EASE for Nursing Students

Eating, Activity, and Supportive Environment (EASE) for Nursing Students

**Purpose:** The feasibility study was designed as a potential model for prevention of obesity at a large college of nursing in the Southwest.

**Conclusions:** Pretest median BMI was 30.4 in intervention group and 30.5 in control group, indicating obesity in the student sample. There were no significant changes in posttest measures in the small sample. The thigh circumference change in the experimental group trended toward change with significance of .06.

**Implication:** ANA launched a *Healthy Nurse* program in 2012 as healthy nurses are role models for a healthy nation. Updating nursing curriculum and active participation of students in weight management programs will promote their own health and positive role modeling.
According to the World Health Organization (WHO), obesity and overweight are the fifth leading cause of death around the world, killing at least 2.8 million adults yearly (Media Centre, 2011). In the United States, close to 17% of children and adolescents between the ages of 2 and 19 are obese (Ogden & Carroll, 2010). Obesity and overweight often lead to many health complications, such as diabetes and heart disease, psychosocial problems, and economic burdens to individuals, as well as to society (Al-Rethaiaa, Fahmy, & Al-Shwaiyat, 2010; Ben-Sefer, 2009; National Institute of Diabetes and Digestive and Kidney Diseases [NIDDK], 2008; RAND Health, 2007). Obesity and overweight are also associated with many psychosocial issues in both adult and pediatric populations such as low self-image and self-concept as well as depression (Poon & Tarrant, 2009). Moreover, obesity and overweight are becoming a major cause of disability in younger people (RAND Health, 2007). Finally, these two conditions are prevalent not only in the general population, but also among healthcare professionals.

Obesity and overweight in nursing students and nurses not only impact their own health status, but can also affect their functional and emotional ability to provide a high standard of patient care in their nursing careers. Recent concerns in the literature highlight that nurses serve as role models and have the responsibility of educating their patients about health promotion and disease prevention (Evans, Moyle, & Purcell, 2006). Several studies have suggested that over 50% of nurses are classified as obese or overweight (Han & Trinkoff, 2011). As high as 58% of nurses, midwives, and other health educators are reported to have poor nutrition intake and/or physical inactivity (Luszczynska & Haynes, 2009). Nurses who are overweight and obese may find it
challenging to fulfill this expectation of healthy role models or health educators. Healthcare professionals in particular can benefit their own health by maintaining healthy lifestyles, and they can also serve as positive role models for their patients and families when advocating for health promotion and disease prevention (Zapka, Lemon, Magner, & Hale, 2009).

**Purpose**

The purpose of this article is to report on the feasibility study that was designed as a potential model for obesity prevention at a large nursing college in the Southwest. The Nursing with EASE (Eating, Activity, and Supportive Environment) study was developed by interdisciplinary faculty who specialize the fields of nutrition science, nursing, kinesiology, and psychology to address the obesity challenge and explore healthy interventions in this special population of nursing students. The first step of the program included an extensive literature search on current challenges and the multiple issues that impact health promotion and obesity for nursing students. The findings of the literature are summarized in this article. Next, a report of the feasibility study on the nutrition and exercise interventions conducted on pre-nursing students is presented. Societal, environmental, and healthcare organizational changes are needed for nursing and the community at large. The issue of obesity in nursing students and nurses remains a challenging issue that requires further investigation.

**Literature Review**

The risk factors leading to obesity and overweight are complex. Although genetic factors play an important role in developing obesity and overweight, it is unlikely to explain a rapid increase in obesity and overweight over a short period of time. Growing
evidence has recognized that environmental factors are also likely to be associated with the obesity and overweight epidemic worldwide. It is believed that an imbalance between energy intake and energy expenditure leads to the development of overweight and obesity (Mahfouz et al., 2011). Many studies have suggested that a lack of physical activity and sedentary lifestyles, such as physical inactivity, watching television, playing digital games, and long-time computer usage, contribute to obesity and overweight in people of different ages, particularly among children and adolescents (Duncan et al., 2011; Mahfouz et al., 2011). Further, a study conducted by Kapinos and Yakusheva (2011) suggested that physical environment, such as “the proximity, density, selection of healthy foods and eating facilities and aspects of the built environment such as walkability, access to physical activity facilities, parks, and trails,” is associated greatly with obesity (p. 53).

Similarly, unhealthy dietary habits, dietary selections, and food advertisements have also contributed to the rise in obesity among both children and adults (Ben-Sefer, 2009). The replacement of traditional diets with foods high in calories, such as those with a great deal of saturated fat and cholesterol, increases the prevalence of obesity and overweight in people of all ages (Duncan et al., 2011). In addition, Matthews, Wien, and Sabate (2011) argued that increased snacking among children and adolescents has increased the rate of obesity and overweight in this population because “an increase in energy density and proportion of energy from fat and a decrease in calcium density obtained from snacks” have occurred (p. 71).

Overweight and obesity cause many health problems in adults and children; thus, high health costs result from these two conditions. The psychological and social
problems associated with obesity can lead to engagement in high-risk behaviors in this population such as smoking and drinking alcohol, problems with family relationships, and poor school performance (Ben-Sefer, 2009).

Obesity and overweight also cause direct and indirect medical cost to the U.S. economy. The increased incidence of obesity is causing a significant negative effect on the national economy (Centers for Disease Control and Prevention [CDC], 2011). Direct costs include expenditures on preventive care, diagnostic tests, and treatment plans, while indirect costs relate to the financial burdens of morbidity and mortality (CDC, 2011). Between 1987 and 2001, the treatment of obesity and its related complications approximated 92.6 to 117 billion U.S. dollars. That is approximately 5.7% to 9.1% of the U.S. health care expenditure (Mercer, 2010). In a 2008 report, the medical cost of obesity and its complications was rated at 147 billion U.S. dollars (CDC, 2011). Approximately 36.5 billion U.S. dollars is paid by private insurance towards the treatment. It is estimated that annual medical costs associated with obesity will double every decade to 861 to 960 billion U.S. dollars by 2030, which is equal to almost 20% of the total U.S. healthcare cost (Han & Trinkoff, 2011). Medicare and Medicaid also pay approximately half of the cost for obesity treatment, a leading cause for higher medical costs in the US (Mercer, 2010).

**Obesity and Overweight in Nurses and Nursing Students**

While many studies have focused on the prevalence of overweight and obesity in younger children and adults and recommended interventions, the college student population has received relatively little attention (Furia, Lee, Strother, & Huang, 2009). Furthermore, even less research has focused on the college pre-nursing and nursing
student population. Literature indicates that obesity in adolescence persists into adulthood with the greatest increase in weight gain between the ages of 18-29 years (Adderley-Kelly, 2007). Currently, 1 in 4 persons between the ages 18-24 years are full-time or part-time college students, and 20.5% of students nationwide are classified as overweight based on body mass index (Adderley-Kelly, 2007). Recent studies indicate common risk factors of obesity and overweight in college nursing students include stress, consumption of energy drinks, inadequate sleep, and rotating shifts. The causes of obesity in college students, including nursing students, can be related to stress; students entering a new environment for the first time; and having the responsibility to make responsible decisions on diet, exercise, and television viewing (Gower, Hand, & Crooks, 2007).

**Stress**

Additional causes of obesity in college students can include negative management of increased stress levels, skipping meals, and snacking all day (Isa & Masuri, 2011). Researchers who studied college students reported an increasing problem in obesity among college students from 12% in 1991 to 36% in 2004 (Brunt, Rhee & Zhong, 2008). Among the few earlier studies conducted with college students, several studies showed that first-year college students tend to experience excessive weight gain and become obese (Adderley-Kelly, 2007). More recent literature included reports that an increase in overweight and obesity among college students has become a serious health concern (Greene et al., 2011). Studies have further shown that students, including pre-nursing students, gain significant amounts of weight during their first year of college (Al-Rethaiaa et al., 2010). During the transition from high school to college, this group of
young adults gains more independence and autonomy, and they need to adjust to their newly-found freedom. Moreover, long-term diet and physical activity habits may be established during this critical period of time; consequently, negative behaviors may become embedded in their lifelong routine (Laska, Pasch, Lust, Story, & Ehlinger, 2011).

Research on stress in nursing students and nurses was studied extensively in the last decade. Analyses of the results indicated that nursing is an occupation that is emotionally and physically demanding and presents the individual with stressful circumstances (Watson et al., 2008). Stress in nursing students can be caused by change of environment, separation from home, financial worries, regular educational and clinical assessment, and frequent changing of the clinical environment (Watson et al., 2008). Eating has been known to be a coping mechanism for alleviating stress and emotions (Ozier et al., 2008). Stress is normal and can be perceived as a complex and dynamic interaction between individuals and their environment, but it can also have negative consequences (Amr, El-Gilany, El-Moafee, Salama, & Jimenez, 2011; Watson et al., 2008). Increased stress levels have been known to influence unhealthy behaviors such as excess drinking, poor eating patterns, inadequate sleep, and smoking (Britz & Pappas, 2010). Hudd and colleagues (2000) reported that students who were more stressed were likely to eat “junk foods” as opposed to students who were less stressed. Han and Trinkoff (2011) performed a secondary data analysis on 2,103 female nurses and concluded that nurses with high job stress were more likely to have eating disorders than nurses with less stressful jobs, and “the association between disordered eating and obesity was exacerbated by psychological stress” (p. 488). From the pathophysiological aspect, stress, especially chronic stress, activates the hypothalamus in the brain to initiate “a
cascade of hormonal pathways resulting in the release of cortisol from the adrenal cortex of the kidney” (Maglione-Garves, Kravitz, & Schneider, 2005, p.1). Cortisol affects fat storage and can cause weight gain in chronically stressed people. A particular enzyme located in fat tissues helps convert cortisone to active cortisol, thus controlling tissue cortisol levels (Maglione-Garves et al., 2005). Researchers have found that fat tissues surrounding the stomach and intestines carry more of this type of enzyme compared to the fat tissues of other body parts. Therefore, increased concentrations of these enzymes in the deep adipose cells surrounding the stomach can cause abdominal obesity because of the higher levels of cortisol concentration secreted at the tissue level (Maglione-Garves et al., 2005). In addition, researchers also have found that high cortisol levels can lead to stress-induced eating of foods that contain high contents of fat and sugar, resulting in obesity or overweight (Vicennati, Pasqui, Cavazza, Pagotto, & Pasquali, 2009).

Britz and Pappas (2010) investigated the sources of stress and unhealthy behaviors, such as sleep quality and poor nutrition, in university students. The students were assessed on major stressors, such as academic workload, time management, adequate sleep, and overall health, and how those stressors compromised their quality of diet and sleep. Analyses of the study’s results revealed that 52.4% of students perceived increased stress, and 50.8% reported they were often stressed. In terms of unhealthy eating habits, 80% of students reported they did not eat breakfast every day, 57% ate breakfast less than four or five times per week, and 12.9% did not eat breakfast at all. The consequence of skipping breakfast can result in snacking, which likely increases the possibility of obesity and overweight (Isa & Masuri, 2011). Further, researchers also reported that many students skipped breakfast, which increases the possibility of snacking
on junk foods and puts them at risk for obesity (Silliman, Rodas-Fortier, & Neyman, 2004).

**Energy Drinks**

In a research study by Malinauskas, Aeby, Overton, Carpenter-Aeby, and Barbar-Heidal (2007) on the energy drink consumption patterns of college students, 67% of participants reported drinking energy drinks such as Red Bull, Amp, Monster, and Rock Star due to a lack of adequate sleep. Energy drinks can be grouped as sugar-free and containing sugar. Except for the sugar-free version, all energy drinks contain sugar in the form of high fructose, sucrose, and glucose (Clauson, Shields, McQueen, & Persad, 2008). Approximately 21 to 34 g of sugar are in an 8oz (236.59 ml) can of energy drink depending on the brand (Clauson et al., 2008). Seventy percent of the students reported drinking energy drinks with sugar as opposed to 12% who drank the sugar-free version. Fifty percent drank energy drinks while studying or completing a course project or while driving for a long distance (Malinauskas et al., 2007).

Results from clinical studies have confirmed that weight gain is related to energy drink consumption because of the sucrose levels and increase in serum triacylglycerols (Johnson et al., 2007). High fructose concentration in energy drinks can also cause obesity because fructose may not cause the level of satiety equivalent to that of a glucose-based meal and therefore encourage additional consumption of fructose (Johnson et al., 2007). Researchers have also argued that fructose is unable to stimulate insulin and leptin to inhibit the appetite hormone ghrelin. Furthermore, the sweetness in fructose is palatable and encourages added intakes (Johnson et al., 2007).
In addition, most energy drinks contain large amounts of caffeine. For instance, each can or bottle of Red Bull contains caffeine content as high as 505 mg (Reissig, Strain, & Griffiths, 2009). There is insufficient documentation in the literature about the association between the caffeine in energy drinks and obesity. However, Rush, Schulz, Obolonkin, Simmons, and Plank (2006) conducted a small study on 10 healthy young women between the ages of 18 and 22 years to evaluate the effect of an energy drink containing caffeine and sucrose compared with a sucrose drink alone on their fat and carbohydrate oxidation. Results indicated that long-term use of energy drinks with the combination of sucrose and caffeine could increase carbohydrate oxidation but decrease lipid oxidation, which could lead to lipogenesis or fat creation, thus resulting in obesity (Rush et al., 2006). Further, excessive consumption of energy drinks causes sleep problems, which can also lead to obesity (Eberly & Feldman, 2010).

Sleep

Recent findings have correlated nutritional habits, obesity, and lack of sleep (Yeh, Chen, Wang, Wen, & Fetzer, 2005). In a study conducted by Spivey (2010), sleeping 5 or fewer hours per night caused a greater risk in weight gain as compared to sleeping for 7 to 8 hours per night. Multiple studies have indicated that sleep deprivation can negatively affect the endogenous signals, leading to the disruption of the homeostatic control of food intake (Lowden, Moreno, Holmback, Lennernas, & Tucker, 2010). Inadequate sleep causes lower leptin levels, which suppress appetite, and higher ghrelin levels that increase hunger and appetite (Eberly & Feldman, 2010; Knutson & Cauter, 2008). In addition, sleeping fewer hours also allows more opportunity to eat (Lauderdale
et al., 2009). This is particularly true of nursing students and nurses who work night shift.

Lack of adequate sleep might alter endocrine and metabolic functions, causing decreased glucose tolerance, increased sympathetic tone, and elevated cortisol concentrations, thus leading to obesity (Eberly & Feldman, 2010). Additionally, with sleep deprivation, the body’s hormonal profile is not allowed to recover, which can increase the risk of obesity (Chaput, Klingenberg, & Sjodin, 2010). Inadequate sleep may lead to weight gain and obesity because more time is available for eating, and fatigue associated with sleeping too little may make it difficult for the individuals to participate in any physical activities (Chaput et al., 2010). Moreover, most students’ sleep hours become irregular due to study and work schedules, with most students having less sleep hours on weekdays and waking up late on weekends (Gilbert & Weaver, 2010). Consequently, students resort to energy drinks and comfort foods to combat falling asleep for late night studying and energy during the daytime (Spivey, 2010).

**Shift Schedules**

Multiple researchers have suggested that shift schedules, such working night shifts, rotating shifts, or long hours, are associated with obesity (Eberly & Feldman, 2010). Results from a study conducted by Zhao, Bogossian, Song, and Turner (2011) on 2494 female nurses and midwives indicated that the risk of obesity and/or overweight among those who worked night shift was as much as 30% higher than those who worked normal day shift. In addition to lack of sleep, studies also have shown that eating later may “reduce the thermic effect of the meal, thus promoting weight gain” (Eberly & Feldman, 2010, p.4). Researchers have also found that shift workers preferred cold and
fast food rather than hot food even though hot food was available, and they tended to have frequent snacks instead of a meal (Eberly & Feldman, 2010). Lastly, one primary reason for obesity and weight gain in people working long, night, or rotating shifts is lack of exercise. Lack of sleep leaves individuals feeling too tired to participate in physical activities (Eberly & Feldman, 2010).

**Feasibility Study as Model Program for Nursing Students**

Based on the literature findings and the need to address behavioral changes for weight loss and increased physical activity among nursing students, faculty members collaborated to design a feasibility study at a southwestern university with a large college of nursing. The theoretical framework that was used for this feasibility study was Prochaska’s Stages of Change model (Prochaska, Diclemente, & Norcross, 1992). Prochaska and colleagues proposed that behavioral changes follow six stages: (a) pre-contemplation, (b) contemplation, (c) preparation, (d) action, (e) maintenance, and (f) relapse. In the pre-contemplation stage, people usually do not realize that their behaviors are problematic; therefore, they are not interested in changing them. In the contemplation stage, people start to acknowledge that a problem with their unhealthy behaviors exists, and they realize the negative impact of their behaviors. During this period, individuals are more open to obtaining information about their unhealthy behaviors and lifestyles. The preparation stage starts when people are ready to change their behaviors and lifestyles. During this time, they try to acquire as much information as possible to help them change their behaviors. In the action stage, people are actively involved in taking a series of steps to change their unhealthy behaviors and lifestyles. Then, in the maintenance stage, they try to maintain their healthy lifestyles, and they are able to resist
any temptations to return to previous behaviors. In the relapse stage, those who have changed their behaviors may feel that they are failures because they are unable to maintain their healthy lifestyles (Kern, 2008).

Faculty represented four disciplines: nursing, nutrition science, psychology, and kinesiology. The weekly nutrition educational interventions were developed by the nutrition science faculty, and the nursing and psychology faculty developed curriculum focused on motivational interviewing and stage of change. The kinesiology department assisted with the physical activity intervention. The 6-week hourly intervention sessions required pre-nursing students to address their personal behavior change goals and their selected modifiable risk factors of obesity and overweight. The study was approved by the university institutional review board (IRB), and the students were recruited via flyers and announcements in large science classes of pre-nursing students. The study design was a pretest-posttest. A convenience sample of 31 pre-nursing students between the ages of 18-21 years of age on the Denton campus of Texas Woman’s University (TWU) were recruited for this feasibility study. The students were randomly divided into intervention and control groups by picking a number. The intervention and control groups were comprised of 16 and 15 pre-nursing students, respectfully. Weight, BMI, and other body composition were measured both before and after the 6-week nutrition and physical activity intervention program for students in the intervention and control groups.

The experimental group participated in a 6-week, 1-hour-per-week nutrition and exercise program. Data collection included body composition, weight, self-efficacy, body mass index (BMI), waist and thigh circumference, and stages of behavior change
Comparison of groups was conducted with body measurements using the Mann-Whitney U test. The Mann-Whitney U test is the non-parametric test used to measure the differences between two groups when the sample sizes are small and the distribution is unequal among the groups (Pallant, 2007). Pretest median BMI was 30.4 in the experimental group and 30.5 in the control group, which indicated obesity in the sample of female students 18-21 years of age. While there were no significant changes in posttest measures in the small sample, the thigh circumference change in the experimental group trended toward change with a significance of .06 (Table 1).

Students wrote their own goals during the weekly intervention sessions and measured their stages of change in relation to their goals. While there were no information available on what level the students’ stress, eating, and addictive behaviors were prior to the intervention, they shared concerns regarding stress of examinations and pressure to receive grades of “A” in science courses due to the competitive admission for nursing. These stresses often resulted in late night studying, lack of sleep, and snacking at night. Their self-reported stage of change was impacted by support from peers participating in the study as well as other friends. Their ability to reach goals and their desired stage of change became more likely with support from peers.

**Nurses Acting as Change Agents**

Obesity and its complications affect the general population as well as nursing students and nurses. Studies have suggested that nursing students’ and nurses’ long work schedules or shift work, school, and work stress negatively impact their eating behavior and food choices, as well as interrupt their normal eating times and reduce their access to
healthy food (Han & Trinkoff, 2011). In addition, nursing students’ and nurses’ heavy academic load, long work schedules, or shift work may cause them to feel a lack of energy and need for more sleep, thus preventing them from participating in physical fitness and exercise (Eberly & Feldman, 2010). These challenges were very evident in the lifestyles of the study participants with resulting difficulties in maintaining their weekly goals for nutrition and exercise choices.

Nursing students and nurses may need guidance in making healthy food decisions, especially because most school and hospital cafeterias offer a variety of food items in a self-service manner similar to “all-you-can–eat” restaurants (Peterson, Duncan, Null, Roth, & Gill, 2010). Nursing students, nurses, and agencies representing universities and hospitals could consider focusing on immediate change for improved access to hot meals with low caloric content, as well as an increase in the availability of vegetables, fruits, and nutritious snacks, if they have to stay up late at night for studying or work the night shift (Lowden et al., 2010).

In addition, nursing students and nurses need education on the importance of increasing their physical activities because exercising actually energizes the body as well as promotes good sleep (Eberly & Feldman, 2010). Since some lifestyle practices formed during the college years continue to impact nursing students when they graduate and progress in their nursing careers, it is important to increase their nutrition knowledge and promote their exercise habit during this critical formation period.

Nursing students and nurses can be given resources and opportunities to fulfill their responsibilities as educators and role models in order to maintain their own health and promote health education to patients and community members. Role modeling a
healthy diet and lifestyle may positively impact a change in their patients’ behavior. Although it is the individuals’ choice to be physically active, select healthy foods, and maintain a healthy weight, school systems and workplaces need to support that nursing students and nurses be healthy and become effective role models by providing a supportive studying and working environment (Zapka et al., 2009). Schools and workplaces could offer healthier food choices and reasonable meal portion size. Providing healthy vending machine choices can also increase food quality (Han & Trinkoff, 2011).

Nursing students and nurses need to align with medical centers, professional agencies, and universities to take a much more active role as change agents. They must have an active role in determining what work and environmental situations are preventing them from reaching their goals and health status. Collectively, they can ensure their school and work environments provide support, access, and resources to sustain their own health. When nursing students and nurses understand the risks of their unhealthy lifestyles, they are better prepared to assess what could be a hindrance in attaining that lifestyle.

Implications

Health promotion and disease prevention are among the strongest curriculum issues for nursing and health care as a whole (Healy & McSharry, 2011). The commitment to health promotion and disease prevention must be taught to nursing students from nursing school through graduation to bedside and advanced practice. It is important that nursing students and nurses play a role in the worldwide and national effort in the prevention of obesity and overweight and its related complications. Many
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nursing students in college environments are still forming lifestyles. They represent the channel of knowledge transferred to patients and the community when they become professionals. College or university settings are ideal venues for the creation of health promotion and disease prevention programs such as the model program highlighted in this article. Nursing education must increase young adults’ awareness of the need for weight management goals combined with healthy eating and exercise (Adderley-Kelly, 2007). The creation of health promotion programs such as this EASE for nursing program that involve both faculty and students holds great promise in the formation of positive health habits within nursing students and the entire college community.

The prevalence of obesity in nursing professionals is as high as in the general population (Han & Trinkoff, 2011). Many healthcare professionals reported that they were challenged with a lack of discipline and motivation to change their lifestyles (Miller, Alpert, & Cross, 2008). Nursing curriculum is often lacking in advanced nutrition content, and some nurses have reported nutritional knowledge deficits (Park et al., 2011). Further study, with large sample sizes is needed to examine environmental issues and successful interventions in order to sustain healthy lifestyle choices in nursing students and nurses. This university study team is planning a larger study program with a longer 8-week nutrition and physical activity intervention. Peer mentors were added to the design as students’ responded will to peer support in the feasibility study.

Nurses, professional organizations, and the health care system as a whole must develop strategies for both individual and societal changes aimed at improving health and changing poor health behaviors and enforcing a healthy work environment. It is imperative to act at societal, organizational, and personal levels to address the
complexities of overweight and obesity in nursing students and nurses as well as patients. The American Nursing Association (ANA) launched a *Healthy Nurse* program in 2012 by hosting a national conference entitled *Nurses as Models of Wellness in Action*. The theme of the ANA conference stated that healthy nurses are a role model for a healthy nation. ANA continues to supports the healthy nurse and a healthy work environment through resources at the Healthy Nurse website (www.nursingworld.org/healthynurse). By integrating curriculum with resources such as the recent ANA *Healthy Nurse*, EASE for Nursing Students can potentially serve as a model program to support healthy behavior change at an early stage of development for nursing students.
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