



Physicians and Physician Trainees Rarely Identify or Address Overweight/Obesity in Hospitalized Children

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Objectives To determine how frequently physicians identify and address overweight/obesity in hospitalized children and to compare physician documentation across training level (medical student, intern, resident, attending).

Study design We conducted a retrospective chart review. Using an administrative database, Centers for Disease Control and Prevention body mass index calculator, and random sampling technique, we identified a study population of 300 children aged 2-18 years with overweight/obesity hospitalized on the general medical service of a tertiary care pediatric hospital. We reviewed admission, progress, and discharge notes to determine how frequently physicians and physician trainees identified (documented in history, physical exam, or assessment) and addressed (documented in hospital or discharge plan) overweight/obesity.

Results Physicians and physician trainees identified overweight/obesity in 8.3% (n = 25) and addressed it in 4% (n = 12) of 300 hospitalized children with overweight/obesity. Interns were most likely to document overweight/obesity in history (8.3% of the 266 patients they followed). Attendings were most likely to document overweight/obesity in physical examination (8.3%), assessment (4%), and plan (4%) of the 300 patients they followed. Medical students were least likely to document overweight/obesity including it in the assessment (0.4%) and plan (0.4%) of the 244 hospitalized children with overweight/obesity they followed.

Conclusions Physicians and physician trainees rarely identify or address overweight/obesity in hospitalized children. This represents a missed opportunity for both patient care and physician trainee education. (*J Pediatr* 2015;167:816-20).

Identification of overweight/obesity by physicians is associated with healthy weight counseling, treatment of comorbid conditions, and healthier patient and family lifestyle choices.¹⁻⁴ The American Academy of Pediatrics and other organizations have recommended body mass index (BMI) calculations and universal overweight/obesity screening during preventive visits for patients over 2 years of age.^{5,6} There are no similar recommendations for overweight/obesity in the inpatient setting.

An acute hospital admission presents an important opportunity to identify and address overweight/obesity. Prior studies show that parents of hospitalized children wish to be told if their child is found to have overweight/obesity.^{7,8} Parents also believe that action should be taken with the majority identifying the inpatient physician as the person who should address weight concerns.⁷

Despite this, limited information exists about inpatient physician identification and management of pediatric overweight/obesity.^{8,9} Previous studies have reported that BMI calculations are seldom performed during hospitalization⁸⁻¹¹ and that overweight/obesity is rarely included among discharge diagnoses.⁹⁻¹²

The primary goal of the study was to determine how frequently physicians identify and address overweight/obesity in hospitalized children. The secondary goal was comparison of physician documentation across training level (medical student, intern, senior resident, and attending). Our primary hypothesis was that physicians rarely identify or address overweight/obesity in hospitalized children. Our secondary hypothesis was that attendings identify and address overweight/obesity with greater frequency than trainees.

Methods

We conducted the study at Primary Children's Hospital (PCH), a 289-bed freestanding pediatric hospital affiliated with the University of Utah, School of Medicine. With more than 12 000 admissions annually, PCH serves as the primary pediatric hospital for Salt Lake County and a tertiary referral center for Utah, Wyoming, Montana, Idaho, and Nevada. The patient population at PCH is similar to other large academic pediatric

BMI	Body mass index
EHR	Electronic health record
PCH	Primary Children's Hospital

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hospitals in terms of volume, socioeconomic status, and subspecialties. PCH is the inpatient pediatric training site for University of Utah medical students and residents from several programs. The University of Utah institutional review board and the Intermountain Healthcare privacy board approved the study.

We examined the medical records of children 2-18 years of age with overweight/obesity admitted to the PCH general medical service between January 1 and December 31, 2010. Per hospital protocol, nursing staff documented height and weight in the electronic health record (EHR) for all patients. The BMI and BMI percentile for age/sex were then automatically calculated and available in the EHR. Our primary goal was to determine the percentage of hospitalized children with overweight/obesity for whom physicians identified and addressed overweight/obesity. Our secondary outcome was comparison of overweight/obesity documentation by physician training levels.

We extracted patient age, sex, weight, height, race, primary hospital service, length of stay, and discharge diagnoses from the Intermountain Healthcare Enterprise Data Warehouse: an integrated, searchable administrative database that stores over 8 million patient encounters and includes clinical, laboratory, and radiologic data from all inpatient and outpatient Intermountain Healthcare facilities.¹³ We restricted the search to patients admitted to the PCH general medical service and excluded records with missing weight and/or height ($n = 56$) and those deemed physiologically impossible outliers by Grubbs outlier test followed by individual inspection of each outlier to confirm they should be excluded based on age, weight, and height ($n = 145$)¹⁴ (Figure 1; available at www.jpeds.com). Next, we calculated BMI z-score and corresponding percentile for age and sex using the Centers for Disease Control and Prevention BMI calculator¹⁵ and selected patients with BMI at or above the 85th percentile (based on BMI z-score ≥ 1.4395) to include only those with overweight or obesity. We then used a random number sampling technique in Statit (Corvallis, Oregon) to select our study population of 300 children with overweight/obesity hospitalized on the general pediatric service.

We reviewed admission, progress, and discharge notes written by medical students, interns, senior residents, and attendings. We assessed documentation of overweight/obesity in: (1) history (diet, physical activity, screen time, family history of overweight/obesity); (2) physical examination (BMI, BMI percentile for age/sex, physical examination findings); (3) assessment; and (4) plan (inpatient nutrition consultation, diet counseling by physician team, laboratory studies discussed or ordered, activity counseling by physician team, referral to primary care physician, referral to weight management program). We extracted the training level of each note's author (student, intern, resident, attending) and examined total documentation for a given patient by combining items noted by any member of the physician team (medical student, intern, resident, or attending) at any point during the hospitalization (admission, progress, or discharge notes). In cases where supervising physicians edited and co-signed

trainee notes, we used the EHR history function to track information entered by each provider.

Statistical Analyses

We used descriptive statistics to characterize the study population and overall physician documentation frequency. We performed Holm-Šidák multiple comparisons test as a follow-up to 1-way ANOVA to compare documentation across physician level of training.¹⁶ Statistical significance was set at $P < .05$. Analyses were conducted with GraphPad Prism (GraphPad Software, Inc, San Diego, California).

Results

Sixteen percent of children 2-18 years of age hospitalized on the PCH general pediatric service had overweight or obesity. Median age of patients in our study was 9 years (IQR: 9). Fifty-three percent ($n = 159$) were male, 43% ($n = 130$) had overweight, and 57% ($n = 170$) had obesity. Of the patients with obesity, 3.7% ($n = 11$) met criteria for extreme obesity with BMI ≥ 99 th percentile for age/sex.⁶ Seventy-one percent ($n = 214$) were Caucasian and 19% ($n = 56$) Hispanic (Table I; available at www.jpeds.com). The demographic characteristics of our study population of 300 randomly selected hospitalized patients with overweight/obesity were similar to known hospital demographics based on internal PCH data. We reviewed 1560 admission, progress, and discharge notes written for 300 hospitalized patients with overweight/obesity. All patients had documented attending notes. Eighty-one percent ($n = 244$) had medical student, 83% ($n = 250$) intern, and 89% ($n = 267$) resident notes within the EHR allowing for duplicate notes per patient.

Twenty-five (8.3%) of 300 hospitalized children with overweight/obesity had documentation of overweight/obesity (history, physical examination, or assessment) written by any member of the physician team (medical student, intern, senior, or attending) at some point during the hospitalization (admission, progress note, or discharge). None of the patients had overweight/obesity included among their discharge diagnoses. Physicians and physician trainees documented overweight/obesity most commonly in physical examination 8.3% ($n = 25$) and diet history 8% ($n = 24$) (Table II). The most likely time to document overweight/obesity in history and physical examination was on admission while the most common time to include overweight/obesity in the assessment was during subsequent hospital day progress notes.

Twelve (4%) of 300 hospitalized children with overweight/obesity had documentation of a plan (hospital or discharge) to address overweight/obesity written by any member of the physician team (medical student, intern, senior, or attending) at some point during the hospitalization (admission, progress note, or discharge). Most common ways of addressing overweight/obesity were inpatient nutrition consultation (2.7%, $n = 8$) and dietary counseling by the

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