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## Eating Problems and Eating Disorders in Youth During COVID-19

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### ABSTRACT

Eating problems and disorders in youth have been increasingly prevalent during COVID-19. Unhealthy eating has resulted in short-term effects like sleep problems and long-term effects including significant weight gain. Several risk factors have been noted for eating problems in these mostly parent questionnaire studies including demographics such as low income and female gender, experiences of the youth including boredom, activities of youth including excessive social media and limited physical activity and parent reinforcement for snacking. Eating disorders have worsened including symptoms and behaviors as well as medical instability and hospitalizations. Although this literature is limited by variability in sampling, measures and data analyses, it highlights the need for further research.

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Eating problems and eating disorders have been increasingly prevalent in youth during COVID-19. This narrative review is based on a literature search of PubMed and PsycINFO for the terms eating problems in youth during COVID-19 and eating disorders in youth during COVID-19. Following the exclusion criteria of case studies and non-English papers, only 59 articles are reviewed here. They include studies that have focused on the prevalence, the effects and the risk factors for eating problems and eating disorders in youth during COVID-19. Although several commentaries appear in the literature on the prevalence and significance of these problems (Allison et al, 2021; Katzman et al, 2021; Margaritas et al, 2020; Schwartz et al, 2021; Solmi et al, 2021), relatively few empirical studies have been conducted. In addition to the prevalence studies suggesting that eating problems have increased and eating disorders have worsened during the pandemic, several studies have focused on the effects of these problems especially overweight and obesity and risk factors including inactivity, excessive screen time and parent snacking.

## **Eating Problems**

### **Prevalence**

The prevalence data on eating problems in youth during COVID-19 have come primarily from Italy, and the separate studies are consistent. In one questionnaire study, 27% of children (N=5,811) were reported by their parents to be eating more during the pandemic and this was specified as an increase in junk food (Dondi et al, 2020). This research team also reported that food insecurity increased from 8% before the pandemic to 16% during the pandemic and that children in southern Italy were at greater risk. This finding may have related to southern Italian children more frequently eating a healthy Mediterranean diet prior to the pandemic and a relatively unhealthy diet during the pandemic.

In a smaller sample of parents (N=439), again responding to a questionnaire, the increased prevalence of overeating during the pandemic

was reported for specific foods (Pujia et al, 2021). For example, 34% of children were noted to increase their consumption of sweet snacks, 25% for processed meat, 47% for bread, pizza and bakery goods and 19% for vegetables, fruit and legumes. Surprisingly, a reduction was reported for sweet beverages and candy.

The title of a study from UK indicated a specific increase in pizza (Rose et al, 2021). In this study entitled "Pizza every day – why?", 44% of adolescents 16- to -18 years old (N=252) were reported to be receiving less healthy food at school following the lockdown versus before the lockdown and 77% said that their lunchtime was shortened after the lockdown.

In contrast, an improved diet was suggested to occur in a sample of 10 -to -16-year-olds from Poland (N=1334) (Kolota et al, 2021). These researchers specified increased portions of healthy foods occurring during the pandemic including an increase from 12 to 15% for four portions of veggies per day, an increase from 19 to 27% for three portions of fruit per day and an increase from 41 to 48% for the intake of three cups of water per day. Unlike these data, a decrease in quantity of food intake was noted in a study from the Gaza Strip in Palestine on 6-to-18-year-olds (N=2,398), although, at the same time, the quality of food intake was said to improve (Radwan et al, 2021). This study was unusual for recruiting both parents and adolescents with parents completing questionnaires for those students less than 12-years -old but students self-reporting if they were 13-to-18-years-old. Having adolescents engage in research, of course, requires parental consent, so it's not surprising that many research groups have chosen to survey only the parents.

### **Effects**

Effects of unhealthy eating in youth during COVID-19 can be divided into short-term and long-term effects. Several studies have addressed the short-term effect of sleep problems related to eating problems. In a logistic regression on a data set from Brazil (N=496), for

example, parents of 3-17-year-olds reported sleep problems in 49% of the kids and 12% did not meet sleep guidelines that were, in turn, related to poor quality eating (Lopez -Gill et al, 2021). The unhealthy eating habits included having fruits and veggies only four times a week and having sweets three times a week. These unhealthy eating habits supposedly lead to greater sleep problems. As in many other studies in this literature, the selection of independent and dependent variables appears to be arbitrary. Unhealthy eating and sleep problems are likely correlates or reciprocal/bi-directional variables.

Similar findings were reported by researchers from Poland on a sample of 6-15 -year-olds (N = 1016) (Luszczki et al, 2021). In this study, poor eating habits lead to shorter sleep duration. However, as in many of the other studies on unhealthy eating during this pandemic, the eating variables were also related to increased media use and decreased physical activity.

Weight gain is the most commonly reported long-term problem related to unhealthy eating in youth during COVID-19. In the study from Italy, body weight gain was reported by 60% of the parents of children and adolescents (N=439) (Pujia et al, 2021). The increase in body weight was greater in the adolescents versus the children (67% versus 55%). The foods leading to increased body weight were different for the children and adolescents. The weight gain for children related to increased dairy products and sweet snacks while the weight gain in adolescents derived from an increase in comfort foods and processed meat. Surprisingly, no gender effects were noted, consistent with other studies.

In a study called COV- EAT on Greek children and parents (N= 397) in 63 municipalities, an increase in body weight was noted in 35% of the sample (Androutsos et al, 2021). Increased body weight in this study was related to increases in breakfast foods and salty snacks. Once again, confounding affects included increased screen time, decreased physical activity and increased

sleep duration. A unique aspect of this study was that the parents reported on their own behavior as well as their child's behavior.

Some surprising exceptions to the frequently reported relationship between unhealthy eating and increased weight gain have appeared in this literature. For example, in the study from Italy, although 27% of children were eating more junk food and there was an increase in weight gain for 32% of the sample, the adolescents in the study were an exception as they actually showed weight loss (Dondi et al, 2020). And in one of the very few longitudinal studies a pre versus during lockdown comparison of overeating was made for undergraduate students from a southeastern university in the US (N=90 undergrads) (Keel et al, 2020). Although overeating and increased body weight were perceived by the students, body weight and BMI did not change during this period, suggesting cognitive distortions among the students. In addition, the students had increased concerns about weight, shape and eating which is probably why no changes occurred for their weight and BMIs.

### **Risk Factors**

Several risk factors have been noted for eating problems in youth during COVID-19. These could be categorized as demographic factors including low income, age and female gender, negative experiences like boredom, excessive social media use, lack of physical activity and reinforcement including parents snacking. In a study from Spain on the relationships between Mediterranean diet and physical activity, the low-income adolescents (10-14-year-olds) and the females in this sample showed the greatest decrease in Mediterranean diet and the greatest decrease in physical activity (Villordes et al, 2021). Age has also been a risk factor. In a sample from the north of Brazil, adolescents (N=720) were compared to children (N=589) (Texeira et al, 2021). The adolescents were reported to have a less healthy diet than the children.

Boredom has been a risk factor for over-eating and snacking (Philippe et al, 2021). In this

sample of French parents of 3- 12-year-olds (N=498), greater boredom in the children lead to greater over-eating and snacking. This variable is compounded by the children appearing to have greater appetite, food enjoyment and food responsiveness which the researchers referred to as emotional over-eating. At least one other study documented snacking as being due to boredom and stress in 10 - 19-year-olds in a multi-national sample from Italy, Spain, Chile, Colombia and Brazil (Ruiz-Rosso et al, 2020). The researchers suggested that fried food and sweet food consumption increased from 14% before the pandemic to 21% during the pandemic. Surprisingly, boredom and stress were the only negative emotions that were linked to eating problems in this literature even though several other emotional problems that would seemingly relate to eating problems in youth during COVID-19 were not addressed including anxiety, depression and post-traumatic stress symptoms.

Excessive screen time has been considered a risk factor for over-eating in youth during COVID-19. In the study from the north of Brazil, greater screen time was related to less healthy food (Texeira et al, 2021). Excessive screen time was also related to less physical activity and less adequate sleep patterns. These relationships were also reported for the sample from Poland (Luszczki et al, 2021).

Social media has also been considered a risk factor for its stigmatizing features. For example, in a study from Connecticut (N=452 11 -17-year-olds), 53% of the sample was exposed to weight-stigmatizing social media that led to an increase in body dissatisfaction in 41% of the sample, especially in the girls with a BMI greater than the 85th percentile (67 % of the sample) (Lessard et al, 2021).

Physical inactivity has been a risk factor in many of the studies that have involved over-eating (Azoulay et al, 2021; Luszczki et al, 2021; Texeira et al, 2021). Although physical inactivity is typically considered a risk factor for over-eating, over-eating may be a risk factor for

physical activity. Again, they are most likely co-occurring. Less physical activity, in turn, has been related to lower muscle to fat ratios in a study from Tel Aviv on 12-year-olds (N=220) (Azoulay et al, 2021) and to excessive weight gain in all age youth (Androutsos et al, 2021; Dondi et al, 2020; Keel et al, 2020; Pujia et al, 2021).

Parent practices, as in purchasing and cooking particular foods, have had both positive and negative effects. For example, in the study from France, parents were notably reinforcing their children by buying more pleasurable foods and engaging in more home cooking with their kids (Philippe et al, 2021). In contrast, in the sample from multiple countries (Italy, Spain, Chile, Colombia and Brazil), an increase was noted in eating legumes, vegetables and fruits due to home cooking (Ruiz-Rosso et al, 2020). Parent snacking has been a problem in some studies. For example, in a study from the U.S. on 2-18-year-olds (N=318), the authors referred to the parents' practices as "snack parenting" and "emotional feeding" (Jansen et al, 2021). Although the majority of the parents reported having regular mealtimes, they were noted to have irregular snack times. The data suggested that COVID-19-related stress was associated with greater snacking ("sweet and savory snacks") that were mediated by the parents' snacking. Schools were also reinforcing over-eating or at least high calorie eating as in the "Pizza every day-why?" article already mentioned (Rose et al, 2021).

## Eating Disorders

The effects of COVID-19 on youth with eating disorders have been studied from two perspectives. These include the thoughts, symptoms and behaviors of those with eating disorders as well as the medical instability and hospitalization of those with eating disorders. With regard to thoughts, symptoms and behaviors, two questionnaires were given to youth with eating disorders in Boston (N=73) (Spigel et al, 2021). These included The Children's Eating Attitudes Test and the Eating

Disorder Examination Questionnaire for Adolescents. Surprisingly, an increased incidence of 81% was noted for both eating disorder thoughts and behaviors of youth during the pandemic.

Although the type of eating disorder has typically been specified in these studies on eating disorders, the different types of disorders are not usually compared. In a study that was establishing the psychometrics of the COVID Isolation Eating Scale, those who have been labeled Other Specified Feeding or Eating Disorder (OSFED) showed the greatest impairment and eating symptomatology and psychopathology (Fernandez-Amanda et al, 2020). Although youth who have been given this label often have symptoms of the various types of eating disorder including anorexia and bulimia, they have not had enough of any specific symptom to have a specific diagnosis. The COVID Isolation Eating Scale may be identifying youth whose eating problems are specifically related to COVID-19 but did not exist prior to COVID or are simply exacerbated by COVID. And, as suggested by studies already reviewed, they may be both over-eating from boredom (Philippe et al, 2021; Ruiz-Rosso et al, 2020) and under-eating. The latter problem may be due to the stigmatization of shape and weight from excessive exposure to social media (Lessard et al, 2021 ) which resulted in their having more symptoms on the COVID Isolation Eating Scale.

In a cohort study on the impact of COVID-19 on adolescents with eating disorders from Canada, a retrospective chart review was conducted to compare the data from the April 2020 lockdown with data from the previous year (Spettigue et al, 2021). This chart review suggested that there was a significant increase in weight in 78% of the sample with 40% citing the pandemic as a trigger. Significantly more youth with eating disorders were medically unstable during the pandemic than before the pandemic (79% versus 55%). The data also indicated a

significant increase in hospitalizations for eating disorders in youth during the pandemic.

In a similar study from Boston, there was also a significant increase in inpatient admissions, hospital bed days and outpatient care-related inquiries regarding adolescents with eating disorders during the pandemic (Lin et al, 2021). And in a chart review that covered the years 2017- 2020, twice the number of admissions occurred during COVID-19 versus the previous three years (N= 125 versus 56) (Otto et al, 2021). Once again, it appears that the pandemic has exacerbated symptoms of eating disorders to the degree that youth with those disorders have required a significant number of hospitalizations.

### **Methodological Limitations**

The COVID-19 literature on eating problems and eating disorders in youth has several methodological limitations. One of the primary problems is that most of the studies are cross-sectional so that it's difficult to know whether the eating problems were pre-existing and simply exacerbated or whether they were novel and unique to the pandemic. Not having baseline data (given that the pandemic was not anticipated) limits any conclusions about causality. The only longitudinal data could be taken from medical records. Only a few of the studies were based on medical records or chart review, but those were limited to serious eating disorders requiring hospitalization. Relatedly, the source of data for most of the studies was parent report on questionnaires. This is not surprising given the difficulties of conducting research on youth that requires parent consent. Only a few of the studies recruited adolescents and those were mainly university age students 18 and 19 years. And even fewer studies were based on both parent and adolescent reports. But those were not designed to assess concordance of parents' and adolescents' perceptions but to tap the parents' eating behavior as well as the adolescents' behavior. And, rarely were the behaviors of parents and youth considered as being related except for cooking together and snacking.

The problem of questionable reliability of data is illustrated by the study that reported perceived increases in eating, body weight, screen time and physical activity along with increased concerns about weight shape and eating (Lessard et al, 2021). The study suggested cognitive distortions because no changes actually occurred in weight and BMI for examples. Food diaries would have been perhaps more reliable, but those data are, of course, more difficult to collect than survey data especially during a pandemic.

The studies not only varied on the source of data but also on the ages that were sampled. Some exclusively focused on children, others on adolescents and most on a large age range. Additional sources of variability were the differences in food classifications and differences in dependent measures as, for example, sleep problems, activity levels and weight gain. In those studies that assessed multiple behaviors, they were often confounded.

As is typical of the COVID-19 literature, the designation of eating problems as effects of other variables like boredom or as risk factors for other problems like weight gain has been arbitrary. Physical activity has been considered a risk factor in virtually all the studies that involved over-eating and although it's typically considered a risk factor for over-eating, over-eating may lead to less physical activity. Less physical activity has also been related to excessive screen time and both have been considered risk factors for over-eating in most of the studies reviewed here. Many measures that have been covered in this review as risk factors could in fact be effects of eating problems. The variability on all of these factors has made it difficult to conduct systematic reviews and meta-analysis which could not be found in the literature.

One of the most apparent problems with this literature is the failure to consider or focus on related emotional problems aside from the problem of boredom which was addressed in two studies (Phillipe et al, 2021; Ruiz-Rosso et al,

2020). Variables like social anxiety and loneliness do not appear in this literature. Although they are addressed in separate studies in the COVID-19 literature, they have not been addressed in the literature on eating problems and disorders in youth.

In summary, determining the causes of over-eating may be as complex as determining the etiology of eating disorders especially those that appear to have emerged during a pandemic or at least been exacerbated by a pandemic. Although this literature has been primarily focused on effects and risk factors or correlates of over-eating in youth during COVID-19, it promises to inform prevention/intervention efforts at reducing over-eating and its related problems of excessive screen time and inactivity in youth during pandemics like COVID-19.

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