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Association between Obesity and Patient-Centered Measures using the Medical Panel Expenditure Survey: Data from 2004-2013

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Abstract

Patient-centeredness is an important factor in patient health and engagement but its association in patients with obesity is not thoroughly understood. Of 28,854 participants aged≥60 from the Medical Expenditure Panel Survey 2004–2013, we evaluated four patient-centered domains: patient/provider relationship, shared-decision making, access to care, overall medical care provider rating, and prescription care. Weighted logistic (OR [95% CI]) and linear (β±s.e.;p-value) regression models demonstrated that participants as having obesity reported a marginally higher delay in getting the necessary care than healthy BMI (OR 1.25 [1.01,1.53]). Older adults with obesity report reduced perceived access to care.

Keywords

obesity; aging; quality; patient-centered outcomes

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6. FINANCIAL DISCLOSURE

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1. INTRODUCTION

The prevalence of body mass index-defined obesity in older adults aged 65 years and older is approaching 40% in the United States population[1]. This chronic disease places older adults at considerable risk for medical comorbidity[2] and functional decline[3], and increases their risk of long-term institutionalization[4] and mortality[5]. Individuals with obesity require increased attention to medical needs for diagnosis and/or treatment or self-management of their medical conditions. Data suggest that patients with obesity experience body shaming, discrimination, and stigma[6], which can impact healthcare contact, access, and utilization[7]. However, there is limited knowledge of whether older adults with obesity have different satisfaction rates, relationships with their provider, or access to medical care. Patient-centered care is often a mediator of more distal outcomes such as functional status and medical comorbidity[8]. In an era of patient-centered care where payment models have begun incorporating patient quality measures, we sought to identify whether such indicators differ across BMI categories in order to ascertain whether care delivery systems need to be altered for this population.

2. MATERIALS & METHODS

The Medical Expenditure Panel Survey (MEPS) is a nationally representative survey of non-institutionalized United States adults, which samples households from the previous year's National Health Interview Survey. MEPS oversamples race/ethnic groups and lower income participants. We used 2004–2013 data and used variables from the first of five in-person interview dates, merging them in accordance to the analytical guidelines. The total sample consisted of 133,248 participants, of whom we excluded participants younger than age 60 (n=104,394), and subjects without data on BMI (n=1,224). The study was deemed exempt from our local Institutional Review Board due to the de-identified status of data.

A number of quality measures exist within MEPS, which are asked using a self-reported questionnaire. We focused on the following domains and their respective questions from the administered survey: Patient/Provider relationship (i.e. provider listened carefully; explained things in an understandable way; showed respect; spent enough time); Shared Decision Making (asked patients to help make decisions; explained all options; asked about prescriptions); access to Care (did not get care right way; had a delay in getting an appointment; difficulty in contacting the provider; difficulty contacting the provider after hours; unable to obtain medical treatment; delay in getting necessary care); overall medical care provider rating (assessed on a scale of 1–9) and prescription care (unable to get prescription medications or a delay in getting prescription medications). Each of these domains were dichotomized.

Self-reported height and weight were used to calculate body mass index (BMI) in kg/m^2, and categorized as follows: underweight ($\leq 18.5 kg/m^2$), health BMI ($18.5–24.9 kg/m^2$), overweight ($25.0–29.9 kg/m^2$) and obesity ($\geq 30 kg/m^2$). Rural/urban status was determined by metropolitan statistical area as defined by the Office of Management and Budget. Age was measured in years and top coded at 85 years. Top coding is a process where values on the

upper end of a range are grouped together to preserve confidentiality as few people are sampled in this distribution. Sex, marital status, race/ethnicity, education, household income were all obtained using standardized questionnaires. All co-morbidities were assessed using the question, “Did a doctor ever tell you that you had [medical condition].” Participants were considered to have ‘any limitation’ if they had any self-reported difficulty in instrumental, basic, social cognitive or walking limitations.

2.1 Statistical Analysis

Descriptive statistics for continuous variables are represented as means ± standard errors, and categorical variables as counts (%). All analyses reflect the survey design using estimated weights, sampling strata and primary sampling unit. All baseline characteristics and univariate results of the quality measures were compared using an r x c chi square or an ANOVA, across BMI categories. The primary aim was to assess whether there were differences among each of the quality measures by BMI status. We created three models (Model 1: unadjusted; Model 2: age and sex; and Model 3: age, sex, wages, depression, heart disease, arthritis, emphysema, high blood pressure or diabetes). The adjusted multivariable model estimated the odds of each quality measure (yes/no) associated with each BMI category (referent=18.5–24.9kg/m^2). Analyses were conducted using STATA v.13 (College Station, TX) and a *p*-value of <0.05 was considered statistically significant.

3. RESULTS

We identified 28,854 participants aged ≥60 years (Table 1), mean age 70.8±0.10 (SE) and the majority were female (55.1%). There were significant differences across BMI categories in all baseline characteristics. Generally, medical comorbidity was high in both underweight and in participants in the obesity category. Table 2 reflects the univariate results of the quality indicators. Across BMI categories, there were statistically significant differences observed in the perception of: the manner in which the provider showed respect; the ability to contact the provider after hours; ability to obtain medical treatment; and in a delay in obtaining necessary care. There were differences observed across overall rating of healthcare and in the perception of the capacity in either obtaining prescription medications across BMI categories or a delay in their receipt.

Our adjusted models (Table 3) demonstrated that underweight participants perceived they did not receive their care right away, as compared to the perceptions of healthy BMI participants (OR 2.28 [1.08, 4.78]). Patients with obesity had a perception in the delay in getting necessary care as compared to those with a healthy BMI (OR 1.25 [1.01,1.53]). Finally, participants classified as overweight had a marginally higher rating of their provider (β=0.093±0.031; p=0.003) as compared to healthy BMI participants. We did not observe any other differences across any of the other quality measures.

4. DISCUSSION

Older adults with obesity were significantly more likely to report a perception in the delay in receiving necessary medical care compared to participants with a healthy BMI, and underweight participants perceived that they did not receive care ‘right away’. These

findings provide preliminary data to suggest the importance of engaging older adults in seeking healthcare and encouraging clinical care teams in carefully monitoring their own practices to be aware of this phenomenon.

We observed that participants classified as underweight perceived that they did not "receive care right away," a finding that was not observed in those classified as having obesity. This is in spite of similar comorbidity burden of these two groups. A potential explanation is the parallel findings observed in individuals classified as having frailty, as those with underweight. Individuals with frailty have multiple competing factors and often such patients feel that they may have been misdiagnosed or incompletely assessed as provider. Nonetheless, these findings are of concern from a public health standpoint as this population is at higher risk of comorbidity and disability.

To our knowledge, this is the first study to present the differences in self-reported health care access and quality in older adults (aged 60+) for different BMI categories. Focusing on older adults is important with the demographic changes and the epidemic of older adult obesity has not been given much attention in the literature[9, 10]. Their care needs differ from a younger population due to impairments in mobility and function. Further, administrative datasets, such as Medicare, cannot provide person-level data that is useful in descriptive epidemiology. A major strength of our study was that we used national data collected over a prolonged period of time that could be broadly representative of the United States population. This survey is an ongoing nationwide study of the most complete source of data available on health care use and expenses in the United States and has been cross-validated with other datasets[11, 12].

Our results, though, should be interpreted with caution. BMI is a commonly used anthropometric measure in clinical practice as it is easy to use, affordable and on a population-level, associated with long-term outcomes[13]. Its utility in older adults has been challenged due to its poor sensitivity[14] that drops with age. Other markers such as waist circumference should be considered[15]. However, accurate assessment of body fat is the only true manner to assess adiposity, data which are unavailable in this cohort. Older adults also lose muscle mass and function, a process termed sarcopenia, which is not accounted for in the assessment of BMI[16, 17].

We deliberately adjusted for a number of comorbidities that likely influenced our multivariable estimates. Increased comorbidity is known to impact satisfaction, care and self-reported health. The covariates included in our analysis were chosen to reflect: a) sociodemographic factors that can negative impact comorbidity; b) common illnesses that are screened for within primary care practices (depression, high blood pressure, arthritis/pain); and c) heart disease and emphysema which are indicators of advanced chronic disease and increased healthcare utilization which are evaluated as part of chronic disease management programs. We recognize that adjusting for other covariates, including sociodemographic factors and social determinants of health could also impact our results.

Our study had a number of limitations. First, to obtain reliable estimates, we pooled 10 years of MEPS data, and as such, the results may not necessarily be reflective of a given time

frame. Second, all measures were self-reported and subject to reporting bias. However, this parallels what is observed using well-validated clinical satisfaction and experience scales, such as those by Press-Ganey. Third, BMI was self-reported and not objectively measured. Last, older adults tend to over report on self-reported questions; only actual utilization data could cross-validate such results.

Access to medical care was perceived to be marginally worse in in older adults with obesity as compared to the other BMI groups. Future research should confirm these results prior to promoting targeted interventions for this subgroup.

Appendix 1:: Multivariable Analysis

Unadjusted – Model 1

		Underweight	Healthy	Overweight	Obese
Patient/Provider Relationship	**Provider Listened Carefully**	0.88 [0.57,1.35]	Referent	1.11 [0.95,1.30]	0.89 [0.75,1.05]
	Explained things in an understandable way	0.77 [0.51,1.18]	Referent	0.98 [0.84,1.14]	0.83 [0.69,1.00]
	Showed Respect	0.99 [0.61,1.59]	Referent	1.06 [0.89,1.28]	0.80 [0.67,0.96]
	Spent enough time	0.98 [0.66,1.45]	Referent	1.10 [0.96,1.26]	0.97 [0.85,1.11]
Shared Decision Making	**Ask patient to help make decisions**	1.01 [0.72,1.44]	Referent	0.98 [0.88,1.08]	0.90 [0.81,1.00]
	Explained all options	1.15 [0.69,1.94]	Referent	1.05 [0.91,1.21]	1.04 [0.88,1.23]
	Ask about prescriptions	0.94 [0.70,1.25]	Referent	1.01 [0.92,1.11]	1.10[0.99,1.23]
Access to care	**Did not get care right away**	1.33 [0.72,2.46]	Referent	1.08 [0.86,1.37]	0.96 [0.75,1.24]
	Delay in getting appointment	1.23 [0.74,2.05]	Referent	0.95 [0.83,1.09]	0.98 [0.85,1.13]
	Difficult to contact provider	1.00 [0.69,1.46]	Referent	1.06 [0.95,1.18]	0.95 [0.85 1.06]
	Difficult to contact after hours	1.01 [0.74,1.38]	Referent	0.96 [0.88,1.06]	0.85 [0.77,0.94]
	Unable to obtain medical treatment	1.15 [0.56,2.36]	Referent	0.95 [0.72,1.25]	1.53 [1.18,1.99]
	Delay in getting necessary care	0.87 [0.50,1.53]	Referent	1.07 [0.87,1.31]	1.60 [1.32 1.93]
Ratings	**Rating of Provider**	β=−0.082±0.092; p=0.374	Referent	β=0.069±0.031; p=0.024	β=−0.065±0.031; p=0.035
	Provider shows respect for treatments	1.32 [0.80,2.16]	Referent	1.04 [0.89,1.21]	0.96 [0.82,1.12]
Prescriptions	**Unable to get prescription medications**	1.21 [0.63,2.30]	Referent	1.15 [0.89,1.50]	1.81 [1.43,2.30]
	Delay in getting prescription medications	1.02 [0.53,1.98]	Referent	1.02 [0.84,1.24]	1.68 [1.41,1.99]

All values presented are odds ratio (95% confidence intevals) or b-coefficient ± standard errors

Model 2: Age, sex

		Underweight	Healthy	Overweight	Obese
Patient/Provider Relationship	**Provider Listened Carefully**	0.85 [0.55,1.31]	Referent	1.12 [0.95,1.32]	0.91 [0.77,1.08]
	Explained things in an understandable way	0.79 [0.52,1.20]	Referent	0.98 [0.84,1.14]	0.82 [0.68,0.98]
	Showed Respect	0.95 [0.59,1.53]	Referent	1.10 [0.92,1.31]	0.83 [0.69,1.00]
	Spent enough time	0.95 [0.64,1.40]	Referent	1.10 [0.96,1.27]	1.00 [0.88,1.15]
Shared Decision Making	**Ask patient to help make decisions**	1.08 [0.76,1.53]	Referent	0.95 [0.86,1.05]	0.85 [0.76,0.95]
	Explained all options	1.17 [0.70,1.96]	Referent	1.05 [0.90,1.21]	1.03 [0.87,1.22]
	Ask about prescriptions	1.00 [0.75,1.33]	Referent	0.97 [0.88,1.07]	1.05 [0.95,1.17]
Access to care	**Did not get care right away**	1.23 [0.65,2.32]	Referent	1.15 [0.92,1.45]	1.09 [0.85,1.39]
	Delay in getting appointment	1.13 [0.68,1.90]	Referent	0.98 [0.85,1.13]	1.04 [0.90,1.21]
	Difficult to contact provider	0.98 [0.68,1.43]	Referent	1.07 [0.96,1.20]	0.96 [0.86,1.08]
	Difficult to contact after hours	1.00 [0.73,1.37]	Referent	0.97 [0.88,1.07]	0.86 [0.77,0.95]
	Unable to obtain medical treatment	1.35 [0.64,2.85]	Referent	0.90 [0.67,1.20]	1.24 [0.95,1.62]
	Delay in getting necessary care	0.96 [0.55,1.67]	Referent	1.07 [0.86,1.32]	1.47 [1.21,1.78]
Overall Medical Care Provider Rating	**Rating of Provider**	β=−0.129±0.091; p=0.156	Referent	β=0.096±0.031; p=0.002	β=−0.025±0.030; p=0.416
	Provider shows respect for treatments	1.27 [0.77,2.08]	Referent	1.07 [0.92,1.24]	0.99 [0.85,1.16]
Prescription Care	**Unable to get prescription medications**	1.37 [0.71,2.62]	Referent	1.17 [0.89,1.53]	1.64 [1.28,2.09]
	Delay in getting prescription medications	1.03 [0.54,1.99]	Referent	1.04 [0.86,1.27]	1.65 [1.38,1.98]

All values presented are odds ratio (95% confidence intevals) or b-coefficient ± standard errors

ABBREVIATIONS

BMI	body mass index
MEPS	Medical expenditure panel survey

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Table 1:

Baseline Characteristics

	Overall	Underweight	Healthy BMI	Overweight	Obese	
	N= 28,854	N=568	N=8,489	N=10,436	N=8,137	p-value
Age, years	70.8 ± .10	75.7 ± .43	72.1 ± .15	70.6 ± .12	69.1 ± .12	<0.001
Female Sex	16,361 (55.1)	423 (75.1)	5,170 (61.8)	5,149 (47.4)	4,865 (55.9)	<0.001
Race						<0.001
White	21,667 (85.4)	404 (81.3)	6,322 (85.5)	8,037 (86.3)	6,034 (84.8)	
Black	4,903 (9.0)	85 (8.0)	1,091 (6.6)	1,693 (8.9)	1,762 (11.7)	
Amer. Indian, Alaska Native	182 (0.5),	5 (0.9)	43 (0.4)	64 (0.5)	61 (0.7)	
Asian	1,664 (3.7)	63 (7.5)	901 (6.4)	499 (3.2)	145 (1.2)	
Native Hawaiian, Pacific Islander	94 (0.2)	4 (0.6)	36 (0.2)	29 (0.2)	20 (0.2)	
Multiple Races	344 (1.1)	7 (1.6)	96 (0.9)	114 (1.0)	115 (1.4)	
Marital Status						<0.001
Married	15,932 (58.5)	205 (36.7)	4,548 (56.0)	6,169 (62.2)	4,380 (58.2)	
Widowed	6,905 (22.7)	223 (40.5)	2,256 (26.0)	2,213 (19.9)	1,881 (21.3)	
Divorced	3,937 (13.0)	85 (14.8)	1,085 (12.4)	1,361 (12.5)	1,255 (14.4)	
Separated	588 (1.3)	15 (1.5)	147 (1.1)	208 (1.4)	190 (1.6)	
Never Married	1,467 (4.4)	40 (6.5)	453 (4.5)	485 (4.0)	429 (4.6)	
Smoking Status						<0.001
Smoker	3,212 (11.9)	126 (25.9)	1,180 (14.6)	1,069 (11.0)	725 (9.2)	
Non-Smoker	22,556 (88.1)	357 (74.1)	6,399 (85.4)	8,394 (89.0)	6,680 (90.8)	
Education, years	11.5 ± .06	10.8 ± .31	11.8 ± .09	11.6 ± .08	11.3 ± .09	<0.001
Wages, $	14,405 ± 307	14,365 ± 660	13,682 ± 482	15,801 ± 426	14,562 ± 495	<0.001
Region						<0.001
Northeast	4,810 (19.5)	76 (19.3)	1,448 (20.1)	1,720 (18.8)	1,365 (19.7)	
Midwest	5,860 (21.8)	108 (17.6)	1,586 (19.9)	2,137 (22.5)	1,813 (23.9)	
South	11,282 (37.2)	232 (38.6)	3,126 (35.6)	4,122 (38.0)	3,314 (37.6)	
West	6,902 (21.5)	152 (24.5)	2,329 (24.3)	2,457 (20.7)	1,645 (18.8)	

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	Overall	Underweight	Healthy BMI	Overweight	Obese	
Metropolitan Area						0.003
Urban	20,467 (80.8)	414 (82.3)	6,180 (82.4)	7,399 (80.7)	5,572 (78.9)	
Rural	5,019 (19.2)	97 (17.7)	1,368 (17.6)	1,835 (19.3)	1,501 (21.1)	
Arthritis	4,322 (47.4)	93 (42.8)	1,196 (42.0)	1,502 (44.5)	1,444 (59.0)	<0.001
Hypertension	18,313 (62.4)	280 (48.4)	4,563 (51.6)	6,608 (61.9)	6,235 (75.6)	<0.001
Depression	6,890 (24.4)	166 (33.1)	1,892 (23.0)	2,238 (21.7)	2,287 (27.9)	<0.001
Heart Attack	**2,816 (10.3)**	58 (10.2)	743 (8.5)	1,021 (9.6)	994 (13.0)	<0.001
Emphysema	1,485 (5.3)	104 (19.9)	439 (5.4)	443 (4.4)	49 (5.5)	<0.001
Cancer	3,863 (26.6)	71 (27.9)	1,199 (29.0)	1,363 (26.4)	1,073 (24.3)	<0.001
Chronic Bronchitis	747 (4.4)	19 (7.2)	162 (3.2)	232 (3.7)	299 (6.1)	<0.001
Diabetes	6,410 (19.7)	44 (6.1)	1,119 (10.9)	2,121 (17.5)	2,870 (32.8)	<0.001
Any Limitations	15,138 (52.3)	384 (69.0)	4,063 (47.5)	5,009 (47.7)	4,999 (61.1)	<0.001

All values represented are means ± standard errors, or counts (weighted percentages).

Table 2:

Univariate Results of Quality measures

		Underweight	Healthy BMI	Overweight	Obese	p-value
Patient/Provider Relationship	**Provider Listened Carefully**	377 (93.5)	5,904 (94.2)	7,483 (94.8)	5,998 (93.5)	0.07
	Explained things in an understandable way	372 (92.4)	5,904 (94.0)	7,433 (93.9)	5,963 (92.9)	0.17
	Showed Respect	385 (95.0)	5,993 (95.0)	7,559 (95.3)	6,058 (93.9)	**0.01**
	Spent enough time	371 (91.2)	5,747 (91.4)	7,288 (92.1)	5,864 (91.2)	0.37
Shared Decision Making	**Ask patient to help make decisions**	362 (84.8)	5,480 (84.6)	7,043 (84.2)	5,636 (83.1)	0.28
	Explained all options	432 (95.2)	6,647 (94.5)	8,481 (94.8)	6,775 (94.7)	0.88
	Ask about prescriptions	361 (78.8)	5,575 (79.8)	7,129 (80.0)	5,777 (81.4)	0.19
Access to care	**Did not get care right away**	15 (6.4)	224 (8.4)	269 (7.8)	245 (8.7)	0.54
	Delay in getting appointment	31 (7.6)	580 (9.1)	750 (9.6)	582 (9.3)	0.64
	Difficult to contact provider	63 (15.9)	1,094 (16.0)	1,363 (15.2)	1,177 (16.7)	0.22
	Difficult to contact after hours	104 (30.8)	1,532 (31.0)	2,063 (31.8)	1,756 (34.6)	**0.02**
	Unable to obtain medical treatment	14 (1.7)	139 (1.5)	178 (1.4)	219 (2.3)	**0.002**
	Delay in getting necessary care	20 (2.7)	247 (3.1)	333 (3.3)	365 (4.9)	**<0.001**
Ratings	**Rating of healthcare**	8.55 ± .093	8.63 ± .024	8.70 ± .021	8.6 ± .025	**<0.001**
	Provider shows respect for treatments	381 (93.5)	5,750 (91.7)	7,288 (92.0)	5,931 (91.4)	0.47
Prescriptions	**Unable to get prescription medications**	13 (1.6)	148 (1.9)	226 (1.8)	263 (2.9)	**<0.001**
	Delay in getting prescription medications	18 (3.0)	261 (3.1)	333 (3.1)	412 (5.0)	**<0.001**

All values represented are means ± standard error or counts (weighted percentages).

Table 3:

Multivariable Model of Patient-Centered Outcomes.

		Underweight	Healthy	Overweight	Obese
Patient/Provider Relationship	**Provider Listened Carefully**	0.88 [0.57,1.37]	Referent	1.12 [0.94,1.33]	1.00 [0.84,1.21]
	Explained things in an understandable way	0.88 [0.56,1.37]	Referent	1.01 [0.86,1.18]	0.96 [0.79,1.17]
	Showed Respect	1.15 [0.69,1.92]	Referent	1.10 [0.91,1.33]	0.93 [0.76,1.14]
	Spent enough time	0.97 [0.65, 1.46]	Referent	1.08 [0.94,1.25]	1.08 [0.93,1.25]
Shared Decision Making	**Ask patient to help make decisions**	1.13 [0.77,1.65]	Referent	0.96 [0.86,1.07]	0.97 [0.86,1.10]
	Explained all options	1.24 [0.71,2.16]	Referent	1.04 [0.90,1.21]	1.05 [0.87,1.27]
	Ask about prescriptions	1.07 [0.79,1.44]	Referent	0.95 [0.86,1.06]	1.02 [0.91,1.14]
Access to care	**Did not get care right way**	**2.28 [1.08,4.78]**	Referent	1.11 [0.88,1.41]	1.09 [0.83,1.41]
	Delay in getting appointment	1.21 [0.71,2.08]	Referent	0.94 [0.81,1.10]	1.06 [0.91,1.25]
	Difficult to contact provider	1.05 [0.70,1.55]	Referent	1.12 [1.00,1.25]	1.04 [0.92,1.18]
	Difficult to contact after hours	1.09 [0.78,1.52]	Referent	0.99 [0.89,1.10]	0.97 [0.87,1.10]
	Unable to obtain medical treatment	1.00 [0.44,2.30]	Referent	0.82 [0.61,1.10]	0.92 [0.69,1.24]
	Delay in getting necessary care	0.83 [0.45,1.52]	Referent	1.02 [0.82,1.27]	**1.25 [1.01,1.53]**
Ratings	**Rating of Provider**	β=−0.063±0.091; p=0.489	Referent	**β=0.093±0.031; p=0.003**	β=0.039±0.032; p=0.229
	Provider shows respect for treatments	1.35 [0.81,2.25]	Referent	1.06 [0.91,1.24]	1.06 [0.90,1.26]
Prescriptions	**Unable to get prescription medications**	1.09 [0.56,2.13]	Referent	1.02 [0.77,1.34]	1.06 [0.81,1.37]
	Delay in getting prescription medications	0.92 [0.46,1.85]	Referent	0.94 [0.77,1.15]	1.17 [0.97,1.42]

All values presented are odds ratio (95% confidence intevals) or b-coefficient ± standard errors

Models adjusted for age, sex, wages, depression, heart disease, arthritis, emphysema, high blood pressure or diabetes