Mental Health Considerations for Pediatric Obesity

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Learning Objectives

- 1. Learn about the interconnection between childhood obesity and social and emotional health
- 2. Identify common mental health concerns that co-occur with obesity
- 3. Identify treatment opportunities for addressing mental health concerns

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Outline

- Developmental Conceptualization
- Attention Deficit Hyperactivity Disorder
- Depression
- Anxiety
- Emotional Eating
- Loss of Control/Binge Eating
- Applying CBT to Pediatric Obesity
- Social Consequences Associated with Obesity
- Assessment Tools

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Developmental Conceptualization

Harrison et al. 2011

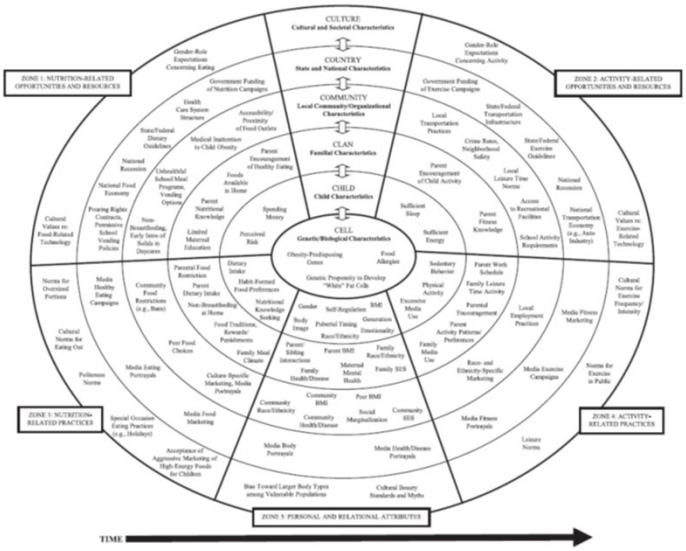

Figure 1. The Six-Cs developmental ecological model of contributors to overweight and obesity in childhood.

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Proposed Causes and Risk Factors: Development of Obesity
(Bomberg et al, 2019)

Table 1. Proposed causes and risk factors for the development of obesity.[a]

Category	Examples
Individual	
Genetics and epigenetics	Congenital leptin deficiency, Bardet–Biedl syndrome
Gut–brain hormones	Ghrelin, leptin, insulin
Eating behaviors	Binge eating, loss of control eating, hunger, food addiction
Disease states	Cushing's disease, hypothyroidism
Medications	Steroids, atypical antipsychotics, insulin
Psychological conditions/mood	Depression, anxiety
Physical activity	Sedentary lifestyle, increased screen time
'-omics'	Microbiome, metabolome, transcriptome, proteome
Pre- and perinatal exposures	Prenatal weight gain, gestational diabetes in mother
Adverse life events	Adverse childhood experiences
Environmental	
Commercial messaging	Advertising for calorically dense foods
Cultural norms	Portion sizes, body image norms
Built environment and area deprivation	Walkability, green spaces
Socioeconomic	
Poverty	'Food desert', 'food swamps'
Education status	Low education level

[a]Nonexhaustive.

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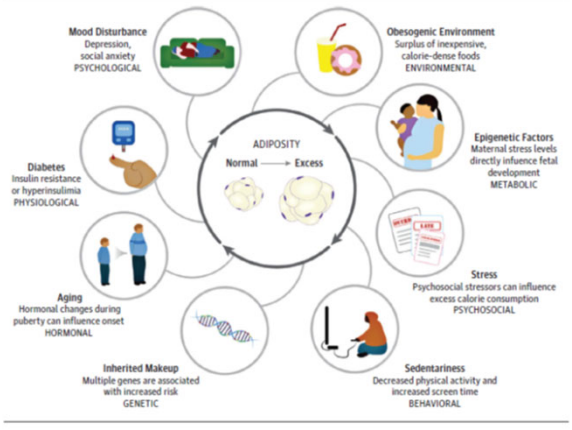
Development of Obesity
Cardel et. al, 2020

Figure 1. The Multifactor Development of Obesity



This figure demonstrates the multifactorial and complex nature of the development of obesity.

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ADHD

Pediatric Obesity Algorithm 2018 – 2020

Cortese et. al. 2019

- Strength of the relationship between ADHD and Obesity appears to get stronger over the course of development
- There is more evidence that ADHD precedes obesity
  - ADHD symptoms at age of 7 – 8 predict adolescent obesity (Khalife, et al 2014)
- Hypothesis that obesity may lead to ADHD via sleep disordered breathing
- Factors underpinning the association:
  - Genetics
    - E.g., those with high ADHD symptoms and greater dopaminergic activation in key brain reward areas have a higher BMI
  - Alterations in hot executive functioning/affective decision making
  - Increased prevalence of loss of control eating (LOC)
    - Over 70 percent of children with ADHD had recurrent LOC eating compared with 20 percent of children without ADHD (Reinblatt et al., 2015)
  - Sleep issues
    - Children with ADHD often have difficulty falling asleep.
    - Short sleep duration increases the likelihood of dysregulated eating
  - Inattention associated with reduced physical activity in childhood
    - Children with ADHD have 50% lower odds of sports participation than children with asthma

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ADHD

Pediatric Obesity Algorithm 2018 – 2020

Cortese et. al. 2019

Treatment

- Address sleep concerns including OSA, if relevant
- Opportunities for physical activity
  - Clinical Experience: Young children with significant ADHD are less apt to participate in organized sports
- Behavior management training for parents (especially for young children)
- Address academic under performance
- Consider medication management of symptoms

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Depression

Pediatric Obesity Algorithm 2018 - 2020

- Bidirectional association between depression and obesity
- Children with obesity or overweight are significantly more likely to have depression
  - Children and adolescents younger than 21 with obesity have a 34% higher risk of developing depression and are more likely to present with depressive symptoms than their peers with healthy weight (Quek, Tam, Zhang, & Ho, 2017)
- More severe depression in groups with more severe obesity
- Depression and antidepressant usage are independently associated with BMI
- Factors underpinning the association with obesity:
  - Depression associated with physical inactivity and binge eating
  - Peer victimization, bullying, and teasing increase with obesity status and are strongly associated with depression
  - Sleep may be a mediator of the relation between depression and obesity

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Depression

Jebeile et al 2019

Treatment

- Participation in structured and professionally run obesity treatment interventions with a dietary component are associated with a reduction in symptoms of depression
  - Even a small reduction during obesity treatment may reduce the susceptibility to worsening of symptoms during adolescence
  - Greater reduction in depressive symptoms found in studies with more severe obesity at baseline
  - Improvement in symptoms not related to weight related outcomes – could be due to changes in dietary intake or other specific intervention components (Omega 3?)
- Bariatric Surgery
  - Initial improvement in depression but return of symptoms with weight regain
- Psychotherapy
- Pharmacotherapy
- Address sleep concerns including OSA, if relevant
- Opportunities for increasing physical activity
  - Relation between "does" of exercise and therapeutic response for depression remains understudied
  - More recent focus on affective based exercise – identifying exercise where you consistently derive pleasure

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Anxiety

Pediatric Obesity Algorithm
2018 - 2020

- Odds of having severe obesity versus obesity were 5x higher for those with anxiety
- Anxiety with increased BMI greater in females than in males
- Strong association with obesity and social anxiety in elementary aged patients
- Factors underpinning the association
  - Imbalance in the Hypothalamic Pituitary Adrenal Axis and altered cortisol
  - Loss of control eating
  - Low self esteem and negative self image
  - Weight bias

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Anxiety

Jebeile et al 2019
Lopez-Alarcon et al 2020

Treatment

- Obesity intervention programs including structured exercise classes had a greater reduction in anxiety compared with studies providing physical activity education alone
  - Longer obesity interventions have a greater reduction in anxiety
  - Recent evidence that Mindfulness based intervention plus dietary intervention led to reductions in anxiety, BMI, and body fat in children with obesity and anxiety
- Psychotherapy
- Pharmacotherapy
- Address sleep concerns including OSA, if relevant
- Opportunities for physical activity

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Emotional Eating

Pediatric Obesity Algorithm 2018 - 2020

- Occurs when individuals eat in response to negative emotions or stress
- Etiology
  - History of high dietary restraint
  - Difficulty identifying hunger and satiety
  - Emotion dysregulation - associated with PTSD and depression
- Treatment:
  - Focus on emotion regulation skills
  - Dialectical behavior therapy with a focus on mindfulness, emotion regulation, and distress tolerance

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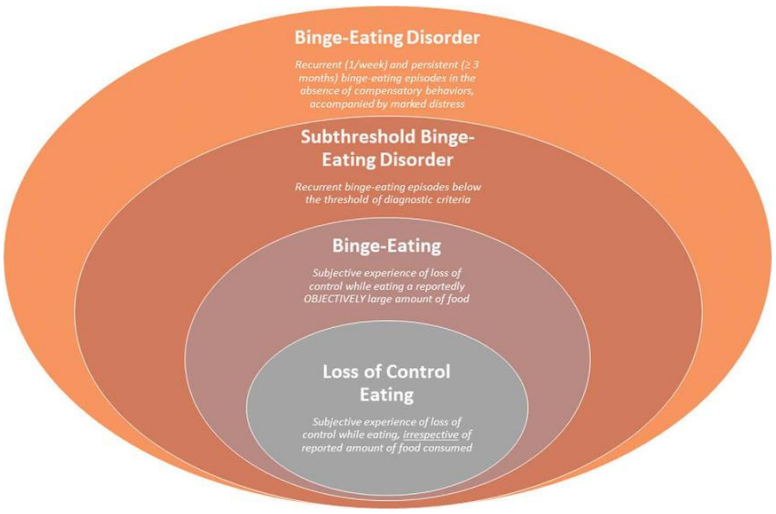
Loss of Control (LOC) Framework

Tanofsky-Kraff, M., Schvey, N.A., & Grilo, C.M. (2020)



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LOC Eating

Tanofsky-Kraff, M., Schvey, N.A., & Grilo, C.M. (2020)

- Issue of what constitutes as abnormally large in youth (9-year-old female versus 16-year-old male) leading researchers to examine LOC eating in youth, instead of binge eating
- 50 percent of youth seeking weight loss treatment report past or current LOC
- Youth as young as 8 years of age report LOC eating
- Risk Factors for LOC eating:
  - Mothers with binge eating more apt to have a child with LOC eating
  - The FTO high risk A allele (a polymorphism placing youth at greater risk for obesity) has been linked to LOC eating
  - Dieting, emotional eating, and eating in the absence of hunger are risk factors for LOC in adolescents
  - Increased impulsivity and reward sensitivity may put youth at risk for LOC eating

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Binge Eating

Tanofsky-Kraff, Schvey, & Grilo, 2020

- Defined as the consumption of an abnormally large quantity of food while experiencing a lack of control
- BED: recurrent binge episodes in the absence of regular compensatory behaviors and must have 3 of the following: eating faster than usual, eating until uncomfortably full, eating large portions when not hungry, eating alone because one feels shame, feeling disgust or guilt after
- Etiology:
  - Model hypothesizes that negative affect, elevated reward responsivity for food, and alterations in executive functioning increase risk for development of binge eating

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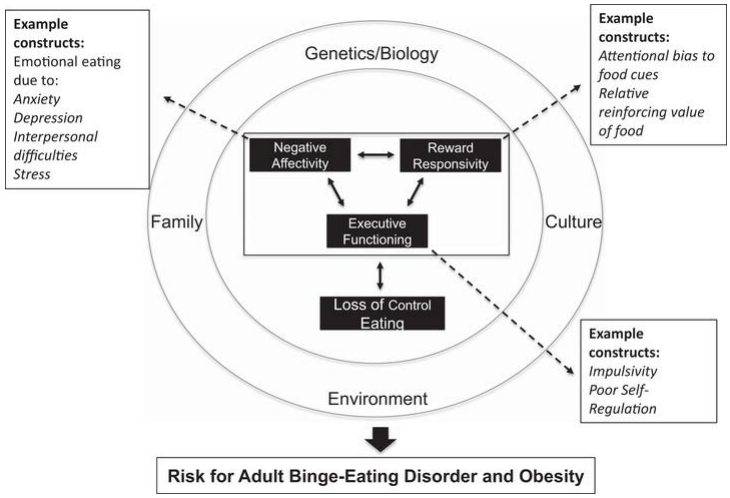
Binge Eating

Tanofsky-Kraff, Schvey, & Grilo, 2020



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Binge Eating

Treatment

- Importance of addressing co-occurring disorders that impact BED
  - Anxiety, ADHD, Depression
- Pharmacotherapy
  - Lisdexamfetamine dimesylate (Vyvanse) may have clinical utility for BED in adolescents (Guerdjikova et al., 2019; Srivastava et al, 2019)
  - Naltrexone? (Stancil et al., 2019)
- Psychotherapy
  - CBT, DBT, Interpersonal Therapy

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Social Consequences of Obesity

- Adverse Childhood Experiences (ACEs)
  - Those predicting obesity in childhood and adolescence include death of parent, family economic hardship, sexual abuse, witnessing domestic violence, physical abuse
- Weight Stigma – the social devaluation of people because of their body weight (Puhl, Himmelstein, & Pearl, 2020)
  - Contributes to:
  - Maladaptive eating behaviors
  - Physiological stress
    - Stigma positively associated with circulating C-reactive protein and increased cortisol reactivity in adults
  - Weight gain
  - In children – related to increased psychosomatic symptoms, decreased physical activity and fitness, increased blood pressure, and poorer self rated health
- Bullying – manifestation of stigma
  - Overweight one of the most common reasons children are bullied
  - Teasing associated with increased gain in BMI and fat mass over time
  - Verbal teasing most common
  - Increases risk of depression

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Early Intervention:
Targeting Preschool Children

- Parenting interventions for children at risk for behavioral difficulties at age 4 associated with lower BMI and improved health behaviors near adolescence (Brotman et al 2012).
- Children participating in the Healthy Steps program, who were identified as at risk of social/emotional challenges, demonstrated lower rates of obesity at age 5 compared with children that did not participate (Gross et al, 2015).

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Applying CBT to Pediatric Obesity

Kang & Kwack 2020

Table 1. Common components of CBT for obese children and adolescents

Goal	Strategies
Behavioral approach	
Psychoeducation	- Information about obesity - Establishing a positive relationship - Presentation of treatment principles - Establishing self-monitoring - Realistic goal setting
Nutrition and eating habits	- Self-monitoring eating and physical activity habits - Healthy food choices - Manage eating cues, behaviors and consequences.
Physical activity	- Reduce sedentary activity. - Increasing daily activity and time management - Establish family rules for TV and computer use, and find alternative activities. - Identify barriers to behavior change
Cognitive approach	
Recognition of negative thoughts and emotions	- Recognize and record thoughts and emotions related to eating and physical activity habits.
Automatic thoughts	- Discuss how the participants can influence their automatic thoughts. - Challenge the validity and utility of negative cognitions.
Stress management	- Strategies for emotion regulation - Avoid emotional eating
Problem solving	- Strategies for handling difficult situations involving food (high risk situation) - Distinguish between hunger and craving
Self-esteem and body image	- Promote self-esteem and healthy body image
Maintenance and relapse prevention	- Review behavior modification goals and coping plans - Cognitive strategies to help improve weight maintenance. - Relapse prevention: plan for high risk situations.

CBT: cognitive behavioral therapy.

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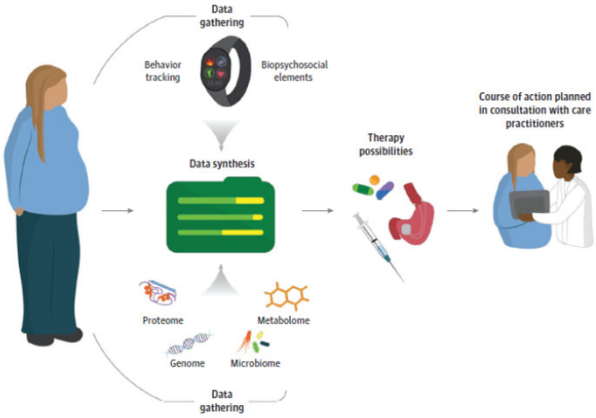
Precision Medicine

Cardel et. al, 2020

Figure 3. Precision Medicine for Obesity Care



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Assessment Tool:

General Screen
PSC
Jellinek et al 1988

Pediatric Symptom Checklist (PSC)

Emotional and physical health go together in children. Because parents are often the first to notice a problem with their child's behavior, emotions, or learning, you may help your child get the best care possible by answering these questions. Please indicate which statement best describes your child.

Please mark under the heading that best describes your child:

		Never	Sometimes	Often
1. Complains of aches and pains	1			
2. Spends more time alone	2			
3. Tires easily, has little energy	3			
4. Fidgety, unable to sit still	4			
5. Has trouble with teacher	5			
6. Less interested in school	6			
7. Acts as if driven by a motor	7			
8. Daydreams too much	8			
9. Distracted easily	9			
10. Is afraid of new situations	10			
11. Feels sad, unhappy	11			
12. Is irritable, angry	12			
13. Feels hopeless	13			
14. Has trouble concentrating	14			
15. Less interested in friends	15			
16. Fights with other children	16			
17. Absent from school	17			
18. School grades dropping	18			
19. Is down on him or herself	19			
20. Visits the doctor with doctor finding nothing wrong	20			
21. Has trouble sleeping	21			
22. Worries a lot	22			
23. Wants to be with you more than before	23			
24. Feels he or she is bad	24			
25. Takes unnecessary risks	25			
26. Gets hurt frequently	26			
27. Seems to be having less fun	27			
28. Acts younger than children his or her age	28			
29. Does not listen to rules	29			
30. Does not show feelings	30			
31. Does not understand other people's feelings	31			
32. Teases others	32			
33. Blames others for his or her troubles	33			
34. Takes things that do not belong to him or her	34			
35. Refuses to share	35			

Total score _____

Does your child have any emotional or behavioral problems for which she or he needs help? ( )N ( )Y
Are there any services that you would like your child to receive for these problems? ( )N ( )Y

If yes, what services?_____

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Assesment Tool:

Preschool PSC
(Weitzman et al, 2015)

Survey of Well-being of Young Children
SWyC

PPSC:

18 months, 0 days to 65 months, 31 days
V1.07, 4/1/17

Child's Name:
Birth Date:
Today's Date:

PRESCHOOL PEDIATRIC SYMPTOM CHECKLIST (PPSC)

These questions are about your child's behavior. Think about what you would expect of other children the same age, and tell us how much each statement applies to your child.

		Not at all	Somewhat	Very Much
Does your child...	Seem nervous or afraid?	0	1	2
	Seem sad or unhappy?	0	1	2
	Get upset if things are not done in a certain way?	0	1	2
	Have a hard time with change?	0	1	2
	Have trouble playing with other children?	0	1	2
	Break things on purpose?	0	1	2
	Fight with other children?	0	1	2
	Have trouble paying attention?	0	1	2
	Have a hard time calming down?	0	1	2
	Have trouble staying with one activity?	0	1	2
Is your child...	Aggressive?	0	1	2
	Fidgety or unable to sit still?	0	1	2
	Angry?	0	1	2
Is it hard to...	Take your child out in public?	0	1	2
	Comfort your child?	0	1	2
	Know what your child needs?	0	1	2
	Keep your child on a schedule or routine?	0	1	2
	Get your child to obey you?	0	1	2

Floating Hospital for Children at Tufts Medical Center

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Assessment Tool: ADHD

Vanderbilt - Parent and Teacher

NICHQ Vanderbilt Assessment Scale—PARENT Informant

Today's Date: _____ Child's Name: _____ Date of Birth: _____

Parent's Name: _____ Parent's Phone Number: _____

Directions: **Each rating should be considered in the context of what is appropriate for the age of your child. When completing this form, please think about your child's behaviors in the past 6 months.**

Is this evaluation based on a time when the child ☐ **was on medication** ☐ **was not on medication** ☐ **not sure?**

Symptoms	Never	Occasionally	Often	Very Often
1. Does not pay attention to details or makes careless mistakes with, for example, homework	0	1	2	3
2. Has difficulty keeping attention to what needs to be done	0	1	2	3
3. Does not seem to listen when spoken to directly	0	1	2	3
4. Does not follow through when given directions and fails to finish activities (not due to refusal or failure to understand)	0	1	2	3
5. Has difficulty organizing tasks and activities	0	1	2	3
6. Avoids, dislikes, or does not want to start tasks that require ongoing mental effort	0	1	2	3
7. Loses things necessary for tasks or activities (toys, assignments, pencils, or books)	0	1	2	3
8. Is easily distracted by noises or other stimuli	0	1	2	3
9. Is forgetful in daily activities	0	1	2	3
10. Fidgets with hands or feet or squirms in seat	0	1	2	3
11. Leaves seat when remaining seated is expected	0	1	2	3
12. Runs about or climbs too much when remaining seated is expected	0	1	2	3
13. Has difficulty playing or beginning quiet play activities	0	1	2	3
14. Is "on the go" or often acts as if "driven by a motor"	0	1	2	3
15. Talks too much	0	1	2	3
16. Blurts out answers before questions have been completed	0	1	2	3
17. Has difficulty waiting his or her turn	0	1	2	3
18. Interrupts or intrudes in on others' conversations and/or activities	0	1	2	3
19. Argues with adults	0	1	2	3
20. Loses temper	0	1	2	3
21. Actively defies or refuses to go along with adults' requests or rules	0	1	2	3
22. Deliberately annoys people	0	1	2	3
23. Blames others for his or her mistakes or misbehaviors	0	1	2	3
24. Is touchy or easily annoyed by others	0	1	2	3
25. Is angry or resentful	0	1	2	3
26. Is spiteful and wants to get even	0	1	2	3
27. Bullies, threatens, or intimidates others	0	1	2	3
28. Starts physical fights	0	1	2	3
29. Lies to get out of trouble or to avoid obligations (ie,"cons" others)	0	1	2	3
30. Is truant from school (skips school) without permission	0	1	2	3
31. Is physically cruel to people	0	1	2	3
32. Has stolen things that have value	0	1	2	3

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Assessment Tool: Depression CES-DC

- Faulstich, Carey, Ruggiero, et al (1986)
- Bright Futures

INSTRUCTIONS

Below is a list of the ways you might have felt or acted. Please check how *much* you have felt this way during the *past week*.

DURING THE PAST WEEK	Not At All	A Little	Some	A Lot
1. I was bothered by things that usually don't bother me.	____	____	____	____
2. I did not feel like eating, I wasn't very hungry.	____	____	____	____
3. I wasn't able to feel happy, even when my family or friends tried to help me feel better.	____	____	____	____
4. I felt like I was just as good as other kids.	____	____	____	____
5. I felt like I couldn't pay attention to what I was doing.	____	____	____	____

DURING THE PAST WEEK	Not At All	A Little	Some	A Lot
6. I felt down and unhappy.	____	____	____	____
7. I felt like I was too tired to do things.	____	____	____	____
8. I felt like something good was going to happen.	____	____	____	____
9. I felt like things I did before didn't work out right.	____	____	____	____
10. I felt scared.	____	____	____	____

DURING THE PAST WEEK	Not At All	A Little	Some	A Lot
11. I didn't sleep as well as I usually sleep.	____	____	____	____
12. I was happy.	____	____	____	____
13. I was more quiet than usual.	____	____	____	____
14. I felt lonely, like I didn't have any friends.	____	____	____	____
15. I felt like kids I know were not friendly or that they didn't want to be with me.	____	____	____	____

DURING THE PAST WEEK	Not At All	A Little	Some	A Lot
16. I had a good time.	____	____	____	____
17. I felt like crying.	____	____	____	____
18. I felt sad.	____	____	____	____
19. I felt people didn't like me.	____	____	____	____
20. It was hard to get started doing things.	____	____	____	____

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Assessment Tool: Anxiety

SCARED – Parent and Child (Birmaher et al., 1999)

Screen for Child Anxiety Related Disorders (SCARED)
CHILD Version—Page 1 of 2 (to be filled out by the CHILD)

Developed by Boris Birmaher, M.D., Suneeta Khetarpal, M.D., Marlane Cully, M.Ed., David Brent, M.D., and Sandra McKenzie, Ph.D., Western Psychiatric Institute and Clinic, University of Pittsburgh *(October, 1995). E-mail:* birmaherb@upmc.edu

See: Birmaher, B., Brent, D. A., Chiappetta, L., Bridge, J., Monga, S., & Baugher, M. (1999). Psychometric properties of the Screen for Child Anxiety Related Emotional Disorders (SCARED): a replication study. *Journal of the American Academy of Child and Adolescent Psychiatry, 38*(10), 1230–6.

Name: _____ Date: _____

Directions:
Below is a list of sentences that describe how people feel. Read each phrase and decide if it is "Not True or Hardly Ever True" or "Somewhat True or Sometimes True" or "Very True or Often True" for you. Then, for each sentence, fill in one circle that corresponds to the response that seems to describe you *for the last 3 months*.

	0 Not True or Hardly Ever True	1 Somewhat True or Sometimes True	2 Very True or Often True	
1. When I feel frightened, it is hard to breathe	O	O	O	PN
2. I get headaches when I am at school.	O	O	O	SH
3. I don't like to be with people I don't know well.	O	O	O	SC
4. I get scared if I sleep away from home.	O	O	O	SP
5. I worry about other people liking me.	O	O	O	GD
6. When I get frightened, I feel like passing out.	O	O	O	PN
7. I am nervous.	O	O	O	GD
8. I follow my mother or father wherever they go.	O	O	O	SP
9. People tell me that I look nervous.	O	O	O	PN
10. I feel nervous with people I don't know well.	O	O	O	SC
11. I get stomachaches at school.	O	O	O	SH
12. When I get frightened, I feel like I am going crazy.	O	O	O	PN
13. I worry about sleeping alone.	O	O	O	SP
14. I worry about being as good as other kids.	O	O	O	GD
15. When I get frightened, I feel like things are not real.	O	O	O	PN
16. I have nightmares about something bad happening to my parents.	O	O	O	SP
17. I worry about going to school.	O	O	O	SH
18. When I get frightened, my heart beats fast.	O	O	O	PN
19. I get shaky.	O	O	O	PN
20. I have nightmares about something bad happening to me.	O	O	O	SP

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Loss of Control overeating Scale – Brief Latner, et al. (2014)

In the last 4 weeks (28 days), how often have you had the following experiences during a time when you were eating? Please respond to each item using the following scale:

1	2	3	4	5
Never	Rarely	Occasionally	Often	Always

1. I continued to eat past the point when I wanted to stop.
2. I felt like I had "blown it" and might as well keep eating.
3. I felt helpless about controlling my eating.
4. My eating felt like a ball rolling down a hill that just kept going and going.
5. I found myself eating despite negative consequences.
6. I felt like the craving to eat overpowered me.
7. I felt like I could not do anything other than eat.

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Binge Eating Scale

J Gormally. (1982)

https://psychology-tools.com/test/binge-eating-scale

Non-binging; less than 17
Moderate binging; 18-26
Severe binging; 27 and greater

1.
   - I do not think about my weight or size when I'm around other people.
   - I worry about my appearance, but it does not make me unhappy.
   - I think about my appearance or weight and I feel disappointed in myself.
   - I frequently think about my weight and feel great shame and disgust.
2.
   - I have no difficulty eating slowly.
   - I may eat quickly, but I never feel too full.
   - Sometimes after I eat fast I feel too full.
   - Usually I swallow my food almost without chewing, then feel as if I ate too much.
3.
   - I can control my impulses towards food.
   - I think I have less control over food than the average person.
   - I feel totally unable to control my impulses toward food.
   - I feel totally unable to control my relationship with food and I try desperately to fight my impulses toward food.
4.
   - I do not have a habit of eating when I am bored.
   - Sometimes I eat when I am bored, but I can often distract myself and not think about food.
   - I often eat when I am bored, but I can sometimes distract myself and not think about food.
   - I have a habit of eating when I am bored and nothing can stop me.

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Assessment Tool: Potential Outcome Measure

West & Sanders 2009

Lifestyle Behaviour Checklist

Below is a list of behaviours parents with overweight children often have to manage. For each item: (1) circle the number that best describes how much of a problem that behaviour has been with your child in the last month, and (2) rate how confident you are in dealing with it. If that behaviour is not currently occurring, rate how confident you are that you could successfully deal with your child's behaviour if it did occur. Remember to put a confidence rating for every item.

Rate your confidence from 1 (Certain I can't do it) to 10 (Certain I can do it).

	How much of a problem is this behaviour with your child?							How confident are you in dealing with it?
	Not at all		A little		Some what	Much	Very much	
Eats too quickly	1	2	3	4	5	6	7	☐
Eats too much	1	2	3	4	5	6	7	☐
Eats unhealthy snacks	1	2	3	4	5	6	7	☐
Whinges or whines about food	1	2	3	4	5	6	7	☐
Yells about food	1	2	3	4	5	6	7	☐
Throws a tantrum about food	1	2	3	4	5	6	7	☐
Refuses to eat certain foods (i.e. fussy eating)	1	2	3	4	5	6	7	☐
Argues about food (e.g. when you say *No* more)	1	2	3	4	5	6	7	☐
Demands extra helpings at meals	1	2	3	4	5	6	7	☐
Requests food continuously between meals	1	2	3	4	5	6	7	☐
Demands food when shopping or on outings	1	2	3	4	5	6	7	☐
Sneaks food when they know they are not supposed to	1	2	3	4	5	6	7	☐
Hides food	1	2	3	4	5	6	7	☐
Steals food (e.g. from other children's lunchboxes)	1	2	3	4	5	6	7	☐

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