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Title: The Relationship of Body Mass Index (BMI) to Job Performance, Absenteeism and Risk of Eating Disorder among Hospital-Based Nurses

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Abstract

Obesity has been linked to job absenteeism and decreased job performance. Additionally, shift work may be related to abnormal eating in nurses. This study examines the relationship between body mass index, job performance, absenteeism, and eating disorder risk among nurses. Registered Nurses (n=63) participated in a survey that included the Work Limitations Questionnaire and the Eating Attitudes Test. Most participants were either overweight or obese. Significant correlations were noted between body mass index and job performance, and body mass index and risk of eating disorders. An understanding of how increased body mass index can affect a nurse's job performance and wellness warrants continued attention from the nursing profession.

Keywords: Obesity; nurses; absenteeism; job performance; eating disorder

Introduction/Background

The American Nurses Association (ANA) has raised awareness about nurse wellness through its Healthy Nurse, Healthy Nation™ Grand Challenge initiative (ANA, n.d.). According to the ANA, a healthy nurse is defined as "one who actively focuses on creating and maintaining a balance and synergy of physical, intellectual, emotional, spiritual, personal, and professional wellbeing (ANA, n.d.)." A goal of the Healthy Nurse, Healthy Nation™ program is to gather data on nurse wellness. Currently, the literature is sparse with references to nurse obesity and its effects.

Nurses are essential providers of healthcare and many are overweight or obese (Krussig, Willoughby, Parker, & Ross, 2012). Increased body weight heightens the risk for preventable health conditions such as hypertension, as well as several leading causes of preventable death including heart disease, stroke, and type 2 diabetes (Goetzel et al., 2010). Burgeoning healthcare costs due to weight, not only affects the overweight population directly, but their employers as well. Obesity-associated absenteeism costs are estimated at $4.3 billion annually and obese employees experience greater losses in productivity when compared with normal weight employees (Goetzel et al., 2010). Additionally, research indicates a co-occurrence between obesity and eating disorders (Villarejo et al., 2012). Due to the effect of obesity on personal health, healthcare costs and employee productivity, the purpose of this study was to examine the relationship between nurses' weight and job performance, absenteeism and eating disorder risk.

A literature review yielded nine research articles, several of which are dated and explicitly related to weight in relation to job performance and absenteeism, as well as eating disorders among nurses. Only one study involved nurses which found a significant correlation between physical work performance and weight (r=.488) as well as a weak, though significant correlation between body weight index (BMI) and absenteeism (Krussig et al., 2012). Other studies associated obesity to higher rates of worker absenteeism (Goetzel et al., 2010) and negative impact on the quality and quantity of work performance (Pronk et al.,

2004). Literature on eating disorders among the nursing population is scarce. A study by Szweda & Thorne (2002) identified a sub-group of nursing students (BMI of > 30) as having disordered eating patterns requiring further investigation. Despite the evidence regarding the impact of weight on work productivity, absenteeism and risk of eating disorder, there remains a paucity of evidence as it relates to nurses.

Methods

Following Institutional Review Board (IRB) approval, a convenience sample of nurses was recruited from a community hospital in New York State. An online invitation describing the study was posted on the hospital's intranet for six weeks. Subjects completed a demographic form and two instruments. The first instrument, the Work Limitations Questionnaire short form (WLQ-SF), assesses the degree to which health problems interfere with aspects of job performance and impact productivity (Lerner et al., 2001). Comprised of four categories (Time Management, Physical Demands, Mental/Interpersonal and Output Demands), the 8-item survey prompts respondents to rate their level of difficulty (or ability) to perform specific job demands within the last two weeks on a 5 point Likert scale from being able or having difficulty with a task all the time, to none of the time. A total WLQ score is calculated and converted to estimate productivity loss (Munir, 2008). Cronbach alpha scores in previous studies were ≥0.90 (Lerner et al., 2001) and 0.76 in the present study.

The second instrument, the 26-item Eating Attitudes Test-26 (EAT-26), is a self-report measure with questions assessing disordered eating psychopathology that are scored on a six-point Likert scale from always to never (Garner, Olmsted, Bohr, & Garfinkel, 1982). Total scores ≥ 20 suggest risk of an eating disorder. The Cronbach alpha for the present study was 0.89, which is consistent with a prior study(0.86) (Gleaves, Pearson, Ambwani, & Morey, 2014).

BMI was calculated from self-reported height and weight. Anyone with an EAT-26 score ≥ 20 was considered at risk for an eating disorder. Job performance was determined by the WLQ productivity loss score; the maximum score being 24.9%. Absenteeism was determined by a question that asked

participants to indicate the number of sick days they took within the past year. A Pearson r correlation was conducted to analyze the relationships between BMI and the following: job performance, absenteeism, and eating disorder risk. Independent samples t-tests were used to examine the relationship between BMI categories and EAT-26 scores as well as WLQ productivity loss scores. The sample size for participants with BMI in the obese and severely obese categories were too small to statistically calculate; thus, the independent samples t-tests were conducted to examine the differences between normal weight and all three overweight BMI categories. Significance was set at .05. The data were analyzed utilizing the IBM Statistical Package for Social Sciences (SPSS 24.0; Amonk, New York).

Results

Of the 82 respondents, 19 were excluded: 11 for missing data and eight for not being a staff RN. The sample of 63 participants was 85.7% female, primarily Caucasian (69.8%) and Asian (15.9%) with an average age of 44.57 (SD = 13.12) years old. About half (49.2%) had a normal BMI, 33.3% were overweight, 11.1% were obese and 6.3% were severely obese. They had an average of 18.57 (SD = 13.07) years of experience and called out sick 1.25 (SD 1.76) days within the year. Educationally, 69.8% had a BSN, 19.0% had an associate degree in nursing, 7.9% had a master's degree in nursing, and 3.2% graduated from a diploma program. Most worked full time (84.1%) on 12-hour day shifts (63.5%) with the top two units being adult acute inpatient (31.7%) and procedural areas (17.5%). Please see Table I for participant characteristics.

Table 1: Study Participant Characteristics		
Variable	n	%
Gender		
Female	54	85.7
Male	9	14.3
Race/Ethnicity		
American Indian	1	1.6
Asian	10	15.9
Black or African American	3	4.8
Hispanic	3	4.8

White	44	69.8
Other	2	3.2
Education		
Associate Degree in Nursing	12	19.0
Diploma Program	2	3.2
BSN	44	69.8
Master in Nursing	5	7.9
Employment Status		
Full-time	53	84.1
Part-time	5	7.9
Per-diem	5	7.9
Shift Worked		
Day shift (8 hour)	7	11.1
Day shift (10 hour)	5	7.9
Day shift (12 hour)	40	63.5
Night shift (12 hour)	11	17.5
Nursing Unit Type		
Adult acute inpatient	20	31.7
Adult ICU	9	14.3
Adult ED	9	14.3
Pediatric ICU	2	3.2
Labor & delivery	7	11.1
Progressive care unit	5	7.9
Procedure areas (e.g. radiology)	11	17.5
BMI Group		
Normal Weight (BMI <=25.0 kg/m2)	31	49.2
Overweight (BMI = 25.0-29.9 kg/m2)	21	33.3
Obese (BMI = 30.0-39.9 kg/m2)	7	11.1
Severely Obese (BMI >=40.0 kg/m2)	4	6.3

A weak/moderate positive correlation (r=0.345, p<0.01) was found between participant BMI and job performance. No statistical significance was found in the relationship between BMI and absenteeism (r=0.03, p=0.85). Results of the independent samples t-test comparing nurses with a normal BMI to those with a BMI in the overweight range regarding the WLQ productivity loss score was statistically significant (t(50.3)= 2.99, p<0.01). The WLQ productivity loss mean score was 8.61 (SD 2.14) for those with a normal weight BMI and 10.81 (SD 3.46) for those in the overweight BMI categories. Finally, a weak/moderate

positive correlation (r=0.365, p<0.01) was found between participant BMI and risk of eating disorder. The

independent samples t-test comparing normal weight to overweight participants on their EAT-26 score was

not statistically significant (t(61)=1.52, p=0.13). Means and standard deviations for the EAT-26 and WLQ

productivity loss scores by BMI category are displayed in Table 2.

Table 2: Means and Standard Deviations for EAT-26 and WLQ Productivity Loss Score by BMI Category				
	EAT-26		WLQ Productivity Loss Score	
BMI Category	M	SD	M	SD
Normal Weight (n=31)	8.65	8.06	8.61	2.14
Combined Overweight Categories (n=32)	11.63	7.48	10.81	3.46
Overweight (n=21)	9.52	4.94	10.68	3.37
Obese (n=7)	14.57	10.28	10.04	3.75
Severely Overweight (n=4)	17.50	10.34	12.68	3.82

Discussion

This study contributes to the current knowledge of overweight and obesity within nursing,

specifically by elucidating the relationships between weight and job performance, absenteeism, and risk of

eating disorders. Study findings support previous literature evidencing the prevalence of overweight/obesity

in the nursing population. Approximately half of the study participants were overweight, obese or severely

obese. Research in occupational fields such as manufacturing, engineering and transportation have shown

obesity can negatively impact employee job performance by way of decreased productivity and

absenteeism (Goetzel et al., 2010). Although the relationship between nurse BMI and absenteeism was not

statistically significant, weak/moderately positive correlations were noted between nurse BMI and job

performance, and nurse BMI and risk of eating disorder. Independent samples t-test results found nurses

with BMIs in the overweight categories did not have a greater risk of eating disorder than nurses with

normal weight BMIs. Nonetheless, nurses with BMIs in the overweight and obese categories had higher

productivity loss scores, when compared to their normal weight counterparts.

The study results indicated nurses with overweight, obese category BMIs had higher productivity loss scores when compared to those with normal weight BMIs, as well as a positive correlation between nurse BMI and risk of eating disorder. As such, weight management, and overweight and obesity prevention among nurses seems necessary since being overweight can affect a nurse's performance.

Similar to previous research, a weakness of the present study is the introduction of bias as participant height and weight, along with absenteeism data, relied on voluntary self-reporting. Additionally, the sample size was small and obtained from one hospital. There is the possibility of a self-selection bias as we do not have information on nurses who did not respond to the survey for comparison. Consequently, the study findings may have limited generalizability. Finally, although BMI is a frequently used measure of health, it may not be a reliable indicator of obesity (Shah & Braverman, 2012).

In future research, the relationship of obesity to work productivity and absenteeism in nurses should be studied in a national sample that includes nurses in various clinical settings (e.g. inpatient, outpatient, and long-term care), which would allow greater generalizability of findings. Additionally, future studies should elucidate the co-occurrence of obesity and eating disorders in nurses. Finally, there is limited evidence on interventions to address nurse obesity (Kelly & Wills, 2018). The Healthy Nurse, Healthy Nation™ initiative may be utilized as a platform for prospective studies to identify the leading motivators for change and better understand current weight management initiatives (ANA, n.d.).

Obesity within nursing remains a relevant healthcare issue warranting greater attention from the nursing profession. Results of this study found significant correlations between BMI and job performance, and BMI and risk of eating disorder. Moreover, nurses categorized with overweight BMIs exhibited higher productivity loss compared to nurses with a normal weight BMI. A possible solution may be to utilize the foci of the Healthy Nurse, Healthy Nation™ initiative to decrease BMI in nurses (ANA, n.d.). As the nation's largest group of healthcare providers, it is imperative nurses remain healthy to provide quality patient care.

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