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RESEARCH

The relationship among registered nurses' weight status, weight loss regimens, and successful or unsuccessful weight loss

Bruce S. Zitkus, EdD, APRN, ANP-BC, FNP-BC, CDE (Clinical Associate Professor; Director, Advanced Practice Nursing Program in Adult Health)

School of Nursing, Health Sciences Center, Stony Brook University, Stony Brook, New York

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Correspondence
Bruce S. Zitkus, EdD, APRN, ANP-BC, FNP-BC, CDE, Clinical Associate Professor, Stony Brook University, School of Nursing, Director, Advanced Practice Nursing Program in Adult Health, Health Sciences Center, Level 2, Room 222, Stony Brook, NY 11794-8240.
Tel: 631-444-3289;
Fax: 969-409-5623;
E-mail: bruce.zitkus@stonybrook.edu

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ABSTRACT

Purpose: To investigate relationships between body mass index (BMI), personality type, weight loss regimens, and successful or unsuccessful weight loss.
Data sources: Seven hundred and twenty-one registered nurses (RNs) were recruited from the American Academy of Nurse Practitioners, the membership of a nursing honor society, and RNs at a large state university. Participants completed the Myers-Briggs Type Indicator (MBTI), a demographic survey (age, gender, height, weight, ethnicity, education status, disability, shift work hours, and prescription medication use), and questions related to their weight status, weight loss attempts, and motivation.
Conclusions: RNs who had a lower BMI were more successful in losing weight than RNs who had a higher BMI. They were also more successful in their weight loss attempts if they did not use a diet regimen.
Implications for practice: RNs who were successful in losing weight did not use a specified dietary regimen.

The U.S. medical and scientific communities have paid specific attention to the increased incidence of overweight and obese children and adults over the past three decades. The number of individuals who are overweight or obese, as defined by body mass index (BMI), appears to be reaching epidemic proportions (Flegal, Graubard, Williamson, & Gail, 2005). Data from the National Center for Health Statistics (NCHS, 2005) demonstrate the population of overweight and obese individuals increased from approximately 45% in the early 1960s to 65% in 2002. Of this 65% increase, 31% are classified as obese; this is an increase in obese individuals from 13% to 31% during the same time period. Individuals with a healthy weight decreased from a high of 51% in 1960 to 33% in 2002.

This article reports the findings from a descriptive correlational survey study conducted among registered nurses (RNs). It addresses weight status (BMI), personality type (Myers Briggs Type Indicator), weight loss regimens, and the relationships between these factors and successful or unsuccessful weight loss.

Background

There is an obesity epidemic in the United States as well as the rest of the world. Obesity leads to increased morbidity and mortality (Must et al., 1999) while decreasing the quality of life in individuals. The National Health and Nutrition Examination Survey (NHANES) conducted between 2001 and 2004 indicated about two thirds of U.S. adults were overweight or obese (NCHS, 2005). The NHANES report indicated a 10%–50% risk of death from all causes, compared to healthy weight individuals (BMI 18.5–24.9; Ogden, Carroll, McDowell, & Flegal, 2007). Most of these deaths were attributed to cardiovascular causes (Field, Wing, Manson, Spiegelman, & Willett, 2001; Haslam & James, 2005; National Task Force on the Prevention and Treatment of Obesity, 2000). However, individuals who are overweight or obese are at greater risk for developing over 30 diseases, disorders, and medical complications than those who are not overweight or obese, which includes not only cardiovascular disease (Houston, Stevens, & Cai, 2005), but also sleep apnea (Tung, 2005), and depression (Heo, Pietrobelli, Fontaine, Sirey, & Fiath, 2006).

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RESEARCH SPOTLIGHT

QUANTITATIVE DESCRIPTIVE CORRELATIONAL SURVEY	
■ Sample	RNs chosen from a national organization, an international organization (the RNs were all located within the United States, however), and RN students or graduates from a large state university on the east coast.
■ Informed Consent	Each participant either received a letter or e-mail notice requesting voluntary participation in the research. Since the research was completely anonymous, no informed consent was needed or obtained.
■ Type of Data	Quantitative self-report survey developed by the researcher for data on demographics, weight control, and personality.
■ Data Collection Instruments or Tools	Data included personality, age, gender, current height, current weight, highest lifetime weight within the past 5 years, highest lifetime weight ever weighed, race/ethnicity, highest education completed, physical disability, shift normally worked, prescription medications, attempts at losing weight over the past 5 years, motivational factors for losing weight, and weight loss regimens that helped or did not help with weight loss. Participants also completed the Myers Briggs Type Indicator Form M (Myers, P.B., & Myers, K.D. [1998]. *Myers-Briggs Type Indicator®* Form M. Mountain View, CA: CPP, Inc.) that specifically measured personality type based on Jung's Theory of Personality (Jung, C.G. [1971]. *Psychological types*. Princeton, NJ: Princeton University Press).
■ What data analyses were used?	Analyses included descriptive statistics, i.e., frequencies & crosstabs, discriminant analysis along with two-way ANOVA, two-way contingency table analysis, correlation coefficient, and logistic regression
■ Strengths and limitations	• Strength: Large sample size that enabled sufficient power for multivariate analysis. • Limitation: The use of self-reported data and information from one point in time.

Fontaine, Redden, Wang, Westfall, and Allison (2003) used information from four national studies to examine the factor of expected number of years of life lost due to overweight and obesity across an adult life span. Their findings indicated a differential mortality rate for Blacks and for Whites, based on BMI status, and noted an optimal BMI for adults aged 18–85 years of 23–25 for Whites and 23–30 for Blacks. Fontaine et al. indicated that the critical variable may be body composition (central adiposity) that may differ by race, especially among women. They also found that there was a higher incidence of years of life lost among men independent of race.

The topic of weight status has been included in the prospective Nurses' Health Study (NHS) since 1980. The researchers added diet and nutrition questions to the NHS because they believed there was a relationship between dietary intake and the development of disease. The percentage of nurses who were overweight (defined as a BMI greater than 25) increased from 37% in 1980 to 51% in 1992. Additional findings from the NHS indicated that active women were less likely than sedentary women to die from any cause. Although nurses made many positive lifestyle changes during the course of the prospective study, the majority did not lose weight (Kuczmarski, Flegal, Campbell, & Johnson, 1994). Field et al. (2001) assessed weight loss and long-term weight change in young and middle-aged women participating in the NHS II conducted between 1989 and 1995. They found those who participated in five or more hours of vigorous physical activity every week gained less weight than their associates who were sedentary.

Dansinger, Gleason, Griffith, Selker, and Schaefer (2005) examined the effectiveness of four commercial diets (Atkins, Zone, Weight Watchers, and Ornish) on weight loss as well as cardiac risk reduction. Dansinger et al. found participants lost modest amounts of weight for each of these diets; however, adherence rates were low. Participants who adhered to their dietary regimen were almost equally successful with weight loss regardless of the diets they followed. Thus, no one diet was more successful than any other in weight loss.

Truby et al. (2006) also examined four commercial weight loss programs used in the United Kingdom (Atkins new diet revolution, Slim-Fast Plan, Weight Watchers pure points program, and Rosemary Conley's eat yourself slim diet and fitness plan). Results revealed all diets were equally as successful. Truby et al. concluded those individuals who are motivated to lose weight should be tried on one of the above listed commercial diets known to be effective.

Dubnov-Raz & Berry (2008) reviewed several effective weight loss studies (including the two studies cited above) on low-carbohydrate and low-fat diets' weight loss effectiveness. They found the most important factor for long-term effectiveness was compliance. Kushner (2007) notes the most salient factor of diet therapy is the reduction of calories consumed by substituting calorie-dense foods with lower calories in the individual's diet.

Most recently, Sacks et al. (2009) examined the ability to maintain weight loss for up to 24 months for those on one of four healthy dietary choices and receiving individual or group counseling. Weight loss occurred by 6 months into the study period, but most groups regained weight by 12 months. The researchers noted that characteristic traits of enthusiasm and persistence were keys to successful weight loss.

Various personality type and trait tests utilized over the years examined relationships among personality, obesity, and weight loss. Few, if any, were successful in providing an understanding of the relationship between personality and weight loss. The Myers-Briggs Type Indicator (MBTI) is a unique instrument because it uses a scale or a continuum dimension to measure the degree of a trait an individual may have, rather than focusing on psychopathology. The MBTI seeks to identify an individual's preference between two opposite categories, thus helping individuals learn the way they perceive their world, come to an understanding of these perceptions, and make choices based on these perceptions. If a relationship between an individual's personality type (as measured by the MBTI) and successful weight loss exists, it might be possible to utilize similar treatment regimens for those with similar personality types. One aspect of this study was to evaluate if there was a relationship between an individual's personality type (MBTI) and their weight status (BMI). The methodology box summarizes reasons for selection of this approach.

Research design and methodology

This is a cross-sectional descriptive study, which compared the relationship of personality type (MBTI), weight status (BMI), weight loss regimens (see Figure 1), and successful or unsuccessful weight loss. The research questions in this study included: (a) How did RNs report their personality and BMI; (b) was there a relationship among RNs' personality type and BMI; (c) what was the relationship between RNs' personality types and weight loss regimen; and (d) to what extent did factors such as personality type, motivating weight loss factors, weight loss regimens, age, gender, BMI, ethnicity, education level, disability status, shift work, and prescription medication predict successful weight loss in RNs?

Diet Regimen	1) Advertised commercial preparation (e.g., Nutrisystem, Medifast) 2) Commercial Weight Loss Program (e.g., Jenny Craig, Weight Watchers, TOPS)
Exercise Regimen	1) Exercise (e.g., aerobic and/or weight training at home) 2) Self Behavioral Change in eating habits and/or exercise
Social Interaction Regimen	1) Behavioral Therapy (e.g., with licensed professional) 2) Nutritional Counseling (e.g., dietician, nutritionist) 3) Self Help Groups (e.g., Overweight or Overeaters Anonymous)
Medication Regimen	1) Herbal Products (e.g., aloe, cascara, chitosan, dandelion) 2) Medical Prescription Diet (e.g., very low calorie or low calorie diet) 3) OTC Products (i.e., Anorex, CarboExpel, Cortislim, Hoodia 911, Elite) 4) Prescription Medication (i.e., Sibutramine, Orlistat, Phentermine)

Figure 1 Weight loss regimens.

Definitions

The definition of successful weight loss in this study was defined using the U.S. Department of Health's *Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults: The evidence report* (1998) criteria. Successful weight loss was defined as reducing the BMI by one classification (i.e., going from a BMI of $\geq$ 30 to a BMI between 25 and 29.9) and maintaining the loss for at least 1 year.

Sample

A convenience sample of 721 participants completed this study. All participants were RNs recruited from one of the following: advanced practice nurses in attendance at a 2007 national conference, randomly selected members of Sigma Theta Tau International Honor Society of Nursing and RNs who returned to school for their bachelor's degree and bachelor's and master's program graduates from a school of nursing in the greater New York area.

Survey instruments

The demographic and survey questionnaire was developed by the researcher based on the current weight loss literature. Factors influencing the onset of overweight or obesity included: age (Ogden et al., 2006), gender (Okosun et al., 2003), ethnicity (Truong & Sturm, 2005), education level (Gurka et al., 2006), shift work hours (Knutsson, 2003), disability (Burkhauser & Cawley, 2004), and prescription medicine use (Malone, 2005). Variables that served as motivation for weight loss (O'Brien et al., 2007) and weight loss regimens (U.S. Department of Health and Human Services, 1998) were

also examined. The survey instrument was reviewed by a panel of five experts who affirmed its content validity.

The standardized survey instrument used for personality type assessment was the MBTI Form M (93 items). Content and construct validity for the instrument has been well documented among adult populations. Briggs Myers, McCaulley, Quenk, and Hammer (1998) used confirmatory factor analytic methods to validate content. Internal consistency reliability of the MBTI was confirmed using the split-half method. Capraro and Capraro (2002) conducted a meta-analytic reliability study on the MBTI and found alpha coefficient reliability scores ranging from .55 to .97 for the various subscales.

Procedure

Permission to conduct the study was obtained from the Institutional Review Board committees from Dowling College in Oakdale, New York, and Stony Brook University, Stony Brook, New York. Each potential participant was provided a letter or an e-mail notice requesting voluntary participation in the proposed research. In order to maintain anonymity for those participating in the study, informed consent was affirmed if the participant completed a survey instrument and the MBTI as either a paper copy or on the web. Individuals who received the paper copy were able to drop off the survey anonymously in a box labeled "Personality and Weight Loss Survey." Those who chose to complete the web-based questionnaire entered a designated website where they could read about the proposed research. Survey materials were located on two additional, linked, survey sites, and were password protected. At the first site, participants completed the demographic survey utilizing Survey Monkey. Participants entered the second site: the Consulting Psychologists Press (CPP) website, to complete the MBTI, which was electronically scored. To maintain anonymity, the surveys contained no personal identifying data for either the paper copy or the internet websites, which were encrypted. Participants who had questions while completing the questionnaire could either contact the researcher or the Committee Design Professor through e-mail, phone, or regular mail. Their contact information was provided in the invitation letter or electronically sent to participants.

Statistical methods

Univariate and multivariate statistics were used to answer each of the research questions. Descriptive statistics and frequencies were used to characterize the sample, to examine relationships between personality type and BMI, and to assess the correlation between weight loss regimens and weight status in RNs who were or were not successful in losing weight. Discriminant analysis was used to explore the relationship between personality type and type of weight loss regimen selected. Logistic regression was used to predict the relationship of which factors influenced weight loss. The factors assessed included: personality type, weight loss motivating factors, weight loss regimens, age, gender, BMI, ethnicity, education level, disability status, shift work hours, and, prescription medication, and the two most important factors were identified as practice for successful weight loss.

Results

A total of 2593 surveys were sent; 865 RNs (33.36%) responded to the invitation. One hundred and forty-four (17%) surveys were incomplete and could not be utilized for research purposes. A total of 721 participants (28%) completed the surveys and were included in this study (see Table 1). The participants were categorized into the four variations of body types (see Table 2). Forty-two percent of participants were considered normal weight, while 57% were either overweight (30%) or obese (27%), and eight individuals were classified as underweight (1%). Those participants who were underweight or within the normal weight loss category and never attempted to lose weight were excluded from the study.

Although all 16 personality types (Table 1) were found among the study participants, they scored predominantly across four personality types: Introverted Sensing Thinking Judging (ISTJ), Introverted Sensing Feeling Judging (ISFJ), Extraverted Intuitive Feeling Perceiving (ENFP), and Extraverted Sensing Feeling Judging (ESFJ).

The assessment of relationships between personality types and weight loss status demonstrated a different set of predominant personality types than those identified above. Approximately 69% (69.2%) of nurses who reported being Introverted Intuitive Thinking Perceiving (INTP) had a normal weight according to their BMI calculation, as did 55.3% of those who were Extraverted Sensing Feeling Perceiving (ESFP). However, the finding for the INTP group needs to be interpreted with caution since they comprised a small representative sample ($N = 13$). Fifty percent who reported their personality type being Introverted Intuitive Feeling Perceiving (INFP) were overweight, while 42% of nurses who reported their personality type as Introverted Sensing Thinking Perceiving (ISTP) were obese (BMI $\geq$ 30), although this statistic did not reach significance.

In addition, participants were asked to indicate which popular weight loss regimen they used and if it was helpful. (See Figure 1, which describes the 11 regimens

Table 1 Demographic data

Demographic variable	*N*	%
Age		
21–30	73	10.1
31–40	173	24.0
41–50	238	33.0
51–60	204	28.3
61–70	33	4.6
Gender		
Female	661	91.7
Male	60	8.0
BMI (body mass index)		
Underweight (<18.5 kg/m^2)	8	1.1
Normal weight (18.5–24.9 kg/m^2)	302	41.9
Overweight (25–29.9 kg/m^2)	216	30.0
Obese (>30 kg/m^2)	195	27.0
Ethnicity		
Native American Indian/Alaska	1	0.1
Asian	22	3.1
Black or African American	50	6.9
Hispanic or Latino	26	3.6
Native Hawaiian/Other Pacific Islander	2	0.3
White	611	84.7
Mixed	9	1.2
Highest academic degree		
Associate	43	6.0
Bachelor's	191	26.5
Master's	356	49.4
Post-master's	90	12.5
Doctorate	36	5.0
Post-doctorate	5	0.7
Physical disability		
Yes	41	5.7
No	680	94.3
Shift work		
Days	546	75.7
Evenings	33	4.6
Nights	69	9.6
No steady shift	73	10.1
Personality type (Myers-briggs type indicator)[a]		
ISTJ	87	12.1
ISFJ	80	11.1
INFJ	30	4.2
INTJ	22	3.1
ISTP	28	3.9
ISFP	39	5.4
INFP	40	5.5
INTP	13	1.8
ESTP	25	3.5
ESFP	47	6.5
ENFP	80	11.1
ENTP	20	2.8
ESTJ	62	8.6
ESFJ	85	11.8
ENFJ	47	6.5
ENTJ	16	2.2

[a]Attitudes: I = Introversion; E = Extraversion.
Functions of Perception: S = Sensing; N = Intuition.
Functions of Judging: T = Thinking; F = Feeling.
Orientation to Outer World: P = Perceiving; J = Judging.

participants were asked to select from.) The various regimens listed were chosen based on the current literature on weight loss.

The relationship between dietary weight loss regimens and weight loss was examined (Table 2). A two-way contingency table analysis was conducted to determine if a dietary regimen was helpful in losing weight. Cross tabulation analysis revealed 29.0% or 171 successful weight loss participants did not use a diet regimen (58.5%) compared to those who chose a use one (41.5%). An analysis of the group (71.0% or 419 participants) who were unsuccessful in weight loss showed 66.3% were more unsuccessful if they adopted a diet regimen compared to the 33.7% who did not use a dietary regimen. A chi-square test for independence (with Yates Continuity Correction) confirmed this significant relationship between weight status and dietary regimens, χ^2 (1, N = 590) = 29.95, p = .00, phi = .23.

To determine which factors were predictive of successful/unsuccessful weight loss a logistic regression was performed. The model contained 19 independent variables after removal of 31 outliers at greater than two standard deviations from the mean. The full model containing all predictors was statistically significant, χ^2 (19, N = 559) = 220.330, p <.001, indicating the model was able to distinguish between participants who reported successful or unsuccessful weight loss. The model as a whole explained between 32.6% (Cox and Snell R square) and 48.2% (Nagelkerke R squared) of the variance for successful weight loss, and correctly classified 80.3% of cases. Use of a diet program and BMI made a unique statistically significant contribution to the model (Table 3). The best predictor of successful weight loss was the BMI scale, recording an odds ratio of .61. This indicated that for every additional increase in BMI number, participants were .61 times less likely to lose weight. Thus, results revealed the lower the initial BMI the greater success in weight loss. The predictor of unsuccessful weight loss was use of a diet regimen with an odds ratio of .572 indicating participants who used a diet regimen were .57 times less likely to successfully lose weight.

Discussion

The report by the National Institutes of Health (Weight-control Information Network, 2007) examining data from the 2001–2004 NHANES survey, indicated that 133.6 million (66%) adults age 20 years and older were overweight or obese compared to 57% of those participating in this study. More specifically, the data from this study revealed that 27% of RNs were obese compared to 31.4%

Table 2 Successful and unsuccessful weight loss results

Weight loss regimen	*N* of those who utilized regimen	Helpful			Not helpful		
		N	%	*p* value	*N*	%	*p* value
Diet	349	71	41.5	.23	278	66.3	.23
Exercise	412	121	70.8	.83	291	69.5	.14
Social interaction	34	12	7.0	.52	22	5.3	.36
Medication	61	17	9.9	.96	44	10.5	.36

of the population and 41.9% were overweight compared to 32.2% of the population as revealed by the NHANES data.

Of the 16 personality types in the MBTI (Table 1), RNs who participated in the study could be found within all 16 categories. The significance of finding RNs in all 16 personality type categories is consistent with Hammer's (1993) study where data revealed healthcare workers were predominantly of four personality types (ISFJ, ISFP, ESFP, ESFJ). Another finding was that presumably personality types are not an important indicator of BMI.

Table 3 Logistic regression predicting likelihood of successful weight loss

	Sig.	Exp(B)	95.0% C.I.for Exp(B)	
	Lower	Upper	Lower	Upper
Age	0.890	1.02	0.776	1.339
Education	0.433	0.87	0.626	1.222
Gender(1)	0.056	0.40	0.157	1.024
Ethnicity(1)	0.174	0.61	0.301	1.242
PhysicalDis(1)	0.909	0.93	0.275	3.154
ShiftWork(1)	0.224	1.45	0.796	2.646
RxMeds(1)	0.078	0.63	0.383	1.052
SDiet(1)	0.035	0.57	0.341	0.961
SExercise(1)	0.322	0.75	0.419	1.331
SBehavior(1)	0.324	1.63	0.619	4.277
SMeds(1)	0.231	0.58	0.240	1.411
USDiet(1)	0.086	0.58	0.309	1.081
USExercise(1)	0.986	0.99	0.466	2.117
USBehavior(1)	0.952	1.03	0.336	3.190
USMed(1)	0.295	1.42	0.734	2.779
Introvert(1)	0.985	0.99	0.605	1.636
Sensing(1)	0.094	0.64	0.380	1.079
Motiv	0.570	1.04	0.901	1.208
BMI Scale	0.000	0.61	0.548	0.676
Constant	0.000	842846.106		

[a]Variable(s) entered on step 1: Age; Education; Gender; Ethnicity; Physical Dis = Physical disability; Shift Work; Rx Meds = Prescription medications; SDiet = Successful diet; SExercise = Successful exercise; SBehavior = Successful behavior; SMeds = Successful medications; USDiet = Unsuccessful diet; USExercise = Unsuccessful exercise; USBehavior = Unsuccessful behavior; USMed = Unsuccessful medications; Introvert; Sensing; Motiv = Motivation; BMI Scale = Body mass index scale.

The findings in this study did not support the current literature regarding use of a dietary regimen and weight loss success. One explanation is the participants in this study who lost weight used more common sense approaches to eating instead of a diet regimen. Perhaps successful weight loss is not in the "how" but in the adherence and consistency of the behavioral change that is undertaken by the individual who attempts weight loss. Truby et al. (2006) and Dansinger et al. (2005) also suggest this. Kushner (2007) noted that weight loss goals could be achieved by just decreasing calories through substitutions to what an overweight or obese individual eats.

Strengths and limitations

The strengths of this study included the large sample size that enabled sufficient power for multivariate analysis. A methodological limitation was the use of self-reported data whereby participants might have been subject to recall bias. Another limitation is the study design. Cross-sectional descriptive studies such as this one look at one point in time, which is not indicative of what a person might do if assessed in a prospective longitudinal study.

Clinical implications

This research provides RNs who have or are attempting to lose weight important information regarding weight loss regimens and strategies, indicating the use of common sense eating habits are more prudent than dieting. Perhaps nurses desiring to lose weight need to make a paradigm shift in their thinking whereby dieting should be replaced with lifestyle change in behavior. No significant relationships between BMI and personality types were found in this study. This supports the idea that all individuals regardless of personality types are susceptible to weight gain and can also successfully lose weight. Providing nurses with this information can motivate them to initiate weight loss.

Conclusion

The current global obesity epidemic requires development of successful treatment measures to assist those who are motivated to achieve their weight loss goal. The cost burden of obesity for individuals is in the emotional and physical realms, but there are associated financial costs that are born by both the individuals and society. These costs include but are not limited to direct treatment costs incurred from treating comorbid medical conditions, for example, hypertension, diabetes mellitus, as well as the indirect costs of lost productivity, and earnings (Colditz, 1999). Thus, successful treatment includes the ability to guide RNs to be successful in their quest to lose weight. The effort to achieve this goal must be the focus of the healthcare profession, the government, and those in the field of obesity research.

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