A Comparison of Nonobese Versus Obese Emergency Department Patient Satisfaction Scores Utilizing Standard U.S. Hospital Survey Query Methodology

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Abstract

Background: Prior research reveals that overweight patients have higher emergency department (ED) utilization rates, longer length of stay, and face increased misdiagnosis risk. Objective: The objective of this study was to evaluate the association between obesity and ED patient satisfaction. Methods: This study was a cross-sectional study. A convenience sample of inner-city ED patients completed a written survey, then rated overall satisfaction with ED care (10-point scale), and rated components of satisfaction (4-point scale; never to always). Body mass index (BMI) was calculated using triage records (obesity = BMI >30). Results: Five hundred and sixty-four patients were included in the study group (50.5%: obese, 55.4% female, mean age: 43.2 ± 25.4 years). With respect to overall visit satisfaction (rating 8 or greater on 10-point scale), bivariate analysis revealed no differences between nonobese versus obese patients (74.6% vs. 73.9%; \( P = 0.85 \)). There were no significant differences for score of 4 (always) for components of ED satisfaction: physician courtesy (87.9% vs. 90.4%; \( P = 0.34 \)), nurse courtesy/respect (89.2% vs. 88.7%; \( P = 0.87 \), doctor listened (85.4% vs. 87.1%; \( P = 0.5 \)), doctor explained (80.2% vs. 85.0%; \( P = 0.14 \)), and recommend to friend (72.5% vs. 81.1%; \( P = 0.02 \)). Within our multivariate model, obesity was not associated with overall satisfaction (scores of 8 or greater) (\( P = 0.97 \); odds ratio = 0.99 [95% confidence interval = 0.65–1.5]). Conclusions: Despite research that suggests that overweight patients have characteristics of their ED visit that might increase dissatisfaction risk, we found no difference in satisfaction scores between nonobese and obese patients.

Keywords: Emergency department, obesity, patient satisfaction

Introduction

Hospital administrators and regulators are ever increasing their focus on patient satisfaction. In recent years, the Centers for Medicare and Medicaid Services have introduced the Hospital Inpatient Value-Based Purchasing Program, which links reimbursements to patient satisfaction surveys.[1] Within this program, the federal government has allocated $850 million in reduced Medicare reimbursement for facilities with lower patient satisfaction scores.[2] When faced with the potential for lost revenues, providers and hospital systems increasingly in need of data that provides a profile of patient subgroups that are at highest risk to provide poor scores for the types of standardized questions that are posed on these survey instruments.

For a variety of reasons, one such subgroup seemingly at risk for poor satisfaction scores is patients with obesity (body mass index [BMI] >30). Currently, more than one-third of the US adults and 17% of the youth are obese.[3] Further, a total of 68.8% of adults are considered to be overweight, which means a BMI of >25.[4] We commonly know that obesity is associated with increased risks for health complications (e.g. heart disease and hypertension), many of which are addressed in the emergency department (ED).

Previously, investigators have reported that obese patients have elements of their ED visit care that would likely contribute to

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How to cite this article: Mock C, Hensley J, Xu KT, Richman PB. A comparison of nonobese versus obese emergency department patient satisfaction scores utilizing Standard U.S. hospital survey query methodology. J Emerg Trauma Shock 2019;12:48-53.

Received: 22.10.17. Accepted: 15.12.18.
dissatisfaction, including increased difficulty with procedures such as repeat intravenous (IV) cannulation attempts, more frequent testing, and longer ED length of stay.\textsuperscript{5-9} Surprisingly, despite the vast amount of research on factors related to patient satisfaction, our Medline search revealed a paucity of data that specifically address the potential impact of obesity on these scores. The purpose of our study was to compare satisfaction scores for obese versus nonobese patients in the ED utilizing the standard US hospital survey query methodology.

**Methods**

**Study design**

This was a prospective, cross-sectional study.

**Setting**

The study was conducted at CHRISTUS Spohn Memorial Hospital in Corpus Christi, TX. The facility is a major teaching affiliate of Texas A and M medical school, a level-two trauma center, and serves an inner-city population. The annual ED census is 45,000 patients. The CHRISTUS Health Institutional Review Board approved the study before the initiation of data collection.

**Population**

We enrolled a convenience sample of medically stable, consenting adult patients aged >18 years who presented to the ED. Patients were excluded for any of the following reasons: refusal to provide consent, pregnancy, and inability to complete the questionnaire due to clinical instability, severe pain, or disorientation as determined by a study physician. Patients that were not English speaking were also excluded from the study.

**Study protocol**

Hemodynamically, stable, oriented, consenting patients at an inner-city, academic ED were consecutively enrolled at hours in which trained research associates were available to assist with data collection (convenience sample) from August 2015 through February 2016. The enrolled patients completed a structured, written survey providing demographic, chief complaint information. Subsequently, the patients provided structured answers to questions regarding components of patient satisfaction as well as overall satisfaction with the visit [Appendix 1].

**Statistical analysis**

Data were entered into the Excel for Windows (Microsoft Corporation, Redmond, WA) and transported into STATA software (STATA, College Station, Texas). Components of satisfaction were assessed with a 4-point scale (never to always). Overall satisfaction with ED care received was rated on a 10-point scale. BMI was calculated by the research assistant using height and weight obtained in triage, and obesity was defined as a BMI >30. Categorical data were presented as frequency of occurrence and analyzed by Chi-square test; continuous data were presented as mean ± SD and analyzed by t-tests. Multivariate logistic regression analysis was performed to control for confounding. The primary outcome parameter was to compare satisfaction scores between obese and nonobese patients. Secondary outcome parameters were to compare the relationship between other patient characteristics and satisfaction scores.

**Results**

We considered 770 patients for participation; 564 completed the survey (study group), 104 refused to participate, and the remaining patients met exclusion criteria. The number of patients for which we had completed data for a given characteristic included: weight (564), gender (560), race (564), income (549), education (561), insurance (542), and chief complaint (557). Table 1 summarizes the demographics, which reveals 50.5%: obese, 55.4%: female, mean age: 43.2 ± 25.4 years. Within the study group, 70.9% had an annual income <$20,000, 29.6% had less than high school graduation/education, and 11% had private insurance. Most common chief complaints, also shown in Table 1, included chest pain (8.8%), back pain (10.4%), abdominal pain (11.5%), and injury (15.2%).

With respect to the primary outcome measure of overall satisfaction with the ED visit (rating 8 or greater), bivariate analysis revealed no differences between nonobese and obese patient scores (74.6% vs. 73.9%; \(P = 0.85\)), which is summarized in Table 2. Likewise, Table 3 shows that there were no significant differences for nonobese versus obese patients for % score of 4 (always) for the following components of ED satisfaction: physician courtesy and respect (89.7% vs. ...
90.4%; \( P = 0.34 \)), nurse staff courtesy and respect (89.2% vs. 88.7%; \( P = 0.87 \)), doctor listened (85.4% vs. 87.1%; \( P = 0.5 \)), doctor took time to explain (80.2% vs. 85.0%; \( P = 0.14 \)), and % who would recommend to friends (72.5% vs. 81.1%; \( P = 0.02 \)). Table 4 summarizes our multivariate model, which revealed that obesity was not associated with differences in overall satisfaction (scores of 8 or greater) (\( P = 0.97 \); odds ratio [OR] = 0.99 [0.65–1.5]), whereas increasing age was the only variable associated with high satisfaction (\( P = 0.010 \); \( OR = 1.02 \ [1.00–1.03] \)). Multivariate analyses for each component of satisfaction, respectively, did not reveal significant associations between obesity and good scores. These findings are summarized in Tables 5–10.

**DISCUSSION**

Obese patients represent a challenging patient population to evaluate from a variety of perspectives. A study by Ngui et al.\(^9\) investigated the number of IV cannulation attempts, liver function tests, cardiac enzyme tests, and abdominal X-rays obtained for obese versus nonobese patients in the ED and found that all were increased for obese patients. Kam et al.\(^5\) performed a similar study and demonstrated that BMI most strongly correlated with difficulty finding anatomical landmarks, venous pressure measurement, physical examination, patient positioning, and procedures including venipuncture.

| Table 4: Multivariate analysis (n=522) |
|---------------------------------------|
| Overall satisfaction                  |
| Obesity                               | \( P = 0.97 \) |
| Increasing age                        | \( P = 0.010 \) |
| OR: Odds ratio                        |

| Table 5: Overall satisfaction level of visit (n=521) |
|------------------------------------------|
| Characteristics                         | \( P \) | OR | 95% CI     |
|------------------------------------------|--------|----|-----------|
| Obese                                   | 0.973  | 0.992 | 0.653–1.508 |
| Female                                  | 0.997  | 0.999 | 0.649–1.538 |
| Increasing age                          | 0.010  | 1.020 | 1.004–1.036 |
| Hispanic race                           | 0.885  | 0.965 | 0.598–1.558 |
| Income of less $20,000                  | 0.179  | 0.685 | 0.394–1.189 |
| Private insurance                       | 0.404  | 0.695 | 0.295–1.633 |

CI: Confidence interval, OR: Odds ratio

When one takes all of these factors into account, it would suggest some risk of prolonged and more costly ED visits for obese patients; however, the data are somewhat contradictory. Peitz et al.\(^6\) reported that when compared with nonobese ED patients, obese patients with chest pain and dyspnea did have significantly increased costs and length of stay. However, two other studies that evaluated the care of ED patients with abdominal found that obese patients were not at risk for longer disposition times, more frequent diagnostic testing/resource utilization, and increased length of stay.\(^7,8\)

To date, Baskerville and Moore conducted the only study that has examined the relationship of body mass to length of stay for ED patients that included patients with all chief complaints.\(^9\) This retrospective cohort included 102 morbidly obese (BMI >40) and 195 normal weight or mildly obese patients. The authors found that the mean length of stay for patients with BMI >40 was 101-min longer than that which was observed for those patients with BMI <35 ([95% CI, 55–146]; \( P < 0.0001 \)).

With some evidence supporting an increased potential for higher cost and length of stay, we were surprised to observe

| Table 7: Did the nurses treat you with courtesy and respect? (n=519) |
|---------------------------------------------------------------|
| Characteristics                         | \( P \) | OR | 95% CI     |
|------------------------------------------|--------|----|-----------|
| Obese                                   | 0.947  | 0.980 | 0.552–1.739 |
| Female                                  | 0.299  | 1.364 | 0.759–2.453 |
| Increasing age                          | 0.425  | 1.008 | 0.987–1.030 |
| Hispanic race                           | 0.393  | 0.741 | 0.373–1.472 |
| Income of less $20,000                  | 0.304  | 0.686 | 0.334–1.407 |
| Private insurance                       | 0.289  | 1.832 | 0.599–5.599 |

CI: Confidence interval, OR: Odds ratio

| Table 8: How often did the doctors listen carefully to you? (n=520) |
|---------------------------------------------------------------|
| Characteristics                         | \( P \) | OR | 95% CI     |
|------------------------------------------|--------|----|-----------|
| Obese                                   | 0.500  | 1.196 | 0.711–2.011 |
| Female                                  | 0.690  | 0.896 | 0.523–1.535 |
| Increasing age                          | 0.796  | 0.997 | 0.979–1.015 |
| Hispanic race                           | 0.721  | 0.896 | 0.491–1.635 |
| Income of less $20,000                  | 0.346  | 0.721 | 0.364–1.424 |
| Private insurance                       | 0.038  | 2.739 | 1.058–7.086 |

CI: Confidence interval, OR: Odds ratio

| Table 9: How often did doctors explain things in a way you could understand? (n=520) |
|---------------------------------------------------------------|
| Characteristics                         | \( P \) | OR | 95% CI     |
|------------------------------------------|--------|----|-----------|
| Obese                                   | 0.178  | 1.385 | 0.862–2.227 |
| Female                                  | 0.082  | 1.532 | 0.947–2.477 |
| Increasing age                          | 0.429  | 0.993 | 0.977–1.009 |
| Hispanic race                           | 0.150  | 0.665 | 0.381–1.159 |
| Income of less $20,000                  | 0.477  | 0.799 | 0.431–1.481 |
| Private insurance                       | 0.384  | 1.486 | 0.608–3.628 |

CI: Confidence interval, OR: Odds ratio
They concluded that obese individuals [11-21] based on the time of survey administration compared with the actual instruments upon which administrators and regulators assess for several elements of customer service. There is also a risk that our need to have a brief survey may led to the omission of potential confounding data points such as severity of illness, though we excluded patients who were critically ill.

We also note that there are potential response differences based on the time of survey administration compared with standard commercial surveying. In our protocol, the survey was administered at the point of care late in the ED encounter. Surveying companies typically mail/e-mail questionnaires to patients multiple days to weeks after their ED visit. We are unsure how these differences in survey technique and timing may have impacted our results.

### Limitations

Our study has several limitations that warrant discussion. Patients were surveyed in a nonconsecutive fashion over several months. We attempted to limit sampling bias by surveying patients on all shifts including nights and weekends. A second limitation may be the generalizability of our study. Our patient population is predominantly Hispanic and of lower educational and socioeconomic status. Although there might be a concern for language barriers impacting the bias of our sample, nearly all of the patients who visit our department speak English fluently, so few were likely excluded on that basis though we did not track such. Further, we attempted to control for such confounding through our multivariate regression models and generally found that few patient characteristics correlated with higher scores. We note that we did not control for other potential co-founders such as severity of illness, so there is the potential that the groups were not similar in this respect.

Another limitation of our investigation was the survey instrument itself and the time of administration. Our study instrument was significantly shorter than the actual Press Ganey questionnaire and most other surveys currently in use commercially. For proprietary/intellectual property reasons, our survey instrument cannot precisely match the one that patients receive from these firms. We have found in our setting that our patients of typically lower educational status have higher survey completion rates when the instruments are kept brief. That being noted, our survey questions are essentially paraphrasing of the majority of key components of the major surveys currently utilized in the US to evaluated EDs and their staff (e.g., physician taking the time to listen and experience pain control). As scores for each component assessed on US hospital-type surveys are typically one question per component (i.e., components are not aggregate scores of several questions), our editing of survey length reflects a reduction in components reported rather than reducing the number of questions asked per component. While we did not perform sensitivity analysis, we believe that our questions well reflect in terms of the components utilized and scoring method the actual instruments upon which administrators and regulators assess for several elements of customer service. There is also a risk that our need to have a brief survey may led to the omission of potential confounding data points such as severity of illness, though we excluded patients who were critically ill.

We also note that there are potential response differences based on the time of survey administration compared with standard commercial surveying. In our protocol, the survey was administered at the point of care late in the ED encounter. Surveying companies typically mail/e-mail questionnaires to patients multiple days to weeks after their ED visit. We are unsure how these differences in survey technique and timing may have impacted our results.

### Conclusions

Despite research that suggests that overweight patients have characteristics of their ED visit that might increase risk for dissatisfaction, we found no difference between nonobese and obese patients for overall and component measures of satisfaction. More research should be performed to assess for patient groups at risk for decreased satisfaction.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

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APPENDIX

Appendix 1: Survey instrument

Survey

1. Sex: Male
   Female

2. If you are female, are you currently pregnant? Yes No

3. Age in years: (enter age if less than 90) [if 90 or older check here]:

4. Race: Caucasian/White Hispanic Native American Asian Non-Hispanic/Black Other

5. What is your household's yearly annual income (estimate)?
   - $0-$20,000
   - $20,001-$40,000
   - $40,001-$60,000
   - $60,001-$80,000
   - $80,001 or more

6. What is the highest level of education you completed in school?
   - Less than High School
   - High School Graduate
   - Some College
   - College Graduate
   - Any Post Graduate Work

7. What type of health insurance do you have?
   - Private Insurance
   - Nueces Aid ("Clinic Card")
   - Medicaid
   - Medicare
   - Self-Insured
   - None

8. Please rate your overall satisfaction level for this visit by circling the number on the scale below.

   [Circle a number between 1 and 10]

9. During this ER visit did the doctors treat you with courtesy and respect? 1. Never 2. Sometimes 3. Usually 4. Always

10. During this ER visit did the nurses treat you with courtesy and respect? 1. Never 2. Sometimes 3. Usually 4. Always

11. During this ER visit, how often did the doctors listen carefully to you? 1. Never 2. Sometimes 3. Usually 4. Always

12. During this ER visit, how often did doctors explain things in a way you could understand? 1. Never 2. Sometimes 3. Usually 4. Always

13. Would you recommend this hospital to your friends and family? 1. Definitely no 2. Probably no 3. Probably yes 4. Definitely yes

14. Please circle the single most important symptom that brought you to the ER today (circle ONLY one):
   - a. Chest pain
   - b. Shortness of breath
   - c. Abdominal pain
   - d. Back pain
   - e. Arm or leg injury
   - f. Fever
   - g. Cough
   - h. Headache
   - i. Other

THANK YOU FOR YOUR PARTICIPATION!

STOP! DO NOT COMPLETE INFORMATION BELOW.
To be filled out by Emergency Room Personnel:
15. BMI/Height: ____________________

Version #2, June 15, 2015