The Online Journal of Issues in Nursing
A Scholarly Journal of the American Nurses Association

Obesity in Older Adults

Ann Mabe Newman, DSN, APRN, CNE

Abstract

The prevalence of obesity in the United States is increasing in all age groups. During the past 30 years, the proportion of older adults who are obese has doubled. In this article the author describes the prevalence and causes of obesity among older adults as well as the consequences of obesity in older adults. Recommendations for interventions to address obesity are also provided. Differences between the two groups of older adults, those 50 to 65 years of age, and those over 65 years of age, will be addressed. The goal of the article is to raise nurses' awareness of the challenges of obesity in older adults.

Citation: Newman, A., (January 31, 2009) "Obesity in Older Adults" *OJIN: The Online Journal of Issues in Nursing* Vol. 14, No. 1, Manuscript 3. Available: www.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TableofContents/Vol142009/No1Jan09/Obesity-in-Older-Adults.aspx

Key words: chronic illness, obesity, older adults

The prevalence of obesity in the United States (US) is increasing in all age groups. During the past 30 years, the proportion of older adults who are obese has doubled (Patterson, Frank, Kristal, & White 2004). The increased number of obese older adults is seen both as an increase in the total number of older obese persons in our population and as an increase in the percentage of the population that is obese (Villareal, Apovian, Kushner, & Klein, 2005). In spite of the increase in obesity among older adults, it is important to note that the majority of older adults are not obese and continue to lead active and healthy lives. The goal of this article is to raise nurses' awareness of the challenges of obesity in older adults. This article will describe the prevalence and causes of obesity among older adults, as well as the consequences of obesity in older adults. Recommendations for interventions to address obesity will be provided. Differences between two groups of older persons, those 50 to 65 years of age, and those over 65 years of age, will be addressed.

Prevalence of Obesity among Older Adults

Currently, 7% of the world's population is over 65 years of age. This figure is projected to rise to 12% by 2030. In the US it is projected to rise from 12% (35 million) to 20% (71 million) by 2030 (Yan et al., 2004). These substantial increases among older adults suggest that obesity among older Americans is likely to become a greater problem in the future (Center on an Aging Society, 2003). By 2000, the prevalence of obesity in people 50 to 69 years of age had increased to 22.9%, and for those above 70 years of age to 15%, representing increases of 56% and 36% respectively, since 1991 (Villareal et al., 2005).

Although the prevalence of obesity in persons who are over 80 years of age is about one-half that of older adults between the ages of 50 and 59, the fact is that more than 15% of the older American population is obese (Villareal et al., 2005). Moreover, as the aging population increases in number, so too will the number of chronic illnesses, which often accompany aging, increase in our society (Flood & Newman, 2007). Chronic conditions, such as arthritis, diabetes, hypertension, and heart disease, are among some of the most common, debilitating, and costly chronic conditions in older adults. These conditions are frequently accentuated by obesity (Federal Interagency Forum on Aging, 2006).

Causes of Obesity in Older Adults

An important determinant of body-fat mass is the relationship between energy intake and expenditure. Obesity occurs when a person consumes more calories than she/he burns. We need calories to sustain life and have the energy be active; yet to maintain a desirable weight, we need to balance the amount of energy we ingest in the form of food with the energy we expend (National Institutes of Health [NIH]), 2006). Weight gain occurs when the balance is tipped and we take in more calories than we burn. Most studies indicate that how much we eat does not decline with advancing age (Gary, Hunt, VanderJagt, & Vellas, 1992). Therefore it is likely that a decrease in energy expenditure, particularly in the 50- to 65-year-old age group, contributes to the increase in body fat as we age. In those 65 years of age and older, hormonal changes that occur during aging may cause the accumulation of fat. Aging is associated with a decrease in growth hormone secretions, reduced responsiveness to thyroid hormone, decline in serum testosterone, and resistance to leptin (Corpas, Harman, & Blackman, 1993). Resistance to leptin could cause a decreased ability to regulate appetite downward (Villareal et al., 2005). Genetic, environmental and social, as well as several other factors can all contribute to obesity. These factors will be discussed below.

Genetic Factors

The observation, often made by nurses, that obesity tends to run in families may lead us to believe that obesity is related to the genes a person has inherited; and science does show a link between obesity and heredity (NIH, 2006). Almost 20 years ago, researchers demonstrated the role of biological inheritance in fat variations (Bouchard, 1989). Bouchard found that visceral fat is more influenced by the genotype than subcutaneous fat. It appears that a genotype-overfeeding interaction component exists for body fat, which suggests that the sensitivity of an individual to changes in body fat following overfeeding is genotype dependent. In a recently released study, researchers used structural equation modeling to identify the specific relationship between genetic loci that affect adiposity and those that affect muscle growth (Brockman, Tsaih, Neuschi, Churchill, & Li, 2008). These important studies provide a substantial contribution toward the understanding of gene expression and how it can be used to expand our knowledge of obesity. While we cannot do anything about genetic inheritance, we can identify other factors that may also contribute to obesity in a given patient and address these modifiable factors as discussed below.

...science does show a link between obesity and heredity.

Environmental and Sociological Factors

Just as genetics plays a role in obesity, so does the environment. The environment includes the world around us; it influences access to healthy food and safe places to walk. What we eat, our level of physical activity, and our lifestyle behaviors are influenced by our environment. Our environment can prevent us from eating healthy foods and/or getting adequate exercise in a number of ways. Examples include the trend toward 'eating out' rather than preparing food in the home; high-fat, high-calorie foods in our workplace vending machines; neighborhoods that often lack sidewalks; and a deficit of readily accessible recreation areas.

...high-calorie, processed food is less expensive and quicker to prepare than fresh fruits and vegetables.

Poverty and lower levels of education have also been linked to obesity (NIH, 2006). It has been suggested that one reason why poverty and lower educational levels are risk factors for obesity is that high-calorie, processed food is less expensive and quicker to prepare than fresh fruits and vegetables (NIH, 2006). Through observation and the anecdotes patients have shared with me, I have come to believe the social environment indeed contributes to the increasing prevalence of obesity. To date, only a few research studies have focused on this factor.

Glass, Rasmussen, and Schwartz (2006) did investigate whether neighborhood psychosocial hazards, defined as "stable and visible features of neighborhood environments that give rise to a heightened state of vigilance, alarm, or fear in residents" (p. 4), independent of individual risk factors, were associated with the increased odds of obesity in older adults. After analyzing data from a cohort study of 1140 randomly selected community dwelling men and women who were 50 to 70 years of age, they found that 38% were obese. Residents living in the more hazardous neighborhoods were more than twice as likely to be obese as those living in the least-hazardous neighborhoods, even after controlling for behavioral and socioeconomic individual-level risk factors. The authors concluded that this significant finding demonstrates that neighborhood conditions can alter patterns of obesity. Community-level interventions that might lead to a reduction in environmental and sociological hazards include increasing educational attainment, increasing public safety, reducing crime rates, and eliminating vacant housing.

Other Causes of Obesity

Other conditions and illnesses that are associated with both weight gain and obesity include: hyperthyroidism, Cushing's syndrome, polycystic ovary syndrome, and depression (NIH, 2006). The older adults who are obese are more likely than those who are not obese to report symptoms of depression, such as feelings of sadness, worthlessness, and hopelessness (Center on an Aging Society, 2003). Lack of sleep may contribute to obesity, as well as certain drugs, such as steroids and some antidepressants that may stimulate the appetite, cause water retention, or slow the metabolism rate (NIH, 2008). Finally, the complex relationship between functional ability and lifestyle patterns merits attention as a contributor to obesity (Center on an Aging Society). Joint pain, decreased mobility, and activity intolerance may lead to weight gain because of decreased activity. Older adults are more likely than younger adults to experience functional limitations associated with chronic illnesses that may begin a stress-pain-depression cycle that can result in lifestyle patterns leading obesity (Lorig et al., 2006).

Consequences of Obesity in Older Adults

Health problems associated with obesity are classified as either *nonfatal* or *life threatening* by the World Health Organization (2005). This section will discuss the consequences of obesity on both nonfatal and life-threatening health problems. Interventions to address these particular consequences will be discussed as each consequence is presented. Specific interventions to decrease obesity will be discussed in the following section titled, "Interventions to Address Obesity."

Nonfatal Health Problems Related to Obesity

Debilitating conditions, such as those associated with respiratory, chronic musculoskeletal, and skin problems are classified as nonfatal, although it could be argued that any of these conditions could

become life-threatening. These conditions, which are aggravated by obesity, will be discussed below.

Respiratory problems. In obese patients, lungs decrease in size. Both the increased weight on the chest wall of obese patients and the difficulty they experience in lifting the heavy chest wall may contribute to difficulty in breathing (Wallace, Schulte, Nakeeb, & Andris, 2003). Obesity is known to induce respiratory mechanical impairment that may be combined with abnormalities in gas exchange (Zerah et al., 1993). In the obese elderly, these changes are accentuated by changes in the lung structure and function associated with normal aging. These changes in the lungs include decreased alveolar surface available for gas exchange, increased chest wall stiffness, and stiffening of the elastin and the collagen tissue supporting the lungs (Tabloski, 2006). The mass loading of the ventilator system induced by obesity alters the static balance within the respiratory system. Obese older patients often have a reduced respiratory efficiency that can reach the point of respiratory insufficiency in the presence of cardiovascular insufficiency of various degrees. The natural decrease in respiratory function in older patients exacerbates the decrease caused by obesity which may in turn lead to an increase in the sleep apnea syndrome, which, in these patients, is related to a greater risk of developing hallucinatory and cognitive disorders caused by hypoxia during sleep (Donini et al., 2006).

Endurance exercise when combined with a dietary weight loss program increases maximal oxygen consumption (Dick, 2004). Diet in conjunction with resistance and endurance exercises improves peak oxygen consumption as well. Nurses can teach patients with respiratory problems to do diaphragmatic or abdominal breathing to help strengthen respiratory muscles. Breathing exercises, as well as good posture, can help patients to exhale and inhale fully (Lorig et al., 2006). Pursed lip breathing may also be helpful for patients who are short of breath or breathless. Pursed breathing includes pursing the lips as if blowing a whistle; using diaphragmatic breathing out through pursed lips without any force; and remembering to relax the upper chest, arms shoulders, and arms while breathing out. Patients with sleep apnea need to be referred for sleep studies.

Arthritis and osteoarthritis. Arthritis is the leading cause of disability in older adults. A high body mass index (BMI) is an associated risk factor for knee osteoarthritis (OA) in older persons (Villareal et al., 2005). By 65 years of age the prevalence of osteoarthritis is 68% in women and 58% in men. This age-related increase in the prevalence of OA may reflect bodily changes as a result of a lifetime of being overweight which results in strain on weight-bearing joints (Villareal et al.).

Obesity, or even being overweight, increases the load placed on joints, especially the knee and hip joints. Breakdown in cartilage, resulting from the increased weight on joints, may result in pain and further functional disability (Lorig & Fries, 2006). Leveille, Wee, and Iezzoni (2005) reported that the relative risk of arthritis in people who are obese increases over time. People with arthritis are particularly vulnerable to the stress-pain-depression cycle mentioned above, in which the pain and stiffness caused by the disease leads to decreased mobility, thereby increasing stress, pain, and depression and likely decreasing quality of life (Newman, 2002). Obese older people above the age of 50 who have arthritis are more likely to say their condition limits their activities than non-obese adults in this age group (Center on an Aging Society, 2003).

For the older person with OA, the most important risk factor that can be modified is obesity. Karlson et al. (2003) noted during the Nurses' Health Study that of all the hip-replacement risk factors examined, including BMI, hormone replacement after menopause, alcohol use, physical activity, and cigarette smoking, only BMI and cigarette smoking were associated with needing a hip replacement.

The goal of managing arthritis is to maintain the maximum use and function of the joint and the surrounding muscles, tendons, and ligaments (Lorig et al., 2006). Exercise is the key to meeting this goal. However, many people with OA and other joint diseases believe that exercise will cause their arthritis to flare up and increase the pain. This is a misperception that nurses can work to dispel. Stretching exercises of all muscle groups should be done ten minutes a day as well as daily active range of motion for all joints. Isotonic exercises, which move the joint in an arc, are also helpful. Aquatic exercise and walking are usually well tolerated by older adults with mild to moderate lower extremity OA (Resnick, 2001). Heat is also helpful in managing arthritis because it reduces stiffness and makes exercise easier. Rest periods between activities help to control the fatigue of arthritis, which is compounded by obesity.

Although many cognitive-behavioral programs have been found to help people with arthritis manage their chronic condition, *The Arthritis Self-Management Course*, designed by a nurse and endorsed by the Arthritis Foundation, has been the most successful (Lorig, 2006). Nurses can make referrals to this program, or become self-management course leaders. Many of the interventions described in the upcoming section on *Interventions for Obesity in Older Adults* also apply to those having OA.

Skin conditions. Brown, Wimpenny, and Maughan (2004) found skin problems, including itching, skin breakdown, redness, and rashes, in 75% of the obese population they sampled. The two main causes of the reported skin problems were perspiration and friction. Groin, limbs, and under breasts were identified as the most troubling areas. Older adults who are obese and have skin problems face additional complications because their skin naturally loses about 20% of its dermal thickness with age (Baranoski, 2001). This combination of older age, fragile skin, and obesity increases the risk for pressure sores (Flood & Newman, 2007).

The first step in addressing skin problems is to conduct a skin assessment of obese patients. The specificity and degree of skin problems will determine the intervention. Nurses are advised to initiate measures to decrease friction as soon as possible after hospital admission. Additionally, in older women, urinary incontinence from a large, heavy abdomen causing the valve on the bladder to weaken may result in the leaking of urine when coughing or sneezing. Nurses should educate patients about keeping the area dry so as to prevent skin problems. Strategies to keep the area dry include wearing absorption pads in their underwear and changing underwear as soon as possible when leakage occurs.

Life-Threatening Illnesses Related to Obesity

The World Health Organization (2005) has noted that *life-threatening* illnesses related to obesity include cardiovascular disease; conditions associated with insulin resistance, such as type 2 diabetes; certain types of cancers, especially hormonally related and large-bowel cancer; and gallbladder disease. The next few sections will discuss these illnesses.

Cardiovascular disease. Coronary heart disease is responsible for significant morbidity and mortality in older patients who are 65 years and older. It remains a leading cause of mortality in the US with 84% of persons 65 years or older dying from this disease (Hanna & Wenger, 2005).

Grundy (2004) has described obesity as a major underlying factor contributing to atherosclerotic cardiovascular disease (ASCVD) and a factor associated with multiple other ASCVD risk factors, including elevated blood pressure, hypertriglyceridemia, low high-density lipoproteins, high cholesterol, and high fasting plasma glucose. It is also a risk factor for type 2 diabetes. Even though there is a strong association between obesity and ASCVD, the relationship underlying the mechanism is not well understood. The fact that obesity acts on so many metabolic pathways, producing so many potential risk factors, makes it challenging to delineate the specific mechanism by which obesity contributes to ASCVD. Gundy suggested that the fundamental question for controlling cardiovascular diseases related to obesity is: how can we intervene at the public health level to reduce the high prevalence of obesity in the general population. He added that indeed, "This approach offers the greatest possibility for reducing the cardiovascular risk that accompanies obesity" (p. 2600). The widely disseminated *Healthy People 2010* (U.S. Department of Health and Human Services, n.d.) challenges individuals, communities, professionals, and indeed all of us, to take specific steps to reduce obesity to ensure that good health, as well as long life, are enjoyed by all. Dietary modification is the cornerstone of treating cardiovascular disease in older adults who are obese. Interventions to decrease obesity are presented in the next section titled, "Interventions to Address Obesity."

Dietary modification is the cornerstone of treating cardiovascular disease in older adults who are obese.

Diabetes. Type 2 diabetes, the most common type of diabetes in older adults, results from interplay between genetic factors and environmental factors that contribute to obesity. Even a 15 pound weight gain can increase a person's risk of diabetes by 50% (Daniels, 2006). There is an age-related increase in total body fat and visceral adiposity until age 65 that is often accompanied by diabetes or impaired glucose intolerance (Wilson & Kannel, 2007). In the Framingham Study 30-40% of people over 65 were found to have diabetes or glucose intolerance. Coronary disease is the most common and lethal sequel of type 2 diabetes. Lean-muscle mass begins to diminish after the age of 65. This decrease may be related to decreased physical activity, disability, anabolic hormone production, or increased cytokine activity. If calorie intake continues at the same rate while the muscle mass decreases, the older person will most likely experience fat weight gain (Tucker, 2006).

The chief goal for obese diabetic persons is to avoid the common cardiovascular sequelae (Wilson & Kannel, 2007). The effect of sedentary behavior, particularly television watching, in relation to risk of type 2 diabetes was studied by a group of researchers who followed a cohort of subjects from the Nurses' Health Study (Hu, Li, Colditz, Willett, & Manson, 2003). These researchers reported that time spent watching TV was positively associated with risk of obesity and type 2 diabetes. Each two-hour-a-day increment in watching TV was associated with a 23% increase in obesity and a 14% increase in risk of diabetes. As with heart disease, a comprehensive approach to social and environmental factors, including weight reduction is suggested. Specific dietary modifications are suggested in the next section, "Interventions to Address Obesity."

Cancer. Obesity is also linked to higher rates of certain types of cancer (NIH, 2006). Breast cancer in older women is increasingly being linked to obesity (Sweeney, Blair, Anderson, Lazovich, & Folsom, 2004). Twenty-five to 30% of several major cancers, including breast (postmenopausal), colon, kidney, and esophageal, have been linked to obesity and physical inactivity (Vainio & Bianchini, 2002). Men who are obese are more likely to develop cancer of the colon, rectum, or prostate, than men who are not obese. Cancer of the gallbladder, uterus, cervix, or ovaries are more common in women who are obese compared with women who are not obese (NIH, 2006). Management of obesity is needed to decrease the incidence of these cancers.

Gallbladder disease. Obesity is a major risk factor for gallstones because obesity is believed to reduce the amount of bile salts in bile, resulting in more cholesterol. Additionally, gallbladder emptying is decreased as a result of obesity (National Digestive Diseases Clearinghouse, 2004). Again, management of obesity, as described below, is the primary approach for decreasing the incidence of this gallbladder disease.

Interventions to Address Obesity

As care providers for older adults, nurses are in a position to assist older adults who are obese in adopting changes to promote a healthier lifestyle. The primary goal is to achieve sustained lifestyle changes through dietary modifications, exercise, and use of community supports (Villareal et al., 2005). Strategies that promote lifestyle modifications include helping older adults who are obese to overcome barriers related to dietary changes and physical activity. Two well-developed programs, as well as general considerations to facilitate safe dietary changes and safe increases in physical activity, will be discussed below.

The Chronic Disease Self-Management Program

The Chronic Disease Self-Management Program has been developed by Kate Lorig, a nurse, and her colleagues at Stanford University. While this program is not directed specifically at obese older adults, it has been used to help people with heart disease, arthritis, diabetes, and respiratory problems learn to self-manage their conditions through increasing their *self-efficacy*. It develops confidence in one's ability to make the changes needed to lead a healthier life style through having participants make an action plan for each week. Each action plan addresses the questions of: what, how much, when, how often, and how confident older adults are that they can carry out the plan. Research has demonstrated that on a scale of one to ten (with ten being the most confident), people who rate themselves as at least a seven are more likely to be able to make the changes to become a more positive self-manager of their chronic condition than are those who score lower on the scale (Lorig et al, 2006). This program can be used as a prototype for nurses helping obese older adults to achieve success in losing weight.

The National Blueprint

The *National Blueprint* (n.d.) is a guide for organizations, associations, and agencies to help adults 50 years and older to increase their physical activity. This document synthesizes input from more than 65 individuals, representing 48 organizations, including the American College of Sports Medicine, the American Heart Association, and the National Institute on Aging (National Blueprint). The *Blueprint* addresses the barriers to increasing physical activity among older adults. It outlines suggestions related to addressing home and community, policy and advocacy, research, and other cross-cutting issues to overcome these barriers. Strategies in which nurses can be involved include:

...nurses can...assist clients to identify physical activity options that match their interests, lifestyles, and functional abilities; and identify opportunities for them to pursue these activities.

- Disseminating information about the benefits of physical activity in older adults to health professionals via professional journals, professional societies, and professional meetings.
- Assisting clients to identify physical activity options that match their interests, lifestyles, and functional abilities; and identify opportunities for them to pursue these activities.
- Providing health professionals with resources describing physical activity opportunities for the older population so professionals can make referrals and recommendation as appropriate.

The *National Blueprint* is available online in a printer-friendly version at <www.agingblueprint.org/>. It is an excellent resource for clinical practice as well as for generating ideas and plans for community service opportunities (Flood & Newman, 2007).

General Considerations to Facilitate Safe Weight Loss Strategies

Older persons present special challenges when making changes in diet and activity levels. In patients over 65, the increase in chronic diseases associated with aging reduces physical activity and exercise capacity, making it more difficult for elderly persons to lose weight. Widowhood, loneliness, isolation, and depression are other factors that need to be addressed during weight-loss programs (Villareal et al., 2005). Participation in these programs by family members, as well as caregiver(s) is especially important if the older person's vision and hearing are impaired or if there is cognitive impairment.

Appropriate nutritional counseling through referral to a registered dietitian is recommended to ensure that the older adult's daily nutritional requirements are met during weight-loss programs.

The benefits and risks of weight reduction in older adults should be carefully considered. Loss of lean body mass, which is already diminished in older adults, may not be appropriate in persons over 65 years of age because the loss of fat-free mass in older adults is associated with significant morbidity and mortality (Flood & Newman, 2007). A weight loss program that minimizes muscle and bone loss is recommended for the older adult who is obese and who has functional impairments or metabolic complications that might be improved by weight loss (Villareal et al., 2005). This is best achieved through a moderate reduction in daily calorie intake (500-750 kcal/d). Appropriate nutritional counseling through referral to a registered dietitian is recommended to ensure that the older adult's daily nutritional requirements are met during weight-loss programs. It is important that the diet continue to contain 1.0g/kg of protein and include 1500mg Ca/d, as well as 1000 IU vitamin D/d (Villareal et al.).

Improving physical function and helping to preserve muscle and bone mass through regular physical exercise is important in older adults who are obese. Increasing flexibility, endurance, and strength are the goals of regular exercise in older adults who are obese. Stretching, aerobic, and strengthening exercises are recommended by the American Society for Nutrition and the North American Association for the Study of Obesity and the Obesity Society, even for very old or frail persons (Villareal et al., 2005). To avoid musculoskeletal injuries and encourage adherence, exercise should be started at a low intensity and gradually progress over several weeks or months to a more vigorous level.

Conclusion

The number of obese Americans ages 65 and older will increase from 10.3 million to 14.3 million by 2010, averaging 400,000 new obese adults per year (Arteburn, Crane, & Sullivan, 2004). Today, more than 65% of adults in the United States are overweight or obese. Obesity puts people at risk for heart

disease, type 2 diabetes, high blood pressure, stroke, and some types of cancer.

The large number of older people with obesity and associated serious health risks make understanding the causes of obesity crucial. Obese older adults are more likely to be severely disabled and require the assistance of another person than those who are not obese (Center on an Aging Society, 2003). Older adults who are obese are more likely to suffer from persistent and chronic symptoms of illness, and to report symptoms of depression. In addition to having difficulty with activities of daily living, older obese adults are more likely to not be able to walk very far, go shopping, or participate in other activities that enrich our lives (Center on an Aging Society).

In patients over 65, the increase in chronic diseases associated with aging reduces physical activity and exercise capacity, making it more difficult for elderly persons to lose weight.

This article has presented formal programs nurses can use to help patients manage their weight along with general considerations to facilitate weight loss safely in older adults who are obese. As trusted and respected healthcare professionals, it is time for nurses to take the lead in combating the obesity epidemic.

Author

Ann Mabe Newman, DSN, APRN, CNE
E-mail: amnewman@uncc.edu

Dr. Ann Mabe Newman received a Diploma in Nursing from The University of Virginia, a BSN from The University of North Carolina at Charlotte, a MSN from the University of North Carolina at Chapel Hill, and a DSN from The University of Alabama-Birmingham. She received CNE certification in 2007. Currently she is an Associate Professor at the University of North Carolina at Charlotte where she has served as President of the Faculty Senate and received the prestigious Bank of America and Governor's Award for teaching excellence. Dr. Newman has also served on the State Board of Nursing for North Carolina and most recently on the American Nurses Association Congress on Nursing Practice and Economics. For the past 20 years she has maintained a research program on self-management in chronic illness, and she has published extensively on this topic. Dr. Newman's work has focused on using the concept of *self-efficacy* to encourage clients, students, and community groups to accomplish things they thought were not possible. Ann notes that as a healthy, older person, her respect and admiration for older adults who persevere in spite of their chronic illnesses continues to grow.

References

Arteburn, D., Craine, P., & Sullivan, S. (2004). The coming epidemic of obesity in elderly Americans. *Journal of the American Geriatric Society,* 52, 1907-1912.

Baranoski, S. (2001). Skin tears. *Nurse Manager*, 32, 25-31.

Bouchard, C., (1989). Genetic factors in obesity. *Medical Clinics of North America*, 73(1), 67-81.

Brockman, G., Tsaih, S., Neuschi. C., Churchill, G., & Li, R. (November 4, 2008). Genetic factors contributing to obesity and body weight can act through mechanisms affecting muscle weight, fat weight or both. *Physiological Genomics, 10,* 1152.

Brown, J., Wimpenny, P., & Maughan, H. (2004). Skin problems in people with obesity. *Nursing Standard*, 18, 38-42.

Center on an Aging Society (2003). *Obesity among older Americans.* Retrieved July 23, 2008, from http://ihcrp.georgetown.edu/agingsociety/pdfs/obesity2.pdf

Corpas, E., Harman, S., & Blackman, M., (1993). Human growth hormone and human aging. *Endocrinology Review,* 14, 20-39

Daniels, J. (2006). Obesity: America's epidemic. *American Journal of Nursing,* 106, 40-9.

Department of Health and Human Services (2000). *Healthy people 2010: Understanding and improving health. (2nd ed.)*. Washington, DC: U.S. Government Printing Office.

Dick, J.J. (2004). Weight loss interventions for adult obesity: Evidence for practice *Worldviews On Evidence-Based Nursing / Sigma Theta Tau International, Honor Society Of Nursing, 1*(4), 209-214.

Donini, L., Chumlea, W., Vellas, B., del Balzo, V., & Cannalla, C. (2006). *Aging Health.* 2, 47-51. Retrieved August 12, 2008, from www.futuremedicine.com.doi/abs/

Federal Interagency Forum on Aging (2006). *Older Americans update 2006: Key indicators of well-being.* Retrieved July 22, 2008, from www.aginastats.gov/agingstats.net/

Flood, M., & Newman, A. (2007). Obesity in older adults: Synthesis of findings and recommendations for clinical practice. *Journal of Gerontological Nursing*, 33, 19-35.

Gary, P., Hunt, W., Koehler, K., & VanderJagt, B. (1992). Longitudinal study of dietary intakes and

plasma lipids in healthy elderly men and women. *American Journal of Clinic Nutrition,* 55,682-688.

Glass, T., Rasmussen, M., & Schwartz, B. (2006). Neighborhoods and obesity in older adults: The Baltimore memory study. *American Journal of Preventive Medicine*, *31(6), 455-463.* Retrieved November 12, 2008 from: www.pubmedcentral.nih.gov/articlerender.

Grundy, S. (2004). Obesity, metabolic syndrome, cardiovascular disease. *The Journal of Clinical Endocrinology & Metabolism. 89,* 2595-2600.

Hanna, I. & Wenger, N. (2005). Secondary prevention of coronary heart disease in elderly patients. *American Family Physician*, 7, 2209-2296. Retrieved September 1, 2008, from www.aafp.org/afp/2005615/2289.html

Hu, F., Li, T., Colditz, G., Willett, W., & Manson, J. (2003). Television watching and other Sedentary behaviors, in relation to risk of obesity and type 2 diabetes mellitus in women. *JAMA,* 289, 1785-1791.

Karlson, E., Mandl, L., Aweh, G., Sangha, O., Liang, M., & Grodstein, F. (2003). Total hip replacement due to osteoarthritis: The importance of age, obesity, and other modifiable risk factors. *American Journal of Medicine*,*114*, 93-98.

Leveille, S., Wee, C., & Iezzoni, L. (2005). Trends in obesity and arthritis among baby boomers and their predecessors 1971-2002. *American Journal of Public Health,* 95(9), 1607-1613.

Lorig, K., & Fries, J. (2006). *The arthritis helpbook, 6th ed.* Reading, MA: Perseus.

Lorig, K., , H., Sobel, D., Laurent, D., Gonzalez, V., & Minor, M. (2006). *Living a healthy life with chronic conditions 3rd ed.* Boulder, CO: Bull.

National blueprint: Increasing physical activity among adults aged 50 and older. (n.d.). Retrieved January 26, 2009 from www.agingblueprint.org/

National Digestive Diseases Information Clearinghouse (2004). *Gallstones.* Retrieved August 15, 2008, from http://digestive.nidd.nih.gov/ddiseases/pubs/gallstones/index.htm#causes

Newman, A. (2002). Patient teaching tools and self-help techniques: Focus on cultural diversity. In Luggen, A. & Meiner, S (Eds.)., *Care of Arthritis in the Older Adult.* NY: Springer.

NIH Publication No. 01-3680 (2006). *Understanding adult obesity.* Retrieved July 23, 2008 from, http://win.niddk.gov/publications/understanding.htm

Patterson, R., Frank, L., Kristal, A., & White, E. (2004). A comprehensive examination of health conditions associated with obesity in older adults. *American Journal of Preventive Medicine,* 27, 385-390.

Resnick, B. (2001). Managing arthritis with exercise. *Geriatric Nursing, 22*(3), 143-150.

Sweeney, C., Blair, C., Anderson, K., Lazovich, D. & Folsom, A. (2004). Risk factors for breast cancer in elderly women. *American Journal of Epidemiology,* 160, 868-875.

Tabloski, P. (2006). The respiratory system. *Gerontological Nursing.* (pp. 460-516. Upper Saddle River, NJ: Pearson Prentice Hall.

Tucker, S. (2006). Nutrition and aging. In PA Tabloski (Ed.) *Gerontological Nursing.* (pp. 110-154). Upper Saddle River, NJ: Pearson Prentice Hall.

U.S. Department of Health and Human Services. (n.d.). *Healthy people 2010*. Retrieved January 26, 2009 from: www.healthypeople.gov/

Vainio, H., & Bianchini, F (Eds.).(2002). *IARC handbooks of cancer prevention Vol. 6: Weight control and physical activity.* Lyon, France: IARC Press.

Villareal, D., Apovian, C., Kushner, R., & Klein, S. (2005). Obesity in older adults: technical Review and position statement of the American Society for Nutrition and NAASO, The Obesity Society. *American Journal of Clinical Nutrition,*82(5), 923-934. Retrieved October 19, 2008,from www.ajcn.org/cgi/content/full/82/5/923.

Wallace, J., Schulte, W., Nakeeb, A., & Andris, D. (2003). *Health problems related to severe obesity.* Retrieved July 24, 2008, from http://healthlink.mcw.edu/article/984434798.html

Wilson, P., & Kannel (2007). Obesity, diabetes, and risk of cardiovascular disease in the elderly. *The American Journal of Geriatric Cardiology, 11,* 119-124.

World Health Organization (2005). *Global strategy on diet, physical activity, and health.* Retrieved July 24, 2008, from www.who.int/dietphysicalactivity/publications/facts/obesity/en/

Yan, L.L, Daviglus, M.L., Liu, K., Pirzada, A., Garside, D.B., Schiffer, L., et al. (2004). Body mass index and health-related quality of life in adults 65 years and older. *Obesity Research*, *12*, 69-76.

Zerah, F., Harf, A., Perlemuter, L., Lorino, H., Lorino, A., & Atlan, G. (1993). Effects of obesity on respiratory resistance. *Chest*, 103, 1470-1476.

Related Articles

- Weight-Loss Surgery
  Nancy J. Kaser, MSN, RN, ACNS-BC; Aniko Kukla, MSN, RN (January 31, 2009)
- Advocating for the Prevention of Childhood Obesity: A Call to Action for Nursing
  Bobbie Berkowitz, PhD, RN, FAAN; Marleyse Borchard, MPH (January 31, 2009)
- Essentials of a Bariatric Patient Handling Program
  Marylou Muir, RN, COHN; Gail Archer-Heese, BEd, O.T.Reg (MB) BMR (January 31, 2009)
- Obesity: An Emerging Concern for Patients and Nurses
  Susan Gallagher Camden PhD, MSN, MA, RN, CBN (January 31, 2009)

ISSN: 1091-3734 | 1-800-274-4ANA | Copyright Policy | Privacy Statement