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Correlating Similarities: the Case of OCD and Anorexia

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ABSTRACT

This paper attempts to answer the research question, "How and to what extent do there exist overlaps between compulsions in OCD and weight loss behaviors in anorexia nervosa?" Anorexia and obsessive-compulsive disorder share disturbances in reward networks that result in unhealthy coping mechanisms, yet the treatment of anorexia results in a high remission rate. This demonstrates a deficit in the treatment methods, and due to the similarities between the two disorders, it is plausible that information regarding one might inform treatment of the other. Through a review of literature, this paper examines those similarities. Both anorexia and OCD share a feedback loop where perfectionism and control lead to distress, which leads to compensatory behaviors like weight loss behaviors and compulsions. The reward systems adapt and the patient becomes dependent on the behaviors to cope with distress. There is evidence that treatments that address anorexia should model OCD in how it addresses both the reward system with SSRIs and neuroplasticity with ERP therapy. For example, successful experimental treatments for anorexia include various substances like ketamine and psilocybin, and PAT-AN is a promising area of treatment that mirrors ERP. The transdisciplinary literature was identified using the HOLLIS and Google Scholar search engines and with the snowball method. Further empirical research regarding testing treatments is strongly encouraged to demonstrate efficacy and applications. Such research should ideally be on humans and have longitudinal follow ups to ensure no lasting negative effects.

Keywords: anorexia, obsessive-compulsive disorder, treatment, neural correlates, cognitive-behavioral therapy, reward systems, psilocybin, ketamine, ERP, SSRI

INTRODUCTION

Anorexia has one of the highest mortality rates of all mental disorders (Lai, 2025). Individuals diagnosed have a standard mortality ratio (SMR) of 5.06 in comparison to the general population's 1.0 (Lai, 2025). SMR is calculated as the amount of expected deaths in a sample size in comparison to the observed number of deaths, making anorexia's difference more than 5 to 1. Anorexia nervosa is an eating disorder where individuals reduce caloric intake, resulting in extremely low body weight (APA, 2013). The

disorder involves a fear of gaining weight, which results in behaviors to compensate, either by restriction or binge-purging (Abber, 2025; Yamamiya, 2023). They are characterized by perfectionistic tendencies, negative self-esteem, concern over mistakes, and high expectations (Delaquis, 2024). Anorexia is often accompanied by obsessive-compulsive features (APA, 2013).

Anorexia and OCD are often comorbid and occur together. Nineteen percent of patients with anorexia had OCD at one point, and 14% had both OCD and anorexia at the moment (Mandelli, 2020). Comorbidity increases to 44% over the course of a lifetime (Mandelli, 2020). OCD is a disorder where individuals have unwanted cognitions that they address with compulsions (APA, 2013). Examples of these cognitions include fears of certain substances, such as bleach, and the consequent avoidance of them in a way that overtakes the patient's ability to live an ordinary life (Jessup, 2024). Examples of compulsions include counting, washing, checking, arranging, and throwing out objects (Davoudi, 2024). About 50% of people diagnosed with obsessive-compulsive disorder report suicidal thoughts, and 25% attempt suicide (APA, 2013). This demonstrates the urgency of addressing the current deficits in treatment, which requires further research.

BACKGROUND

Two treatments that have positive effects on patients with both anorexia and OCD are Deep Brain Stimulation, or DBS, and ERP, or Exposure Response Prevention therapy (Steinhoff, 2025). Deep Brain Stimulation involves implanting electrodes into the brain, which are later connected to a pulse battery in order to change the brain's electrical activity at the specific nodes (Lozano, 2019). These nodes are implanted at the anterior limbs of their internal capsules (Abelson, 2005; Denys, 2020; Menchón, 2021), nucleus accumbens (Barcia, 2019; Welter, 2020), anteromedial globus pallidus internus (Azriel, 2020), bed nucleus of stria terminalis (Farrand, 2018), caudate nucleus (Welter, 2020), medial dorsal and the ventral anterior nucleus of the thalamus (Maarouf, 2016), or ventral caudate/ventral striatum (Chang, 2017; Mulders, 2017; Tyagi, 2019). DBS has been connected to successful treatment of OCD (Gadot, 2022; Mar-Barrutia, 2021) and increased weight gain in anorexic patients (Hsu, 2022). In anorexic patients, deep brain stimulation has been linked to beneficial outcomes in terms of symptoms of depression, obsessive-compulsive disorder, and anxiety (Karaszewska, 2022). DBS in the nucleus accumbens has been seen to have positive outcomes on depression and anxiety in anorexic patients (Liu, 2020). However, this form of treatment is considerably invasive due to the implantation process, and therefore other treatments should be investigated.

A form of cognitive behavioral therapy, exposure response prevention therapy is considered the most well studied effective treatment of OCD (Bragdon, 2024; Yan, 2022). ERP slowly exposes patients to their obsessions either in real life or in vivid imagination in order to encourage them to avoid connecting them to their compulsions (Foa, 2012). Cognitive behavioral therapy is a form of talk therapy where the patient and the clinician work together to address the goals set by the patient (Institute for Quality and Efficiency in Health Care, 2025). The foundational idea behind CBT for OCD is that the negative cognitions are not

inherently the problem: rather, the interpretation of the thoughts into compulsions causes the disorder (Salkavskis, 1985). ERP has been investigated as a treatment for anorexia nervosa, but there have been few advancements in the last decade. In terms of anorexia, ERP has historically been used in two ways: to address body image fears (Griffen, 2018), and to better the patient's relationship with fear foods (Glasofer, 2016). ERP has been shown to increase caloric intake (Steinglass, 2012) and reduce body-checking behaviors (Morgan, 2013). When examining non-pharmaceutical treatments for comorbid anorexia and OCD, Steinhoff and colleagues found that anorexia symptoms improved, but OCD symptoms did not (2025). The literature demonstrates that while there has been research on similarities between OCD and anorexia, as well as research on treatments, there has been very little informing anorexia treatments using the connections between the two disorders.

Treatments for the two disorders have also been investigated when the disorders occur comorbid to each other. In a case study of a woman in her twenties who was diagnosed with OCD and did not demonstrate weight gain during remission from anorexia nervosa, despite an increase in caloric intake (Inoue, 2026). She reported a need to eat excessively cleanly, expressing a fear of her body oxidizing with the intake of "unhealthy" foods, and exercised compulsively for more than 400 minutes a day (Inoue, 2026). The patient was treated using a registered dietician, after which each meal her emotions were discussed (Inoue, 2026). After many of these sessions, the patient displayed more flexible attitudes towards many processed foods (Inoue, 2026). In order to address her compulsive exercise, the patient was presented with a myriad of alternate activities that she should turn to, and readily accepted (Inoue, 2026). However, as time passed, she reported compulsive urges to exercise resulting in crying, shouting, and running around, which resulted in her being restrained (Inoue, 2026). As recovery progressed and she returned to work, she had less time to exercise (Inoue, 2026).

PROBLEM

There is much research regarding anorexia and its impact on weight loss behaviors, especially regarding food (Foerde, 2021) and exercise (Coniglio, 2021). There also exists literature regarding obsessive-compulsive disorder, from its development to the processes that define it (Chen, 2022). There are statistics regarding comorbidity rates between the disorders (Mandelli, 2020), as well as elements of the disorders that indicate similarities (APA, 2013). There is research on OCD (Jalal, 2023), anorexia (Nagy, 2023), and the disorders when comorbid (Steinhoff, 2025). However, there exists an under researched area at their intersection, where the both disorders can be examined through compulsive behaviors. The gap can be filled through examining each area through psychology, neuroscience, education, and health.

RESEARCH QUESTION

In order to address the gap in literature, this paper will attempt to answer the research question: How and to what extent do there exist overlaps between compulsions in OCD and weight loss behaviors in anorexia nervosa?

LITERATURE REVIEW

To answer the research question, "How and to what extent does existing literature on overlapping neural correlates of compulsions in OCD and of weight loss behaviors in anorexia nervosa inform treatment interventions?" The literature review will be separated into two sections. Firstly examining anorexia, including anorexia's treatments, then examining OCD, including OCD's treatments. This is in order to gather information both about the disorders and their treatments, allowing the paper to draw connections between the treatments and their purposes, or what they address. The connections form the foundation for answering the research question, as they take into account the disorders, their treatments, and the similarities.

Literature Genres

This literature review primarily uses recent peer-reviewed articles and studies, from original experiments to meta-analyses. It also includes citations of reputable psychological resources, such as the Diagnostic Statistical Manual, in order to provide background for the disorders. The majority of the sources were taken from Google Scholar or HOLLIS and span across the disciplines of neuroscience, psychology, health, and education in order to examine the research question from a multitude of perspectives to get the most accurate picture. The older sources are foundational knowledge upon which the rest of the literature builds, and were often found from the references of more recent studies.

Anorexia Nervosa

In an empirical study interviewing 11 women, researchers examined perfectionism, comparison, shame, and the impacts the three had on their disorder (Howard, 2023). Anorexic patients report feeling a need to control their bodies, seeing their often emaciated selves as positive, evidence of their successes (Evans, 2022; Fuchs, 2021). Howard found that patients set high goals for themselves, especially in relation to their appearances and eating habits, and that when those goals were unattainable, feelings of shame followed (2023). One hundred percent of the participants spoke about feeling shame, which revolved around their bodies, identity, personality, and intelligence (Howard, 2023). Eating food brought feelings of anxiety and distress in 81% of participants in a study regarding anxiety in anorexia (Simonazzi, 2023). One hundred and forty-one patients filled out questionnaires regarding depression, eating disorder

psychopathology, and food related anxiety and aversive experiences (Simonazzi, 2023). Other triggers for anxiety included a fear of looking disgusting while eating, losing control, and gaining weight (Simonazzi, 2023). Stice initially concluded that the cognitive changes happened simultaneously alongside behavioral changes (2021), but Yamamiya's study resulted in behavior changes after cognitive ones (2023) through an empirical study on 496 adolescents over the course of eight years. Yamamiya suggested that the higher risk resulted in the mental connections between desire for weight loss and weight-loss behaviors forming more rapidly (2023).

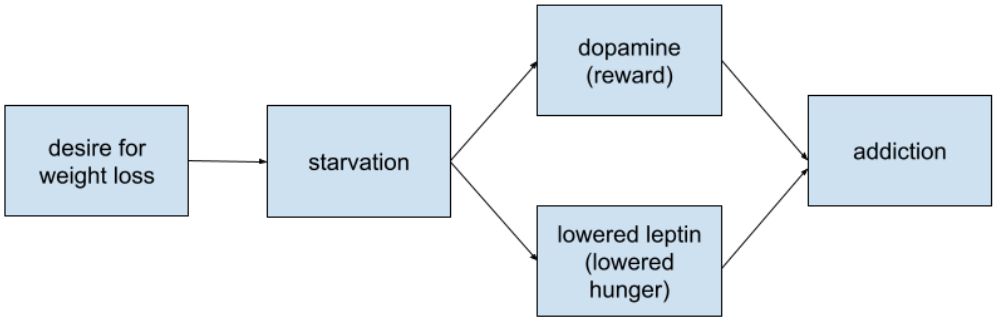
Anorexia's shift between an active choice to relieve distress into a compulsive action closely resembles the path of addiction. There is evidence that by creating a feedback loop requiring constant control through perfectionism, anorexic behaviors became normalized. When these behaviors are tied to the reward networks, the connection between control and eating strengthens (Beeler, 2022).

The part of the reward network is dopamine. Anorexia nervosa historically has been investigated in conjunction with dopamine since the 1970s (Barry, 1976). Beeler proposed in 2022 based on a review of literature that the role dopamine plays in anorexia changes through two stages. In the first stage of the disorder, initial weight loss causes an increase in dopamine, which fuels further weight loss (Beeler, 2022). An analysis of literature based on the neural correlates of dopamine signals found that dopamine positively reinforces the behaviors, thereby strengthening the connections (Roitman, 2025). The transition into the second stage is what changes the anorexic behaviors from occasional actions into severe and enduring anorexia as seen in an analysis of research (Ambwani, 2020). The second stage functions much like an addiction, where the substance (restriction/binge-purging) becomes less pleasurable over prolonged exposure (Beeler, 2022).

Researchers are beginning to debate examining anorexia, as well as other habit-based disorders, as addictions to behaviors (Ziemichód, 2024). Researchers examined texts on the dopaminergic, endocannabinoid, and orexinergic systems to synthesize hypotheses about anorexia. One definition of addiction is a change from acting for a goal to continuous control, or a shift from a goal that rewards the individual to compulsive behavior (Ziemichód, 2024). This shift is also seen through the brain, as the basolateral amygdala and nucleus accumbens work to accomplish the goal and the dorsolateral striatum becomes involved in habits (Ziemichód, 2024). In the case of anorexia, the addiction is to weight loss and starvation (Ziemichód, 2024). The body adjusts around the dopamine in order to facilitate more anorexic behaviors, which leads to changes in hormones and neurotransmitters, strengthening the neural connections, as seen in Figure 1.

Figure 1

Model of Anorexia as an Addiction



Note. This figure demonstrates anorexia nervosa's pathway from the initial desire for weight loss to the addiction to the behavior itself. The individual begins starvation, which releases dopamine and creates a false sustainability with lowered leptin, prompting continued behaviors that strengthen the feedback loop until the behaviors themselves are rewarded. This creates an addiction that makes weight-loss behaviors compulsory.

Anorexic patients continue to engage in weight loss behaviors even when unnecessary or when already at low body weight, which is hypothesized to be related to perception of body image (Norrlin, 2025). Through a meta-analysis of brain imaging studies on the neural correlates of body image processing, anorexic patients were found to have hyperactivation in the inferior and superior parietal lobules, precuneus, fusiform gyrus, posterior cingulate, parahippocampal gyrus, and inferior occipital gyrus (Norrlin, 2025). Particularly the left superior and inferior parietal lobule saw differences in terms of in group differences for body stimuli (Norrlin, 2025).

Thirty-six anorexia patients from the University Hospital Muenster in Germany and 42 healthy controls were presented with computer-generated images of women, then either given no instructions or given the choice between two buttons, "narrower" and "wider" respectively (Romero Frausto, 2024). Patients with slight overestimation had greater responses to images with very low BMI, but patients with stronger overestimation responded more to images with normal or high BMI (Romero Frausto, 2024). This demonstrates that anorexic patients have skewed perceptions of their bodies.

With time, this damage to the reward systems alter. The reward pathways connecting taste and enjoyment are changed due to the anxiety that weight gain brings, thereby changing the rewarded activity from eating to weight loss (Keating, 2012). After examining literature regarding anorexia and relationships with food, Keating and colleagues brought forth the theory that as food becomes associated with negative

emotions, the positive feelings that accompany weight-loss-driven activities become associated with rewards, positively reinforcing them even as body weight drops (Keating, 2012).

The American Psychiatric Association recommends three methods of treatment to be combined and utilized depending on individual patient needs. Firstly, they suggest weekly weight gain goals in order to return patients to their physical health (APA, 2023). Adults are suggested psychotherapy revolving around healthy relationships with weight gain and eating, while adolescents and younger adults with caregivers utilize family-based therapy where the caregiver is also instructed (APA, 2023). However, anorexia nervosa is notoriously difficult to treat, with almost 10% of patients having two or more unfinished treatment journeys (Smith, 2021). Patients who stay for shorter durations of time tend to need readmission (Smith, 2021). These statistics were found via a review of existing literature from a Canadian inpatient program (Smith, 2021). Concerningly, 50% of patients with restrictive anorexia and 56.2% of patients with binge-purging anorexia drop out of their treatment programs without completing them (Huas, 2011). By analyzing 601 patients over the course of their treatment, they found the dropout rates of the treatments (Huas, 2011).

Haynos and colleagues researched PAT-AN, or Positive Affect Treatment for Anorexia Nervosa, finding it helpful on many fronts for treating anorexia (Haynos, 2023). Positive Affect Treatment aims to address the shifts in reward systems, and is typically used in treatment of depression and anxiety (Craske, 2014). Patients were treated over 20 weeks with six modules (Haynos, 2023). The modules introduced the patients to the upcoming treatment and the rationale behind it, then focused on rewarding participation and focusing on the positives through mindfulness, then decreased the positive mental associations with disordered behavior, then finally created a path for the patient post-treatment to prevent relapse (Haynos, 2023). PAT-AN had a 100% retention rate and strong acceptability ratings, and the patients who received treatment showed improvement (Haynos 2023).

There have been experiments regarding the treatment of anorexia using a variety of substances, including psychedelics and dissociative anesthetics. For instance, psilocybin therapy was implemented in a group of 10 women with a dose of 25 mg of COMP360, a synthetic psilocybin designed for stability (Peck, 2023). Psilocybin has been demonstrated to decrease negative affect, increase positive affect, and decrease amygdala reactions when presented with emotional stimuli when given in a single large dose (Barrett, 2020). Psilocybin has been connected to functioning as an agonist to serotonin 2A, or 5-HT2A (Madsen, 2019), which is altered in anorexia nervosa (Kaye 2005, 2013). Peck's study found no serious adverse effects, though eight participants reported headaches, seven reported fatigue, and three reported nausea (2023). Peck's study also resulted in significant improvements in terms of weight concerns and shape concerns, as well as in terms of food related anxiety and food related rituals (2023). Finally, 90% of study participants felt more positively about their life endeavors (2023).

Ketamine is a non-competitive antagonist for NMDA (Dingledine, 1999), and has been connected to increased dopamine levels when administered to rats (Kokkinou, 2017). Ketamine also impacts dopamine levels in humans (Witkin, 2016). El Iskandrani and colleagues suggested that the effect was confined to

repeated administrations, noting that a single dose was not enough to reach increased and sustained dopamine neuron firing, as well as ketamine's lack of impact on 5-HT (serotonin) neuron firing (2021). However, ketamine's results rely on the patient's mental state (Reed, 2019). Thirty three participants diagnosed with depression and 24 healthy controls, ages from 18 to 65, were either given a placebo or 0.5mg/kg of ketamine (Reed, 2019). Two weeks later, they received the other treatment (Reed, 2019). Their brains were scanned pre-ketamine, post-ketamine, and post placebo. Participants needed to complete an emotional processing task, where they were presented with emotional (sad, angry, happy, or neutral) faces either right side up or upside down, and were asked to classify the faces as either positive (neutral and happy) or negative (sad or angry) (Reed, 2019). The depressed patients who received ketamine had results that were similar to the results of healthy controls who received a placebo (Reed, 2019).

Ketamine has been linked to the treatment of anorexia since 1998, where Mills and colleagues treated five patients with diagnosed anorexia with ketamine, resulting in effective treatment. The first patient overcame her fear of weight gain after three treatments and maintained it even after treatment (MIlls, 1998). The second not only returned to a healthy weight after three, but continued treatment in order to improve restricting compulsive weight-loss behaviors (Mills, 1998). The third returned to a normal weight after five treatments, regaining her periods and was able to become pregnant (Mills, 1998). The fourth stabilized eating habits between bulimia and anorexia after four treatments and remained stable (Mills, 1998). The fifth was pregnant, and her anorexia resulted in a severely malnourished baby (Mills, 1998). With treatment, she was unable to return to a healthy weight, but her baby developed healthily (Mills, 1998). In a case study of a 29 year old woman who had struggled with anorexia for 15 years, ketamine and a ketogenic diet, it was found that the patient was able to achieve complete remission (Scolnick, 2020). The ketogenic diet was reported by the patient as only "30-40% effective", which prompted the researchers to include ketamine in order to address the compulsive weight loss behaviors (Scolnick, 2020). The patient was without compulsive weight loss behaviors or anorexic obsessive thoughts or anxieties throughout post-treatment evaluations (Scolnick, 2020). In a study involving five anorexic women who received six injections combined with a ketogenic diet, there were significant improvements in anorexic psychopathology, including concern about shape, weight, and eating, as well as restraint (Calabrese, 2022).

Other pharmacological approaches that have been considered are Acyl-Coa and cannabinoids. Acyl-Coa has been identified as influential to appetite, alongside leptin (satiety) and ghrelin (hunger) through a meta-analysis (Bravo-San, 2019). By taking plasma samples from anorexic patients and artificially raising Acyl-Coa levels in the plasma of rats under anorexic conditions, Chen and colleagues found that Acyl-Coa helped combat weight loss (2024). They observed a positive correlation between Acyl-Coa and BMI (2024), hinting at Acyl-Coa's potential as a supplement in treating anorexia as a way to increase the success of weight-gain treatment. Cannabidiol has also been found to be a tolerable potential method of treatment for anorexia (Sahota, 2026).

Obsessive-Compulsive Disorder

There is evidence that OCD is connected with the idea of perfectionism (Sarafraz, 2020). Perfectionism is also connected with many common compulsions that accompany OCD, from checking to cleaning (Frost, 2000) to hoarding (Frost, 1993). In these foundational studies, 90 female university students were surveyed on hoarding behaviors as well as perfectionism, which was evaluated based on concern over mistakes, high personal standards, high parental standards, and doubt of actions (Frost, 1998). In another study 70 people with OCD hoarding, OCD non-hoarding, other anxiety disorders and 34 controls were surveyed regarding hoarding behaviors, compulsions, and symptoms of depression (Frost, 2000). In patients who had hand-washing as a compulsion, it was found that they had higher expectations for cleanliness, which the study concluded demonstrated a need for perfection (Rigoux, 2024). More compulsive individuals required more certainty about the cleanliness of their hands before cooking, or 87.5% in comparison to the non-compulsive group's 74.8%, which suggests a higher level of perfectionism (Rigoux, 2024). Rigoux and colleagues used a computational model to simulate different scenarios, where the model would have to balance success with risk and safety (2024). "Perfect" obsessive cognitions have been connected to danger/check compulsions, as well as hoarding and ordering compulsions (Davoudi, 2024). Perfectionism has been linked to anxiety when faced with loss of control (Sarafraz, 2020), which mirrors the situations that deepen anorexia's neural correlates. One hundred and five participants were interviewed and surveyed on factors such as perfectionism, obsessive compulsive traits, and depression, which demonstrated that the patients with OCD scored higher on perfectionism (Miegel, 2020). Miegel hypothesized that perfectionism created feelings of failure that increased compulsive activities in order to address those feelings (2020).

In OCD, a fear of losing control is deeply ingrained in the relationship between obsessions and compulsions. One hundred sixty-three study participants were given false feedback regarding their perceived capability of losing control, and then presented with a task to evaluate an OCD related situation, which was followed by an interview (Sandstrom, 2024). The study demonstrated that a fear of losing control was central to acting upon compulsions (Sandstrom, 2024). OCD has been demonstrated to change the reward processing centers in the brain (Vahedi, 2025). 85 participants completed both an active and an observational probability task, learning from both themselves and other participants, which resulted in the finding that patients with OCD took negative feedback differently than healthy controls (Vahedi, 2025). Dorsal striatal dopamine mitigates anxiety and compulsive behaviors in rats (Casado-Sainz, 2022) The researchers surgically injected a virus targeting dopamine neurons in rats, then observed increased compulsive grooming behaviors (Casado-Sainz, 2022), hinting at the crucial role dopamine plays in OCD. OCD includes dysfunction in the striatal and cortical circuits, especially irregular dopamine activity, which results in mental rigidity and the compulsive behaviors that are characteristic of the disorder (Mota, 2026). Mota and colleagues analyzed literature about OCD and dopamine in order to draw their conclusions, synthesizing the information from 19 papers (2026). Performing a compulsion has been connected with dopamine in the striatum, which reinforces the connection between the compulsion and mitigating the negative emotions brought by the obsession (Xue, 2022). Researchers used a fiber-optic patch cord to send light to a brain area in mice, and observed the

results by dissecting their brains. In the orbitofrontal cortex, dopamine irregularities cause cognitive rigidity, leading to obsessive thoughts (Mota, 2026). In the anterior cingulate cortex, the dopamine irregularities lead to distress, and in the cortico-striato-thalamo-cortical loop, it leads to feedback loops connecting the obsessions and compulsions, often at the expense of existing loops (Mota, 2026).

OCD is typically treated with a combination of SSRIs, or Selective Serotonin Reuptake Inhibitors, and cognitive behavioral therapy (Swierkosz-Lenart, 2023). OCD is often also addressed with cognitive behavioral therapy, specifically Exposure and Response Prevention, or E/RP. Therapy typically begins with initial assessments of the patient and their unique obsessions and compulsions, as well as briefing the patient about the treatment to come (Spencer, 2023). Through two case studies, one of a 10 year old and one of an adult, Spencer found that ERP therapy was an effective treatment at reducing dependency on compulsive actions and anxiety regarding obsessions (Spencer, 2023). The patient works with the practitioner in order to create a list of increasingly terrifying triggers from 0 to 100, which they then slowly face over time until they hit the end (Spencer, 2023). Craske and colleagues used exposure and response prevention therapy as outlined above to treat an adult man who struggled with obsessive thoughts about harming his newborn son (Craske, 2014). By repeatedly exposing the patient to these triggers, the patient learns to weaken the connections to fear by replacing them with more positive memories (Craske, 2014), thereby lessening the need to mitigate anxiety with compulsions.

Over four days, patients were treated using the Bergden method in Iceland (Davidsdottir, 2025). On the first day, patients were informed about their treatment and the rationale behind it, namely the idea of combating the way the brain changes based on their reactions, and refined their list of exposure tasks (Davidsdottir, 2025). The next two days involved eight to ten hours of exposure response prevention therapy where the patients worked individually with their respective therapists during the day and alone in the evenings to "lean into the anxiety" and accept the distress the triggers brought (Davidsdottir, 2025). On the third day, relevant close relationships were introduced, such as family and partners, in order to create a safe environment post-treatment (Davidsdottir, 2025). On the fourth day, patients were informed on how to maintain their positive results after the treatment (Davidsdottir, 2025). Patients saw improvement in their OCD symptoms, and the patients reported that the treatment was satisfactory (Davidsdottir, 2025). In the 12 month follow up, the positive effects of the treatment were still present (Davidsdottir, 2026).

SSRIs work by preventing the uptake of serotonin, meaning there is more of it in the brain (Chu, 2023). They are widely used and prescribed because they have few side effects on other neurotransmitters (Chu, 2023), and their effects on OCD lie mainly in balancing out the negative effects of obsessions, with higher doses corresponding to better effects (Bloch, 2010). Bloch found the effects of SSRIs by conducting a meta-analysis of nine studies.

Psilocybin has been suggested to be helpful to the treatment of OCD (Maloney, 2024) due to its effects in increasing cognitive flexibility (Torrado, 2023) and neuroplasticity (Lepow, 2021). An online survey suggested that serotoninergic psychedelics played a positive role in the treatment of OCD (Buot, 2023).

Maloney examined the effects of psilocybin and other serotonin-related substances, compared them to each other, and finally examined the effects of serotonin-related substances on OCD in established empirical studies, suggesting that psilocybin might have related effects (2024). Besides psilocybin, however, there have been other psychedelics that have been investigated in terms of their potential as treatments for OCD, including the new HBL20017 (Lerer, 2025). The researchers tested the psychedelic on rats homogenous for the deletion of the SAPAP3 gene, which has been found to be associated with OCD (Lerer, 2025). The mice exhibited obsessive grooming behaviors that were improved after taking the substance, suggesting the role psychedelics could play in the treatment of OCD (Lerer, 2025).

Glutamatergic dysfunction is generally recognized as an aspect of OCD (Pittenger, 2011), and neuroimaging demonstrates different glutamate or glutamine levels in the caudate nucleus and anterior cingulate cortex (Bloch, 2012). Ketamine has been suggested to play a role in glutamatergic neurotransmission that addresses OCD (Bloch, 2012). Kumar and colleagues investigated the role of ketamine in the treatment of OCD in treatment-resistant adolescents, finding that though results varied depending on age, with the older patients seeing better therapeutic effects, ketamine could be a viable treatment method (2025). In the sample size of four, the first patient was a 13 year old girl who responded poorly to the ketamine, developing psychosis which resulted in her treatment stopping and being put on anti-psychotic medication (Kumar, 2025). The other three patients were males with ages ranging from 17 to 19, and each saw improvement throughout five sessions (Kumar, 2025).

METHODOLOGY

This paper draws conclusions from a transdisciplinary Literature Review in order to examine the research question from a multitude of lenses. This ensures that the conclusions come from many perspectives, which are all synthesized in order to create a more accurate conclusion.

The research was primarily conducted with a combination of Google Scholar and the Harvard Library HOLLIS search engines using keywords and dates from 2022 onwards, as well as Boolean operators to better organize the literature. HOLLIS allows results to be filtered by a variety of factors, so this paper was limited to English papers that had been peer reviewed. Research was done in waves for each section, beginning with the terms “OCD” and “anorexia nervosa” separately. Each key term was then used in tandem with the Boolean operator “AND” for both OCD and anorexia nervosa, as well as the Boolean operator “NO” for “children”. Key terms for the first subsection were: “diagnostics”, “behaviors”, “shame”, “perfectionism”, “control”, “reward pathways”, and “self esteem”, which were all coupled with “anorexia”. Key terms for the second subsection were: “anorexia” and “treatment”, but after finding initial sources, the snowball method was used, and key terms included “ketamine”, “psilocybin”, "cannabidiols", “Acyl-Coa” and “PAT-AN”. Key terms for the second subsection were: “diagnostics”, “behaviors”, “perfectionism”, “control”, “compulsions”, “reward pathways”, and “dopamine”, which were all coupled with “OCD” or “obsessive-compulsive disorder, as well as “treatment”, which found a

variety of sources. From there, the snowball method was used, as well as the keywords, "psilocybin", "ketamine", "SSRI", "ERP therapy" and "Bergden".

From many sources, there were crucial insights in their respective references, so the snowball method was used to gather more in depth information. Many sources were literature reviews that mentioned especially relevant and interesting information, so the studies references were found in the citations and reviewed for suitability for this paper. While researching, studies from 2022 onwards were prioritized, but older texts also appear and serve as foundational texts to provide background, or originated from the snowball method while researching. The Diagnostic and Statistical Manual of Mental Disorders, 5th edition, for example, is a resource commonly used for diagnosing various disorders, and was cited in many of the other studies as background knowledge. Foundational sources that initially investigated various treatments were also included (e.g. Barcia, 2019; Bloch, 2010; Bloch, 2012). There were also early sources that first studied the bases of OCD and anorexia (e.g. Barry, 1976; Dalgleish, 2001). The studies cited were required to be peer-reviewed in order to maintain academic integrity, and were required to be in English and excluded all that solely focused on children, though adolescents were included.

ANALYSIS

This section of the paper aims to draw conclusions from the literature review in order to answer the research question. In order to do so, it will first examine the flaws and limitations in the research process. Then, it will synthesize the research that contributed to the expected findings, and then the unexpected findings.

There was very little research on treatment of OCD and anorexia when they occurred comorbid with each other (Inoue, 2026; Orsolini, 2022). Given the high comorbidity rate, the lack of research on treatment in individuals with both disorders was surprising. Due to this gap in research, this paper was unable to concretely find what aspects of OCD and anorexia feed off each other to become more or less extreme and how various treatments for the disorders separately might impact the other.

Many of the sources (e.g. Barret, 2020; Chang, 2017; Scolnick, 2020) were case studies or involved small sample sizes, meaning the conclusions drawn from them could be skewed. This might be due to the difficulties in studying anorexic patients as their physical health is typically precarious. This could be due to the urgency of weight gain in order to prioritize survival, which pushes addressing the mental correlates to the side in favor of protecting patients survival. Not only that, but many of the treatments were tested on rats (e.g Torrado, 2023; Xue, 2022), or used direct injections (e.g. Bloch, 2012; Calabrese, 2022), which makes drawing concrete conclusions difficult.

Expected Findings

In order to answer the research question, "How and to what extent do there exist overlaps between compulsions in OCD and weight loss behaviors in anorexia nervosa," this paper examined literature that demonstrated two key findings. Firstly, the literature illustrated anorexia and OCD's shared desire for perfection (Howard, 2023; Sarafraz, 2020) and control (Sandstrom, 2024; Simonazzi, 2023) and influence on the reward system (Mota, 2026; Ziemichód, 2024). Then, the research found some similarities in treatments for both disorders using psilocybin (Buot, 2023; Peck, 2023), cognitive behavioral therapy (Haynos, 2023; Spencer, 2023), and ketamine (Calabrese, 2022; Kumar, 2025).

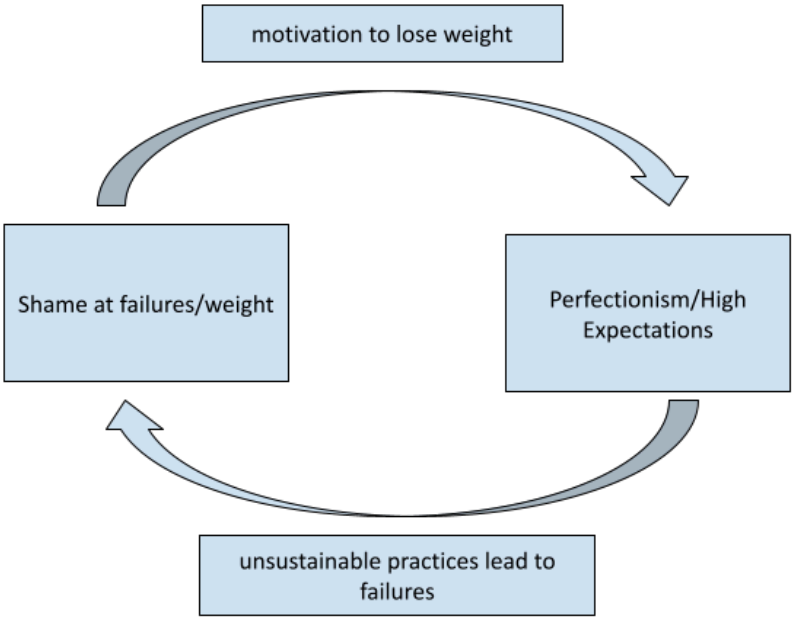
Both anorexic patients (Howard, 2023) and those with OCD (Sarafraz, 2020) share high standards for perfectionism. This hints at a similarity between the two disorders. Because perfectionism is crucial to decision making and actions, the idea that perfectionism is an important factor in the development of excessive weight loss behaviors for anorexics and compulsions for those with OCD is not improbable (Beeler, 2022; Davoudi, 2024). Perfectionism should be addressed in a successful treatment of anorexia in order to address the root issues that perpetuate cycles to compulsive weight-loss behaviors. Therefore, this need for perfectionism should be addressed in subsequent treatments in order to tackle the root issues of the disorders. This might potentially address the deficit in treatments for anorexia that Huas demonstrated (2011).

Both anorexic patients and those with OCD exhibit a need for control, as well as a fear of losing control (Sandstrom, 2024; Ziemichód, 2024). When patients lose control after falling short of their high standards, negative emotions follow, such as shame and , which are then mitigated by weight loss behaviors and compulsions, respectively (Mota, 2026; Ziemichód, 2024). This again demonstrates similarities as both sets of actions serve as ways to avoid distress. Successful treatments should then include breaking the high needs for control in order to address anorexia. Control is also a key element that should be considered in addressing treatment to ensure that patients recover in the long term.

Anorexia and OCD also both warp the patient's reward systems around the relationship between thoughts and actions. In the case of anorexia, the aforementioned perfectionism and control work together to create a spiral of shame whenever the individual's expectations are not met, which motivates the patient to double down on weight loss behaviors (Beeler, 2022). The triggers happen whenever the patient inevitably falls short of their impossible expectations of themselves or loses perceived control over their bodies or eating. At the same time, this warps their perception of food into something negative and their perception of weight loss behaviors as positive (Keating, 2012). This can be seen in figure 2.

Figure 2

The Anorexia Feedback Loop.

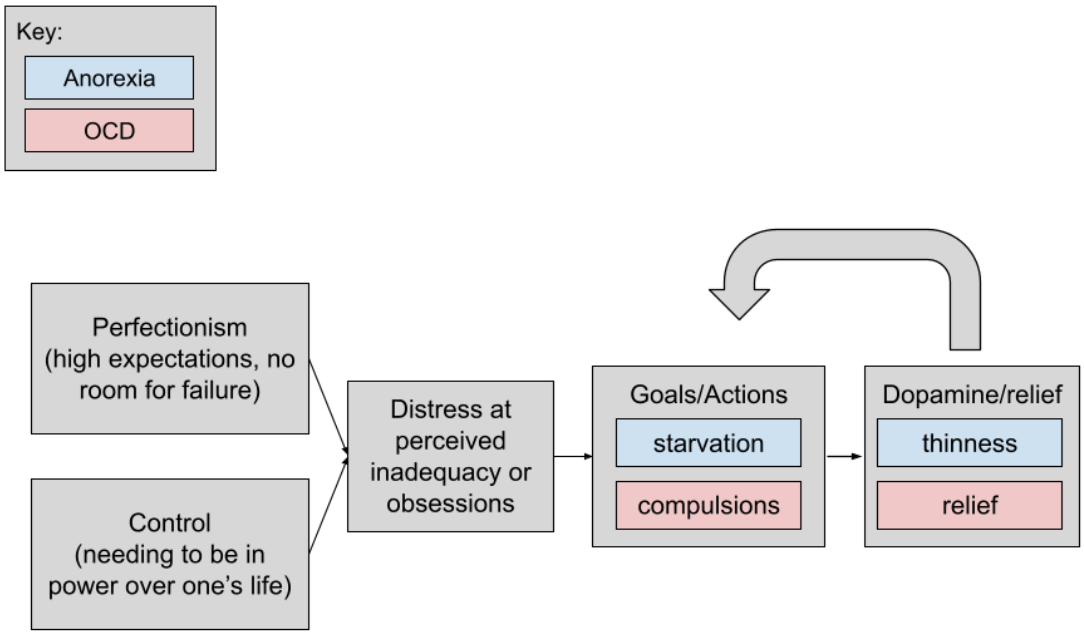


Note. Anorexia's feedback loop, where perfectionism sets high expectations that lead to unsustainable weight-loss behaviors. When failures follow, the need for control renews the individual's motivation to lose weight. Coupled with the dopamine that comes with success, both feedback and success cause the individual to continue reinforcing their behaviors.

OCD uses a similar feedback loop, where negative feelings brought on by obsessions are soothed by compulsions, creating mental connections between relief and the compulsive actions, twisting the reward system around the action (Mota, 2026). Together, these sources demonstrate another similarity between the disorders through how they maintain themselves, and shed light on the importance of considering reward systems in formulating treatment. The two loops are compared in figure 3.

Figure 3

The Feedback Loop for OCD and Anorexia.



Note. This figure demonstrates the similarities between the feedback loops of the disorders, covering both the loop for anorexia and for OCD. Both begin with the combination of perfectionism and control, which result in distress, which culminates in actions that are reinforced by the reward system over time to become compulsive, creating compulsions in OCD and a reliance on weight loss behaviors in anorexia nervosa.

Finally, the literature pointed to a similarity in treatment; both disorders responded well to cognitive behavioral therapy, though anorexia typically uses typical therapy or group therapy (APA, 2023), and OCD utilizes exposure and response prevention therapy (Spencer, 2023). This suggests a starting off point for further therapies, potentially ones that integrate the information found here regarding perfectionism and control as well as reward centers, in order to better address both disorders. The similarities between ERP and PAT-AN suggest the importance and effectiveness of therapeutic approaches to treating the link between negative cognitions and compulsive weight-loss behaviors. Both also utilize psilocybin as a potential treatment method (Buot, 2023) due to relationships with serotonin, hinting at not only the role of the reward system in the disorders, but also the treatments. Psilocybin being an effective treatment for both suggests that addressing the differences in serotonin could be helpful to the treatment of anorexia especially, since it addresses the reward network that is being skewed by the disorder. The psilocybin

increases neuroplasticity (Torrado, 2023), and it can be assumed that the increased flexibility in the brain allows for the easier manipulation of the neural-correlates that connect relief to the actions, be it weight loss behaviors or compulsions. Psilocybin could play the role that SSRIs play in addressing OCD, serving the same purpose to increase serotonergic system activity.

The literature also illustrated, though briefly and experimentally, the usage of ketamine as a treatment for both disorders (Kumar, 2025; Scolnick, 2020) Ketamine also addresses the brain's connections between the thought and the action, which might be why it was demonstrated to be helpful in addressing compulsive behaviors in both anorexia and OCD (Bloch, 2012; Calabrese, 2022). Similar to psilocybinAll the similarities between treatments either addressed the reward system, serving as a distraction or to create relief for the patient, or the connections between the compulsive behavior and the negative emotions, serving as ways to change that relationship so the patient relies less on the action to feel relief.

These similarities in research further support the idea that there are underlying similarities between the disorders: similarities that might prove helpful in developing new, more effective treatments for anorexia.

Unexpected Findings

The main unexpected findings were that there were more differences than similarities in terms of the treatments of OCD and anorexia nervosa. Given the similarities (e.g., Howard, 2023; Sandstrom, 2024; Sarafraz, 2020; Simonazzi, 2023) outlined in the literature review, the lack of similar treatments was surprising, especially because the similarities were fundamental to the disorders. This could perhaps be due to the need in the case of anorexia for the patient to regain weight, which may complicate treatments, accounting for the differences. Although the rationale is logical, there is evidence that effective treatments for anorexia nervosa could align more closely with existing treatment for OCD because of the above similarities.

Another unexpected finding was how many potential treatments for anorexia nervosa were based on substances, especially addictive ones (Calabrese, 2022; Peck, 2023, Sahota, 2026). However, that might be due to the way that these substances target the reward system, providing the relief from anxiety and shame that is pervasive with anorexia, thereby weakening the reliance on weight-loss behaviors.

In summary, the literature provided insights that suggest that the disorders anorexia and OCD are related in their relationship with perfectionism (Howard, 2023; Sarafraz, 2020), control (Sandstrom, 2024; Simonazzi, 2023), and the neural correlates between negative cognitions and compulsive actions (Mota, 2026; Ziemichód, 2024). This similarity can be implemented in treatments to better treat the disorders, but especially anorexia. There are many experiments examining various substances, from psychedelics to ketamine, as well as therapies, in order to address the neural correlates and reward network that has been changed by the disorders. However, despite the overlaps between the disorders, overlaps between treatments are far less common. This may be because of the difference in urgency in the two disorders.

OCD patients are rarely hospitalized based on an emergency, but anorexic patients often require hospitalization or in-facility treatment. Anorexia treatment's weight-gain process inevitably diverts attention from addressing the cognitive reasons behind the disorder, while OCD treatment allows patients to be more independent, focusing more on the psychological aspects of the disorder. However, the similarities demonstrated in the paper may be useful in shaping future anorexia treatments to better address the disorder.

CONCLUSION

Answer to the Research Question

The paper aimed to find the answer to the research question, "How and to what extent do there exist overlaps between compulsions in OCD and weight loss behaviors in anorexia nervosa?" By examining the literature about anorexia and OCD, as well as their treatments, the overlaps seem to be important in addressing treatment. Firstly, the disorders are similar, especially in core aspects that need to be addressed for a patient to be considered recovered. Secondly, successful treatment of anorexia often bears resemblance to the treatment of OCD through both the reward network and the connections between the compulsive actions and the obsessive thoughts.

The disorders share a great deal of similarities. Both rely on a loop that is formed by a fear of losing control or imperfection, which motivates behaviors that alleviate the distress, which strengthen the feedback loop (Beeler, 2022; Sandstrom, 2024). Patients of both report high expectations, fear, anxiety, and shame when falling short of expectations (Howard, 2023; Sarafraz, 2020). This motivates them to do their compulsive actions, which are weight-loss behaviors for anorexics and compulsions for those with OCD. By continuing these actions over time, the patient becomes dependent on their behaviors until they become compulsive and the reward network is twisted to reward the action. Therefore, effective treatment for either might be similar, as they should address similar things. Treatment might also address either the changes to the reward networks or the connections between the thoughts and the actions.

The treatment of the disorders do exactly that, with some targeting the reward system and others targeting the brain's ability to change. Psilocybin, SSRI's, and Ketamine target the reward center, allowing the patient to feel relief from their distress brought on by the aforementioned fear of losing control or imperfection without turning to their compulsive actions. By allowing something other than the compulsive actions to soothe the patient, these treatments weaken their dependence on the action. As time passes, that mental connection may become weaker and weaker, allowing the patient to feel less desire to partake in the weight-loss behaviors. In a sense, ketamine and psilocybin might be able to fill the role that SSRIs play in the treatment of OCD for anorexics. SSRIs address the obsessions in OCD, allowing the patient to feel more relaxed and less inclined to perform compulsions. Both ketamine and psilocybin make individuals more relaxed, which may make patients with anorexia feel less reliant on compulsions.

Exposure and Response Prevention Therapy (Spencer, 2023), and Positive Affect Therapy (Haynos, 2023) both use therapy to restructure patient's minds around healthier coping mechanisms, taking advantage of neuroplasticity. Psilocybin (Buot, 2023; Peck, 2023) and ketamine (Bloch, 2012; Scolnick, 2023) also both have psychopharmaceutical effects that include greater cognitive flexibility, which allow the patients to weaken the mental bonds between their obsessive thoughts and compulsive actions. By weakening the connections, the patients also weaken their reliance on their compulsive behaviors, cutting the issue away at the root and allowing any further treatment, such as gaining weight or healing skin rubbed raw from washing, to happen more efficiently.

Limitations to the Study and Suggested Future Steps

Limitations of this paper include its dependency on existing research rather than conducting an empirical study, a limited time frame, and the researcher's lack of prior knowledge on the topic, resulting in inefficient research. Prior to future research, the researchers should develop a base understanding of all keywords in order to research more efficiently. While time frame is not always a factor in the researcher's control, they should aspire to plan effectively and block in time for unexpected findings and the research that follows it. As this paper is based on a literature review and is about disorders and treatments, there is a reliance on studies that are focused on rodents, especially in testing new and experimental drugs, as well as on studies with small sample sizes that are not ideal for drawing massive conclusions.

Future steps include further empirical research on the various medications and therapies discussed, especially on humans, and in larger, more diverse sample sizes. An especially interesting study to conduct would investigate the effects of combining not only the ketogenic diet and ketamine, but also a form of exposure and response prevention therapy with patients of anorexia and OCD, with a control group as well as a group with both disorders occurring comorbidly. This would allow the researchers to further see not only the effects of ketamine and the ketogenic diet, but also how it supports exposure and response prevention therapy to reshape cognitions around food and obsessions. It may not be ethical to do this study double blind, as ketamine is a controversial substance that participants should be aware of interactions with. It may also not be possible to perform the study longitudinally, but rather researchers could follow up with patients after treatment finished in order to ensure no lingering unexpected effects.

Summary

Anorexia nervosa has a high mortality rate (Lai, 2025), yet current treatments fall short (Huas, 2011). Patients often do not finish their treatment paths, leading to higher remission rates (Huas, 2011). In order to address this concern, this paper looked to OCD to compare its psychopathology and treatments to those of anorexia, hypothesizing that the similarities between the two disorders might correspond to similarities in treatments. Through a review of existing literature, the paper found that both disorders share harmful feedback loops where negative emotions combine with perfectionism and a desire for control to create feelings of distress whenever the individual "fails". The failures then motivate the individuals to do

certain actions, and as time passes, the actions become linked to relief. The reward network adapts and becomes reliant on the actions, making them compulsory rather than choices.

Treatments for both disorders are varied, but successful treatments typically involve treating either the reward circuit or the neural correlates between the distressing thoughts and the compulsions or both. By addressing the root causes of anorexia and taking account information from OCD, treatment can be more effective. Future research should involve an empirical study testing these proposed treatments in combination with each other.

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