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The association between body mass index and patients' experiences with inpatient care

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Abstract

Objectives: To explore the association between patients' body mass index (BMI) and their experiences with inpatient care.

Design: Cross-sectional. Mail survey.

Setting: University Hospital of Geneva

Participants: Questionnaires were mailed to 2385 eligible adult patients, 6 weeks after discharge (response rate = 69%).

Main Outcome Measures: Patients' experiences with care was measured using the Picker Inpatient Survey Questionnaire. BMI was calculated using self-reported height and weight. Main dependent variables were the global Picker patient experience score (PPE-15) and 9 dimension specific problem scores, scored from 0 (no reported problems) to 1 (all items coded as problems). We used linear regressions, adjusting for age, gender, education, subjective health, smoking and hospitalization, to assess the association between patients' BMI and their experiences with inpatient care.

Results: 4.8% of the patients were underweight, 50.8% had normal weight, 30.3% were overweight and 14.1% were obese. Adjusted analysis show that compared to normal weight, obesity was significantly associated with fewer problematic items in the surgery-related information domain, and being underweight or overweight was associated with more problematic items in the involvement of family/friends domain. The global PPE-15 score was significantly higher (more problems) for underweight patients.

Conclusions: Underweight patients, but not obese patients, reported more problems during hospitalization.

Key words: obesity, quality of care, patients experiences, satisfaction, survey.

1. Introduction

In recent years, the prevalence of overweight and obesity has been increasing [1]. Obesity is associated with increased morbidity and mortality [2], as well as with higher healthcare utilization and costs [3]. In addition, since obese individuals show physical embarrassment and low self-esteem [4], and physicians may hold negative attitudes towards obese patients [5], the quality of care for overweight and obese patients might be suboptimal.

Current medical practice often lags behind recommended care [6], but whether obesity is an additional risk factor for poor care remains unclear. Several recent studies have examined the association between body mass index (BMI) and receipt of preventive services [7-9]. While most have shown that screening procedures such as cervical, breast and colorectal cancer screening, as well as influenza immunization, are less often offered to obese individuals, compared to normal weight individuals [7,9], this finding is not universal [8]. Other studies have evaluated how satisfaction and/or patients' experiences with care varies according to BMI. Many reported similar or even higher levels of satisfaction with increasing BMI [10;12-14], while others found patients with higher BMI to be less satisfied with outpatient care [11]. Whether BMI is associated with patients' experiences or satisfaction with inpatient care remains unknown.

To clarify this issue, we examined the relationship between patients' BMI and their report of problems during hospitalization. We hypothesized that overweight and obese inpatients would report more problems than normal weight patients.

2. Methods

2.1. *Data source and participants*

From April to August 2007, we surveyed patients discharged from the University Hospital of Geneva between February 15 and March 15 2007. All inpatients aged 18 years and over who had been hospitalized for more than 24 hours were included in the study. Patients staying in prison, residing outside Switzerland, deceased during hospitalization or transferred to another hospital during that stay were excluded. Secondary exclusions, defined a priori, were carried out during data collection (patients who considered themselves or were considered by their proxies to be too sick to complete a questionnaire, who had died after discharge, who did not understand French, or whose address was invalid). The first survey package, mailed within 6 weeks of hospital discharge, comprised a cover letter, the questionnaire and a stamped return envelop. Up to two reminder mailings including a full survey package were sent to non-respondents four and eight weeks later, if no reply was received in-between.

Out of 2686 eligible patients, 1654 returned a questionnaire (response rate: 69.2%) After exclusion of 19 patients who returned only partially filled questionnaires and 113 patients because of missing BMI, the analysis sample consisted of 1522 patients.

As for all patient satisfaction surveys conducted on a regular basis, this project was exempted from full review by the research ethics committee of the Geneva University Hospitals.

2.1. *Measurements*

2.1.1 *Patients' experiences and satisfaction questionnaire*

Our main outcome of interest was patients' experiences with inpatient care, measured using the Picker institute inpatient questionnaire [15], a 50-item questionnaire mainly including report items (what happened or did not happen) and divided into 9 sections representing 9 core dimensions (problem scores): emotional support, respect for patients preferences, involvement of family and/or friends, information and education, physical comfort, continuity of care, coordination of care, surgery-related information and general impression. The global 15-item score (Picker Patient Experience questionnaire, PPE-15) was

also computed [16]. First, each item was coded as a "problem score" indicating either the presence or absence of a problem. Then, each domain score and the global score were scored from 0 (no reported problem) to 100 (all items reported as problems).

Two other single-item outcomes considered in our analysis were an overall satisfaction rating (excellent/very good/good versus fair/poor) as well as the patients' willingness to recommend the hospital to others (yes certainly or yes probably versus no).

2.1.2 Body mass index (BMI)

Height and weight were self-reported, and body mass index (BMI) was calculated as the weight in kilograms divided by the squared height in meters (kg/m^2). Individuals were classified as underweight ($\text{BMI} < 18.5 \text{ kg}/\text{m}^2$), normal ($\text{BMI} 18.5\text{-}24.9 \text{ kg}/\text{m}^2$), overweight ($\text{BMI} 25\text{-}29.9 \text{ kg}/\text{m}^2$) or obese ($\text{BMI} \geq 30 \text{ kg}/\text{m}^2$).

2.1.3 Other variables

Age and gender were recorded from administrative charts, and the following patient's characteristics were collected using the questionnaire: education (elementary school, apprenticeship, high school, university), subjective health (excellent, very good, good, fair, poor), current smoking (yes/no) and previous hospitalization in the past 6 months (≥ 1 versus 0).

2.3 Statistical analysis

To compare the patients' characteristics across BMI groups, we first used chi-squared tests for categorical variables and one-way ANOVA for continuous variables. Then, we performed crude and adjusted analyses using i) linear regression to examine the association between BMI and each of the 9 problem scores and the global PPE-15 score, and ii) logistic regression to examine the association between BMI and the overall satisfaction rating, as well as between BMI and hospital recommendation to others. The "normal weight" category was taken as the reference, and adjustment for age, gender, education, subjective health, tobacco use and previous hospitalization during past 6 months was considered. In all analysis, P -values < 0.05 were considered significant.

3. Results

Patients with missing BMI ($n=113$) were older (64.1 vs 55.6 years, $p < 0.01$) than patients with non-missing BMI ($n=1522$), but the 2 groups were similar in terms of gender, education, smoking status, subjective health and hospital use.

Among the 1522 participants, the mean age was 55.6 years (SD19.3), 58% were women, and 24.1% were current smokers. Other characteristics appear in Table 1.

In non-adjusted analysis (Table 2), compared to normal weight patients, overweight patients reported more problems (less satisfaction with inpatient care) in the "involvement of family and/or friends" domain, and underweight patients reported significantly more problems in the "involvement of family and/or friends", the "information and education", and "physical comfort" domains. Obese individuals presented significantly fewer problems in the "surgery-related information" domain. After adjustment for potential confounders (Table 3), significant differences remained for obese (less problems in the "surgery-related information" domain) as well as for under- and overweight patients (more problems in the "involvement of family and/or friends" domain), compared to normal weight patients. Underweight patients had significantly higher (worse) PPE-15 scores than other groups (Table 3).

In adjusted analysis, BMI was neither associated to the overall satisfaction rating (underweight: OR 0.6, 95%CI 0.2-1.4; overweight: OR 0.7, 95%CI 0.4-1.3; obesity: OR 2.4,

95%CI 0.9-6.5) nor to the willingness to recommend the hospital to others (underweight: OR 0.6, 95%CI 0.3 -1.3; overweight: OR 0.9, 95%CI 0.5-1.4; obesity: OR 1.2, 95%CI 0.6-2.3).

4. Discussion

The results of this study do not support our hypothesis, and suggest that obesity is not associated with negative inpatient experiences and lower levels of satisfaction with care. On the other hand, underweight patients reported significantly more problems (less satisfaction) in the global PPE-15 score and the involvement of family/friends domain.

One reason for finding no differences between inpatient care experiences of non-obese and obese patients could be the lack of sensitivity of the instruments to these types of comparisons. Despite the fact that other authors assessing patients' experiences and/or satisfaction with ambulatory care in diverse healthcare contexts found similar results, it remains difficult to compare results. Indeed, even though other studies mostly targeted outpatients from US academic settings, measures of satisfaction varied greatly and did not always use validated instruments assessing patients experiences (they rather considered satisfaction rating). Alternatively, obese patients do experience some form of discrimination during their health care episode, that common patient opinion instruments fail to capture. Another reason could be that discrimination against obese patients is accepted by these as a fact of life, and does not influence their satisfaction and experience with care.

We did not expect to find significantly more problems among underweight patients, even after adjustment for age, gender, health status, and previous hospitalizations during the past 6 months. We believe that the most likely interpretation is that many underweight patients suffer from severe chronic diseases, and that it is their poor health and the nature of the health care they receive that explains their higher report of problems during hospitalization, not their underweight status per se. These findings require confirmation in other studies.

Some limitations must be considered. First, self-reported height and weight underestimates the true prevalence of overweight and obesity [17] and may overestimates the associations between BMI and health outcomes [18]. However, since obese patients were not found to be statistically less satisfied than normal weight patients, this should not affect our conclusions. Also, we are not sure how BMI reported 6 weeks after discharge reflects usual (true) BMI and how this might have modified the BMI - patients' experiences/satisfaction association. The response rate was moderate, so that selection bias cannot be excluded. Second, the sample size could have prevented the detection of true differences between subgroups.

Obese patients did not report more problems and lower satisfaction with hospital care than normal weight patients. Since patients' experiences and satisfaction with care represent only one of several indicators of quality of care, healthcare professionals should continue to provide appropriate and high quality care to their patients, irrespective of weight. To better understand how BMI is associated with patients' experiences and satisfaction of care, future studies should reassess this question both in in- and out-patients of various countries, always compare results to non-obese patients, and use validated instruments. Using qualitative methods to explore experiences of obese patients may also shed light on this issue.

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Conflict of interests

None of the authors has any conflict of interest to declare.

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Table 1
Characteristics of included patients, by body mass index (BMI) category

	All patients (n= 1522)	Underweight (BMI < 18.5 kg/m ²) (n= 73)	Normal weight (BMI 18.5-24.9 kg/m ²) (n= 773)	Overweight (BMI 25.0- 29.9 kg/m ²) (n= 461)	Obesity (BMI ≥ 30.0 kg/m ²) (n= 215)	P *
Age, mean (SD) (n= 1518)	55.6 (19.3)	55.7 (22.3)	52.8 (20.2)	59.5 (17.6)	57.5 (16.5)	< 0.001
Women (n= 1518)	58%	74%	63.1%	45.9%	60.6%	< 0.001
Education (n=1481)						< 0.001
- elementary school	27.6%	26.9%	20.9%	33.8%	38.9%	
- apprenticeship	31.4%	28.4%	32.4%	33.3%	28.4%	
- high school	8.5%	7.5%	10.1%	7.7%	4.7%	
- university	32%	37.3%	36.5%	25.1%	27.9%	
Subjective health (n=1495)						< 0.001
- excellent / very good	24.4%	17.4%	29.6%	22.8%	12.2%	
- good	48%	36.2%	47.7%	51.3%	45.5%	
- fair / poor	27.5%	46.4%	22.7%	25.9%	42.3%	
Current smoking (n=1389)	24.1%	37.3%	26.2%	22.8%	14.5%	< 0.001
Hospitalization past 6 months	29.9%	43.9%	29.5%	32.3%	21.2%	0.002

Table 2
Unadjusted means of the 9 problem scores (domains) of the Picker satisfaction instrument, and the PPE-15 summary score, by body mass index (BMI) category

Problem score (domain)	Underweight (BMI < 18.5 kg/m ²)	Normal weight (BMI 18.5-24.9 kg/m ²)	Overweight (BMI 25.0-29.9 kg/m ²)	Obesity (BMI ≥ 30.0 kg/m ²)	P†
Emotional support	39.7	34.1	33.6	32.2	0.39
Respect patients preferences	34.2	29.7	29.5	31.5	0.44
Involvement of family/friends	31.0	23.5	28.5	27.0	0.02*
Information and education	36.4	29.0	28.1	28.9	0.17
Physical comfort	25.5	18.2	18.1	19.4	0.13
Continuity of care (discharge)	38.4	34.7	37.8	35.9	0.38
Care coordination	31.3	28.4	25.5	27.3	0.14
Surgery-related information	38.5	35.0	31.4	25.6	0.03*
General impression	14.2	10.4	9.4	9.2	0.15
PPE-15	36.7	29.5	30.2	30.7	0.09