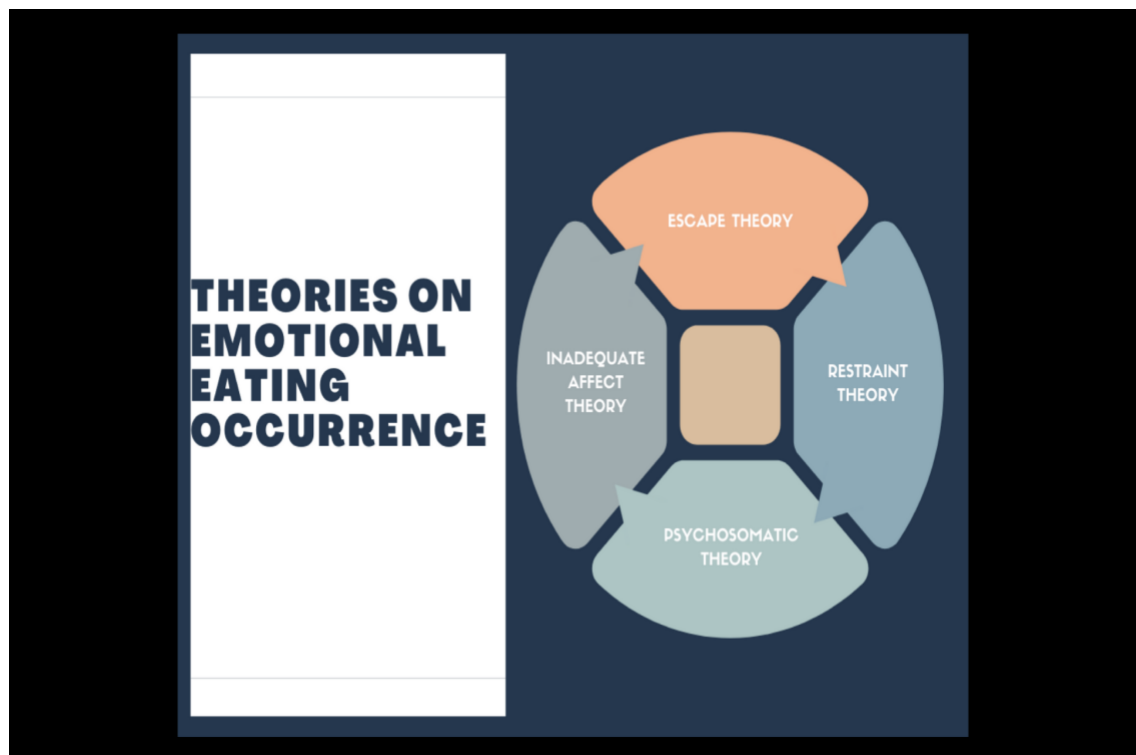
Figure 4. *Mediating Effect of Emotional Dysregulation*



The conclusion of the study conducted in the United Kingdom found that alexithymia influences the development of emotional eating via emotion dysregulation (McAtamney et al., 2021). As seen in Figure 4, greater difficulty identifying feelings relates to greater reported emotion dysregulation, which is subsequently related to more emotional eating urges in response to negative emotions (McAtamney et al., 2021). In Figure 4 difficulty identifying feelings, also called alexithymia, was entered as the predictor variable. Emotional eating urges as measured by the emotional eating scale

were entered as the outcome variable, and emotion dysregulation was entered as a potential mediating variable (McAtamney et al., 2021). Findings indicate that difficulty identifying feelings was indirectly related to emotional eating scale total scores through its relationship with emotion dysregulation.

Figure 5. *Theories on Emotional Eating Occurrence*



SECTION FOUR: THEORIES ON THE DEVELOPMENT OF EMOTIONAL EATING

There are many theories aimed at discovering the root cause for emotional eating. The four theories that are of interest to this research paper are the inadequate affect theory, escape theory, psychosomatic theory, and restraint theory. Before venturing to explain the different effects of quarantine in support of these theories, an in depth look at each theory and the hypotheses and facts that make each of them up will be provided.

The first listed, inadequate affect theory, identifies the cause for emotional eating as the need to alleviate negative feelings (Spoor et al., 2007). This theory states that individuals engage in emotional eating as a means to cope with, and alleviate, negative feelings (Spoor et al., 2007). This theory would then apply to COVID-19 and isolation, as studies have shown an increase in emotional eating occurrence as a result of quarantine and stress (Cecchetto et al., 2021).

The second theory listed is escape theory, which builds off of inadequate affect theory. This theory suggests that individuals not only overeat in order to cope with negative feelings, but also to divert their attention away from the negative stimuli that threatens self-esteem and towards a pleasurable stimulus (Blackburn et al., 2006). This theory is also supported by findings during quarantine, as the need to alleviate the stress of the unknowns about the future and combat negative stimuli caused many people to seek out ways to distract themselves from what was going on in the world (Wang et al., 2009).

The third theory listed is the psychosomatic theory, which posits that poor interoceptive awareness relates to an inability to recognize hunger and satiety signals and distinguish them from other bodily sensations (McAtamney et al., 2021). The inability to distinguish these signals from one another then results in eating in response to any sensation, particularly emotional arousal (McAtamney et al., 2021). This theory could be the result of long-term emotional eating, as the body loses the ability to distinguish between signals being sent from the brain (Timmerman & Acton, 2001). This theory has the potential to reflect the future for those who suffered from emotional eating as a result of quarantine and isolation during the COVID-19 pandemic.

The fourth and final theory listed is the restraint theory, which suggests that emotional eating occurs as a result of negative emotion spikes in individuals who engage in restrictive eating (Van Strien & Oosterveld, 2008). These individuals typically limit what they eat, but engage in emotional eating to cope with negative emotions. This theory supports the idea that individuals who suffer from eating disorders are more likely to engage in emotional eating in times of crisis.

In addition to the theories mentioned above, the biological stress response can also play a role in emotional eating. This response occurs in a crisis, and the body combats the negative stimuli by secreting corticotropin-releasing hormone (CRH) from the hypothalamus which suppresses appetite and triggers the release of glucocorticoids from the adrenal gland (Hillhouse et al., 2006). These steroid hormones increase appetite and remain in the bloodstream for a prolonged period of time, which often results in an increased occurrence of eating (hyperphagia) (Hillhouse et al., 2006). Those who

experience this biologically instigated increase in appetite during times of stress are therefore primed to rely on emotional eating as a coping mechanism.

For individuals who are inclined to engage in emotional eating, the increase in stress and triggering environments present during the COVID-19 pandemic have the potential to cause disastrous effects on emotional and physical health. Through the need to find coping mechanisms to help combat the negative stimuli, many individuals have found themselves in a cycle of emotional eating due to one, or multiple, of the potential causes of emotional eating listed above. It is more important now than ever to be intentional in monitoring the stress levels of those who are at risk for engaging in emotional eating, in addition to providing healthy ways to cope with stress during quarantine and isolation.

SECTION FIVE: EATING DISORDERS AND SOCIAL MEDIA: THE PSYCHOLOGICAL EFFECTS OF ISOLATION

The negative impacts of social media on mental health are not unknown to the medical community (Mills et al., 2017). Not only can the use of social media be linked to an increase in feelings of depression, anxiety, fear of missing out, and bullying, but it has also been found to negatively impact body image (Mills et al., 2017). While it is true that social media offers a way to build community with individuals far outside of a regular realm of meeting, the exposure to negative content is also a risk to keep in mind.

The compounding of increased social media use with isolation creates a cocktail of the perfect conditions to result in worsened eating disorder symptoms, as well as increase in eating disorder prevalence. According to a study on social media use in India, social media use has been found to have increased by 87% throughout quarantine (Singh et al., 2020). The increase in use is speculated to be a coping mechanism rather than an addictive behavior, although research has yet to indicate one over the other (Singh et al., 2020).

The relevance of social media use in relation to COVID-19 and eating disorders is due to the negative impact social media can have on body image, and subsequent potential for an increase in the instances of eating disorder development. Throughout quarantine and isolation, social media has seen an increase in traffic as a result of stay-at-home orders limiting opportunities to build community and communicate with loved ones. In addition to offering means of communication and feelings of connectedness,

social media also offers a means of escape from everyday monotony by providing an outlet of humor and validation (Pearl, 2020). The positives of social media use exist, but in relation to eating disorder prevalence and severity social media can be the source of many feelings of discontentment.

Weight stigmas and topics centered on the so-called “quarantine 15” have been on the rise on many social media platforms (Pearl, 2020). Due to the increase in sedentary lifestyles, and concern for an increase in emotional eating occurrence, many individuals took to their social media platforms to warn the public on the dangers of weight gain during quarantine (Pearl, 2020). As mentioned above, social media offers a way to communicate with the public on matters important to you, as well as share insight into positive stress management techniques for dealing with living through a global pandemic. In light of quarantine, posts related to fitness and health have increased in popularity, some of which offer positive ways to remain healthy in quarantine. While there exist positive social media platforms who seek to uplift and encourage those in isolation, there is a dark side of social media being affected by COVID-10 (Pearl, 2020). A significant number of social media posts include written and visual content that conveys fat-phobia, or fear of gaining weight (Pearl, 2020). A number of these posts depict individuals “with an exaggerated amount of weight gain, wearing ill-fitting clothing in an unflattering manner (sometimes in cartoon form), and eating excessive amounts of food” (Pearl, 2020). Not only do these grotesque images demonize the appearances of obese individuals by labeling them as slovenly and lazy, but they also perpetuate the highly

toxic ideal that weight gain is the worst thing to happen to someone and should be avoided at all cost (Pearl, 2020). These quarantine-related messages that actively promote unrealistically thin ideals and extreme weight control practices have been flagged as dangerous by eating disorder advocates (Pearl, 2020). The weight stigmas being portrayed in social media content are harmful across the weight spectrum, and can be detrimental to mental health.

Table 2. *Quality of Treatment Survey*

Items	Country	Response options			
Choose the best alternative that characterizes your situation over the past 2 weeks?		I have had face-to-face (in person) interactions with my eating disorders treatment provider(s)	I have transitioned to online care with my eating disorders treatment provider(s) (i.e., telehealth)	I have not been able to engage with my eating disorders treatment provider(s) at all	I do not currently receive eating disorders treatment
	US (%)	3	45	6	45
	NL (%)	6	42	5	47
The quality of my treatment in the past 2 weeks has been:		Better than usual	As good as usual	Somewhat worse than usual	Much worse than usual
	US (%)	5	48	40	7
	NL (%)	4	22	56	18

(Termorshuizen et al 2020)

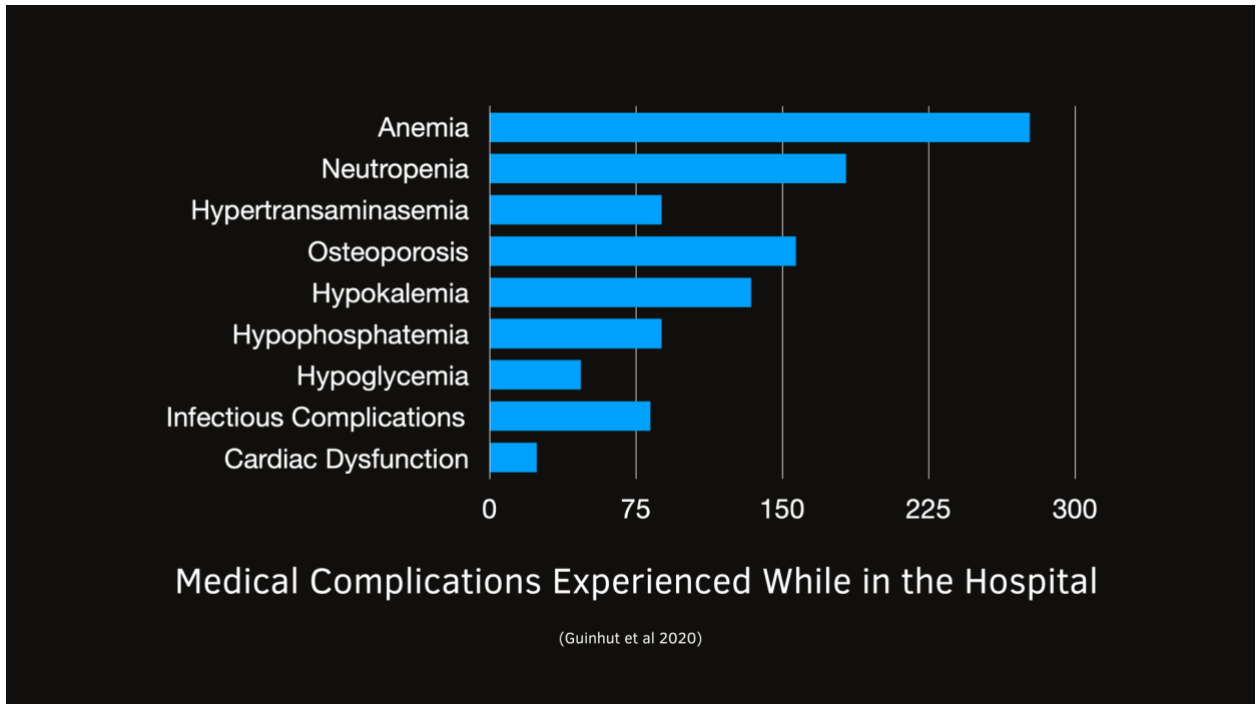
SECTION SIX: TREATMENT OPTIONS DURING COVID-19

The COVID-19 pandemic has forced an abrupt change in the delivery of clinical services, including treatments for individuals with an eating disorder (Termorshuizen et al., 2020). By disrupting service delivery visits with a healthcare provider, the COVID-19 pandemic has exacerbated the already immense problem that is unmet treatment for individuals suffering from disordered eating habits, many of whom do not receive care or have access to care in the first place. Even before COVID-19, it was difficult for eating disorders to be diagnosed and treated (Milos et al., 2005). As a result of COVID-19, the number of individuals receiving care for their ongoing battle with an eating disorder has decreased from the already small number that existed prior to COVID-19 (Fernández-Aranda et al., 2020). The results of the isolative nature of quarantine during COVID-19 show how important treatment and support are, and highlight the disparities in eating disorder treatment options.

The initial onset of COVID-19 resulted in many healthcare facilities transitioning their services to an online format which, for many patients, resulted in a sharp decline in the quality of care being given (Termorshuizen et al., 2020). One study sought to identify the effects of the transition of online treatment by surveying patients on the quality of care being received and its impact on recovery. It is important to note that this study found that half of the participants who responded to the survey were in the midst of an eating disorder, but had never received treatment for their eating disorder (Termorshuizen et al., 2020). For the patients interviewed who were receiving treatment for their eating disorder, the quality of care they were experiencing declined in quality and effectiveness as a result of the transition to online delivery (Termorshuizen et al., 2020). This study also found that over one-third of the participants involved in the study experienced a worsening of dietary restriction and compensatory behaviors after the transition to online treatment delivery (Termorshuizen et al., 2020). The findings of this study are reflected in table 2 above and highlight the importance of adapting to the needs of the time, as well as how few treatment options are readily available to be chosen by patients.

It can be clearly seen that the effects of COVID-19 on the patient population have the potential to be disastrous if left to spiral. The need for healthcare professionals to be intentional and attentive to their patients that suffer from eating disorders is more important now than ever, as the isolating and tumultuous times that are being experienced could push individuals to revert back to a restrictive diet in order to regain some semblance of control.

Table 3. *Medical Complications Experienced*



SECTION SEVEN: COVID-19 WHEN CONTRACTED BY AN INDIVIDUAL WITH AN EATING DISORDER

Not only is it found that COVID-19 and isolation have caused increases in instances of eating disorder worsening and occurrence, but also that the risks associated with the contraction of COVID-19 are potentially more severe for those who suffer from eating disorders (Fernández-Aranda et al., 2020). The effects of COVID-19 on the health of eating disorder patients are largely unknown, but through the observation of the effects of other diseases on this patient population a clearer image on what these effects have the potential to be can be gained (Fernández-Aranda et al., 2020). Due to the nature of eating disorders resulting in a severe lack of nutrients, eating disorder patients have been stated to be at high physical risk and have the potential to develop more severe cases of COVID-19 as a result of malnutrition and damage to the body's natural defenses (Fernández-Aranda et al., 2020).

COVID-19 infection can vary from asymptomatic to critical illness, the latter having the potential to result in an overactive inflammatory immune response, which leads the patient to develop acute respiratory distress syndrome or ARDS. Concern for eating disorder patients varies among the different stages of recovery, in particular the refeeding process (Simeunovic-Ostojic et al., 2021). Since an abnormal inflammatory profile has recently been found to be associated with anorexia nervosa, infection has the potential to be reactivated during the refeeding process. Reactivation has the potential to

occur due to a silent infection of COVID-19 occurring during the acute stage of anorexia nervosa, allowing a second episode of viral replication and/or a greater immune activity response and consequently a greater case of infection during the re-nutrition process (Simeunovic-Ostojic et al., 2021).

Individuals who suffer from eating disorders have weakened immune systems due to the lack of nutrients entering the body, and are at a higher risk of infection due to conditions they may experience as a result of their eating disorder (Guinhut et al., 2020). The conditions documented to have been affecting patients with eating disorders include anemia, neutropenia, hypertransaminasemia, osteoporosis, hypokalemia, hypophosphatemia, and hypoglycemia as well as cardiac dysfunction and other complications from infections (Table 3) (Guinhut et al., 2020). Due to the loss of homeostatic mechanisms as a result of the lack of nutrition, individuals who suffer from eating disorders are particularly susceptible to opportunistic infections. The lack of the body's standard defenses leaves patients vulnerable to diseases, and increases the likelihood of a more severe case of infection of a pathogen such as COVID-19 (Guinhut et al., 2020).

Due to the weakened state of the immune systems of those who suffer from eating disorders, the common indicators of an infection are also affected (Simeunovic-Ostojic et al., 2021). The lack of immune activity causes the inflammatory process, the immune process that is typically the first indicator that an infection is occurring, to not be activated as it would be in a healthy individual (Simeunovic-Ostojic et al., 2021). The

inflammatory process is responsible for activating pyrogens, which cause a fever in the patient experiencing the infection. In the instance that an individual's immune system is weakened, the inflammatory process would produce a weaker or absent fever in the patient. The lack of fever would make identifying an infection more difficult, allowing the infectious agent to have more time to wreak havoc on the body before medical assistance can intervene (Simeunovic-Ostojic et al., 2021). This is a particular concern when regarding an infection of COVID-19 in a patient who suffers from an eating disorder, as a reduced or absent fever and CRP response, as well as a delayed occurrence of leukocytosis, may cause delays in the diagnosis of an infection of COVID-19 (Simeunovic-Ostojic et al., 2021). The inability to detect a fever in a patient with an eating disorder is troubling, as one of the key indicators of a COVID-19 infection is a fever (‘‘Symptoms of Coronavirus.’’, 2021).

In addition to potentially masking the occurrence of an active infection of COVID-19, eating disorders also have the potential to mimic other COVID-19 symptoms and delay the diagnosis of an eating disorder due to it being mistaken for an infection of COVID-19 (Simeunovic-Ostojic et al., 2021). Some of the clinical manifestations of Anorexia Nervosa are similar to those of a COVID-19 infection, such as gastrointestinal issues, fainting spells, muscle aches and pain, and generalized fatigue (Simeunovic-Ostojic et al., 2021). To further add to the complexities associated with diagnosing an infection of COVID-19 in an individual who suffers from an eating disorder, the use of body temperature can both mask and falsely indicate an infection of COVID-19

(Simeunovic-Ostojic et al., 2021). Using body temperature to indicate the presence of acute infection in an individual with anorexia nervosa during the re-feeding process is difficult due to the lower body temperature, as stated above. However, there is an increased production of heat during the re-nutrition period, which has the potential to be falsely identified as a fever resulting from an infection process (Simeunovic-Ostojic et al., 2021).

Obesity, defined as a BMI greater than 30, has also been identified as a potential independent risk factor for more severe cases of COVID-19 infection and greater risk of mortality (Simeunovic-Ostojic et al., 2021). ACE2 has been identified as the host cell-surface receptor for COVID-19, forming a basis for viral tropism in several cells including adipocytes. Increased numbers of ACE2-expressing cells, due to higher adipose tissue volume, may increase susceptibility to viral host-cell entry. One study found that the COVID-19 virus can infect human adipocytes as well as that the viral load is three times higher in aged adipose cells (Toledo, 2020). This information can then be used to show that an increase of visceral adipose tissue and fat mass percentage directly correlates with increased risk of COVID-19 morbidity (Simeunovic-Ostojic et al., 2021).

A study seeking to identify the potential risks for patients with eating disorders in the event of contracting COVID-19 found that individuals with anorexia nervosa who have been hospitalized, and obese patients who suffer from eating disorders, both have a greater potential to develop a silent infection of COVID-19, which would then increase the chances of the infection resulting in a case of acute respiratory distress syndrome

(ARDS) (Simeunovic-Ostojic et al., 2021). It is extremely important to remain vigilant in administering care to these individuals, as they are highly susceptible to more severe forms of COVID-19 infection (Simeunovic-Ostojic et al., 2021).

Table 4. *Pertinent Interventions*

Pertinent Interventions	
Accessible treatment options	Telehealth Guided self-help Email and text messages Digital tools for self-monitoring Online support groups
Targeting specific eating and food related challenges	Reassessment of meal plans and flexible meal planning Maintaining daily structures and routines Focus on internal awareness of satiety and hunger Use self-compassion toward current struggles Encourage focus on body functionality Challenge unhealthy food-related cognitive distortions Practice exposures to challenging foods
General Recommendations	
Media consumption strategies	Limit news media exposure Reduce appearance-related media consumption Alter social media feeds Critically evaluate media images and messages
Increasing valued activities and helpful social connection.	Schedule activities that promote a sense of mastery/achievement, as well as those that promote pleasure Identify activities that improve self-worth Connect with peers online Monitor meaning and pleasure resulting from peer interactions

(Cooper et al 2020)

CONCLUSION

The COVID-19 pandemic has caused major impacts within the eating disorder community. Through both forcing treatment options to move to a remote format, as well as causing an increase in exposure to stressful and triggering environments, the COVID-19 pandemic has disrupted the care and treatment of individuals who suffer from pre-existing eating disorders. In addition to affecting the population of individuals who suffered from eating disorders prior to the pandemic, the stressful and triggering environments caused by COVID-19 have resulted in an increase in the prevalence of eating disorders and emotional eating in groups of people who were not at risk for developing an eating disorder prior to the start of quarantine and isolation. The increase and prevalence and worsening in severity will undoubtedly have lasting effects on this mental illness.

COVID-19 has impacted individuals who suffer from eating disorders not only by isolating them in a stressful environment, which causes a subsequent worsening of their symptoms, but also by increasing the prevalence of eating disorders due to the unchecked heightening of stress levels. It is important to learn from the exacerbated issues that have arisen from COVID-19 and isolation, and take this newfound knowledge forward to better the care of these individuals in future times of need. Table 4 shown above lists pertinent interventions needed to take place in order to help individuals suffering from

eating disorders while enduring the COVID-19 pandemic. It is extremely important that these interventions be enacted as soon as possible in order to make the greatest positive impact possible.

For those who suffer from eating disorders, the contraction of COVID-19 can prove to be more deadly, and thus impact these individuals further. It's important for healthcare providers to use screening as a way to identify patients, use technology to effectively reach patients, improve the quality and accessibility of online information, and advance self help treatment. This treatment option has shown to be a promising treatment option within the binge-eating disorder community, and so further research on how to provide more treatment options, and make them more effective in reaching patients and impacting them in a positive way, is important to shaping the future of this mental illness (Termorshuizen et al., 2020). Through utilizing these different methods of prevention and treatment, the prevalence and severity of eating disorders resulting from COVID-19 can be effectively combatted.

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