Pediatric Obesity and Nutrition Counseling

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Abstract: About one third of children are overweight/obese. This study examined whether these children were more likely to have nutrition counseling documented and if counseling was affected by gender or ethnicity. Method. A retrospective secondary data analysis was used to explore nutrition counseling for an insured pediatric population. A sample of 526 records met inclusion criteria. Member records were categorized based on BMI as underweight, normal weight, or overweight/obese. Results. The observed proportion of overweight/obese children was significantly higher than the national average, 37% versus 33% respectively, \( P = .03 \). No significant difference was found in documented nutrition counseling for children with overweight/obese BMIs—Pearson \( \chi^2(1, N = 526) = 1.586; P = .21; \Phi = 0.06 \). Likewise, no significant difference was found in documented nutrition counseling for overweight/obese children by race—Pearson \( \chi^2(1, N = 37) = 0.11; P = .74; \Phi = 0.05 \)—or gender—Pearson \( \chi^2(1, N = 194) = 0.35; P = .55; \Phi = -0.04 \). In this sample, African American children were almost twice as likely to have Medicaid compared with commercial benefits—Pearson \( \chi^2(1, N = 114) = 13.57; P < .001; \Phi = -0.35 \). However, no significant difference was found in documented nutrition counseling between insurance benefits—Pearson \( \chi^2(1, N = 194) = 0.04; P = .85; \Phi = 0.01 \).

Keywords: pediatric obesity; nutrition counseling; overweight

Objective

The aim of this study is to evaluate the use of nutrition counseling for weight management in overweight pediatric patients evaluated in various outpatient clinics based on weight status (as measured by BMI), gender, ethnicity, and type of insurance coverage.

Problem

Reported increases in pediatric obesity rates, as evidenced by a body mass index (BMI) greater than the 95th percentile, may result in higher comorbidities within the pediatric population. Comorbid conditions such as diabetes and hypertension decrease life span and negatively affect quality of life. Approximately one third of the pediatric population is overweight (>85th percentile), and half of those are considered obese (>95th percentile). It is unknown how often overweight/obese children, with insurance benefits, have nutrition counseling documented and if the counseling is significantly affected by gender or ethnicity.

“Best practice, in primary care settings, indicates that all children should have nutrition counseling as part of normal anticipatory guidance.”

Rationale

It is expected that overweight/obese children will receive nutrition counseling more often than those of normal weight. Best practice, in primary care settings, indicates that all...

*Body mass index (BMI), which is calculated by taking the weight in pounds divided by the height in inches, divided again by the height in inches, and then multiplied by 703. BMI is then plotted on a growth curve specific for sex and age. Percentages are as follows: underweight, BMI less than the 5th percentile; normal weight, BMI between the 5th and 85th percentile; overweight, BMI between the 85th and 95th percentile; obese, BMI greater than the 95th percentile.

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research design and methods

This retrospective descriptive study used secondary data analysis to explore documented nutrition counseling. Methodology limitations included preexisting conditions that may present reasonable alternative explanations, and causality cannot be inferred. The study protocol was reviewed and approved by the region's institutional review board. The population included a convenience sample of pediatric members of a regional health care insurance company, aged 3 to 17 years, insured during the 2009 calendar year. Insurance benefits included Medicaid and commercial. Commercial included both HMO (health maintenance organization) and POS (point of service) benefit structures. Pediatric member records were included in the analysis if they met the defined age criteria and had data available for height, weight, and gender because these variables were necessary to calculate BMI. Additional required data elements included race and insurance benefit. Data were collected from medical records by registered nurses from the insurance company who were subject matter experts. These nurses used chart abstraction criteria, provided by the National Committee for Quality Assurance, to collect Health Care Effectiveness Data and Information Set/Consumers Assessment of Healthcare Providers and Systems Survey (HEDIS/CAHPS 4.0H Child Survey) data. Interrater reliability was assessed at 95% by third-party auditors using secondary chart audits.

results

The secondary data file provided for analysis consisted of 942 member records for children aged 3 through 17 years. Approximately 44% (416) of the records were missing height, weight, age, and/or gender data and were excluded from the analysis. The total sample consisted of 526 records. Each record represented a unique pediatric member insured during calendar year 2009. Descriptive statistics, \( \chi^2 \) analysis, and a one-tailed \( z \) approximation test were used for data analysis. Statistical tests were designed to ensure that the probability of a type I error was small (.05).

demographics

As illustrated in Table 1, the 526 sample records represented a pediatric population that was 53.4% male, with ages ranging from 3 to 17 years (median = 17.99; standard deviation [SD] = 4.50). Ethnicity was available for only 23.4% of the sample, of which the majority were African American and Caucasian, non-Hispanic (54% and 39%, respectively; Figure 1). Insurance benefit was evenly distributed: 50% commercial and 50% Medicaid. Nutrition counseling was documented in 65.8% of the sample records. Researcher-calculated BMI ranged from 12.3 to 51.8 (median = 17.99; SD = 4.52). The calculated BMIs were used to define weight ranges (underweight, normal weight, overweight, or obese). Approximately 4% of sample records were underweight and 59% of normal weight. Almost 18% of sample records identified children as overweight, with 19% obese, compared with national averages of 20.6% and 12.4%, respectively (Figure 2).

For records representing children with BMI equal to or greater than the 85th percentile (overweight/obese), 56.2% were male, the median age was 10.00 (SD = 4.52), and 52.5% were Medicaid beneficiaries. The median BMI percentile for this group was 95.7% (SD = 4.42), with nutrition counseling documented on 62.4% of the records. Children with BMI greater than or equal to the 95th percentile (obese) were 56.4% male, with a median age of 11 (SD = 4.74), with 52.5% being Medicaid beneficiaries. Median BMI percentile was 98.4% (SD = 1.34), and nutrition counseling was documented on 60.4% of records (Figure 3).

A one-tailed, \( z \) approximation test was conducted to test whether the population proportion for overweight/obese children (BMI equal to or greater than the 85th percentile) in the study population was significantly different from the national proportion of 0.33 (Hassink, 2007). As illustrated in Table 2, the observed proportion of 0.37 differed significantly.
Hypothesis 1: Children aged 3 through 17 years who are overweight/obese are significantly more likely to have nutrition counseling documented than those who are of normal weight or underweight.

A 2-way contingency table analysis using cross-tabs was conducted to evaluate whether children aged 3 to 17 years with BMIs equal to or greater than the 85th percentile were significantly more likely to have nutrition counseling documented than those with BMIs less than the 85th percentile. As illustrated in Table 3, nutrition counseling was documented more often for children with BMI less than the 85th percentile (67.8%) than for those with BMI equal to or greater than the 85th percentile (62.4%);
however, the difference was not statistically significant: Pearson $\chi^2(1, N = 526) = 1.586; P = .21; \Phi = 0.06$. It is surprising to note that 37.6% of those who were overweight or obese did not receive any documented nutrition counseling, compared with 32.2% of those of normal weight who did not receive any documented nutrition counseling.

**Hypothesis 2**: African American children who are overweight/obese are significantly less likely to have nutrition counseling documented than Caucasian non-Hispanic children who are overweight or obese.

A 2-way contingency table analysis using cross-tabs was conducted to evaluate whether African American children with BMI greater than the 85th percentile were significantly less likely to receive nutrition counseling than Caucasian non-Hispanic children with BMI greater than the 85th percentile (Table 4). No statistically significant difference was found in documented nutrition counseling between the 2 race categories: Pearson $\chi^2(1, N = 37) = 0.11; P = .74; \Phi = 0.05$. Because of the low number of records with documented ethnicity, a 2-way contingency table analysis was conducted to evaluate whether insurance benefit served as an effective proxy measure for ethnicity. Although there is no reference validating the use of insurance benefit as a proxy for ethnicity, and the results may be unintentionally biased, a significant difference was found in races for commercial and Medicaid benefits within the study population: Pearson $\chi^2(1, N = 114) = 13.57; P < .001; \Phi = -0.35$. Specifically, African American children were almost twice as likely to have Medicaid (73.8%) as commercial insurance (39.6%). Therefore, analysis was conducted to evaluate documented nutrition counseling based on insurance benefit (Table 5). Nutrition counseling was documented in 61.7% of children with commercial benefits compared with 63.0% of children with Medicaid benefits. However, as illustrated in Table 6, this difference was not statistically significant: Pearson $\chi^2(1, N = 194) = 0.04; P = .85; \Phi = 0.01$.

### Table 2.

<table>
<thead>
<tr>
<th>Category</th>
<th>n</th>
<th>Observed Proportion</th>
<th>Test Proportion</th>
<th>Asymptotic Sigma (1 tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI 85+ Percentile</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 1 &lt;85th Percentile</td>
<td>332</td>
<td>0.63</td>
<td>0.67</td>
<td>0.03*</td>
</tr>
<tr>
<td>Group 2 85th+ Percentile</td>
<td>194</td>
<td>0.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>526</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Alternative hypothesis states that the proportion of cases in the first group <0.67; based on z approximation.

### Table 3.

<table>
<thead>
<tr>
<th>BMI 85th+ Percentile</th>
<th>BMI &lt;85th Percentile</th>
<th>Count</th>
<th>Expected count</th>
<th>Percentage with BMI 85+ percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrition counseling not documented</td>
<td></td>
<td>73.0</td>
<td>107.0</td>
<td>66.4</td>
</tr>
<tr>
<td>Nutrition counseling documented</td>
<td></td>
<td>121</td>
<td>225</td>
<td>127.6</td>
</tr>
</tbody>
</table>

*Pearson $\chi^2(1, N = 526) = 1.59; P = .21; \Phi = 0.06$; continuity correction $\chi^2(1, N = 526) = 1.36; P = .25; \Phi = 0.06$.
Table 4.
Contingency Table Analysis of Documented Nutrition Counseling for Children With BMI Greater Than the 85th Percentile Based on Race Category

<table>
<thead>
<tr>
<th></th>
<th>African American</th>
<th>Caucasian Non-Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrition counseling not documented</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>9.0</td>
<td>6.0</td>
</tr>
<tr>
<td>Expected count</td>
<td>8.5</td>
<td>6.5</td>
</tr>
<tr>
<td>Percentage within race category</td>
<td>42.9</td>
<td>37.5</td>
</tr>
<tr>
<td>Nutrition counseling documented</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Expected count</td>
<td>12.5</td>
<td>9.5</td>
</tr>
<tr>
<td>Percentage within race category</td>
<td>57.1</td>
<td>62.5</td>
</tr>
</tbody>
</table>

*Pearson $\chi^2(1, N = 37) = 0.11, P = .74, \Phi = 0.05$; continuity correction $\chi^2(1, N = 37) = 0.00, P = 1.00, \Phi = 0.05$.

Table 5.
Contingency Table Analysis of Insurance Benefit by Ethnic Group in the Total Sample

<table>
<thead>
<tr>
<th></th>
<th>African American</th>
<th>Caucasian Non-Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial/HMO/POS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>21.0</td>
<td>32.0</td>
</tr>
<tr>
<td>Expected count</td>
<td>30.7</td>
<td>22.3</td>
</tr>
<tr>
<td>Percentage within race category</td>
<td>39.6</td>
<td>60.4</td>
</tr>
<tr>
<td>Medicaid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>45</td>
<td>16</td>
</tr>
<tr>
<td>Expected count</td>
<td>35.3</td>
<td>25.7</td>
</tr>
<tr>
<td>Percentage within race category</td>
<td>73.8</td>
<td>26.2</td>
</tr>
</tbody>
</table>

Abbreviations: HMO, health maintenance organization; POS, point of service.

*Pearson $\chi^2(1, N = 114) = 13.57, P < .001, \Phi = 0.35$; continuity correction $\chi^2(1, N = 114) = 12.20, P < .001, \Phi = 0.35$.

Hypothesis 3: Male children who are overweight/obese are significantly less likely to have nutrition counseling documented than female children who are overweight/obese.

A 2-way contingency table analysis using cross-tabs was conducted to evaluate whether male children with BMI greater than the 85th percentile were statistically significantly less likely to have nutrition counseling documented than female patients with BMI greater than the 85th percentile. Table 7 indicates that whereas male patients with BMI greater than the 85th percentile were less likely to have documented nutritional counseling (60.6% vs 64.7% for female patients), the difference was not statistically significant: Pearson $\chi^2(1, N = 194) = 0.35, P = .55, \Phi = −0.04$.

Summary

Results of the present analysis indicated that the observed proportion of overweight/obese children in the study population was significantly higher than the national average: 37% versus 33%, respectively; $P = .03$. No significant difference was found in documented nutrition counseling between children with BMIs equal to or greater than the 85th percentile and those with BMI less than the 85th percentile. Likewise, no statistically significant difference was found in documented nutrition counseling for overweight/obese children by race, gender, or by insurance benefit.

Discussion

The purpose of this study was to explore differences in documented nutritional counseling for an insured pediatric population. Results of this study were mixed. Published research indicates that nutrition and weight loss counseling by primary care providers are inadequate. Providers cite barriers such as insufficient knowledge, confidence, and skills to provide such counseling.6 One study reported that only 5% of children recalled being told to lose weight and exercise.6 However, practitioners who counseled their children had an effect on the patient’s motivation for weight loss.6 This study did not review the effect on patient’s behavior; however, it did show that a greater percentage of nutrition counseling occurred (65.8% of the total population), but the effectiveness of such counseling is unclear. This study also revealed a significantly higher proportion of overweight/obese children compared with the national average.
Limitations

Study results should be considered with caution and not generalized to all pediatric, insured populations. This study used a retrospective, convenience sample of children and was limited to data recorded in the medical chart the previous calendar year. Those trained to gather the data may have missed data with errors on the patients’ charts. These data were limited to children living in a coastal area and insured by a regional health insurance company and thus may not be representative of the general population. The reason for patients receiving or not receiving nutrition counseling is unknown and may affect what may be derived from the study. The impact of a type I or a type II error was not assessed.

Potential Application of the Study to Practice

By examining the trends surrounding nutrition counseling, specialists and health insurance providers can collaborate to provide essential and crucial interventions, including nutrition counseling, among others, in the lives of children living with overweight/obesity. Nutrition counseling is only one intervention among many needed to improve complex issues associated with pediatric obesity. The effectiveness of the nutrition counseling, examined within this study in changing attitudes, behavior, or BMIs is unknown. There is little research available documenting the effectiveness of nutrition counseling, although motivational interviewing has been shown to be a highly effective counseling strategy, especially when combined with cognitive behavioral therapy. Goal setting, problem solving, and social support are also effective strategies, but more research is needed in this area. The most cost-effective way to approach pediatric obesity may be to appropriately educate health professionals. Implementing a curriculum to prevent obesity in pediatrics by improving primary care providers’ knowledge and level of comfort in managing pediatric obesity has merit. Nutrition counseling can assist children, in that people who are told to lose weight are more likely to attempt to lose weight than those who are not told to do so. Improved BMIs may result in lower comorbidities and less premature mortality, which hopefully will result in longer length and quality of life for the next generations. Not only does this improvement have the potential to save millions in future health care dollars, but it could improve the overall future health of obese pediatric children—clearly, a goal worth achieving.

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Authors’ Note

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References


Additional References