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Nursing Home Perspectives on the Admission of Morbidly Obese Patients from Hospitals to Nursing Homes

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Abstract

Purpose of the Study—Care challenges have been described for hospitalized morbidly obese (MO) patients. These challenges likely persist post-discharge. As a result, nursing homes (NH) may be reluctant to admit these patients, potentially leaving them “stranded in hospitals” with subsequent health deterioration and increased costs. This study sought to identify issues NHs consider in admissions decisions for MO patients transitioning out of hospitals. Design and Methods: IRB-approved surveys were mailed to nursing directors at federally-certified NHs in Arkansas (n=234) and Pennsylvania (n=710) to collect NH experience in the admission of patients weighing 325 pounds. Data were analyzed using descriptive and inferential statistics to summarize and identify predictors of MO patient admissions decisions.

Results—In total, 360 surveys were returned (38.1% response rate). Although two-thirds of respondents reported patient size as an admission barrier, only 6% reported that MO patients were always refused admission. Adjusted analysis showed that NHs with adequate staff were significantly ($p=0.04$) less likely to report obesity as an admission barrier while NHs reporting concerns about availability of bariatric equipment were significantly ($p<0.0001$) more likely to report obesity as a barrier.

Implications—Lack of staff and bariatric equipment in NHs appears to negatively affect the care transition of MO patients out of the hospital to NHs. Additional research, including examination of current regulations and reimbursement policies, should be undertaken to understand NH staffing and equipment acquisition decisions in light of the current obesity epidemic. Such research has implications for the optimal care of obese individuals during times of transition.

Keywords

Hospital/ambulatory care; nursing homes; obesity; placement issues

Introduction

Today, one in three Americans is obese (defined as a body mass index [BMI] ≥ 30) leading to very high annual obesity-related medical spending (Finkelstein, Fiebelkorn, & Wang, 2003; Finkelstein, Ruhm, & Kosa, 2005; Flegal, Carroll, Ogden, & Curtin, 2010; NHLBI, 1998). Obesity takes a significant toll on individuals and the health care delivery system. Obese patients are hospitalized longer (El-Solh, Sikka, Bozkanat, Jaafar, & Davies, 2001; Hauck & Hollingsworth, 2010; Schafer & Ferraro, 2007) and experience more medical complications than non-obese patients (Craft, May, Dorigo, Hoy, & Plant, 1996; Williamson, Webb, Szekely, Gillies, & Dreosti, 1993). Obese patients also placed greater demands on staff (Rose, Baker, Drake, Engelke, & McAuliffe, 2007). Recent evidence is also indicating that morbid obesity of patients is making it difficult for hospital staff to locate skilled nursing facility placements for these patients after leaving the hospital (Miles et al., 2012).

The care challenges experienced by morbidly obese patients in the hospital settings most likely persists in other settings, such as nursing homes (NH) and/or private homes (Miles et al., 2012). Emerging research indicates that newly admitted NH residents that are obese require significantly more personal assistance than their non-obese peers (H. C. Felix, 2008). They also require a substantial amount of staff time and specialized equipment for routine care (e.g. showering) (H. Felix et al., 2009; H. C. Felix et al., 2010; Powell et al., 2010). Unfortunately, many NHs lack appropriate bariatric equipment and supplies, specialty-trained staff and adequate number of staff (Lapane & Resnik, 2006) which can lead to negative resident outcomes such as rapid onset of pressure ulcers (GAO, July, 2003). Because of the challenges faced by NHs in providing care for obese individuals, it is possible that some facilities may not be willing to admit obese patients, potentially leaving them “stranded in hospitals” (Miles et al., 2012) and vulnerable to adverse medical events and increased health care costs. Anecdotal reports by hospital staff suggest this to be the case; yet few studies have examined NH admission decisions for post-acute care needs of morbidly obese patients (Davis, Devoe, Kansagara, Nicolaidis, & Englander, 2012; Miles et al., 2012; Popejoy, Galambos, Moylan, & Madsen, 2012). We are aware of only one study (Miles et al., 2012) that has specifically addressed hospital to NH care transition of morbidly obese patients. Documenting the experience and perceptions of NHs in making admission decisions for morbidly obese patients leaving the hospital is important to assess access to post-acute care settings as well as inform potential interventions to address NH admission challenges to ease challenges in the hospital to NH transition process. Towards this end, the

purpose of our study was to determine NHs willingness to admit patients weighing 325 pounds and above and identify barriers to admission.

Design and Methods

This cross-sectional study used data obtained from postal mail surveys and existing sources to examine issues NHs considered when making admission decision for morbidly obese patients discharging from hospitals. We conceptualize the NH admission decision process as being influenced by facility-level characteristics related to the availability of resources. We categorized the characteristics as capacity (number of beds and occupancy rate), facility type (profit status and chain affiliation), internal resources (staffing levels and equipment concerns) and rurality. We hypothesize that NHs with fewer resources (fewer beds, higher occupancy rate, non-profit status, not a part of a chain, inadequate staff, equipment concerns, and rural location) will be more likely to view morbid obesity as an admission barrier.

The study was approved by the institutional review boards at the [blinded for review].

Sample

The study targeted nursing directors at all federally-certified NHs in Arkansas (AR) and Pennsylvania (PA). NHs were identified using the publicly available on-line database, Nursing Home Compare (www.medicare.gov/nursinghomecompare). In order to be eligible for the study, participants had to be: 1) a director or their designee of a federally-certified NH in AR or PA; 2) able to understand and communicate in English in order to complete the survey instrument(s) and 3) over 18 years in age.

Primary Data Collection

All identified NHs were mailed a survey packet containing a paper survey (see Instrument section below); a postage-paid return envelope; and a cover letter that described the purpose of the study, the potential risks and benefits of participation, and the study procedures. Return of the survey signified consent to participate. In order to achieve a high response rate, potential participants that did not return a completed survey received up to three reminders (e.g. additional survey mailings, postcard reminders) to encourage completion of the surveys (Dillman, 2000).

Instrument

Data were collected through the use of an IRB-approved survey instrument (available from the authors) that was a modified version of the instrument developed by researchers at the [blinded for review] based on their review of the available literature, their experiences as researchers, and their pilot testing of the instrument with clinical experts (Miles et al., 2012). For our study, participants were instructed to respond to survey items as if considering admission of a morbidly obese patient weighing 325 pounds or more.

Survey items focused on the issues NHs considered when making decisions about admitting morbidly obese patients discharging from a hospital. Survey questions had defined response options but most questions provided space for comments.

Secondary Data Collection

Two online, publicly available sources, Nursing Home Compare and the University of Washington's Rural Urban Commuting Area (RUCA) Codes database (Morrill, Cromartie, & Hart, 2005), were used to obtain existing NH facility-level characteristics. These characteristics enabled the profiling of NHs by capacity (number of beds and occupancy rate), facility type (profit status and chain affiliation), and rurality (RUCA code). They were selected, in part, based on previous literature indicating that these NH characteristics can affect admissions for special populations (e.g. racial minorities) and quality of care (Carter & Porell, 2003; Harrington, Zimmerman, Karon, Robinson, & Beutel, 2000; Harrington, Woolhandler, Mullan, Carrillo, & Himmelstein, 2001; Hillmer, Wodchis, Gill, Anderson, & Rochon, 2005).

Data Analysis

All collected survey data were coded and entered into a database for analyses that also included facility-level characteristics obtained from existing sources for all responding and non-responding NHs. Characteristics of non-responding NHs were compared to responding NHs and descriptive statistics were reported in order to examine potential selection bias. For NHs that responded to the survey, descriptive statistics were used to summarize and compare responses of responding NHs overall and by state.

Using logistic regression, the effect of facility-level characteristics on NH admission decisions for morbidly obese patients discharging from the hospital were examined. The dependent variable was the dichotomous response to whether morbid obesity was considered an admission barrier. Independent variables considered in the analysis represented facility-level characteristics and were obtained from the survey (staffing levels and equipment concerns) as well as existing sources (number of beds, occupancy rate, profit status, chain affiliation, and rurality). These variables were initially tested individually against the outcome, and then together in a single model.

As a sensitivity analysis, the alternate but similar dependent variable was selected from the survey responses and tested with the previously listed independent variables (each individually and then all together). The alternate dependent variable was the dichotomized unwillingness to admit morbidly obese patients (calculated by combining the "often" and "always" refuse admission survey response as "yes, unwilling to admit" and combining "never" and "rarely" refuse admission survey response as "no, willing to admit").

Results

Survey Population and Respondent Profile

Of the total 15,659 federally certified NHs in the US (Nursing Home Compare; www.medicare.gov/nursinghomecompare), 944 were located in AR or PA and comprised our survey population.

In total, of the 944 surveys sent to NHs in AR and PA, 360 surveys were returned, producing an overall response rate of 38.1%. The response rate was 39.3% for AR (92

responded out of 234) and 37.8% for PA (268 responded out of 710). Table 1 shows facility characteristics of responding and non-responding NHs, overall and by state. Of the responding NHs, the average number of certified beds per NH was 121.8, with an overall mean occupancy rate of approximately 87.0%.

Compared to PA, responding NHs in AR had smaller facilities (107.1 certified beds vs. 126.9) and a lower occupancy rate (76.7% vs. 90.4%). There were substantial differences in proportion of responders from for-profit facilities by state, with 77.2% of AR responders being for-profit compared to 47.1% of PA responders. Very few of the responding facilities were hospital-based but just over half of the responders in each state (57.6% in AR and 54.1% in PA, respectively) were chain-based facilities.

The responding and non-responding NHs were found to significantly differ on certain NH characteristics. Overall, those responding had a significantly higher occupancy rate (86.9% vs. 84.9%; $p=0.04$) and were significantly less likely to be for-profit (54.7% vs. 61.5%; $p=0.04$) or affiliated with chains (55.0% vs. 62.7%; $p=0.02$) compared to non-responding NHs. See Table 1.

When looking at responding and non-responding NHs within each state, significant differences were found only for AR. AR responders were found to have a higher mean occupancy rate (76.7% vs. 71.8%; $p=0.03$) and were less likely to be chain-based facilities (57.6% vs. 74.7%; $p=0.01$) than AR non-responders. No significant differences were found between responders and non-responders in PA (Table 1).

Survey Responses

Table 2 shows the responses to survey questions, overall and by state. Respondents were asked the frequency with which they received referrals to admit morbidly obese patients. Overall, about one-third (29.2%) indicated they received monthly referrals while nearly 35.0% of responding facilities reported such referrals to occur more frequently than monthly (e.g., daily, weekly, bi-weekly). However, there was significant variability ($p<0.0001$) in the frequency of referrals between the two states, with more facilities (about 41.1%) reporting referrals occurring more frequently than monthly in PA compared to in AR, where only 16.3% of NHs reported referrals more frequently than monthly. No facilities in AR reported never receiving such referrals whereas five facilities in PA indicated they had never received a request to admit a morbidly obese patient.

Two-thirds (66.1%) of responding facilities reported that patient size (e.g., morbidly obese) acted as an admission barrier, but only 5.8% ($n=21$) reported that morbidly obese patients were always refused admission. There was no significant difference between states on patient size acting as an admission barrier. However, there was a significant difference ($p=0.04$) between AR and PA NHs in terms of their reported frequency for refusing admission due to morbid obesity, with 7.5% of PA NHs reporting they always refuse admission to morbidly obese persons compared to only 1.1% among AR NHs. The independence level of morbidly obese patients was reported as an admission barrier by just under half of the facilities (overall and by state); whereas only about one in five respondents

indicated the personal care needs of morbidly obese patients would serve as an admission barrier.

Facilities were asked whether financial considerations (e.g. the cost of care for obese patients) affect admissions. Overall, 43 NHs (11.9%) reported that financial considerations would always act as an admission barrier for a morbidly obese patient. Similar response rates were observed among PA responders (11.9%) and AR responders (12.0%).

Facilities were asked to indicate whether they had concerns about staffing levels or availability of specialized equipment to care for patients who are morbidly obese. There were significant differences between states on staffing concerns but no difference on equipment concerns. Nearly one-third (31.4%) of NHs in both states reporting having inadequate staff to care for morbidly obese residents; however, there was significant variation by state on staffing concerns. In AR, only 19.6% of responding NHs (n=18) reported having inadequate staffing levels while 35.5% of responding NHs in PA (n=95) reported the same ($p=0.01$). More than two-thirds of responding NHs in both states indicated that there were concerns about having adequate specialized equipment.

Facility Characteristics associated with Admission Decisions

Table 3 shows the unadjusted and adjusted results obtained through the logistic regression models that were run to examine the association between NH characteristics and morbidly obese patient admission **decisions**. In the unadjusted analysis where separate models were run using only one NH characteristic as the independent variable, all six individually tested characteristics (number of certified beds, occupancy rate, for-profit status, chain status, staffing levels and concerns about specialized equipment) were significantly associated with NHs indicating that morbid obesity would act as an admissions barrier. Specifically, higher number of beds, higher occupancy rate, and concerns over available equipment were significantly and positively associated with NHs indicating obesity would act as an admission barrier. NHs that were for-profit, chain-affiliated and had adequate staffing had significantly lower odds ($p<0.01$) of reporting morbid obesity as an admission barrier.

In the adjusted analysis, after controlling for capacity (number of beds and occupancy rate), facility type (for profit and chain affiliation), internal resources (staffing and equipment) and NHs rurality status, only two factors were significantly associated with NHs reporting morbid obesity as a NH admission barrier. NHs reporting adequate staffing were significantly less likely than those understaffed ($OR=0.5$; 95% CI: 0.3-0.9) to report that morbid obesity would act as an admission barrier to the NH ($p=0.03$), after controlling for other characteristics in the model. NHs reporting concerns about the availability of specialized equipment required to care for the morbidly obese patients were significantly more likely to report morbid obesity as an admission barrier ($p<0.0001$), after controlling for other characteristics in the model.

Sensitivity Analysis

Table 4 shows the results of the sensitivity analysis where the outcome measure models whether NHs would often or always refuse admission to patients due to morbid obesity.

Both unadjusted and adjusted results show that equipment concerns and staffing levels affected admissions decisions in the same manner as the original model: lower equipment concerns and higher staffing levels positively affected admission decisions. However, in the alternate model, higher occupancy rates was shown to negatively affect admission decisions.

Discussion

In this study, 360 directors of federally-certified NHs (or their designees) reported on the issues considering when making decisions about admitting morbidly obese individuals. Study findings add to the limited existing literature and provide new insights regarding access to post-acute care for the morbidly obese.

Almost one-third of our respondents noted that they received monthly referrals from an acute hospital setting and another third reported at least weekly or bi-weekly referrals. In a recent study by Miles and colleagues (Miles et al., 2012), 78% of skilled nursing facility directors reported monthly referrals. Therefore, it seems that NHs in our study, particularly those located in PA, receive more frequent weekly or bi-weekly referrals than previously reported in the literature. This may be attributed to differences in the population of NH residents in these states, potential differences in the location of facilities included in our study (rural, urban, and suburban) versus those in the Miles et al study (Miles et al., 2012) which were primarily rural and/or the increasing numbers of obese individuals seeking either short or long-term care in the NH settings (Bradway, DiResta, Fleshner, & Polomano, 2008; Lapane & Resnik, 2005).

Not surprisingly, concerns about availability of bariatric equipment in NHs appear to negatively affect the admission decisions. Our findings strongly suggest that NHs without appropriate bariatric equipment are significantly more likely to view morbid obesity as a barrier to admission than those facilities not concerned about equipment issues. This is similar to findings from the North Carolina NHs study (Miles et al., 2012), which revealed 81% of the respondents from the considered equipment as a “major barrier” to successful NH placement. In addition to be a challenge to admission decisions, equipment concerns are also a recurring theme throughout the literature regarding the general care needs of obese NH residents. NHs accepting obese individuals need to plan for increased costs and staff in-service instruction associated with the purchase and use of specialized equipment such as larger beds, scales and lifts, shower and other chairs, and alterations to the physical environment including wider doorways and larger bathrooms (H. C. Felix, 2008; Lapane & Resnik, 2005; Lapane & Resnik, 2006). Obese individuals are also keenly aware that equipment plays an essential role in their day-to-day experiences in a long-term care setting. For example, one assisted living resident (who has since moved to a NH setting due to increased care needs) notes that he has “a beautiful outdoor patio-but my wheelchair is too wide to negotiate the doors, so I can’t wheel myself out onto it” (Bayne, 2012; Vitez, 2013). In another study, NH residents and nursing staff identified “fitting in the environment” (including numerous examples of how equipment and supplies, and/or the lack thereof, impacted care (Bradway, Miller, Heivly, & Fleshner, 2010) as a primary theme associated with continence care and obesity.

Finding a NH bed for an obese individual is difficult. In the Popejoy et al study (Popejoy et al., 2012), hospital health care professionals noted that morbid obesity caused difficulties in finding appropriate skilled nursing facility placement for patients ready for discharge, and in another study (Miles et al., 2012), 62% of the NH staff respondents noted size to be a barrier for admission. Similarly, more than two-thirds of the respondents in our study noted that size acted as a barrier to NH admission; however, despite acknowledgement of this issue, a much smaller percentage noted that morbidly obese patients were “often” or “always” refused NH admission.

Next Steps

This is a complex issue with multiple organizational, environmental and patient factors likely affecting the decision. Our findings indicate organizational resources are important factors. However, finding a bed for an obese individual may also be associated with the reimbursement mix/financial resources of the NH (e.g., whether payers will cover the cost of more expensive bariatric equipment) (H. Felix et al., 2009; Powell et al., 2010; Zhang, Li, & Temkin-Greener, 2013), the physical environment of the NH (e.g., whether doorways are wide enough for bariatric equipment) and evacuation concerns, as noted by one of our respondents: the “fire marshal does not like bariatric beds, too hard to evacuate.” Finally, patient’s functional status and level of independence are important factors to consider. We therefore recommend further investigation to understand whether these additional factors affect the admission decisions for the morbidly obese. Similar calls for research into the effect of obesity on NH operations has been by other researchers who have examined the increase in diabetes among NH residents in Texas (Coxe, Lennertz and McCullough, 2013).

Limitations

This study was conducted in PA and AR and although our response rate of 38.1% was **low**, it is higher than in the recent study by Miles and colleagues (Miles et al., 2012) and similar to what is typically obtained in survey research targeting organizations (35.7%) (Baruch & Holtom, 2008). Nevertheless, the low response rate and focus on two states limits the generalizability of our findings to other states, areas of the country, or globally; however, we can build on similar data collected in primarily rural North Carolina (Miles et al., 2012). This allows us to begin to develop a more complete understanding of the issues NHs confront with making admission decisions for the post-hospital care of morbidly obese individuals.

An additional limitation of note is the wide confidence intervals for our finding regarding equipment concerns from both our initial models and our sensitivity models. These wide confidence intervals create uncertainty around our estimate of the effect of equipment concerns on admission decisions. To improve the precision of the estimate, we recommend expansion of the survey population to increase the sample.

Implications

Results from this study have clinical as well as economic implications as health care providers and organizations attempt to deal with increasing numbers of morbidly obese patients. Additional research, including examination of current regulations and

reimbursement policies, should be undertaken to understand NH equipment acquisition decisions. Such research will likely have important implications for research and optimal care of obese individuals during times of transition. Further research is also recommended to address other areas of the U.S and worldwide, and to describe the on-going needs of NHs as they provide day-to-day care for obese residents and test strategies for addressing these needs. We also believe it is essential to consider inter-professional perspectives including licensed and unlicensed nursing staff who oftentimes spend the most time with the obese NH resident, as well as the perspective of the resident and family members/significant others in the experience of transition between settings. Additional studies are also needed to build on this study, and the work of Miles and colleagues (Miles et al., 2012) describing the transitional care challenges experienced by hospital discharge planners and home health care agencies associated with care of obese individuals. Finally, it is of utmost importance and urgency that research findings are widely disseminated and used to address necessary changes in reimbursement and health policy for the NH industry.

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TABLE 1

Characteristics of Responding Nursing Homes, Overall and by State

Characteristic	Responders	Non-responders	p-value
Overall (AR and PA)			
Number of NH	360	584	
Response rate	38.1%		
Mean number of certified beds (SD)	121.8 (81.5)	119.3 (73.70)	0.62
Mean occupancy rate, % (SD)	86.9 (12.44)	84.9 (15.31)	0.04
For-profit facilities, % [n]	54.7 (197)	61.5 (359)	0.04
Hospital-based facilities, % [n]	5.0 (18)	6.5 (38)	0.34
Chain-based facilities, % [n]	55.0 (198)	62.7 (366)	0.02
AR			
Number of NH	92	142	
Response rate	39.3%		
Mean number of certified beds (SD)	107.1 (32.6)	103.7 (34.2)	0.45
Mean occupancy rate, % (SD)	76.7 (14.0)	71.8 (17.8)	0.03
For-profit facilities, % [n]	77.2 (71)	86.62 (123)	0.06
Hospital-based facilities, % [n]	1.1 (1)	5.6 (8)	0.08
Chain-based facilities, % [n]	57.6 (53)	74.7 (106)	0.01
PA			
Number of NH	268	442	
Response rate	37.8%		
Mean number of certified beds (SD)	126.9 (92.1)	124.3 (81.88)	0.70
Mean occupancy rate, % (SD)	90.45 (9.7)	89.1 (11.69)	0.13
For-profit facilities, % [n]	47.0 (126)	53.4 (236)	0.10
Hospital-based facilities, % [n]	6.3 (17)	6.8 (30)	0.82
Chain-based facilities, % [n]	54.1 (145)	58.8 (260)	0.22

Key: Statistically significant results at alpha of 0.05. NH=Nursing Homes, AR=Arkansas, PA=Pennsylvania, SD=standard deviation, n=number

TABLE 2

Responses to Survey Questions, Overall and by State

	Total Responders (N=360)		AR (N=92)		PA (N=268)		p value
	n	%	n	%	n	%	
Frequency of morbidly obese patient referrals to NH*							
Daily	7	1.9%	2	2.2%	5	1.9%	<0.0001
Weekly	67	18.6%	6	6.5%	61	22.8%	
Bi-weekly	51	14.2%	7	7.6%	44	16.4%	
Monthly	105	29.2%	36	39.1%	69	25.8%	
Quarterly	39	10.8%	16	17.4%	23	8.6%	
Yearly	30	8.3%	11	12.0%	19	7.1%	
No response/Unclear response	54	15.0%	13	14.1%	41	15.3%	
Never	5	1.4%	0	0.0%	5	1.9%	
Patient size acts as an admission barrier to NH facility							
No	119	33.1%	35	38.0%	84	31.3%	0.27
Yes	238	66.1%	57	62.0%	181	67.5%	
Morbidly obese patient's degree of independence acts as an admission barrier to NH facility							
No	184	51.1%	48	52.2%	136	50.8%	0.89
Yes	173	48.1%	44	47.8%	129	48.1%	
Morbidly obese patient's finances acts as an admission barrier to NH facility							
Never	106	29.4%	23	25.0%	83	31.0%	0.68
Occasionally	131	36.4%	37	40.2%	94	35.1%	
Often	64	17.8%	18	19.6%	46	17.2%	
Always	43	11.9%	11	12.0%	32	11.9%	
Morbidly obese patient's personal care requirements act as an admission barrier to NH facility							
No	288	80.0%	72	78.3%	216	80.6%	0.38
Yes	66	18.3%	20	21.7%	46	17.2%	
Frequency of refusing NH admission due to morbid obesity*							
Never	94	26.1%	29	31.5%	65	24.3%	0.04
Occasionally	209	58.1%	56	60.9%	153	57.1%	
Often	28	7.8%	4	4.4%	24	9.0%	
Always	21	5.8%	1	1.1%	20	7.5%	
Is staffing adequate at NH facility to care for morbidly obese patients*							
No	113	31.4%	18	19.6%	95	35.5%	0.01

	Total Responders (N=360)		AR (N=92)		PA (N=268)		p value
	n	%	n	%	n	%	
Yes	232	64.4%	67	72.8%	165	61.6%	
Are there concerns of specialized equipment at NH facility to care for morbidly obese patients							
No	103	28.6%	25	27.2%	78	29.1%	0.97
Yes	245	68.1%	60	65.2%	185	69.0%	

Key:

* - Statistically significant results at alpha of 0.05 NH=Nursing Homes, AR=Arkansas, PA=Pennsylvania, n=number

Table 3

Unadjusted and adjusted analysis of the association between nursing home characteristics and morbid obesity acting as an admission barrier

NH Characteristics	Unadjusted				Adjusted			
	OR	LCL	UCL	p	OR	LCL	UCL	p
Number of certified beds	1.0	1.0	1.0	0.03*	1.0	1.0	1.0	0.17
Occupancy Rate	1.0	1.0	1.0	0.03*	1.0	1.0	1.0	0.18
For-profit facility	0.6	0.4	0.9	0.01*	0.7	0.4	1.3	0.25
Chain-based facility	0.5	0.3	0.8	0.003*	0.7	0.4	1.2	0.17
Adequate staff	0.4	0.2	0.6	0.0001*	0.5	0.3	0.9	0.03*
Concerns about equipment	7.5	4.5	12.6	<.0001*	6.5	3.7	11.3	<.0001*
Large Rural (Ref: Urban)					1.1	0.6	2.1	0.79
Small Rural (Ref: Urban)					1.4	0.5	3.5	0.52
Isolated Rural (Ref: Urban)					0.3	0.1	1.1	0.08

Notes: Key:

* - Statistically significant results at alpha of 0.05, NH=Nursing Homes, OR=Odds Ratio, UCL=Upper Confidence Interval, LCL=Lower Confidence Interval

TABLE 4

Unadjusted and adjusted analysis of the association between nursing home characteristics and often or always refusing admission due to morbid obesity

NH Characteristics	Unadjusted				Adjusted			
	OR	LCL	UCL	p	OR	LCL	UCL	p
Number of certified beds	1.00	1.00	1.00	0.74	1.00	1.00	1.00	0.40
Occupancy Rate	1.08	1.03	1.12	0.0006*	1.09	1.04	1.15	0.001*
For-profit facility	0.70	0.38	1.29	0.25	1.13	0.54	2.36	0.74
Chain-based facility	0.67	0.36	1.22	0.19	0.65	0.32	1.33	0.24
Adequate staff	0.30	0.16	0.58	0.0003*	0.44	0.22	0.87	0.02*
Concerns about equipment	23.94	3.256	176.02	0.002*	18.94	2.52	142.23	0.004*
Large Rural (Ref: Urban)					0.80	0.34	1.86	0.60
Small Rural (Ref: Urban)					0.74	0.15	3.74	0.71
Isolated Rural (Ref: Urban)					0.42	0.05	3.81	0.44

Notes: Key:

* - Statistically significant results at alpha of 0.05, NH=Nursing Homes, OR=Odds Ratio, UCL=Upper Confidence Interval, LCL=Lower Confidence Interval