


Clinical Versus Objective Assessment of Overweight and Obese Children Among Primary Care Physicians

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Introduction

In the past few decades, pediatric obesity has become a major issue in the care of children.¹ The prevalence of overweight and obese children ages 2 to 19 years in 2011 to 2012 was 31.8% according to an original investigation done by *JAMA*.² When solely examining obesity in the same group, prevalence was 16.9%.

According to the American Academy of Pediatrics (AAP) Clinical Report from July 2015, pediatricians should identify children at risk for developing obesity at every health visit using the recommended growth charts. The World Health Organization's weight-for-age and weight-for-length normative growth chart is recommended for birth through 23 months of age. The Centers for Disease Control and Prevention (CDC) body mass index (BMI) growth charts should be used for age 2 years and older.³

A study published in *Pediatrics* in 2010 showed that of 677 primary care clinicians surveyed, 97% reported visually assessing children for weight status. For children older than age 2 years, only 52% reported assessing the BMI percentile.⁴ Another study published in *Public Health Reports* in 2009 was conducted in an urban academic pediatric practice and reviewed 397 medical records of children ages 5 to 11 years. Results showed that 59.7% of records contained a CDC BMI growth chart, 5.5% of physicians documented BMI, and 4.3% of physicians plotted BMI.⁵

Several articles have provided evidence that visual assessment of BMI alone does not correctly identify overweight and obese patients.⁴⁻¹⁰ Additionally, some of these studies demonstrate that physicians tend to underestimate a patient's weight versus BMI.^{4,7-10} This could be due to a higher prevalence of overweight and obese patients changing perceptions of what is the norm.¹⁰

The current literature suggests a disconnect between clinical and objective assessment of weight. The purpose of this study was to assess physician visual interpretation of BMI within our hospital system. The primary goal was

to see how well physicians in our hospital system clinically estimated weight versus an objective assessment tool (BMI). Another goal was to raise awareness within our own hospital system of the importance of addressing BMI at all health visits.

Methods

Data was gathered via online surveys collected from physicians at St. Vincent Hospital, a community hospital in Indianapolis, Indiana, from March through April of 2016. The 5 groups of physicians surveyed included pediatric outpatient physicians, family medicine outpatient physicians, pediatric hospitalists, pediatric residents, and family medicine residents.

Surveys were created via SurveyMonkey and distributed via email. Three surveys were created (Survey A, Survey B, and Survey C), and each included one photograph of a child with a known BMI. Photographs used were obtained from the CDC's "Visual Assessment Versus Calculation of BMI" growth chart training website.¹¹ Each contacted physician received one copy of the survey. Survey A had a photograph of an overweight child, Survey B had a photograph of a normal weight child, and Survey C had a photograph of an obese child. BMI definitions used were normal weight 5th to <85th percentile, overweight 85th to <95th percentile, and obese 95th percentile or greater.¹¹ Aside from the photograph, the 3 surveys were otherwise identical. Each survey asked the physician to characterize the patient's weight as underweight, normal weight, overweight, or obese. A response was counted as correct if the physician's visual interpretation matched the known BMI of

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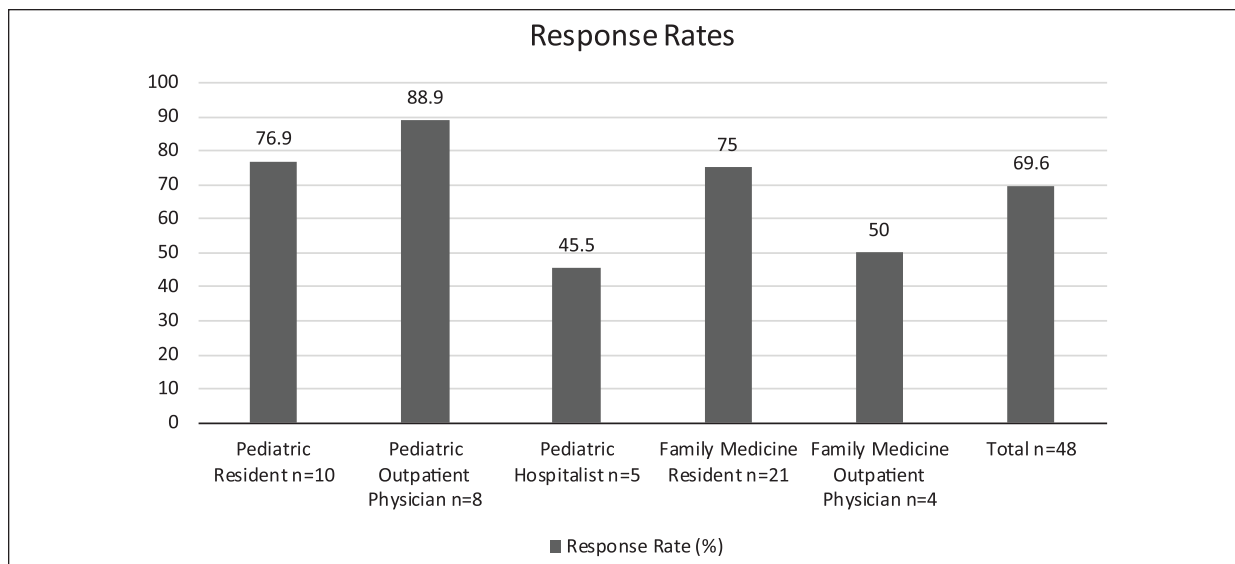


Figure 1. Response rates of participants from each group.

the child in the photograph. A response was incorrect if it did not match. The known BMI of the patient was not revealed to the physician at any point during the survey. Physicians were given a single photograph in order to replicate a single office visit.

The director of research and regulatory affairs at St. Vincent Hospital determined that this project did not fit criteria for “Human Subject Research” and therefore did not require review and approval by the hospital’s institutional review board. The hospital’s research protocol development team assisted with data analysis, randomization of surveys equally among each group, and distribution of surveys.

Results

A total of 69 physicians were emailed surveys, and of these, 48 physicians responded for a response rate of 69.6%. Specifics for response rates of each group are detailed in Figure 1.

Survey A showed the photograph of an overweight child. There were 15 responses to this survey. One physician (6.7%) characterized the patient’s weight correctly. The remaining 14 physicians (93.3%) characterized this patient’s weight as normal.

Survey B showed the photograph of a normal weight child. There were 16 responses to this survey. Twelve physicians (75%) characterized the patient’s weight correctly. Three physicians (18.8%) characterized the patient as underweight, and one physician (6.3%) characterized the patient as overweight.

Survey C showed the photograph of an obese child. There were 17 responses to this survey. One physician

(5.9%) characterized the patient’s weight correctly. Four physicians (23.5%) characterized the patient as normal weight, and 12 physicians (70.6%) characterized the patient as overweight.

Results of all respondents showed that 14 physicians (29.2%) characterized the patient’s weight correctly and 34 physicians (70.8%) characterized the patient’s weight incorrectly. See Table 1 for details of the survey results.

Discussion

Our results showed that physicians at our institution have difficulty clinically estimating BMI in overweight and obese patients. This trend has been demonstrated with several previous studies.⁴⁻¹⁰ The majority of physicians in our study characterized these patients as a lower weight status than their true BMI. Most responders thought the obese child was overweight and the overweight child was normal. It is interesting to note that the majority of physicians correctly identified the normal weight child as normal weight. Our results are similar to Ahlers-Schmidt et al, whose study looked at visual interpretation of BMI using the same CDC photographs our study utilized.⁷ In this study the majority of physicians selected the obese child as overweight, overweight child as normal, and normal weight child as normal weight.

Perhaps due to the increasing prevalence of overweight and obese children, the norm has shifted to include these groups. This may lead to a physician’s perception of what appears visually normal to shift as well.

Table 1. Numbers and Percentages of Respondents That Correctly Versus Incorrectly Identified Body Mass Index Using Visual Interpretation.

	Answered Correctly, n (%)	Answered Incorrectly, n (%)
Survey A: Overweight child		
Pediatric resident	1 (25%)	3 (75%)
Pediatric outpatient physician	0 (0%)	2 (100%)
Pediatric hospitalist	0 (0%)	1 (100%)
Family medicine resident	0 (0%)	6 (100%)
Family medicine outpatient physician	0 (0%)	2 (100%)
Total	1 (6.7%)	14 (93.3%)
Survey B: Normal weight child		
Pediatric resident	1 (33.3%)	2 (66.7%)
Pediatric outpatient physician	3 (100%)	0 (0%)
Pediatric hospitalist	1 (100%)	0 (0%)
Family medicine resident	5 (71.4%)	2 (28.6%)
Family medicine outpatient physician	2 (100%)	0 (0%)
Total	12 (75%)	4 (25%)
Survey C: Obese child		
Pediatric resident	0 (0%)	3 (100%)
Pediatric outpatient physician	1 (33.3%)	2 (66.7%)
Pediatric hospitalist	0 (0%)	3 (100%)
Family medicine resident	0 (0%)	8 (100%)
Family medicine outpatient physician ^a		
Total	1 (5.9%)	16 (94.1%)
All surveys		
All respondents	14 (29.2%)	34 (70.8%)

^aFamily medicine outpatient physicians who received Survey C did not respond.

This brings up the importance of assessing a calculated BMI on a recommended growth chart at health visits as evidence suggests that visual interpretation alone is not reliable when examining overweight and obese patients. Using an objective tool like BMI could increase opportunities to diagnose overweight and obese patients and looking at the point on a growth chart could reveal if the patient's BMI trend is increasing over time.

Our study has several important limitations. First, our study used a photograph rather than a live patient for clinical assessment. A photograph does not provide the full 3-dimensional picture of the patient that a physician would have in an office encounter. Second, our sample size was small and only sampled physicians within one hospital system. Other areas of the country with lower or higher rates of obesity may have different results based on what the norm is in that region. Although only one photograph was used per survey to prevent physicians from comparing images, providing each respondent with a larger amount of photographs could increase our sample size. Participants were asked to keep survey information confidential, but we could not guarantee that respondents did not discuss images among colleagues before responding.

Conclusion

Our study reaffirms previous findings of discrepancy between physician clinical and objective assessment of overweight and obese children. Accordingly, we recommend routine assessment of patient body habitus with BMI on AAP recommended growth charts at all health visits. Larger, longitudinal studies are needed to further assess physician visual interpretation of BMI.

Author Contributions

AG: Contributed to conception and design; contributed to acquisition, analysis, and interpretation; drafted manuscript; critically revised manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

SJ: Contributed to conception and design; contributed to acquisition, analysis, and interpretation; critically revised manuscript; gave final approval.

SR: Contributed to conception and design; critically revised manuscript; gave final approval.

Declaration of Conflicting Interests

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