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Measuring Clinical Weight Loss in Young Children with Severe Obesity: Comparison of Outcomes using zBMI, Modified zBMI, and Percent of 95th Percentile

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Measuring Clinical Weight Loss in Young Children with Severe Obesity: Comparison of Outcomes using zBMI, Modified zBMI, and Percent of 95th Percentile

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Describe role of Submitting/Presenting Trainee in this project (limit 150 words): The trainee conducted data analysis, interpreted results, wrote the abstract, and will present this project at a national conference with support from GME funding (Society of Pediatric Psychology Annual Conference in April 2019)

Background, Objectives/Goal, Methods/Design, Results, Conclusions limited to 500 words

Background: Young children with obesity are at risk for negative health consequences throughout life, emphasizing the need for effective weight management strategies (Biro & Wein, 2010). However, there is a lack of consensus regarding the best metric for assessing weight change among children with severe obesity (Freedman et al., 2016). Body mass index z-score (zBMI), modified (MzBMI), and percent of 95th percentile (%95thpercentile) have each been proposed as appropriate measurements for change in extreme values of weight (Dietz, 2017), and researchers generally accept a 0.15 change in zBMI as a clinically significant difference. However, few studies have considered how these metrics may interact with age (Chambers et al., 2017).

Objectives/Goal: The current study utilizes several measurement strategies to examine weight change outcomes from a clinical pediatric weight management program among young children with obesity based on age group and obesity severity.

Methods/Design: Families of 153 children recruited primarily from primary care and weight management clinics in the Kansas City metropolitan area, took part in a 6-week family-based

behavioral weight management treatment program, Zoom to Health, and participated in 6-month follow-up measures. Children were 23% Caucasian, 29% African American and 41% Hispanic, and ages 2-9 years old (M age = 6.94, 61% female). Height and weight were measured and calculated as zBMI, MzBMI, and %95thpercentile based on age and gender norms (CDC, 2000). Repeated measures analyses of variance were run to examine differences in weight change outcomes based on measurement strategy, and age and baseline obesity class were explored as moderators.

Results: Approximately 68% of participants presented with severe obesity (class 2 or greater) at baseline. Younger children (i.e., under 6 years of age) recorded higher zBMI at baseline than older children ($t(50)=5.84$, $p<.001$). On average, participants experienced a significant reduction in weight over time as measured by change in zBMI ($F(1.3,194)=32.86$, $p<.001$), MzBMI ($F(1.4,213)=16.81$, $p<.001$), and %95thpercentile ($F(1.5,223)=6.87$, $p<.01$). Age group emerged as a significant moderator of weight change only in models that tested zBMI as an outcome ($F(2,151)=6.66$, $p<.05$). Specifically, children younger than 6 years of age experienced a more significant weight change over time when weight was measured using zBMI. Obesity class did not emerge as a significant moderator of weight loss in models using zBMI, MzBMI, or %95thpercentile as an outcome.

Conclusions: Consistent with other weight management programs, participating children were predominantly in the severe obesity range. Early identification of obesity risk is critical in order to improve the trajectory of obesity over time. While significant changes over time were evidenced across all BMI measurements, different magnitudes and patterns of change emerged. Current literature designates clinically meaningful definitions of change in weight using zBMI metrics only, and there are questions about the validity of these measures in children with severe obesity. Results suggest it is essential to identify similar metrics of change for other measures (MzBMI, %95thpercentile) in order to thoroughly evaluate longitudinal health outcomes of children with obesity and severe obesity, especially younger children.