

Background and Hypothesis

- Dissatisfaction with body image and weight are often contributors to eating disorders.
- Large bone structure can be advantageous with respect to lower fracture risk because they are denser than medium or small bones.
- The perception of being large-boned can translate into worries of being fat by the average American youth or adult.
- Larger bone structure can also contribute to a person's weight and add to these worries.
- The objective of this study was to describe the bone structure of patients being treated for eating disorders in the inpatient and outpatient setting.
- Our hypothesis was that patients with eating disorders would be more likely to have large bone structure than small bone structure.

Methodology

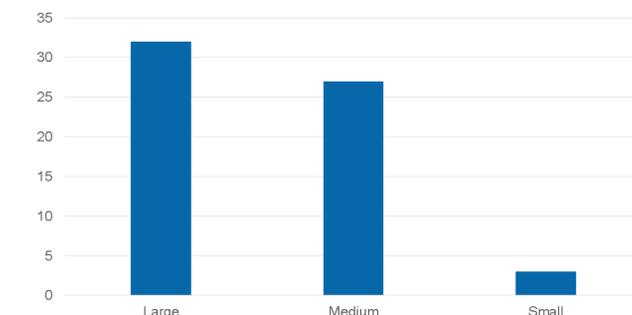
- A retrospective chart review was performed of patients ages 7 to 25 years presenting for outpatient medical evaluation for their disordered eating at Cleveland Clinic Children's Hospital.
- Bone structures were characterized by the Rome Bone Structure Assessment.
- The patient would wrap the pinky and thumb of one hand around the wrist of their other hand.
 - When the pinky and thumb overlapped, they had small bone structure.
 - When the fingers just touched, they had medium bone structure.
 - When the fingers did not touch, they had large bone structure.
- Statistical analysis was performed using Chi-square and Fisher Exact tests for categorical variables. Kruskal-Wallis tests were used for continuous variables. JMP Pro 12.0 was used to analyze data.

Data

- Data were collected through a retrospective chart review.
- Charts were reviewed of 193 patients seen from May 2008 to July 2017, with bone structures available for 62 patients (32.1%). Data from those 62 patients included the following:

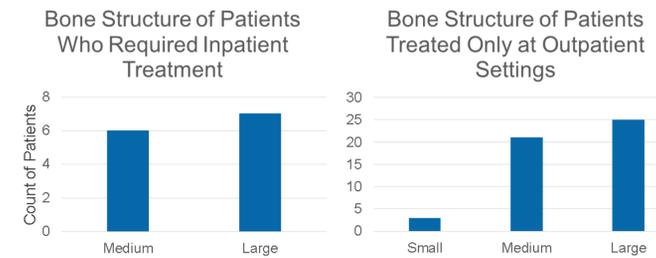
	Small Bone Size (n = 3)	Medium Bone Size (n = 27)	Large Bone Size (n = 32)	p-value
Age (years)	17.7 ± 0.6	15.6 ± 2.3	16.7 ± 2.5	0.06
Female	3 (100%)	25 (92.6%)	30 (93.8%)	NS
Race				NS
Caucasian	2 (66.7%)	27 (100%)	30 (93.8%)	
Other	1 (33.3%)	0 (0.0%)	2 (6.2%)	
DSM-5 Diagnosis				0.02
Anorexia Nervosa	0 (0.0%)	21 (77.8%)	16 (50.0%)	
Avoidant/Restrictive Food Intake Disorder	2 (100.0%)	5 (18.5%)	6 (18.8%)	
Atypical Anorexia Nervosa	0 (0.0%)	1 (3.7%)	7 (21.9%)	
Binge Eating Disorder	0 (0.0%)	0 (0.0%)	1 (3.1%)	
Bulimia Nervosa	1 (33.3%)	0 (0.0%)	2 (6.3%)	
Type of Visit				NS
Inpatient	0 (0.0%)	6 (22.2%)	7 (21.9%)	
Outpatient	3 (100.0%)	21 (77.8%)	25 (78.1%)	

- Participants included children and adolescents aged 7 to 25 years meeting the DSM-V diagnostic criteria for avoidant/restrictive food intake disorder (ARFID, 21.0%), anorexia nervosa (AN, 59.7%), atypical anorexia nervosa (12.9%), binge-eating disorder (BED, 1.6%), or bulimia nervosa (BN, 4.8%).
- 3 patients (4.8%) had small bone structures
- 27 patients (43.5%) had medium bone structures
- 32 patients (51.6%) had large bone structures.

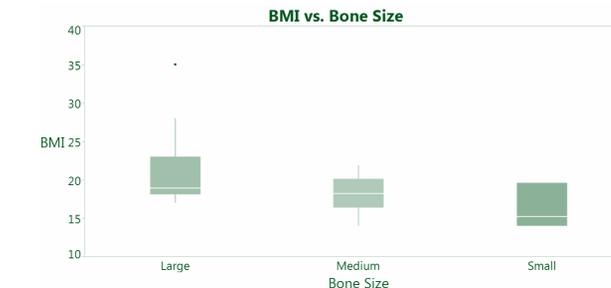


Results

- Of the 62 patients with available bone structure, 13 (21.0 %) patients had initially presented to an inpatient setting.
- Of these 13 patients in critical enough condition to be hospitalized, there were no patients with small bone structure.



- Overall, more patients had large bones than medium or small bones.
- This was especially true in the group of 13 that presented at both inpatient and outpatient clinics, where no patient had small bone structure.



	Small Bone Size (n = 3)	Medium Bone Size (n = 27)	Large Bone Size (n = 32)	p-value
BMI at Presentation (kg/m ²)	16.3 ± 3.0	18.2 ± 2.0	20.8 ± 4.0	0.004
Weight Loss Prior to Presentation (kg)	11.3 ± 2.3	9.4 ± 5.9	12.5 ± 7.4	NS

- The patients with large bone structures had a higher body mass index at presentation than the patients with small bone structures.
- All patients lost similar amounts of weight prior to presentation.

Conclusions

- Patients with eating disorders were more likely to have large bone structure than small bone structure.
- For patients who first required acute medical stabilization in an inpatient setting, no patients presented with small bone structure. Theoretically, large bone structure may have led to more aggressive weight loss for those with medium and large bone structure, leading to more acute medical decompensation.
- Patients with large bone structures were more likely to have a higher body mass index than patients with small bone structure, consistent with their more dense, larger bones.



Recommendations

- The small study size limits generalizability of this data.
- This study was a pilot study. Ideally, this study could be done with more participants and more data to lead to more reliable results.
- In addition, it would be beneficial to compare the bone structure distribution of eating disordered patients to the bone structure distribution in the general population. This use of a control population would clarify if large bones are more common worldwide, or just in patients diagnosed with eating disorders.