

Substance Use Among Individuals with Eating Disorders Webinar Transcript

July 16, 2021

la-shell_johnson@med.unc.edu: Good afternoon, everyone. I apologize, we have a thunderstorm going on here, and I had some difficulties. So I'll start over. I'd like to welcome you again today to today's webinar with Dr. Stephanie Ferrin.

la-shell_johnson@med.unc.edu: A few things to note. Participants will be muted upon entry and videos turned off. For technical assistance, we ask that you please use the question and answer box located at the bottom of your screen.

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la-shell_johnson@med.unc.edu: We will allow 10 minutes at the end of today's presentation for questions and answers. Any unanswered questions will be emailed one week from today by Dr. Stephanie Ferrin. I'll now introduce you to today's speaker.

la-shell_johnson@med.unc.edu: Dr. Stephanie Ferrin is an Assistant Professor at the University of North Carolina. She completed her residency in pediatrics at Oklahoma University School of Medicine in 2016 and her fellowship in adolescent medicine in 2020.

la-shell_johnson@med.unc.edu: She completed a Master's of Science in Clinical Research from Indiana University Purdue University, and her clinical and research focus lies primarily in the treatment and management of eating disorders. Dr. Ferrin has experience managing patients with eating disorders at all treatment levels and currently sees patients in eating disorders, both in outpatient and inpatient settings for medical management. She is passionate about working with her adolescent population and the challenges they face.

la-shell_johnson@med.unc.edu: Dr. Ferrin also enjoys providing clinical teaching to residents and medical students whom she supervises as the director of the adolescent medicine rotation at UNC. Of note, Dr. Ferrin spent a year working as a physician for the Tsehootsooi Medical Center in the Navajo Nation and has an interest in providing care for Native American youth. In her spare time, Dr. Ferrin enjoys hiking, gardening, and spending time with her husband and pet rabbit. I'll now turn things over to our presenter today, Dr. Stephanie Ferrin.

la-shell_johnson@med.unc.edu: All right, Dr. Ferrin you can go ahead.

Stephanie Ferrin: Hello.

Stephanie Ferrin: Can anyone hear me?

la-shell_johnson@med.unc.edu: Hi Dr. Ferrin, You're good to go now, yes you're good.

Stephanie Ferrin: Okay.

Stephanie Ferrin: Thank you so much, so minor technical difficulties.

Stephanie Ferrin: Alright, so I'm Stephanie Ferrin and one of the Adolescent Medicine doctors. Thank you for being here today.

Stephanie Ferrin: I do just want to start off by saying that, since I am an Adolescent Medicine specialist some of the talk will definitely be from the perspective of a provider that sees primarily adolescents, but will hopefully be applicable to everyone that's here today.

Stephanie Ferrin: Alright, as far as disclosures, I have no financial interests or relationships to disclose that is relevant to today's discussion.

Stephanie Ferrin: The objectives for our talk would be that following this presentation, I would hope you'd be able to identify the risk factors for the development of both substance use disorders, as well as eating disorders.

Stephanie Ferrin: That you would be able to describe the overlay between the addiction model found in individuals who have substance use disorder and those with an eating disorder.

Stephanie Ferrin: And that you would also be able to plan how to approach, an evaluation and potentially intervention for patient who may present with both an eating disorder and a substance use disorder.

Stephanie Ferrin: So to start off with I want to discuss a little bit about the epidemiology of eating disorders.

Stephanie Ferrin: So eating disorders, specifically anorexia nervosa and bulimia nervosa are severe psychiatric disorders that often present in adolescence and most commonly occur in females.

Stephanie Ferrin: However, there has been an increase in prevalence among males in recent years, and whether this is due to shifting demographics or increased diagnosis and reporting is unclear.

Stephanie Ferrin: The exception to this general rule are those who present with ARFID or avoidant restrictive food intake disorder.

Stephanie Ferrin: Which is more probably common among males and often tends to present prior to puberty and adolescence.

Stephanie Ferrin: Anorexia nervosa has a lifetime prevalence of about one to 1.5% in the population and typically appears in middle adolescence so think around middle school to high school age range.

Stephanie Ferrin: Bulimia nervosa has a higher prevalence of around 1.5 to 2% and tends to appear in later adolescence so think more high school to college age range.

Stephanie Ferrin: Similarly, binge-eating disorder has an even higher prevalence rate of 3.5 to 5% and also develops most commonly in later adolescence similar to bulimia.

Stephanie Ferrin: As ARFID is a newer diagnosis within the DSM V, information about it is still emerging at this time and the most recent prevalence range is based on a limited number of studies.

Stephanie Ferrin: So you'll see it quoted from anywhere between 1.5% to 5%, and that is for both males and females. And while there are other eating and feeding disorders than these listed for the purposes of this discussion, I will mostly be focusing on anorexia nervosa, bulimia nervosa, and binge-eating disorder, which are the three most common well-known and well-studied eating disorders.

Stephanie Ferrin: Because the other part of this talk is about substance use disorders when we're discussing substance use disorders, it is important to note how prevalent they actually are. So in the 2019 National Survey of Drug Use and Health related statistics released information that about 19.3 million people in the United States, who were over the age of 18 had a substance use disorder of some sort.

Stephanie Ferrin: Of those 7.4 million or 38.5% struggled with an illicit drug use, including opiates, stimulants, and other associated substances.

Stephanie Ferrin: 14.1 million or 73.1% struggled with alcohol use and another 2.2 million or the remaining 11.5% struggled with both illicit substances and alcohol use.

Stephanie Ferrin: Of course, this data is limited by the exclusion of younger adolescents who are less than 18 years old.

Stephanie Ferrin: And it's also important to note that many substance use disorders start during earlier adolescence, and at a younger age at first substance use is a risk factor for the development of a substance use disorder.

Stephanie Ferrin: So, keeping that in mind, I would like to draw attention to substance use statistics as broken down by age specifically early adolescence at 12 to 17 years, late adolescence at 18 to 25 years and then adulthood.

Stephanie Ferrin: Note that these statistics reflect substance use and not abuse or substance use disorders. Also note that this is a single snapshot in time that the data was collected and does not trend or serve as a potential for development of substance use disorder later and is based on self-report which may impact the results.

Stephanie Ferrin: As you can see, alcohol use is by far the most common substance that is reported as being used in the United States, with almost 20-120 million reporting use in the age group of 26 and older and then 20 million reporting use in the 18 to 25 year age group.

Stephanie Ferrin: However, when we remove alcohol use, we are able to see that marijuana is the most common illicit substance that is used for all age groups in those drugs, which were inquired about.

Stephanie Ferrin: This is followed by opioid misuse then prescription pain relievers and then prescription stimulant misuse.

Stephanie Ferrin: Of note, most prescription medications both stimulants and pain relievers, were found to be either obtained from that individual's own provider meaning the individual

was given a prescription for it and we're using it in a way that was not intended or the medications were obtained from a relative or friend who did have a prescription for that drug.

Stephanie Ferrin: Now that we have discussed some of the statistics on eating disorders and substance use, I would like to follow that up with discussion on some of the risk factors that have been linked to eating disorders and substance use.

Stephanie Ferrin: Both of those are often explained by the use of the bio-psychosocial model.

Stephanie Ferrin: The late George Engle, created the bio-psychosocial model, as he believed that to understand and respond adequately to a patient's suffering and to give them a sense of being understood, clinicians must attend simultaneously to the biological, psychological, and social dimensions of illness. Philosophically, it is a way of understanding how suffering, disease, and illness are affected by multiple levels of organization from the societal to the molecular.

Stephanie Ferrin: At the practical level, it is a way of understanding the patient's subjective experience as an essential contributor to accurate diagnosis, health outcomes, and humane care.

Stephanie Ferrin: In the medical management of both eating disorders and substance use, we often use the bio-psychosocial model to help explain the risk factors for development of both eating disorders and substance use disorders and help guide potential treatment options by mitigating those risks when possible.

Stephanie Ferrin: From the biological domain, a variety of risk factors have been identified that could predispose an individual to developing an eating disorder. Biological risk factors are currently hypothesized to account for anywhere between 5% to 80% of the risk of development of an eating disorder.

Stephanie Ferrin: That is not to say that an individual is pre-programmed or destined to develop an eating disorder. As it is much more complex than that. In many individuals with similar biological risk will not go on to develop an eating disorder.

Stephanie Ferrin: The bio-psychosocial model rather attempts to account for the complex interactions between the psychosocial and the neurobiological abnormalities found within patients who have eating disorders.

Stephanie Ferrin: So when studying eating disorders, we have found that there is an increased prevalence of eating disorders within families and those who have a first degree relative who are diagnosed.

Stephanie Ferrin: And those individuals will go on to have an increased risk of developing an eating disorder them self.

Stephanie Ferrin: This applies to eating disorders, as a whole, rather than one specific eating disorder, such as anorexia nervosa or bulimia nervosa.

Stephanie Ferrin: It has also been found in studies that there's a higher importance rate for the development of an eating disorder in a monozygotic or identical twin as compared to a dizygotic or fraternal twin, particularly in the case of anorexia nervosa.

Stephanie Ferrin: Genetic studies have also found some alterations in chromosomes, specifically chromosome 14 which has been linked to bulimia nervosa and then chromosome number one which is linked to anorexia nervosa.

Stephanie Ferrin: Furthermore, there appears to be a significant association for differences in the serotonin 2A receptor gene and anorexia nervosa. When it comes to eating disorders, we also know that neurotransmitters or the brain chemistry has a significant role to play.

Stephanie Ferrin: We know that there are disturbances in the neurotransmitters for serotonin, norepinephrine, and dopamine which are all linked to eating disorders and especially anorexia nervosa and that these are usually found to be at depress levels.

Stephanie Ferrin: Whether those disturbances are due to malnourishment and then result in further disordered eating habits or the altered neurotransmitters themselves cause the disordered eating in malnourishment remains unclear at this time.

Stephanie Ferrin: But we do realize the altered levels likely play a considerable role in the development and perpetuation of eating disorders, like so many other mental health illnesses.

Stephanie Ferrin: Other biological factors that are considered to be risks for predisposition of the development of eating disorders include underlying medical conditions.

Stephanie Ferrin: Such conditions may include things such as an endocrine or hormonal problem so, for example, this would be things like Type-1 diabetes and thyroid disorders.

Stephanie Ferrin: Other medical conditions may include malabsorptive states so things such as cystic fibrosis or celiac disease which may make it quite difficult when trying to distinguish between the disease and the eating disorder itself.

Stephanie Ferrin: Finally, we also know that sometimes an illness that results in rapid weight loss may result in perpetuation of that weight loss or development of the disordered eating process.

Stephanie Ferrin: This is similar to what was found in the Minnesota starvation studies of the 1940s, where those who are subjected to starvation states developed difficulties in reading their own hunger cues and using binge eating and purging behaviors during their refeeding period. Even after completing refeeding, they would then continue to use those behaviors and developed body image concerns as well that persisted for many years.

Stephanie Ferrin: It is hypothesized that these biological changes they endured resulted in long lasting psychological changes as well.

Stephanie Ferrin: So this now brings me to my next point regarding the different risk factors in the development of eating disorders and those who would be the psychological risk factors.

Stephanie Ferrin: So, though, through multiple studies, we know that there are many psychological factors that contribute to various mental health disorders.

Stephanie Ferrin: One such factor that is often cited, especially in the case of anorexia nervosa is the underlying temperament of the individual.

Stephanie Ferrin: So certain personality traits have often been associated with anorexia nervosa. While the narrow and now outdated view that anorexia nervosa only affects cisgender, Caucasian females from more affluent or upper social economic standing is a little bit more outdated. The idea that it is associated with what is colloquially called a Type A personality may hold some merit.

Stephanie Ferrin: So anorexia nervosa, particularly the restricting type, has an association with character traits of perfectionism. With rigidity and scheduling and attempts at being the best in other arenas of their life so such as academics and sports.

Stephanie Ferrin: Well, this is not always the case, the rigidity and thought and seeking of control does tend to be very common in individuals who are diagnosed with anorexia nervosa.

Stephanie Ferrin: Bulimia nervosa and binge eating disorder, on the other hand, often have more personality traits of impulsivity and sometimes risk taking behaviors.

Stephanie Ferrin: Other psychological risk factors may include difficulty with coping skills and emotional regulation.

Stephanie Ferrin: Large changes or life events such as moving to a new city or matriculating to a new school, may serve as a trigger for the development of an eating disorder with individuals who have poor ability to cope with the stress that may bring other known risks that play a part in poor coping skills around change include early puberty changes and an early menarche.

Stephanie Ferrin: Or the age when they first start having periods being much younger so typically less than the national average, which is around 12 years of age, and this is especially when they're in comparison to their peer group.

Stephanie Ferrin: We also know that poor self-esteem and body dissatisfaction play a large role in the development of eating disorders and behaviors attempting.

Stephanie Ferrin: To correct their perceived deficiencies, we know that early dieting behaviors and females is often brought about by poor body satisfaction and that those individuals who engage in dieting behavior are attempting to use cognitive control in an effort to override their psychological cues of hunger and fullness. This places them at risk for disinhibited eating and will make them more vulnerable to binge eating.

Stephanie Ferrin: Dieting due to body dissatisfaction is also known to frequently precede the use of more extreme weight control behaviors that are quite typically found in anorexia nervosa.

Stephanie Ferrin: Finally, trauma is a very large psychosocial risk factor. We know that adverse childhood experiences, or what we often refer to as aces have a tremendous impact on lifelong health and opportunity.

Stephanie Ferrin: This includes the development of eating disorders so adverse childhood experiences are potentially traumatic events that occur in childhood between the ages of 0 to 17, so newborn up until the age of majority and some of the examples of these experiences would be things like experiencing violence, abuse, or neglect to themselves.

Stephanie Ferrin: Sexual and physical assault in particular have a strong link with the development of eating disorders.

Stephanie Ferrin: Other potential aces include witnessing violence, abuse, and assault in the home or community, having a family member attempt suicide or die by suicide, and then also having a parent removed from the family or incarcerated or placed in jail.

Stephanie Ferrin: And finally, the last concern for potential risk factors include social or environmental factors that are occurring around or outside of the individual.

Stephanie Ferrin: For a long time social influences were often attributed as being the main reason for the development of an eating disorder.

Stephanie Ferrin: And while they definitely serve as a potential cause, they are not necessarily the singular root problem. Instead it is likely that there is a large amount of interplay between societal and environmental pressures and the other risk factors mentioned previously.

Stephanie Ferrin: So a study titled, "Project Eat or Eating an Activity Among Teens and Young Adults" was carried out to evaluate eating and weight related issues in adolescence and the intersections between weight, binge eating, and extreme weight control practices, such as the use of diet pills laxatives, diuretics, and self-induced vomiting.

Stephanie Ferrin: When they evaluated their outcomes, certain trends emerged as risk factors in adolescent males and females. These included risk, based on the family's weight related norms and household culture around eating and food.

Stephanie Ferrin: Negative risk factors that they noted were commentary by a family member, usually parents or siblings, but sometimes other extended family members around the youths' weight. This includes both comments made to be helpful or encouraging such as a suggestion to diet, as well as more harmful weight teasing.

Stephanie Ferrin: Another risk factor includes the modeling of both maternal and paternal weight concerns and behaviors such as dieting, exercise habits, and commentary around their own weight that the youth was observant of.

Stephanie Ferrin: Positive or protective factors, on the other hand, included frequent family meals, where there was a positive atmosphere and a normalization of eating practices and behaviors.

Stephanie Ferrin: Similar to family pressure, peer pressure, and bullying, are common influencing factors that may predispose the development of an eating disorder.

Stephanie Ferrin: Bullying around weight in childhood and adolescence is a common and frequent trigger cited by numerous youth receiving treatment for an eating disorder. Furthermore, it may be something that is engaged in by their peers, especially in weight focused activities and sports, such as ballet, wrestling, and others and is accepted as something that is not only just done, but is even expected. Sometimes authority figures such as coaches and trainers will also serve as an outside force the acts upon the team and leads to the development of their disordered eating.

Stephanie Ferrin: Individuals may receive feedback that the weight they have lost is a positive thing, even if the methods were harmful or detrimental to their health, which then serves as a positive cue to continue such practices and to continue to receive praise for their efforts.

Stephanie Ferrin: Sociocultural expectations for fitness, are risk factor for eating disorders are not limited to what could be considered Western civilization's with increasing incidence among other cultures and countries globally that place a value on fitness. Thin inspiration or weight loss, is equated with success or something to strive for and is propagated commonly across various social media outlets, as well as media in general found at movies, TV, magazines, and even radio advertising. All promoting and propagating the ideal body standards that are neither realistic nor attainable.

Stephanie Ferrin: Internet influences, such as pro-Ana, or pro-anorexia, and pro-MIA or pro-bulimia sites can be found that give tips and advice, while also providing a social outlet and support system for individuals and especially adolescents who are struggling with an eating disorder.

Stephanie Ferrin: And the Project EAT that I had mentioned before, also suggested that the high degree of weight stigma within our society likely increases the risk of overweight individuals, in particular, to engage in eating disorder behaviors.

Stephanie Ferrin: To further emphasize the importance and magnitude that environmental influences have upon individuals and the potential for development of eating disorders from these known risk factors, I'd like to read a few excerpts to you from various studies and papers published around the topic.

Stephanie Ferrin: So the best known environmental contributor to the development of eating disorders, is the sociocultural idealization of thinness.

Stephanie Ferrin: Seventy-nine percent of weight loss program participants reported coping with weight stigma by eating more food. Up to 40% of overweight girls, and 37% of overweight boys are teased about their weight by peers or family members. Weight teasing predicts weight gain, binge eating, and extreme weight control measures.

Stephanie Ferrin: Weight-based victimization among overweight youth has been linked to lower levels of physical activity, negative attitudes about sports and lower participation and physical activity among overweight students.

Stephanie Ferrin: Among overweight and obese adults, those who experienced weight-based stigmatization engage in more frequent binge eating or an increased risk for eating disorder symptoms and are more likely to have a diagnosis of binge eating disorder.

Stephanie Ferrin: And then finally multiple studies have found that dieting was associated with greater weight gain and increased rates of binge eating in both boys and girls.

Stephanie Ferrin: So returning to our overview of the interplay between the biological, social, and psychological factors that we had discussed in regards to eating disorders.

Stephanie Ferrin: I now want to extend the same principles when evaluating risk factors for the development of substance use disorder, as the model can be applied to both.

Stephanie Ferrin: There's a significant overlap between the bio-psychosocial model of eating disorders and substance use. When looking at the biological factors, we know that substance use disorders definitely have an impact on substance use with heritable factors contributing to 30% to 80% of the total variance and risk of cannabis use disorder.

Stephanie Ferrin: For alcohol use disorder, we know that alcoholism runs in families with 40% to 60% variance which is explained by genetic influences and has a three to four fold increase of risk if close relatives, particularly parents, have an alcohol use disorder that the individual will also go on to develop an alcohol use disorder.

Stephanie Ferrin: Similar to anorexia nervosa there is a significantly higher rate of alcohol use disorder in monozygotic or identical twins as compared to dizygotic or fraternal twins. Drug effects on the body also play a large role by including craving and withdrawal symptoms, which we will talk about a bit more, but that is another biological factor that is a little bit more unique to substance use disorder.

Stephanie Ferrin: For the psychological domains, we know that when it comes to temperament, individuals with substance use disorders often exhibit more impulsive and novelty seeking behaviors.

Stephanie Ferrin: And that youth with high behavioral disinhibition scores show early onset substance use disorders and multiple substance involvement.

Stephanie Ferrin: History of conduct disorder in childhood or adolescence and antisocial personality disorder are risk factors for the development of many substance related disorders including cannabis related cannabis-related disorders and cannabis use disorder.

Stephanie Ferrin: Finally, the environment surrounding substance use and cultural norms likely plays a large role in the development of substance use disorder.

Stephanie Ferrin: Cannabis is widely accepted as a lower harm substance and is easily obtained in the United States.

Stephanie Ferrin: Hallucinogen use is more prevalent in the West and Northeast regions of the U.S., which is, which suggests a certain amount of cultural acceptance of use as inhalant gases are widely and legally available, which increases the risk of misuse as well.

Stephanie Ferrin: For overlapping environmental factors, one study by Baker and colleagues, found that there's an association between childhood, sexual abuse, and the development of co-morbid bulimia nervosa and substance use disorder.

Stephanie Ferrin: Another study by Corstorphine and colleagues, found an association between history of childhood sexual abuse substance use disorder in impulsivity and patients who had already been diagnosed with an eating disorder.

Stephanie Ferrin: Other known environmental risk factors that impact the risk of developing a substance use disorder and an eating disorder include poor paternal education, close maternal relationship, and that the lack of a close maternal relationship was a risk factor, whereas a healthy maternal relationship was often considered protective substance use disorder an eating disorder behavior modeling by those around them, particularly parents and siblings.

Stephanie Ferrin: And then, a maternal concern about weight loss and appearance seem to serve as a risk factor for both the development of eating disorders and substance use disorder.

Stephanie Ferrin: Several studies examine the genetic possible genetic links in eating disorders and substance use disorder, particularly in alcohol use disorder.

Stephanie Ferrin: So study by Slane and colleagues, found a significant overlap in genetic factors between binge eating and compensatory behaviors in bulimia nervosa and alcohol use disorder suggesting that there's a heritable link in these two disorders.

Stephanie Ferrin: A study by Redgrave and colleagues, found that patients with eating disorders, who had a first degree relative with alcohol use disorder, are more likely to use alcohol than those without.

Stephanie Ferrin: However, it should be noted that the study concluded that having a first degree relative with alcohol use disorder was more likely to exacerbate the eating disorder than to actually serve as a cause of it.

Stephanie Ferrin: The overall takeaway is that co-morbid, bulimia nervosa and alcohol use disorder might share overlapping common genetic, environmental, and familial factors when evaluating the disorders, from the viewpoint of the bio psychosocial model.

Stephanie Ferrin: So why do we care?

Stephanie Ferrin: I am looking through at it through a lens of a provider who primarily manages, and patients who have eating disorders, but I would say that, as a rule, all providers want for their patients to have the best possible outcome.

Stephanie Ferrin: From my perspective, especially since anorexia nervosa has the highest mortality rate of any psychiatric disorder, I want to make sure that there are no complicating factors that would impede my patients from getting better.

Stephanie Ferrin: So if a co-morbid use of substances leads to poorer outcomes then that is something I need to be screening for and addressing in my patient population.

Stephanie Ferrin: Specifically, we know that co-morbid substance abuse or misuse results in worsening of their eating disorder symptomatology, poor outcomes for both morbidity and mortality than those with eating disorders alone, including increased general medical complications and psychopathology in longer recovery time which is crucial and eating disorders such as anorexia nervosa in regards to their long term prognoses.

Stephanie Ferrin: It will result in poor functional outcomes and a worst quality of life for the individual.

Stephanie Ferrin: And finally, there is a higher relapse rate of the eating disorder itself is there is a co-morbid diagnosis of substance use disorder. Similarly, due to the poor outcomes and behavioral overlay between substance use and eating disorders, I would want for patients with a substance use disorder to also be screened for an eating disorder, so they may be appropriately addressed as well.

Stephanie Ferrin: So co-morbid substance use and bulimia nervosa is well known and documented. All those saying that 30% to 70% of adults with bulimia nervosa have substance use disorder throughout their lifetime is a bit wide, I typically like to quote the DSM V which estimates that for bulimia nervosa there's a 30% lifetime comorbidity of substance use disorder and bulimia nervosa.

Stephanie Ferrin: Women with eating disorders are more likely to abuse substances than women that do not have eating disorders.

Stephanie Ferrin: We also know that binge-eating disorder has higher rates of substance use disorders as well for both males and females, but in this case the males tend to, tend to exceed the females in their numbers, it is important to note that most studies look at patient populations who have eating disorders who then have substance use rather than a patient population of individuals with a substance use disorder.

Stephanie Ferrin: That, then, may be diagnosed with an eating disorder, on top of that, which may have an effect on the interpretation on these reported prevalences.

Stephanie Ferrin: I also want to note that most of the studies look at bulimia nervosa or binge-eating disorder, rather than anorexia nervosa for co-morbid substance use which you'll see in my upcoming slides.

Stephanie Ferrin: And because I am an adolescent medicine physician, I always tend to look at the adolescent specific demographics.

Stephanie Ferrin: So, as we saw in the graphs at the beginning of the talk. Adolescents who use substances had the greatest use of an alcohol and that was followed by marijuana use.

Stephanie Ferrin: For adolescents who are diagnosed with bulimia nervosa alcohol was also found to be preferred for substance use, but at a much higher prevalence rate than that found in the general population.

Stephanie Ferrin: Nicotine products such as cigarettes were used at similar rates of illegal drug use. And of that, marijuana was by far the highest substance use.

Stephanie Ferrin: Followed them by cocaine and then by amphetamines and, I suspect, if the studies were repeated with a larger patient sampling that we would probably see more opiate use as well.

Stephanie Ferrin: And this is important, because we know that individuals who start substance use at an earlier age, less than 21 years old, specifically, are at the highest risk of altering their reward system in their brain, which is still forming up until they hit about 26 years of age.

Stephanie Ferrin: For many who treat patients with eating disorders, we will often use the term substances, but that will often encompass medications and other things.

Stephanie Ferrin: That are not what you would classically think of as a substance with substance use disorders so for the purpose of this talk when I say substances, I do mean those that are associated with substance use disorders.

Stephanie Ferrin: But if following this, you look through the eating disorder literature yourself, just be aware that substances may refer to other things such as laxatives, diuretics, or anything the individual is taking to facilitate their disordered eating.

Stephanie Ferrin: That being said, in regards to substance use and eating disorders, alcohol and other psychotropic drugs are commonly used by individuals with eating disorders for emotional regulation.

Stephanie Ferrin: Or, as part of the pattern of their impulsive behavior they may also be used as a method to aid in their disordered eating with attempts to decrease hunger, in an effort to promote weight loss, and that was usually with the use of stimulants and nicotine.

Stephanie Ferrin: When talking about substance use disorders, I think it is also important to discuss what addiction is. So addiction is a chronic disease of the brain and not a moral failing or lack of willpower.

Stephanie Ferrin: The American Society of Addiction Medicine's public policy statement has a short definition of addiction. "Addiction is a primary, chronic disease of brain reward, motivation, memory, and related circuitry. Dysfunction in these circuits leads to the characteristic biological, psychological, social, and spiritual manifestations. This is reflected in an individual pathologically pursuing reward and/or relief by substance use and other behaviors."

Stephanie Ferrin: Addiction is characterized by the inability to consistently abstain impairment and behavioral control craving, diminish recognition of significant problems with one's behaviors in interpersonal relationships.

Stephanie Ferrin: Development of a physical dependence upon a drug, in a dysfunctional emotional response. Like other chronic diseases, addiction often involves cycles of relapse and remission.

Stephanie Ferrin: Without treatment or engagement and recovery activities, addiction is progressive and can result in disability and premature death.

Stephanie Ferrin: Because addiction and substance use in general, involves changes to the reward circuit of the brain, which affects judgment, decision making, learning, and memory and behavior control.

Stephanie Ferrin: These areas may continue to be persistently altered, even after the substance use has stopped.

Stephanie Ferrin: The changes to the brain are evident on imaging studies and are therefore more than just a simple behavior or choice that the individual is making, as the brain is almost literally being rewired, so to speak.

Stephanie Ferrin: Dopamine is a neurotransmitter that is released during a pleasurable experience so things such as eating a highly palatable food like cakes or other things high in sugar and typically fat content, or other pleasurable activities such as sexual activity or social engagement. Dopamine will serve to try to increase the likelihood of the experience being repeated.

Stephanie Ferrin: Substance use leads to the release of endorphins and other neurotransmitters including dopamine, associated with that reward circuit in the brain. That continued release of dopamine associated with a pleasurable experience leads to changes in the brain that make it easier for the activity to be repeated.

Stephanie Ferrin: And over time, the brain will start to seek this experience and habit will be formed to help perpetuate that activity and pleasure response. These activities can then trigger cravings even after substance use is stopped and why it continues to be a problem for those who are diagnosed with a substance use disorder.

Stephanie Ferrin: So substances of abuse act on the brain reward regions that are areas of the brain that evolved long time ago to mediate our responses to natural rewards, so again think sex, food, socialization. These areas focus on dopamine-containing nerve cells and the part of the brain called the ventral tegmental area or VTA.

Stephanie Ferrin: That projects into areas of the brain like the prefrontal cortex, nucleus accumbens, amygdala, and hippocampus.

Stephanie Ferrin: While each drug may have a different chemical structure and different protein target on the neurons in their synapses.

Stephanie Ferrin: They all produce the same functional effect on the brain, brain's reward regions and circuitry by acting to increase pleasurable sensations and drive addiction.

Stephanie Ferrin: Substances of abuse act on these areas much stronger than natural rewards do and create changes in these areas of the brain due to repeated exposure to drugs which ultimately change the chemistry of the nerve cells and in turn alters the way they transmit

signals. By altering neurotransmission, drugs can produce effects that make people want to use them repeatedly causing cravings and induce health problems that can be long term and lasting.

Stephanie Ferrin: This is a positron emission tomography or PET scan, which is a functional imaging tool that uses radioactive substances known as radio tracers.

Stephanie Ferrin: To visualize and measure changes in metabolic processes, regional chemical composition and ultimately the physiologic activity in the brain, these PET scan images show that repeated exposure to specific drugs depletes the brains dopamine receptors which are critical for one's ability to experience pleasure and reward.

Stephanie Ferrin: These changes in the brain make it harder for people to stop using drugs as they now become reliant on the substance to be able to feel pleasurable sensations. Other activities that may have elicited pleasure in the past, so food, sex, etc., are now diminished and their ability to do so.

Stephanie Ferrin: Eventually, the person using the drug will start craving more of the drug to feel the same high or even just to feel normal. This is referred to as an increase in tolerance.

Stephanie Ferrin: If the person using the drugs stops using it, they will experience negative side effects, known as withdrawal symptoms. The combination of increased tolerance and withdrawal symptoms causes the drug user to crave the drug and avoid withdrawals at all costs.

Stephanie Ferrin: This leads to dependence and the brain experiences physical changes as a result of the drug use and gets rewired to prioritize getting more of the drug, even if it causes those physical, emotional and financial harm to the individual.

Stephanie Ferrin: When talking about the addictive process, we should discuss the addiction model, which includes dysfunction in the three domains: the motivation and reward system, which we discussed is a physiological component, affect regulation, and behavioral inhibition. There's a common underlying impulsivity in the dysfunction in the neurobiological reward system in both eating disorders and substance use disorders.

Stephanie Ferrin: They share common neurobiological processes that include disturbance in neurotransmitter functions such as dopamine, serotonin, and opiates, and gamma aminobutyric acid. These are also significant similarities and the behaviors of those with eating disorders and substance use.

Stephanie Ferrin: The bingeing and purging behavior and, bulimia nervosa and binge eating disorder is associated with a high risk of development of substance use disorder.

Stephanie Ferrin: However, behaviors of women with anorexia nervosa and restriction types of eating disorders are less associated with substance use.

Stephanie Ferrin: Substance use disorder and binge eating disorder, specifically, share some common addictive diagnostic criteria.

Stephanie Ferrin: Such as bingeing more amounts than intended, continuous bingeing despite the presence of negative consequences, and not engaging in pleasurable activities due to bingeing.

Stephanie Ferrin: Patients with both disorders struggle with shame and guilt after bingeing or substance use has occurred, and several studies have discussed the possibility that the opioid system dysregulation could underlie addictive binge eating.

Stephanie Ferrin: So central dopaminergic mechanisms are involved in the motivational aspects of eating and food choices. This suggests the importance of dopamine on binge eating behaviors.

Stephanie Ferrin: Early work examining dopamine metabolites in the cerebral spinal fluid and plasma of individuals with bulimia suggest decreasing dopamine turnover during the active phase of the illness.

Stephanie Ferrin: While neuroimaging studies of dopamine mechanisms in bulimia and binge eating disorder are limited, genetic studies in humans have implicated an increase frequency of

dopamine transporter and associated dopamine-to-receptor polymorphisms with binge pathology. Recent studies and related models of dietary induced binge eating haven't investigated plausible dopamine mechanisms involved in sustaining binge eating disorders.

Stephanie Ferrin: The endogenous opioid system is also hypothesized to be implicated in the reward circuit that drives compulsive binge eating and purging. Several studies have discussed the possibility that the opioid system dysregulation could underlie binge eating and food craving as a form of anticipatory return reward that is regulated by both the endogenous opioid and mesolimbic dopaminergic systems. So, in addition to the regulation of food intake by homeostatic signals, opioids play an important role in the hedonic aspects of eating and reward mechanisms.

Stephanie Ferrin: To further explain, binge eating behavior is driven by three factors, hunger, distressed moods, and habit patterns related to time of day or place.

Stephanie Ferrin: Initially, binges typically start as a response to food restriction, weight loss, and hunger.

Stephanie Ferrin: The most common abnormal eating pattern in high school and college students is to skip breakfast, eat a light lunch, or also skip it and then have to fight hunger later in the day.

Stephanie Ferrin: Many times this hunger leads to binge eating behavior by late afternoon with bingeing on palatable food, the body releases dopamine and that restricted access to food enhances the reinforcing effects of dopamine when they do eat.

Stephanie Ferrin: Models and mice suggest that alterations in the mesolimbic or reward centers for dopamine, occur as a result of this restriction in bingeing behaviors. Vomiting, on the other hand, results in a release of hormones, such as ACTH and cortisol as well as endogenous opioids. Vomiting was also associated with falls in depression and anxiety.

Stephanie Ferrin: So gradually, binges become triggered by distressed moods such as anxiety about a test, low mood from a relationship, upset or feelings of boredom and emptiness.

Stephanie Ferrin: Bingeing behaviors help in those triggering situations by temporarily providing a respite and these behaviors often become patterns and condition reflexes.

Stephanie Ferrin: Many studies, looking at substance use and eating disorders evaluate the use of alcohol. Individuals with eating disorders may use alcohol as a way to cope with their eating problems.

Stephanie Ferrin: The presence of addictive personality traits could be the reason for the frequent association of alcohol use disorder with eating disorders as eating disorders are frequently conceptualized as addictive disorders.

Stephanie Ferrin: Alcohol consumption can function as a primary trigger for binge eating in women with bulimia nervosa and attempts to restrict alcohol intake, because of the caloric content in patients with bulimia is usually followed by binge drinking.

Stephanie Ferrin: Alcohol use disorder and adolescents specifically with bulimia, is associated with an increased risk in risk-taking behaviors such as attempting suicide and risky sexual behaviors. Much like caffeine, tobacco is commonly used by individuals with eating disorders as an appetite suppressant. Tobacco can be used as a distractor from thinking about food as well. In one study, it was found that women with eating disorders appear to be at particularly increased risk for smoking, especially those who binge eat and/or purge and display impulsive personality characteristics.

Stephanie Ferrin: There are few studies looking exclusively at the use of other substances in eating disorder patients is many will lump them together as substance use.

Stephanie Ferrin: However, they did find that amphetamine use is higher among women with anorexia nervosa than those with bulimia and is more associated with dieting and purging than bingeing behaviors. Cannabis and opiate use are also common among women with eating disorders and especially those with anorexia.

Stephanie Ferrin: Binge eating disorders are more prevalent in male patients with heroin use as compared to control subjects. And again, it's hypothesized that due to the role of those endogenous opioid system with bingeing and purging the risk for use of opioids in eating disorders may be higher than other substances, although that claim isn't necessarily substantiated at this time.

Stephanie Ferrin: So, knowing what we know now, what action should we take? Well for patients who are being seen for substance use disorder? Consider screening for eating disorders, I'll go over some of the available screening tools and discuss their potential merits and limitations.

Stephanie Ferrin: The SCOFF questionnaire is a short and easy to use tool for assessing the presence of anorexia and bulimia. It includes five questions related to self-control, weight loss, body image, and the role of food in the person's life. It has about 100% sensitivity rate for anorexia and bulimia separately and combined and a specificity of about 87.5% if they score above a 2. Another potential screener that can be used as the eating disorder screener for primary care (ESP), and it has a set of five questions, taken from other questionnaires and is a quick and easy tool that doctors can use in their general practice to get a sense of what an eating disorder may look like when it may be present.

Stephanie Ferrin: Multi-level analysis has demonstrated that the ESP was not clearly different from the SCOFF questions at ruling in an eating disorder, but that they were better at ruling out. The Eating Attitudes Test (EAT-26) is a 26-question screening tool that asked questions that fall into three general categories, including distorted body image, body weight, bulimic behavior, and self-control. This questionnaire allows for complete picture of symptoms and behaviors.

Stephanie Ferrin: The questionnaire for eating disorder diagnosis, or the Q-EDD was designed to capture the diagnostic criteria for eating disorders based off the DSM V and it has been shown to have a sensitivity of about 97% and specificity of 98%.

Stephanie Ferrin: And so it's fairly reliable and compares well against the diagnostic interview. And then, finally, the Eating Disorder Examination (EDE) is a diagnostic interview that reflects the current DSM V diagnostic criteria.

Stephanie Ferrin: It is available in the Eating Disorder Examination Questionnaire (EDE-Q), both are considered gold standard screening tools, the examination and questionnaire are delivered a little bit differently.

Stephanie Ferrin: But the EDE-Q is delivered by the clinician interview, while the questionnaire can be completed by a patient on their own. It does go over four sub skills or categories related symptoms of eating disorder and these categories include: restraint eating concern, shape concern, and weight concern.

Stephanie Ferrin: So in comparison, the EDE and EDE-Q are excellent for detection, but the EDS for primary care and SCOFF may be better for screening purposes in a busy practice.

Stephanie Ferrin: The Eat-26 is good for trending and, unlike the SCOFF and EDS, it is better validated for use among adolescents who present to your practice.

Stephanie Ferrin: The United States Preventive Services Task Force best practices and the treatment for substance use disorder does endorse screening for tobacco, alcohol and illicit drug use and then referring for specialty treatment, where indicated. Available on the IDA website, you can find multiple screening tools available for free and I've included that web link here for you.

Stephanie Ferrin: And currently, one of the most recommended is the model SBIRT, which is based on recommendation of development of integrative services linking community based screening and brief intervention with assessment and referral activities. So SBIRT stands for Screening Brief Intervention and Referral to Treatment.

Stephanie Ferrin: It fills a gap between primary intervention and more intensive treatments for those with substance use disorder and tries to improve community health by reducing overall prevalence and adverse outcomes.

Stephanie Ferrin: There are two common screeners for use in adolescent medicine they include the screening to brief interventions or the S2BI and the CRAFFT. The S2BI consists of frequency of use questions to categorize screening of substance use by adolescent patients into

different risk categories and it has an accompanying resource list to assist clinicians and providing patient feedback and follow up.

Stephanie Ferrin: The CRAFFT is an efficient and effective health screening tool designed to identify substance use, substance related risk factors, and substance use disorder in youth among youth ages 12 to 21.

Stephanie Ferrin: It has been implemented as part of a universal screening effort in thousands of busy medical community health settings and yields good information that can serve as the basis for your early intervention and patient-centered counseling.

Stephanie Ferrin: There is a paucity of treatment studies on the management of co-occurring eating disorders and substance use disorder. Overall, the literature indicates that the eating disorder and substance use disorder should be addressed simultaneously using a multi-disciplinary approach.

Stephanie Ferrin: The need for medical stabilization, hospitalization, or inpatient treatment needs to be assessed based on general, medical, and psychiatric considerations.

Stephanie Ferrin: Common features across therapeutic interventions include psycho-education about the ideological commonalities, risks, and sequelae of concurrent eating disorder behaviors, and substance abuse, dietary education and planning and then cognitive challenging of eating disorders attitudes and beliefs with building of skills and coping mechanism and addressing obstacles to improve the prevention of relapse.

Stephanie Ferrin: Emphasis should be placed on building a collaborative, therapeutic relationship and avoiding power struggles. CBT or cognitive behavioral therapy was the most frequently recommended psychotherapy for intervention showing efficacy for both eating disorders and chemical addictions, as documented by most of the studies.

Stephanie Ferrin: Naltrexone, an opioid antagonist has also been used to treat binge eating disorder and purging associated with eating disorders. Most people will think of it in its historic use for treatment of alcohol and substance use disorders. Naltrexone creates a nonspecific

blockade of the opioid receptors and the endogenous opioid action. It acts on the cells that have what's called the hypothalamic proopiomelanocortin, or POMC, plays an important role in regulating appetite and sends a stop food signal to the brain, so creating the melanocytes stimulating hormone.

Stephanie Ferrin: Since naltrexone blocks feedback inhibition, it could provide continuous release of MSH, so the hormone I mentioned before, which can lead to a decrease of appetite. And so, you will often see it in sometimes medications that attempt to help with appetite and obesity that contain both bupropion and naltrexone. In addition to regulation of food intake by homeostatic signals,

Stephanie Ferrin: Opioid will play an important role in the pleasant aspects of eating and reward mechanism like we talked about before, and in that area naltrexone may be particularly beneficial for those who have binge eating and purging.

Stephanie Ferrin: And finally, while there are multiple treatment options for substance use disorders, which are outside the scope of this talk, there are a few psychotropic options for treatment of eating disorders.

Stephanie Ferrin: Those that have evidence behind their use include SSRIs is for treatment of co-morbid depression or anxiety. Although they may also be helpful in bulimia nervosa and also to help stabilize neurotransmitter levels.

Stephanie Ferrin: And Lisdexamfetamine, while it is approved for use and binge eating disorder, I would caution against its use in a patient with an underlying substance use disorder or have a serious discussion of risk versus benefit of treatment prior to starting that medication.

Stephanie Ferrin: And at this time, I will end. These are my references and I welcome any questions I apologize for going just a little bit over.

la-shell_johnson@med.unc.edu: Thank you so much, Dr. Ferrin excellent presentation.

la-shell_johnson@med.unc.edu: I'm now going to begin to open up for question and answer. As a reminder, I just wanted to let you know this session was recorded and will be available on our training Center within two weeks from today.

la-shell_johnson@med.unc.edu: And also, you will receive an evaluation, with the slides from today, along with the references immediately following the webinar. I'll go to our first question.

la-shell_johnson@med.unc.edu: Doesn't binge eating produce similar internal brain chemicals as substance use?

Stephanie Ferrin: Yes, so the binge eating can produce similar opioid and endogenous opioid responses, especially with bingeing because it acts on those same pleasure centers of the brain.

la-shell_johnson@med.unc.edu: Thank you so much for that Dr. Ferrin. The next question asks, "Can you comment on the use of DBT for treating eating disorders?"

Stephanie Ferrin: So, I do know that DBT is used in some cases of eating disorders. My personal experience with it is limited as I'm a medical provider, rather than a psychologist or therapist. However, I do know that especially in patients with a history of trauma, that oftentimes DBT can be quite beneficial.

la-shell_johnson@med.unc.edu: Thank you for that again Dr. Ferrin.

la-shell_johnson@med.unc.edu: Someone was asking about the PowerPoint slides. The slides will be sent, once again, immediately after the webinar. The next question asks, "Are there any studies, with ARFID and substance use?" My guess is because these folks are avoidant of novel experiences, perhaps no.

Stephanie Ferrin: None that I am aware of. ARFID is rather new and there's emerging studies on it currently. There's actually not many consensus as far as management and treatment. And so as far, as I'm aware, there's no specific studies around that.

la-shell_johnson@med.unc.edu: Thank you again, Dr. Ferrin. I'll address one more question. The remaining questions will be sent out with responses from Dr. Ferrin by next Friday. "What are the pros and cons of considering food as addictive is the food itself addictive, or is it the behavior of eating?"

Stephanie Ferrin: So the food itself, I'm not necessarily going to say that it's addictive, although the act of eating for different individuals, certain foods will create a higher pleasurable response. So typically, it's going to be foods that are higher in a sugar content or a higher fat content and that that can then lead to those similar sensations that you get with addiction and addiction being more in regards to substance use. However, it should be noted that there is quite a magnitude of difference between addiction as it relates to substance use as compared to the pleasure that you get with eating, but they are similar. And can you reread the cons question?

la-shell_johnson@med.unc.edu: They ask is, "Is the food itself addictive, or is it the behavior of eating?" They just asked what are the pros and cons when considering food as addictive.

Stephanie Ferrin: I think I answered that.

la-shell_johnson@med.unc.edu: Thank you once again Dr. Ferrin for today. We truly appreciate your time and the presentation.

la-shell_johnson@med.unc.edu: I would like to just let everyone know that all of the unanswered questions, which we have three at this time will be answered and responses will be sent on behalf of Dr. Ferrin by next Friday. Thank you once again for joining us today, we truly appreciate your time.

Stephanie Ferrin: Thank you all.