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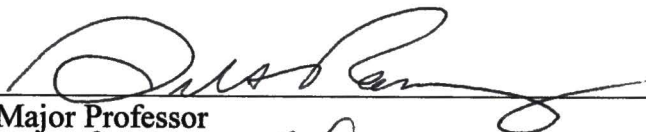
Cummings, Dana M., Enhancing the Care of the Elderly; an Educational Intervention to Improve Nutritional Knowledge of Nursing Home Staff. Master of Public Health, June 1998, 81 p.p., 5 tables, bibliography, 15 titles.

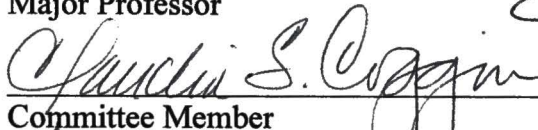
Gross deficiencies exist in the quality and quantity of health care personnel taking care of the aged (Hersch, 1989). Eighty to ninety percent of nursing home staff are untrained aides paid the minimum wage to care for one of the sickest and frailest populations in the United States (Patenaude, 1997). The purpose of this study was to determine if short term nutrition education, utilizing principles for adult learners, would result in knowledge improvement in nursing home staff. An interactive, participatory instructional model was implemented into an existing structure of regular staff inservices to answer this question. To test the effectiveness of the intervention a questionnaire was developed using items from previously validated instruments. Using three nursing homes in the Dallas-Fort Worth metroplex, a total of 157 pre-test and 132 post-test questionnaires were completed. A significant increase in overall knowledge from 80.6% at baseline to 96.1% at post-test was found ( $p < .001$ ). Participants also showed a significant ( $p < 0.001$ ) overall increase in knowledge for each of the three learning domains; patient care related to nutrition, food and fluid intake of residents, and eating. These findings suggest that employing short-term education to nursing home staff, using principles for adult learners, can improve nutritional knowledge significantly.


ENHANCING THE CARE OF THE ELDERLY; AN EDUCATIONAL  
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OF NURSING HOME STAFF

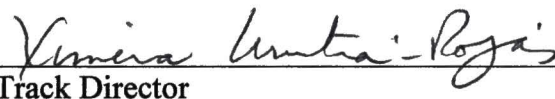
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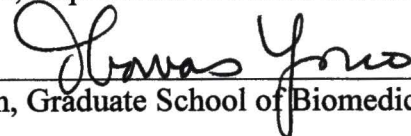
  
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## INTRODUCTION

The segment of the population over 65 has reached close to 40 million in the United States and they are rapidly becoming one of the largest groups utilizing medical care (Chernoff, 1995). Public health professionals are challenged to determine appropriate and effective ways to ensure improved health in this population.

It has been well established that throughout the aging process nutrition plays a key role in the prevention and treatment of most disease states, reduces complications of illness, and enhances quality of life (Weddle, 1996). However, it has also been shown that nutrition knowledge among health care professionals is lacking (Bahl & Hamilton, 1993). Therefore, since many of the elderly depend on health care professionals for assistance, it is essential that the entire health care team be informed about medical nutrition therapy and its benefits.

The purpose of this research project was to determine if short-term nutritional education to direct-care staff in nursing homes would result in significant improvement in nutritional knowledge. An interactive, participatory instructional model was implemented as part of an existing structure of regular staff inservices to answer this question. Principles for adult education were incorporated as part of the model. The major premise of this research was that care of the elderly would be improved with increased nutritional knowledge of long-term care staff.

## REVIEW OF LITERATURE

The elderly are the fastest growing age group in the United States. In 1994, 33 million adults (13% of the population) were 65 years and older. It has been estimated that these numbers will double over the next four decades (Greenburg, 1997). Health professionals, both public and private, are challenged more than ever to help ensure that elderly individuals have enjoyable, productive, and healthful lives as they continue to grow older. To be prepared for the increased elderly population it is important to understand aging, the impact of disease, and other health problems that will affect their quality of life and their overall needs.

The research project was designed to utilize principles of adult education to teach nursing home staff the importance of nutrition in aging. The following review of literature examines nutrition and its role in aging, the need for nutrition education of health care professionals, and principles for adult learning. For the purpose of this review and research, three knowledge domains are recognized. Domain One is patient care related to nutrition. It includes topics on preventing nutrition-related problems, measuring height and weight, positioning at meals, and establishing a pleasurable dining experience. Domain Two is food and fluid intake of residents. Topics covered were charting the amount of food and fluid consumed by the resident, swallowing problems, procedures for adequate intake of food and fluids. Domain Three is eating. Decreased senses, aspiration, feeding residents, and serving meals were the topics covered.

## **Nutrition and Aging**

For people over 65 that permanently live in institutions such as nursing homes, elder care hospitals, or assisted care homes, life is not necessarily easy. These patients need more help and care than they can receive at home and they may spend months or years living in these facilities. The task of determining the needs of the elderly is difficult because this population is the most diverse of any age group. Individual rates of physiologic and functional health differ significantly in this segment of the population. Additionally, many elderly have multiple diseases and can no longer function independently. Some do not have relatives, or their relatives and friends live far away. Those who care for the 1.5 million institutionalized elders living in the nation's 20,000 nursing homes face major responsibilities and challenges (Abbasi & Rudman, 1994).

## **Evolution of Nursing Homes**

It is noteworthy to examine the evolution of nursing homes to meet the needs of the elderly. A qualitative study by John Burton (1994) describes how nursing homes must change into complete, comprehensive geriatric centers. He suggests that the elderly are the heaviest and most vulnerable users of health care in the United States and now need access to comprehensive care. Recently geriatric care facilities have begun to see a change in the type of patients that are admitted. Patients have been admitted directly from the hospital both sicker and after shorter hospital stays. Their increased mortality rate compared to the same age individuals not in nursing homes suggests that long-term care patients are suffering from more acute illnesses. Once admitted into long term care they tend to frequently be readmitted to the hospital, indicating the instability of the

population. Exacerbating the problem is the rapid increase of alternative services for the elderly to support lower levels of care, thus shifting the responsibility and function of the nursing home to become more comprehensive for a higher level of care.

There is now a demand for on-site physicians, many types of practitioners, a wide variety of services more like that of a hospital, and cross-trained staff members to do a variety of tasks. Only when nursing homes provide a full continuum of health care programs will they serve the needs of institutionalized elderly effectively.

### Elder Care Priorities

Educational intervention goals should be based on an assessment of the priorities of both residents and staff. A study by Nores (1997) helped describe how patients handle institutional care. A total of 120 elders from 37 long-term care institutions in Finland were interviewed using a 96-item questionnaire. All patients were oriented to both time and place and could communicate verbally. Although mentally healthy, most had many physical diseases and 28% were bedridden. Twelve factors that affect an elderly patient's life in an institution were identified. They included: 1) being understood, 2) being heard, 3) being able to be oneself, 4) being liked and accepted, 5) being able to discuss worries, 6) knowing that illness-related pain is taken seriously, 7) receiving support, 8) participating in daytime activity, 9) sensing a good atmosphere in the institution, 10) having no need to fear nurses, 11) receiving gentle care, and 12) knowing that needs, wants, and opinions were taken into account (Nores, 1997).

A similar study by Roberts and Philp (1996) studied the perspective of purchasers (health commissions, general practitioners) and providers (business, nursing, therapy

managers) in terms of performance measures in geriatric medical services. Utilizing a postal questionnaire, participants ranked fifteen specific measures in order of priority. The top ranked measures were improving patients' quality of life and improving their physical function; both of which can be achieved by improving nutritional care.

In order to more effectively serve the needs of the elderly it is important to consider areas of priority in the care of these populations. It has been well documented that nutrition plays a key role in the health of these populations, not only in the prevention of disease complications, but also in the improvement of their quality of life (Gray-Donald, 1995; Morley & Silver, 1995). The following is a brief review of some of the nutrition-related problems seen in the nursing home setting.

### Malnutrition

Many older adults are at risk for malnutrition. An evaluation of the Elderly Nutrition Program of the Older American's Act indicated that 67-88% are at increased nutritional risk (Weddle, et al., 1996). Malnutrition in the elderly contributes to premature death and lower quality of life. It also contributes to serious illness, decreased functional status, and disability. Treatment and proper nutrition can benefit the elderly in many ways. Nutritional interventions should begin with an assessment of the patient to include the following:

- Diagnosis, body weight, estimated nutritional needs, ability to self-feed, and food preferences (Domain One).
- Investigate for chewing and swallowing problems.

- Consider the most appropriate diet; possibly to include supplements, enteral, or parenteral feeding.
- Continue to reassess during patient stay.

Calories must be adequate, protein should be given at a level to promote anabolism, and vitamins and minerals will be essential.

### Osteoporosis

A very important nutrition related problem is the common condition of osteoporosis (Domain One). Osteoporosis literally means 'porous bone'. Gamble (1995) outlines some primary risk factors for osteoporosis including Caucasian or Asian race, genetic factors or positive family history, excessive caffeine and/or animal protein intake, smoking, alcohol use, menopause, age, and sedentary lifestyle. The disease affects 25 million Americans and is the cause of 1.5 million fractures yearly. After age 65, osteoporosis related fractures occur in 1 in 2 women and 1 in 5 men (Gamble, 1995). Additionally, fractures increase the likelihood that an individual will die or be institutionalized within a year. Ironically, a consequence of osteoporosis may be both falls and fractures, but both of those may also act as a risk factor for osteoporosis or the worsening of existing osteoporosis (Mykyta, 1997).

Specific therapies for osteoporosis include an adequate level of physical activity, including weight bearing activity, and an avoidance of immobilization. Additionally, it is recommended that nutritional interventions include calcium and vitamin D to be supplemented for normal bone metabolism. Replacing the sex hormone estrogen in women and testosterone in men may offer a preventive factor to help decrease bone loss.

Finally, bisphosphonates (available by prescription) have been shown to be effective at increasing bone mineral density (Mykyta, 1997). It is most important to remember that it is never too late to start therapy no matter what the specific goal. Initiating some type of intervention can help prevent the complications of osteoporosis.

### Oral Health

Another very important contributor to nutritional health is dental condition (Domain One). When caring for the elderly, dentists must go beyond the health of the oral cavity. Diagnosis, medications, and functional limitations must be identified in order to determine the patient's ability to contribute to oral self-care (Shay, 1994). A decrease in self-care ability can increase the risk of oral problems, especially in nursing homes, where dental care and oral hygiene are neglected. Exacerbating the problem according to Mojon, et al. (1995) is that most root caries in the elderly are covered and masked by plaque. In institutionalized elderly an average of 17 of the original 28 teeth remain. Approximately 53% have dentures but up to 34% of those do not wear them. Periodontal disease, gingivitis, and caries affect up to 78% of those in nursing homes (Henry and Ceridan, 1994). Under OBRA-87 it became public law to provide routine and emergency dental services to meet the needs of the residents. However, only about 19% of dentists provide care to nursing homes because of poor reimbursement and inadequate treatment facilities (Henry and Ceridan, 1994). It is important that oral health needs are met for this population due to complications, especially nutritionally, when the oral cavity is not healthy.

## Dysphagia

In addition to having oral health problems, approximately 50% of residents in long term care facilities have dysphagia, a swallowing disorder (Domain Two and Three). It has also been reported that between 10,000 and 12,000 Americans choke to death each year (Logemann, 1992). Some common causes of dysphagia are neurological disorders, stroke, Parkinson's Disease, Alzheimer's Disease, muscular dystrophy's, head or neck cancers, and even certain medications. Simply put, the diagnoses seen most frequently in the nursing home are those associated with dysphagia. A normal swallowing reflex causes food or fluid to pass from the mouth through the pharynx and esophagus into the stomach. If any phase of swallowing is not functional it can result in pocketing of the food in the mouth, drooling, gagging, choking, and regurgitation. Residents may be unable to suck through a straw, have chronic upper respiratory infections, or a gurgly voice or moist cough after swallowing (Mahan and Arlin 1992). The consequences of dysphagia in elders can range from discomfort, to chronic coughing, aspiration, pneumonia, dehydration, and malnutrition. It is very important that staff members are aware of these problems and that speech therapists and dietitians become a part of those resident's daily care.

## Hearing and Vision

Other senses are important to discuss in the care of the elderly (Domain Three). Approximately 80-90% of elderly in institutionalized settings have hearing disorders while 40-50% have some form of visual impairment. Therefore according to the American Civil Liberties Union and the Americans with Disabilities Act, communicating

with patients plays an important role in ethics (Wright, 1997). Health care professionals must learn to effectively communicate medical information to the patients.

Misunderstood information causes anxiety, confusion, and may even be life threatening. Most healthcare facilities employ speech and occupational therapists as resources to help communicate with this population.

### Dementia

Another wide spread problem in the health of the elderly is late life dementia, affecting more than 30 million individuals in the United States (Reisburg, Enc. Of Aging). Dementia has a large effect on the nutritional status of individuals. Residents may lose the ability to perform simple tasks and actions like setting the table or using silverware (Domain Two and Three). Patients begin to prefer highly salted, seasoned, or sweetened foods because they may have a difficult time recognizing and detecting flavors (Gray, 1989). Constant movement causes the patient's energy needs to increase by as much as 1600 calories per day. However, those needs are often not met as some residents no longer recognize food, others refuse to eat, and most all patients require considerable assistance at meal times or must be fed. Weight loss is very common and averages 5 kilograms per year once the patients are institutionalized since they seldom consume sufficient calories (Gray, 1989).

### Pressure Ulcers

Pressure ulcers affect approximately 23 percent of nursing home patients (Domain One). The condition is a very serious one that can be difficult to treat, painful, and even require extended stays. A pressure ulcer is defined as any lesion caused by pressure

resulting in underlying tissue damage or death. They are most often seen over bony prominences and pressure points like ankles, shoulder blades, sacrum, elbows, and the back of head. Furthermore, decubitus ulcers are categorized by four stages to describe severity of skin breakdown (Campbell, 1994 & AHCPR, 1994). Stage I, the most minor form, includes epidermal redness, warmth, edema, or hardness of the area. Stage IV, the most serious form, includes skin loss and destruction, tissue necrosis, damage to bone, muscle, and joints. In more serious stages surgical wound closure, removal of necrotic areas, nutrition support and antibiotics are used (Campbell, 1994 & AHCPR, 1994).

It has been widely recognized that nutrition plays a major role in skin integrity and healing. Poor nutrition can be a primary cause of pressure areas when cachexia, dehydration, hypoalbuminemia, anemia, vitamin deficiencies, or improper caloric intake are present. It is very important not only that the body is well hydrated to ensure proper circulation, but that circulating proteins are also available to make tissues less susceptible to skin breakdown. Frequently, increasing protein intake in those with pressure areas is often emphasized. Vitamins A, C, and Zinc are routinely supplemented due to their proven role in collagen synthesis, cellular proliferation, and wound healing (AHCPR, 1994). It is important to note that one nutrient alone is not enough to heal a wound and therefore sufficient calories, vitamins, minerals, and nutrients must all be provided.

### Urinary Incontinence

Noted as a risk factor for decubitus ulcers, urinary incontinence, or inability to control urine flow, is quite common in the elderly. Fifty percent of all women and twenty percent of all men will be incontinent at some point in their life (Family Health Media,

1994). Urine control is defined as the ability to inhibit the passage of urine until an appropriate time. Treatment includes diet therapy such as avoiding urinary stimulants such as caffeine, alcohol, smoking, acidic juices, nutra-sweet products, and chocolate (Family Health Media, 1994). Most importantly, fluid intake should not be restricted (Domain Two). It should average 14-20 milliliters per pound body weight (Wells, 1986). Too little fluid contributes to UTI and constipation or impactions.

### Elder Abuse

A rapidly growing concern in the health and well being of the elderly is elder abuse, neglect, and exploitation. It is not uncommon to open a newspaper and find headlines like some of those noted in the last ninety days:

"State cites violations at 5 nursing homes" (Star Telegram, 8-10-97),

"States sues nursing center in man's death" (Star Telegram, 8-19-1997),

"Local nursing home sued for improper care" (Burleson Star, 8-13-97),

"Nursing home accused of showing neglect" (Star Telegram, 9-12-97), and

"Nursing home death a tragedy of silence" (Star Telegram, 10-26-97).

Since the 1987 Amendment to the Older American's Act, which established definitions of what constitutes neglect, abuse, and exploitation of the elderly, many such cases have been identified.

Institutional abuse, in this case, refers to any types of abuse that occur in residential facilities for older persons. Most often the perpetrators of the abuse are those persons paid to provide care to the individual. This includes a refusal to provide the residents with adequate food, water, clothing shelter, personal hygiene, medication, and

safety ([www.interinc.com/NCEA](http://www.interinc.com/NCEA)). It is important for staff members to be educated on basic nutritional principles. If their residents are not properly provided with food and water these conditions constitute abuse.

In conclusion, it is apparent that even in the presence of adequate food supply as mandated by law, inadequate food intake occurs often in the nursing home. Despite the regulations for foods to meet the resident's nutritional needs, be prepared in a sanitary environment, and served in an appropriate setting, there is no system in place to ensure good intake of food in elders (Abbasi & Rudman, 1994). Promotion of adequate nutritional status requires more than just serving a good, hot meal. Rather, the elderly present a challenge since they are combated with all of the problems discussed above; altered senses, dementia or depressed mood, swallowing problems, skin breakdown, fluid restriction, poor teeth, and osteoporosis.

After reviewing the literature it is evident that many problems seen in the nursing home are nutrition related. It is an unfortunate reality that malnutrition is a common, and usually undetected and/or untreated problem in long-term care institutions. In fact, often times in addition to the poor health of the elderly individual, lack of appropriate knowledge in staff members can exacerbate the problems of undernutrition. The domains included in this research were established to address that lack of knowledge. Domain One is patient care related to nutrition; Domain Two is food and fluid intake of residents; and Domain Three is eating.

## **The Need for Nutritional Education of Health Care Professionals**

Peter Mason (1994) writes in his article *Unhappy Eaters* that nursing home care staff, including nurses, often ignore the importance of diet to an older person's well being. It is very easy for them to arrange care regimens around their schedule, rather than that of the resident. For example, serving dinner at 4:30 p.m. without another meal until 8:00 a.m.. Staff members have a crucial role in determining reasons for undernutrition and becoming more involved in nutrition assessment.

Abbasi and Rudman (1994) pointed out that medical charts in many nursing homes show no documentation of awareness of underweight status or hypoalbuminemia. They concluded that undernutrition could be reduced by correcting modifiable causes such as staff unawareness and suboptimal feeding assistance. Further, they suggest that the prevention or correction of undernutrition is dependant upon the care of all staff members, not just the dietitian. In fact, Sullivan (1995) documented that after following a cohort of patients, a lack of consistent clinical response to the dietitian's recommendations was found. Additionally, he identified many reversible and preventable problems on the staff's part that contribute to the elderly's continued poor nutritional status. Those included: 1) failure of staff members to set up meal trays or provide feeding assistance, 2) use of inappropriately restrictive diets, 3) failure to follow resident's food preferences, 4) providing food of the wrong texture or consistency, 5) giving medications that cause nausea or anorexia, 6) lack of alternative feeding schedules like six small meals daily, 7) environments non-conducive to eating, and 8) frequently changing the resident's dining location. He suggested that in order to guarantee optimal nutrition of the

residents, a greater understanding of nutrition related issues must be acquired, and that monitoring and treating malnutrition requires the efforts of all staff members. To provide quality services to the elderly, staff must be trained on principles that are important in day to day care such as nutrition.

### Recommendations for Nutrition Education

#### Healthy People 2000, National Health Promotion and Disease Prevention

Objectives provides a vision for improving health for all Americans, many of which are 65 years and older. The objectives recommend that 75% of all visits to a health care provider include nutrition education (O'Sullivan-Malliet, et al, 1997). A further goal is to increase to at least 75% the proportion of primary care providers who provide nutrition assessment and counseling, or referral to qualified dietitians. The Surgeon General's Report on Health Promotion and Disease Prevention states that training in nutrition for health professionals should have high priority and nutrition training and services should be promoted in health care settings (Fitz, 1997). According to the article by Fishman (1996) however, more work is needed to combat the problem of malnutrition in the aged. To achieve the goals set forth in the objectives, significant gains must be made before the millennium. To help accomplish this he suggests that health promotion and disease prevention activities centered around nutritional care should be integrated into all aspects of geriatric care.

The future will bring demands for more services and different options than those that presently exist in long term care facilities (Chernoff, 1995). In fact the role of professionals in these facilities are already changing. The Nutrition Screening Initiative

sponsored by the American Dietetic Association, the American Academy of Family Physicians, and the National Council on Aging has improved nutrition promotion in the elderly. Their concept of nutritional risk screening grew into a national effort and brought many health professionals to a new level of knowledge about nutritional care. Further, Age Wave, a consultant firm has stated major factors that will influence the success of health care institutions for the aged. One of those is the expansion of traditional health care services and professional roles and therefore, recognizing risk factors for poor nutritional status in the elderly should be an interdisciplinary team approach (Morley & Silver, 1995). The rising number of older clients entering the health care system will mandate such coordination of health care providers.

#### Nutritional Knowledge of Health Care Professionals

Although more than 10 percent of the population is over the age of 65, very few people know why hair turns gray and skin wrinkles when you get older (Blysyone, et al, 1988). The lack of knowledge about basic physiology of aging leads to the assumption that there is also little knowledge of more complex issues of aging such as nutrition care of the elderly. In fact, surveys have shown that nutrition education is either absent or inadequate in schools for health professionals (Bahl & Hamilton, 1993). The role of nutrition in the causation, treatment, and prevention of diseases is not generally part of the curriculum. Further, training programs for most types of nursing home workers do not include information on nutrition and its relation to physical health, psychosocial health, and overall well being (Glanz and Scharf, 1985). It has been documented in the literature that few valid and reliable testing instruments exist to adequately measure nutritional

knowledge of health care providers (Nelson, et al, 1997). It is ironic that although the importance of nutrition in the management of disease is well known as summarized above, this vital subject has been overlooked in the training of allied health professionals.

Health care aides, which make up 80-90% of nursing home staff, rarely have a educational background beyond high school (Patenaude, 1997). Many do not have their high school diploma and they generally do not have any medical background other than their experience as an aide. If they are trained aides, their training would have included topics like bathing and transferring a patient and very little or no information related to nutritional care. As a primary care provider in the nursing home, aides could greatly benefit from nutrition education.

The licensed practical nurse (LPN), which also makes up a large proportion of the staff in nursing homes, can also benefit from nutrition education. Almost on a daily basis the LPN must deal with problems regarding dietary intake. In these institutions they are involved in providing bed side nourishment to the elderly patient. Obviously nutrition is very important in maintaining a state of wellness in each patient. The LPN must have a sound basic knowledge of nutrition in order to support patient's need to consume the nutrients necessary to meet basic needs and to maintain health (Oklahoma State Dept., 1990).

Nutrition education has long been recognized as an essential component of nursing education for those seeking registered nurse (RN) status (Morse, 1997). The American Nursing Association states that nursing is the "diagnosis and treatment of human responses to actual or potential health problems." Nutrition is an integral part of

the prevention, management, and treatment of those health problems. As the health care professional with the first and most sustained contact with the patients, the nurse plays a central role in supporting nutritional well-being (Weigley, 1997). Articles exist in the literature that offer guidelines for nutrition evaluation to be used by nurses in clinical practice (Houston, 1989).

Though not included in this study, physicians can also benefit from nutrition education. Surveys have revealed that up to 70% of medical schools do not offer a required course in nutrition and 25% do not offer elective nutrition courses (Bahl & Hamilton, 1993). The National Academy of Sciences note that scientific conferences and congressional hearings have reinforced the need to improve nutrition education in US medical schools (Hark, 1997). Further, the position of the American Dietetic Association is to support the inclusion of nutrition education as a component in all levels of medical education (White, 1994). Many articles can be found on the importance of including medical-nutrition education in the curriculum (Ritenbaugh, 1996; Weinsier, 1995; Lazarus, 1997; Feldman, 1995). The article by Lazarus (1997) demonstrated that after 6 months of a nutrition education program there was an increase in physician's nutrition knowledge scores ( $p < 0.01$ ) and in the frequency in which they discussed nutrition with patients ( $p < 0.05$ ). Sadly, the presence of iatrogenic, or physician induced, malnutrition still exists due to undesirable practices that affect the nutritional status of patients. Researchers have claimed that this is an inevitable consequence of the lack of nutrition curriculum in medical schools (Bahl & Hamilton, 1993).

A review of the current nutrition curriculum guidelines for other health care

providers such as therapists, physicians assistants, and nursing aides show few nutritional competencies (Nelson, et al, 1997; O'Sullivan-Malliet, et al, 1997; Patenaude, 1997).

However, literature does exist that gives suggestions for including nutrition education for a variety of health care professionals like nurses, dentists, physicians, and aides (Fitz, 1997; Morse, 1997; Weigley, 1997) (Patenaude, 1997; Nelson, 1997; Puckett, 1997; Hark, 1997). The goal in including nutrition in the curriculum is to enhance a health professional's skill in providing cost effective care (O'Sullivan-Malliet, 1998).

### Importance of Nutrition Education

Early identification of health risk, including poor nutrition is important for improving the health of the elderly. To achieve this, many health care providers must have enough knowledge about nutrition to screen for risk, educate and counsel on basics, and refer to a dietitian when needed (O'Sullivan-Malliet, et al, 1997). This is increasingly important because often times a health care professional other than a dietitian may be the person with the earliest contact with a patient (O'Sullivan-Malliet, 1998). In the nursing home setting it is often not cost effective to have a dietitian provide direct services on a daily basis, rather, most are hired as a consultant and many only be given a few hours a month to provide nutritional care for all the residents (Glanz & Scharf, 1985).

Early nutrition intervention may only occur when health professionals are aware of the early signs of nutritional problems to look for in screening (O'Sullivan-Malliet, et al, 1997). Therefore, an efficient method to ensure nutrition promotion is to provide training to the staff who are already responsible for the daily care of the residents. This approach will be less costly and allow for a more holistic approach to nutritional care

delivery. The overall goal of educational intervention should be to inform health care professionals of nutrition related concerns in the elderly to more appropriately meet the needs of the nursing home residents.

### **Applying Principles of Effective Teaching**

Inservice training in the private sector is important due to the amount of staff members working in those facilities and the lack of organized training available. For example, there are approximately 63,000 nurses working in the nursing home setting. And as stated by the previous Secretary of State for Health and Social Service, the private sector's training and continuing education is "patchy and provided mainly by larger companies to meet their own needs" (Bennett, et al, 1989) . Ironically, however, health practitioners are responsible for taking every opportunity to improve their professional knowledge and competencies. Therefore, the use of inservice education in these settings can have a tremendous impact.

The article by Burke, 1996, explains some of the keys to inservice success. First, research the subject matter and be sure to include information that staff members can use on a daily basis. Schedule the inservice and promote the event by posting signs one week prior to the inservice. Record formal objectives and goals for instruction and use them as a guide. Educators have found that developing clear objectives before teaching provides a framework for use in the teaching plan (Jackson & Lynch, 1986). Next, enhance the program with audiovisual aids and evaluation forms. Finally, when teaching, stress important information, keep a good pace, use humor, solicit questions, and be prepared for disinterested individuals. Additionally, when planning courses there should be a

balance between general and specialized topics, for trained and untrained staff (Bennett, et al, 1989). Evidence has also suggested that when courses are taught during paid work time it is easier to achieve good staff attendance (Bennett, et al, 1989).

### Audience

Another way to ensure an effective presentation is to consider the audience that will be present at the inservices. It is very important to apply the principles of adult education in these settings. Because adults learn differently than children or adolescents it is beneficial to understand some of the principles of education. The relationship between the student and his or her learning style has been extensively investigated (Sutcliffe, 1993). Teaching, increasing knowledge, and learning have an interdependent relationship. Therefore, teaching theories are concerned with how to enable the transfer of knowledge and for learning to take place.

A critical factor in the success of an inservice is to have objectives that fit the needs of the audience. Robert Mager was an early pioneer in the process of developing instructional objectives (Jackson & Lynch, 1986). The general objective describes the intended outcome, thus it is what the learner will be able to do, not what the instructor just did. His classification of objectives helps describe the three domains from which students can learn. First, the cognitive domain emphasizes educational outcomes like knowledge and understanding. Next, the affective domain emphasizes feelings, attitudes, and adjustments. Lastly, the psychomotor domain emphasizes motor skills. The domains are in a hierarchical order from simple to most complex.

### Malcom Knowles and Andragogy

Andragogy, the art and science of helping adults learn was originally developed by Malcom Knowles (Jackson & Lynch, 1986). Knowles provides us with information about adult learning upon which teaching can be improved (Conklin, 1995). The first assumption is adult learners want to be and do become self directed in their learning. The situation includes staff members who want to learn in order to have better job performance. No one outgrows the need to learn and change. Next, the second assumption is the experiences adults have had in life are good resources for learning. Educators should assess the knowledge and experience of learners and build on them to facilitate the learning process. The third assumption is adults are frequently aware of their own learning needs and want to learn in order to improve their life situation. Participation helps them retain what they have learned and will make the learning process more enjoyable. Finally, assumption number four is adults are competency based learners. They want to be able to apply the knowledge immediately. Therefore, simulation (described below) can improve their attention and outcomes.

In service education in nursing homes generally follows the andragogic approach to learning (Jackson & Lynch, 1986). The application of Knowles principles can be made to the nursing home setting for inservice education. For example, staff members want to learn as a part of their professional growth, use problem solving and demonstration, and frequent use of on the job education. Conklin (1995) states teaching is central to staff management. There is no role in the nursing profession that does not include the need for teaching and learning.

### Kolb's Learning Styles

Kolb formulated learning styles that demonstrate four dimensions of learning; convergent, divergent, assimilation, and accommodation (Sutcliffe, 1993). First, the convergent learns from abstract conceptualization and active experimentation. The diverger learns from concrete experimentation and reflective observation. The assimilator prefers abstract conceptualization and reflective observation. Finally, the accommodator learns from concrete experience and active experimentation. As individuals learn they cycle and recycle through the dimensions and excel in some dimensions more than in others.

### Techniques to Enhance Learning

Various techniques also exist to enhance adult learning such as gaming, simulations, and drama. Introduced as a teaching strategy over 75 years ago, gaming offers many advantages over more traditional methods of teaching (Henry, 1997). Educators need to provide learning environments that incorporate participation into the learning process to make the experience more meaningful. Gaming, or the use of games in teaching, is one strategy to achieve this.

Games are closer to real experiences than the pictures and words of other educational methods. Nursing education relies mostly on those traditional teaching methods such as lectures and audiovisual presentations. However, Henry (1997) writes that in her experience as an educator, many complaints from staff members are given regarding the "repetitious, boring, basic, and time consuming" mandatory inservices. It has been reported that adults find the active problem solving and participation of games

more appealing than lectures or other passive teaching methods. Furthermore, gaming involves interactions that allow for cognitive, psychomotor, and affective learning (Lewis, et al, 1989). Students with different learning styles can gain knowledge because the games are presented in a way that corresponds to many styles of learning. As described above, adult learners are self directed and motivated and will prefer an environment that utilizes group involvement like that of gaming. Finally, gaming allows for discussion, which can increase motivation and interest, stimulate the learning process, and reinforce information (Lewis, et al, 1989). Gaming can therefore can help link theory and daily practice.

Educators of those caring for older people are also faced with the challenge of helping the learner understand the perspective of the elderly individual. Affective learning takes place when the student has the opportunity to participate in what they are studying (Menks, 1993). Simulation as it is called, involves creating a situation similar to real life experience. The use of these simulations involves the learner in a real life event, process, or condition by role-playing. Menks goes on to say that this method sparks the adult student's interest. The role of the teacher becomes more like that of a facilitator and the atmosphere becomes more relaxed. Experiences can therefore be remembered and combined with the cognitive material to increase knowledge.

Drama also is a way in which the impact of psychosocial conditions on nutrition can be conveyed (Davis, 1993) A short skit or dialogue immediately arouses audience interest and involvement. The audience is also very likely to remember the information presented because they see it, hear it, and can identify with the scenario. As Davis found,

drama can help people of any target audience explore their attitudes and behaviors related to nutritional care.

It is easy to see the importance of inservice education in the nursing home setting. In one example, an inservice on the urinary system and urinary tract infections (UTI's) resulted in a drop in the number of UTI's from a pre-inservice high of 21 to seven (Burke, 1996). The Nutrition and Gerontology Services Project (Meckler, 1983) also showed positive results using inservice type instruction. Nutrition knowledge was assessed in a group of 478 California citizens who were live in residents in homes for the aged. Subjects were pre-tested with a 12 item multiple choice test to address nutritional knowledge and then divided into a control and experimental group. The experimental group was instructed with audiovisual materials, conferences, and written materials while the control group received only written materials. The experimental group demonstrated significantly more growth in knowledge than did the control group. Additionally, the staff demonstrated sufficient knowledge to teach basic nutrition facts after the project.

In order for learning to occur, there must be a change in knowledge. Teaching with traditional methods without considering principles for adult learners may not result in an increase in knowledge to the extent that applying the methods discussed above would. Games, simulations, and drama are innovative teaching strategies that employ the principles of adult education and are suited for adult learners. Learning is a response to stimulation, but not every learner responds to the same approaches. Therefore it is important to combine approaches to maximize the learner's opportunity to gain knowledge in a short time. The delivery of information using these methods will increase

the likelihood that staff will learn new information, incorporate it, and overall enhance patient care. As concluded by Hersch (1989), ongoing, stimulating inservice training of nursing home personnel will give them greater insight and empathy into the problems of the elderly and would result in improved nursing care.

## **Conclusion**

Gross deficiencies exist in the quality and quantity of health care personnel for the aged (Hersch, 1989). An average of 80 to 90 percent of nursing home staff are untrained aides paid the minimum wage to care for one of the sickest and frailest populations in the United States. The relationship between nutrition and aging has been well demonstrated, however, many health care workers have little or no nutritional training. After reviewing the literature, it becomes apparent that one solution to this problem is educating and cross-training the staff members, using principles for effective adult education.

## **Research Objectives**

Research questions were formulated as follows:

- 1.) Does short-term nutrition inservice type education, utilizing principles of adult learning improve nutritional knowledge of nursing home staff?
- 2.) Does the change in nutritional knowledge vary by site?
- 3.) Does the change in nutritional knowledge vary by domain?

## METHODS

An education intervention was designed to improve the nutritional knowledge of nursing home staff. Participants were given inservice education in a two part series with each session covering different topics. To investigate the nutritional knowledge of the participating staff members at baseline and after the education a research questionnaire (Appendix A) was developed.

### Instruction

Nursing home staff, according to state and federal law, are required to be given educational inservices to cover various topics including nutrition (Bennett, et al, 1989). This research was established to utilize an already existing system of inservice training to assess and promote nutritional knowledge. No staff member was exempt from being present at the time of the inservice, however, participation through pre and post-testing was completely voluntary.

A manuscript (Appendix B) was developed to outline goals, objectives, and specific procedures during instruction. (The reader is directed to refer to the appendix to learn more about the instructional model.) During the educational process systematic procedures were followed to ensure consistency across sites. Stations were set up at each inservice to help divide the classes into the topics to be addressed. Audiovisuals were used to develop and summarize the topics identically at each site.

### Questionnaire Design

To test the effectiveness of the intervention a nutritional questionnaire was developed using items from previously validated instruments. To ensure validity and clarity of all questions, both the New Nursing Assistant Manual by Barbara Gillogly (1991) and Dining Skills; Practical Interventions for Care Givers of the Eating Disabled Older Adult by the American Dietetic Association (1994) were utilized. As training manuals specific to nutrition and nursing type care, all questions were obtained from those sources. Further, the complete questionnaire was reviewed by two long term care dietitians, and the personnel at each nursing home responsible for setting up inservices. Based on their comments, no modifications of the research instrument were made.

The questionnaire was employed and administered to the staff of the selected nursing homes. The research instrument used in the study contained twenty multiple choice questions including 5 demographic questions. The first domain, Patient Care Related to Nutrition, contained five question to address preventing nutrition related problems, importance of measuring height and weight, and proper positioning for eating. Domain Two, Food and Fluid Intake of residents, also contained five questions, reviewing specific procedures for serving and documenting food and fluid intake. The third domain, Eating, asked questions regarding appetite, feeding and eating. The demographic section included occupation, years experience, family in elder care facilities, gender, and ethnicity.

### Administration of Questionnaire

The questionnaire was administered immediately before beginning the first educational inservice and immediately after the second educational inservice as a pre and post-test. A cover letter (Appendix C) explaining overall objectives of the research, study design, contact person, and a request for completion was attached to the questionnaire. Further, all participants were ensured complete anonymity and were not asked to add their name or other personal identifier to the questionnaire. Simply, a self selected identification code was requested to allow for matching of pre and post-test only.

### Sample Selection

The population included staff members from three selected nursing homes in and around Fort Worth. Silverhaven Nursing Center, Burleson, Texas (site one); Fort Worth Nursing Rehabilitation Center, Fort Worth, Texas (site two); and Valley View Nursing Center, Grandbury, Texas (site three) were the facilities utilized. Sites were selected from the group of nursing homes visited by the author as a long-term care consultant dietitian. Further, these homes were chosen because of their existing structure of monthly inservice education that was needed to complete the research.

This sample was also established to include facilities in Tarrant, Johnson, and Hood Counties to allow for a more diverse population. Nursing homes employ a variety of health care practitioners and support staff, which allowed for the assessment of nutritional knowledge of a heterogeneous group.

Individuals participating in this study were those employed by the nursing homes. As stated above nursing home staff are required to be given educational

inservices to cover various topics including nutrition. Signs were posted one week prior to the inservice to increase participation and attendance. No staff member was exempt from being present at the time of the inservice, however, participation through pre and post-testing was completely voluntary.

### Statistical Analysis

Data were analyzed using SPSS version 7.1 (SPSS Incorporated, Chicago, Illinois) and Excel version 5.0 (Microsoft Corporation). Two sided statistical tests were employed using  $\alpha = 0.05$ . Demographic characteristics and knowledge scores were measured at baseline and post-test by site and overall. Descriptive analyses of baseline demographic characteristics and knowledge scores were performed for all subjects and by site. These analyses were repeated at post-test.

Post-test demographic characteristics were compared to baseline demographic characteristics using the z-statistic for the purpose of detecting potential confounding factors due to attrition. Percent correct responses between baseline and post-test were measured by item and domain, and by site. Baseline to post-test change in knowledge scores by domain and by site were carried out using the t-statistic. Differences in domain-specific and overall knowledge scores between sites for pretest, post-test, and change were analyzed using analysis of variance (ANOVA) and the Scheffe post hoc multiple comparison test.

## RESULTS

### Questionnaire Distribution

One hundred fifty-seven pretest questionnaires and 132 post-test questionnaires were completed. Staff from Silverhaven Nursing Center (n=63, 39%), Valley View Health and Rehabilitation (n=41, 26%), and Fort Worth Nursing and Rehabilitation Center (n=54, 34%) participated in the pretest survey. One month later at post-test 51 (39%) staff members at Silverhaven, 32 (24%) staff members at Valley View, and 49 (37%) staff members at Fort Worth Nursing participated.

### Baseline Demographic Characteristics and Knowledge

Table one reflects demographic characteristics of participants at baseline. As displayed, most frequently identified occupation overall was nursing assistant (34.9%), followed by food service employee (19.7%) and vocational nurse (18.4%). The most reported category of experience of the 157 participants was 0 to 5 years (36.5%) or 6 to 10 years (32.7%) in long term care. Approximately half (50.6%) of all baseline participants currently have or have had a family member in a long term care facility. Overall demographics show a majority of females (87.7%) at baseline ranging from 89.5% at Site Three to 93.3% at Site One. The top three ethnic groups represented at baseline were Whites (54.2%), African Americans (26.5%), and Hispanics (12.9%).

Baseline demographic characteristics show slight differences at each site. Site one consisted of a predominantly white (86.9%) population with 0 to 5 years experience.

**TABLE ONE**

**BASELINE DEMOGRAPHICS (n = 157)**

<b>Characteristic</b>	<b>Site 1</b>	<b>Site 2</b>	<b>Site 3</b>	<b>Overall</b>
<b>Occupation</b>				
Nursing Assistant	28.3%	49.1%	25.6%	34.9%
Vocational Nurse	20.0%	15.1%	20.5%	18.4%
Environmental Services	5.0%	1.9%	12.8%	5.9%
Food Service	23.3%	13.2%	23.1%	19.7%
Therapy	0.0%	5.7%	0.0%	2.0%
Aide	11.7%	9.4%	15.4%	11.8%
Other	11.7%	5.7%	2.6%	7.2%
<b>Years Experience</b>				
0 to 5 years	45.2%	22.6%	41.5%	36.5%
6 to 10 years	22.6%	43.4%	34.1%	32.7%
11 to 15 years	11.3%	15.1%	9.8%	12.2%
16 or more years	21.0%	18.9%	14.6%	18.6%
<b>Family in LTC Facility</b>				
Yes	52.5%	45.3%	55.0%	50.6%
<b>Gender</b>				
Female	93.3%	86.8%	80.5%	87.7%
<b>Ethnicity</b>				
African American	1.6%	71.7%	4.9%	26.5%
American Indian	0.0%	1.9%	2.4%	1.3%
Hispanic	6.6%	5.7%	31.7%	12.9%
White, non Hispanic	86.9%	18.9%	51.2%	54.2%
Asian	3.3%	1.9%	2.4%	2.6%
Other	1.6%	0.0%	7.3%	2.6%

**TABLE TWO**

**BASELINE KNOWLEDGE:PERCENT CORRECT**

Question Number	Site 1	Site 2	Site 3	Overall
<b>Domain One, Patient Care Related to Nutrition</b>				
1. T or F, It is easier to prevent bedsores...	91.9%	94.9%	92.7%	93.0%
2. Which reduces constipation?	91.9%	83.3%	80.5%	86.0%
3. Why is measuring weight important?	93.5%	94.4%	85.4%	91.7%
4. T or F, Height and weight should be ecorded...	100.0%	96.3%	95.1%	97.5%
5. The proper position for eating includes...	59.7%	63.0%	73.2%	64.3%
Domain One Overall, questions 1-5	87.1%	81.8%	85.4%	84.8%
<b>Domain Two, Food and Fluid Intake of Residents</b>				
6. How do staff members chart food and fluid...	95.2%	90.7%	85.4%	91.1%
7. Which of the foods should be recorded as fluids?	87.1%	83.3%	68.3%	80.9%
8. Drinking from a straw can prevent choking...	66.1%	48.1%	29.3%	50.3%
9. T or F, Discourage residents from taking fluids....	95.2%	94.4%	80.5%	91.1%
10. Which meals should a substitute or supplement...	85.5%	51.9%	56.1%	66.2%
Domain Two Overall, questions 6 - 10	85.8%	73.7%	63.9%	75.9%
<b>Domain Three, Eating</b>				
11.T or F Loss of taste can cause loss of appetite?	95.2%	92.6%	97.6%	94.9%
12. When small pieces of food, fluid, mucus....	90.3%	74.1%	68.3%	79.0%
13. When feeding a dependent resident you....	71.0%	77.8%	78.0%	75.2%
14. When residents eat in DR, guidelines for staff...	96.8%	88.9%	85.4%	91.1%
15. If a resident eats in room and feeds themself...	83.9%	72.7%	84.5%	80.3%
Domain Three Overall, questions 11-15	87.4%	81.1%	82.9%	84.1%

(45.2%). Most were either nursing assistants (28.3%), vocational nurses (20%), or were employed in food service (23.3%). Baseline at Site Two differed from Site One because the majority of participants were African Americans (71.7%) with 6 to 10 years experience (43.4%) employed as nursing aids (49.1%). Finally, Site Three participants at baseline were similar to site one in that most were employed as nursing assistants (25.6%), vocational nurses (20.5%), or in food service (23.1%) with 0 to five years experience (41.5%). However, ethnicity at Site Three consisted mainly of Hispanics (31.7%) and Whites (51.2%).

Table 2 summarizes baseline knowledge scores for each question and domain by site for the three sites and overall. At baseline overall mean score of participants was 80.6%. Site One scored the highest with 86.7% correct, followed by Site Three (77.4%) and Site Two (76.1%). Baseline scores for Domains One to Three were 84.8%, 75.9%, and 84.1% correct respectively.

Domain One scores ranged from 64.3% correct for question number 5 to 97.5% correct for question number 4. Knowledge of Domain Two shows the lowest score for question 8 (50.3%) while questions 6 and 9 yielded the highest score (91.1%). Domain Three scores ranged from 75.2% for question 13 to 94.9% for question 11.

Site One had the highest average score for each domain. Site Three followed with the next highest score for each domain with the exception of Domain Two (73.7% vs. 63.9%). Of all sites and domains the highest score was obtained at Site One for question 4 (100%). The lowest score was obtained at Site Three for question number 8 (29.3%).

**TABLE THREE****POST-TEST DEMOGRAPHICS (n=132)**

<b>Characteristic</b>	<b>Site 1</b>	<b>Site 2</b>	<b>Site 3</b>	<b>Overall</b>
<b>Occupation</b>				
Nursing Assistant	32.0%	40.8%	21.9%	32.8%
Vocational Nurse	24.0%	14.3%	28.1%	21.4%
Environmental Services	6.0%	0.0%	12.5%	5.3%
Food Service	18.0%	14.3%	18.8%	16.8%
Therapy	0.0%	8.2%	0.0%	3.1%
Aide	10.0%	12.2%	18.8%	13.0%
Other	10.0%	10.2%	0.0%	7.6%
<b>Years Experience</b>				
0 to 5 years	45.1%	28.6%	46.9%	39.4%
6 to 10 years	25.5%	32.7%	31.3%	29.5%
11 to 15 years	7.8%	18.4%	6.3%	11.4%
16 or more years	21.6%	20.4%	15.6%	19.7%
<b>Family in LTC Facility</b>				
Yes	59.0%	51.0%	53.1%	53.8%
<b>Gender</b>				
Female	94.1%	89.8%	78.1%	88.6%
<b>Ethnicity</b>				
African American	6.0%	62.5%	3.1%	26.2%
American Indian	0.0%	2.1%	0.0%	0.8%
Hispanic	8.0%	6.3%	28.1%	12.3%
White, non Hispanic	82.0%	27.1%	59.4%	56.2%
Asian	2.0%	0.0%	3.1%	1.5%
Other	2.0%	2.1%	6.3%	3.1%

### Post-Test Demographic Characteristics and Knowledge

Post-test demographic characteristics, displayed in Table 3, are similar to those at baseline. None of the demographic characteristics were significantly different ( $p > 0.05$ ) between baseline and post-test (Table 4).

Item and domain specific changes in knowledge are summarized in charts displayed in Appendix D. Table 5 reflects the t-statistic analysis for the change in knowledge by site, domain, and overall. A statistically significant change in knowledge was found for all sites overall ( $p < 0.004$ ) and domains overall ( $p < .001$ ). Within each site statistically significant changes were found by domain. The only exception found was at Site One for Domain Two ( $p = 0.391$ ) without a significant change in knowledge.

Analysis of variance resulted in significant differences between sites for Domain Two pretest scores ( $p < .001$ ), Domain Three post-test scores ( $p = .012$ ), and total pretest knowledge scores ( $p = .003$ ). The Scheffe multiple comparison test identified Sites One and Two ( $p = .005$ ) and Sites One and Three ( $p < .001$ ) were different for Domain Two pretest scores. Domain Three post-test scores were different between Site One and Three ( $p = .024$ ). Total pretest knowledge scores were different between Site One and Two ( $p = .006$ ) and Site One and Three ( $p = .035$ ).

ANOVA also identified statistical significant differences between sites in total knowledge change ( $p < 0.001$ ) and Domain Two knowledge change ( $p < 0.001$ ). Scheffe test suggests significant change exists between Sites One and Two for overall knowledge change ( $p = .002$ ) and between Sites One and Two ( $p = .003$ ) and One and Three ( $p = 0.002$ ) for Domain Two.

TABLE FOUR

## DEMOGRAPHICS: PRETEST VS. POST-TEST

<u>Category</u>	<u>Pre Test <u>n</u></u>	<u>Post Test <u>n</u></u>	<u>Pre Test <u>x</u></u>	<u>Post Test <u>x</u></u>	<u>Pre Test Percent</u>	<u>Post Test Percent</u>	<u>Std. Error</u>	<u>Z- Statistic</u>	<u>p- Value</u>
<b>Occupation</b>	152	131							
Nursing Assistant			53	43	34.9%	32.8%	0.056	0.362	0.717
Vocational Nurse			28	28	18.4%	21.4%	0.047	0.622	0.534
Env'tal Services			9	7	5.9%	5.3%	0.028	0.210	0.834
Food Service			30	22	19.7%	16.8%	0.046	0.637	0.524
Therapy Aide			3	4	2.0%	3.1%	0.019	0.583	0.560
Other			18	17	11.8%	13.0%	0.039	0.289	0.772
Years Experience	156	132	11	10	7.2%	7.6%	0.031	0.127	0.899
0-5			57	52	36.5%	39.4%	0.057	0.498	0.619
6-10			51	39	32.7%	29.5%	0.055	0.574	0.566
11-15			19	15	12.2%	11.4%	0.038	0.214	0.831
16-20			29	26	18.6%	19.7%	0.046	0.238	0.812
<b>Family in LTC</b>	154	132							
Yes			78	71	50.6%	53.8%	0.059	0.530	0.596
<b>Gender</b>	154	132							
Female			135	117	87.7%	88.6%	0.038	0.254	0.800
<b>Ethnicity</b>	155	130							
African American			41	34	26.5%	26.2%	0.052	0.057	0.955
American Indian			2	1	1.3%	0.8%	0.012	0.429	0.668
Hispanic			20	16	12.9%	12.3%	0.040	0.151	0.880
White			84	73	54.2%	56.2%	0.059	0.331	0.740
Asian			2	4	1.3%	3.1%	0.017	1.046	0.295
Other			4	4	2.6%	3.1%	0.020	0.253	0.801

**TABLE FIVE**

**KNOWLEDGE SCORES: PRETEST VS. POST-TEST**

<b><u>Category</u></b>	<b><u>Pre Test n</u></b>	<b><u>Post Test n</u></b>	<b><u>Pre Test Mean</u></b>	<b><u>Post Test Mean</u></b>	<b><u>Pre Test Std. Dev.</u></b>	<b><u>Post Test Std. Dev.</u></b>	<b><u>Pooled Variance</u></b>	<b><u>Degrees Freedom</u></b>	<b><u>T- Statistic</u></b>	<b><u>p- Value</u></b>
<b>Site One</b>										
Domain one	62	51	87.1%	96.5%	0.150	0.087	0.016	111	3.955	<.001
Domain two	62	51	85.8%	88.6%	0.168	0.180	0.030	111	0.861	0.391
Domain three	62	51	87.4%	93.7%	0.171	0.147	0.026	111	2.080	0.040
Overall	62	51	86.8%	92.9%	0.104	0.117	0.012	111	2.968	0.004
<b>Site Two</b>										
Domain one	57	49	81.8%	95.1%	0.252	0.096	0.038	104	3.501	0.001
Domain two	54	49	73.7%	93.1%	0.025	0.015	0.000	101	47.537	<.001
Domain three	54	49	81.1%	98.4%	0.228	0.069	0.030	101	5.093	<.001
Overall	57	49	76.1%	95.5%	0.226	0.058	0.029	104	5.821	<.001
<b>Site Three</b>										
Domain one	41	32	85.4%	96.9%	0.185	0.074	0.022	71	3.324	0.001
Domain two	41	32	63.9%	85.6%	0.254	0.170	0.049	71	4.164	<.001
Domain three	41	32	82.9%	100.0%	0.231	0.000	0.030	71	4.183	<.001
Overall	41	32	77.4%	94.2%	0.190	0.065	0.022	71	4.780	<.001
<b>Sites Total</b>										
Domain one	160	132	84.8%	96.1%	0.200	0.087	0.025	290	6.040	<.001
Domain two	157	132	75.9%	89.6%	0.216	0.155	0.036	287	6.059	<.001
Domain three	157	132	84.1%	97.0%	0.209	0.103	0.029	287	6.466	<.001
Overall	160	132	80.6%	94.2%	0.184	0.087	0.022	290	7.819	<.001

## DISCUSSION

It has been noted that many health care practitioners have little or no training or knowledge in nutrition (Bahl & Hamilton, 1993). The close relationship of nutrition to the health of the elderly has also been well established (Weddle, 1996). Due to the importance of nutrition in the care of the elderly an educational intervention to train staff on such matters is advised. Mandatory inservice sessions in nursing homes presents an opportunity to apply principles of adult education and participatory models of teaching to improve knowledge and ensure success as demonstrated here.

The major finding of this study was that short term nutrition education does improve nutritional knowledge. Overall knowledge in this study improved 13.6% from baseline to post-test. Baseline knowledge was found to be much higher than expected at average of 80.6% overall. Although a portion of nursing home staff members are aware of some nutritional care practices, there is still much room to increase their knowledge to improve patient care.

### Limitations

This study has several limitations. The research questionnaire was developed using the New Nursing Assistant Manual by Barbara Gillogy. The unexpected level of baseline knowledge could be attributed to the fact that a majority of participants were nursing assistants who may have already been familiar with some of the topics.

Participants could have also gained valuable information related to nutrition through contact with the consultant dietitian working in their facility. Previous inservices on the topic of nutrition could have improved their knowledge over time. Staff orientations and cross training sessions that review nutrition related aspects of care may have also contributed to the increased level of baseline knowledge. The current trend of individuals taking the responsibility for their health and learning about preventive measures like nutrition may have also improved knowledge in some individuals. Lastly, differences in demographic breakdown (occupation, years experience, ethnicity) within each site could have attributed to the difference in the knowledge scores between sites.

Selection bias may have occurred because although all staff members are to participate in mandatory inservices, some still do not attend. Therefore, it is possible that a select group of the most dedicated staff members, or those most interested in the topic were those in attendance. Those individuals may have had more knowledge at baseline or were more likely to absorb what was taught due to their interest or dedication. This is likely to have caused an unintentional positive skew in percent correct responses.

Participants were also administered the questionnaire in a group setting where it would be very easy to share answers or solicit answers from their peers. Further, the questionnaire did not contain 'none of the above' or 'unknown' for an answer selection. In the event that a participant did not know an answer, he or she would either have to guess or ask a peer for the answer, further skewing the results. To combat this, more answer choices on the questionnaire and stricter testing procedures would need to be followed. The results and implications of this study may only be applied to similar size

nursing homes with the same demographic characteristics of those applied here due to the above limitations.

### Implications and Conclusions

Studies on the effect of short-term education on change in knowledge of nursing home staff are scarce in the literature. After a thorough review of Medline, CINAHL, Health Star, and Eric databases, this study, an evaluation of the effect of short term education on nutritional knowledge of nursing home staff, was found to be the only one of its kind. This study therefore contributes significantly to the current body of literature on educating health care professionals in the long-term care setting. Because of its potential contribution to improving nutritional knowledge of staff members, the intervention of this research could be implemented at any long term care facility wanting to develop its staff members. It has been established that various health problems and diseases of the elderly are nutrition related. Many of them could be prevented with nutritional care or be resolved with nutritional care once they occur. Based on the results of this study, it is possible to improve nursing home staff member's knowledge of nutrition to aid in the care of the elderly. While more studies are certainly needed to further examine the outcomes of improved knowledge, this study represents an example of an effective intervention to meet the needs of a population working in a field where knowing the basics of nutrition is a must.

### Future Directions

Future surveys could include a questionnaire regarding behaviors related to nutrition. Subjects could be asked that based on their knowledge do they; always,

sometimes, or never, practice the corresponding appropriate behavior. It has been determined that knowledge can be increased with short-term education, therefore it would also be appropriate to assess if that improvement in knowledge correlates to improved health in the elderly. Any behavior change associated with increased knowledge could be monitored to determine improved care of the elderly.

Further investigations could include the use of different principles of education to test the most effective models to impart the information. Finally, retention of nutritional knowledge at long term intervals should be measured to assess the need for further training or refresher courses.

**APPENDIX A**  
**RESEARCH QUESTIONNAIRE**

PLEASE CIRCLE THE BEST ANSWER FOR EACH

ID \_\_\_\_\_

**Domain I: Patient Care related to Nutrition**

1. It is easier to prevent bedsores than it is to heal them: A. True B. False
2. Which of the following reduces constipation?
  - A. Decreased exercise
  - B. Drinking less fluids
  - C. Staying in the same position for long periods of time
  - D. Eating more fruits and vegetables
3. Why is measuring the resident's weight important?
  - A. Weight changes can indicate nutritional problems
  - B. Weight changes can indicate medical problems
  - C. Both A and B
  - D. Neither A nor B
4. Height and Weight should be recorded in the resident's medical chart at admission and throughout their stay. A. True B. False
5. The proper position for eating includes:
  - A. Hips slightly forward in chair
  - B. 90 degree angle at hips, knees, and ankles
  - C. Body 12 inches from table
  - D. Proper positioning includes all of the above

**Domain II: Food and Fluid intake of Residents**

6. How do staff members chart the amount of food and fluid consumed by the resident?
  - A. Ask the resident how much he/she ate
  - B. Observe the tray and note how much was eaten
  - C. Guess the amount from past observation
  - D. Asking family or friends of the resident how much they ate
7. At dinner Ms. Jones eats soup, salad, chicken, Jell-O, and ice cream. Which of the foods should be recorded as fluid intake?
  - A. Soup only
  - B. Soup and Ice Cream
  - C. Soup, Jell-O, Ice Cream
  - D. None of the Above

- ### Domain III: Eating

- 44

#### **Domain IV: Demographics**

16. What best describes your occupation?

- A. Nursing assistant
- B. Vocational Nurse, specify title \_\_\_\_\_
- C. Environmental services (housekeeping/maintenance)
- D. Food Service, specify title \_\_\_\_\_
- E. Therapist, please specify type \_\_\_\_\_
- F. Aide, please specify type \_\_\_\_\_
- G. Other, please specify \_\_\_\_\_

17. How many years of experience do you have in geriatric or nursing home care?

- A. 0 to 5 years
- B. 6 to 10 years
- C. 11 to 15 years
- D. 16 or more years

18. Do you currently have, or have you ever had a family member in an elderly care facility, or been in charge of the care of an elderly family member?

- A. Yes
- B. No

19. Are you:                      A. Male                      B. Female

20. What is your ethnic background?

- A. African American
- B. American Indian
- C. Hispanic
- D. White, non-Hispanic
- E. Asian
- F. Other, \_\_\_\_\_

**APPENDIX B**  
**MANUSCRIPTS CLASS ONE AND TWO**

Class One Manuscript  
(questions 1-6, 9,10)

**GOAL:** To employ a participatory model of teaching to increase participant's knowledge of nutrition related problems, calculating food intake, proper positioning for eating, and what makes a dining experience pleasurable.

**I. Introduction:** Hello, my name is Dana Cummings, and I am the facility's dietitian. Each year the home is required to give one or more inservices on the topic of nutrition and the elderly so I will be giving today's and next month's inservices. Before we get started however, I need for you to take a look at the packet you were given when you came in. You should have a 3x5 card, a letter and a three page questionnaire. Does anyone not have that?.....OK, tear off the 3x5 card and take a quick look at the letter I gave you. It explains that I will be giving you a pre and post-test on the information that will be presented in the two inservices I will be giving. The information obtained from the two tests will be used for my thesis project in graduate school. The questionnaire should take no more than about ten minutes. Before you get started answering the questions, please listen closely, I need for you to turn to the first page of the questionnaire and look at the top of the page where it has "ID". Please put your choice of numbers or letters in the provided blank, (will give examples) but be sure it is an ID that you will remember next month when I will ask for it again. This ensures that I will not know who filled out which questionnaire. Once you have selected an ID you may begin filling out the questionnaire. Please circle an answer to each question and when you are finished I will collect them. Thank you.

**II. Topic one: What is nutritionally related? (questions 1-4,9)**

**OBJECTIVE:** To educate caregivers to identify nutrition related problems seen in nursing homes with emphasis on weight loss, dehydration, skin breakdown, and constipation.

**MATERIALS:** Station One sign, Flip Chart, Magic Markers, Bag of Candy

**PROCEDURE:** Turn your attention to station one. Please stop me at any time if you have questions. We are going to play a short game of pin the problem on the person, like the game pin the tail on the donkey. (Will show flip chart sketch of person). Meet Pat the resident. Anyone who can give me a nutrition related problem that Pat could have will win themselves a treat. Let me get us started: hip fracture, (will write in on Pat's hip). OK your turn.....(Responses hopefully volunteered will include weight loss, skin breakdown, anemia, poor appetite, pureed diets, dehydration, poor teeth, multiple medicines but any answers will be acceptable. Will throw out candy to participants volunteering. After all problems have been written on flip chart I will begin discussing each.) Isn't it amazing how many things that we thought of are nutritionally related! Let's discuss a few of them.

1. Skin breakdown--did you know that it is much easier to prevent skin break down than it is to heal it? To prevent them we keep the residents clean and dry, turned frequently in bed, and make sure they get enough to eat. But when the skin breaks down, or forms a painful skin ulcer, it is very difficult to heal. So remember we want to avoid skin problems because it is easier to prevent breakdown than it is to heal it.
2. Constipation--The elderly are more likely to be constipated because they have little exercise, they stay in the same position for hours, drink little amounts of fluids, and don't eat fresh fruits or vegetables. So wouldn't it be easy to encourage some of those things rather than always giving an enema or pill for constipation?
3. Weight loss--We've identified weight loss as a problem for resident's, but how will we know they have lost weight unless we have a good record of the weights? It is actually a federal law that residents be weighed on admit and throughout their stay. And this is important because weight changes can indicate nutritional or medical problems.
4. Dehydration--Do you ever hesitate to give a resident fluids because you know it will make them have to go to the bathroom, which means you'll have to help them or they'll wet the bed and you'll have to clean up the mess? Well, it is really important to encourage residents to drink plenty of fluids during the day. Can you imagine if you weren't given any fluids during the day except at meals?

The most important thing that I want you to remember from this is that there are many things that are nutritionally related. Today we named \_\_\_\_ and that is why it is so important that we do things like encourage fluids, help resident's get out of bed for some exercise, and weighing residents. Isn't it harder to take care of a resident like Pat than it is a resident with less nutritional problems?

### **III. Topic Two: P.O. Intake (questions 6, 10)**

**OBJECTIVE:** To teach staff members to correctly identify the amount of food consumed by residents, and when substitutes or supplements must be offered.

**MATERIALS:** Station two sign, Tray set up with 25% intake, one supplement/substitute

**PROCEDURE:** Please turn your attention now to station two and can I get a volunteer? (I will instruct volunteer to say "No" to all my questions.) This is Pat's lunch tray and here is the scenario: You are trying to decide how much Pat ate during lunch but you're in a hurry and I want you to go on your lunch break with me, what are you going to do! Now remember you are in a hurry as always, so should we just go ask Pat what she ate?  
"No"

OK, let's just ask someone else on staff if they know how much Pat ate?

"No"

Well, then let's just guess what Pat ate, 'cause I am ready for lunch!

"No"

OK, we'll do it the right way. (At this point I will demonstrate that you must remove the lid on the plate and actually look at what was eaten to determine a percentage. The tray

will be set up so that he resident only ate 25%. At this point I will make someone go into the kitchen and get a supplement as regulations state that must be done when a resident doesn't eat above 50%.)

So, remember you must look at the tray decide how much was eaten, record that number, and decide if a substitute or supplement needs to be offered. Thank you volunteer.

#### **IV. Topic Three: Positioning (question 5)**

**OBJECTIVE:** To demonstrate incorrect and correct positioning of residents for eating.

**MATERIALS:** Station three sign, five chairs, five small snacks

**PROCEDURE:** Now turn your attention to station three, the chairs.

I need five volunteers.

Chair one: falls forward during meals

Chair two: leans to one side

Chair three: head tilts

Chair four: lays back too far

Chair five: Sits up straight in proper position

Take a look at our five new residents that were admitted today. We are now going to talk about proper positioning of residents. I am passing out a small snack for each of them to eat in the position they are in. When they are done eating they are going to tell us what it was like to eat in those positions. Remember that we see our residents in these positions all the time.

At this point each volunteer will say how it felt to be in each position. Then I will point out that chair number 5 is the ideal position, hips slightly forward, nice 90 degree angles at knees, hips, ankles, and body to be 12 inches from the table. Thank you volunteers.

#### **V. Conclusion: Dining Experience (emphasize all questions)**

**OBJECTIVE:** To emphasize the importance of creating a pleasurable dining experience for nursing home residents.

**MATERIALS:** 3x5 cards, pens/pencils, flip chart

**PROCEDURE:** For our last activity I want you all to get your 3x5 card and your pen ready. On one side I want you to write about the best dining experience you have ever had. Not just where you were, but write about the lighting, the noise, the smells, the service, what you ate, who you were with, what your table looked like. Just jot down a few things.

Now, turn the card over and do the same thing on the back but write down words that describe the worst dining experience you ever had.

So, thinking about the most and least pleasant dining experience you had, where do you think eating in the nursing home day after day would fit? And what can you do to make it

a more pleasurable experience for our residents?

(Summary on flip chart)

I also want you to remember the \_\_\_ things that we said were nutritionally related, how to correctly calculate food intake, and proper positioning at meals.

With that I am done but I need your pens back, keep the letter and the 3x5 card, and remember your ID code for next time. Thanks, see you next month.

By the end of the lesson the staff will be able to:

1. Identify four nutrition related problems
2. Correctly calculate percentage of meals eaten
3. Correctly position residents for eating at meal time
4. Describe what makes a dining experience pleasurable

Class Two Manuscript  
(questions 7, 8, 11-15)

**GOAL:** To increase awareness of appropriate elder care guidelines, sensory changes, swallowing problems, and fluid intake.

**I. Introduction:** Hello, my name is Dana Cummings, and I am the facility's dietitian. Each year the home is required to give one or more inservices on the topic of nutrition and the elderly, hopefully you remember what a fun inservice we had last month and you are ready for your final nutrition inservice today. At the end of class I will be asking you to fill out a short questionnaire, the same one you did last time.

**II. Brief Review of Last Class**

We've already begun to learn about the importance of nutrition in the care of the elderly. Last time we played pin the problem on the patient and discussed many nutrition related problem that residents can have. We talked about determining meal time intake by looking at the tray, we talked about proper positioning, and finally we talked about pleasant and unpleasant dining experiences.

**III. Topic One: Dependent Residents (questions 13-15)**

**OBJECTIVE:** To educate care givers on general guidelines for serving meals and feeding residents.

**MATERIALS:** One tray set up, handy wipes, station one sign, extra supplement/substitute

**PROCEDURE:** Turn your attention to station one. I need two volunteers from the audience. (Will have volunteers demonstrate all of this). When you are going to serve a meal or feed any resident the very first thing you must do is what? Wash your hands! (Volunteers will wash hands) Then we must take the tray and make sure what is on their diet card matches what is on the tray. (Volunteer will do so) Then do we serve the tray even if the resident isn't in their room or in the dining room? No, you must wait until the resident is present to serve the tray. Now are resident is here so we can go ahead and serve the tray. Assuming that this resident can feed him/herself we shouldn't just serve the tray and leave, nor do we have to sit in the room during the meal, but we must help open all containers and wait until the resident starts eating to leave.

Now, assuming the resident cannot feed him/her self what should we do. Let's have our volunteers show us. I am going to tie down volunteer one and tell him or her that they cannot talk to volunteer two. Then I will ask volunteer two to feed volunteer one. (At this point I will instruct volunteer two to feed volunteer one from the tray.) As the volunteer feeds it is important to make eye contact. That way you can watch for facial expressions to help identify the resident's needs. You must also allow adequate time to chew and swallow and alternate foods and fluids, just as you do when you feed yourself.

Keep feeding...

(As they are doing this I am going to address the audience again.)

As they are doing that I want you to think of a time in your life when you were completely dependent upon someone else. It could have been an injury, illness, or even that your car broke down and you were dependent for a ride. Think about how you felt during that time. Now, let's ask our volunteers how they feel about it. 'Resident,' how does it feel to be totally helpless and dependent upon volunteer number two? 'Nurse,' how does it feel to be responsible for a totally dependent person?

(summarized on flip chart) So remember, wash your hands, serve the tray only when resident is present, watch them begin eating before you leave the room., and if you are feeding a resident make eye contact, allow enough time to chew and swallow, and alternate fluids and foods.

#### **IV. Topic Two: Changes in Senses (question 11)**

**OBJECTIVE:** To demonstrate the effect of decreased senses on taste and appeal of food.

**MATERIALS:** Ear plugs, nose plug, glasses smeared with Vaseline, flavored candies, station two sign

**PROCEDURE:** Please direct your attention to station two. At this time I need a volunteer for a really fun activity. OK, put on these glasses, nose plug, ear plugs. Do you ever remember being a child and plugging your nose so that you wouldn't have to taste your vegetables? We are going to do the same type of thing with our volunteer to show how poor the elderly senses are. Now I am going to give our volunteer a piece of candy and see if her senses are good enough to tell us what flavor the candy is. (Will give various flavors and see how volunteer responds.) The point of this activity is to show that sometimes the elderly may not have an appetite or may say some foods don't taste good and I want you to remember that often it is because their senses are not as good as ours. So they may actually have a decreased appetite because their sense of taste is decreased. Thank you volunteer.

#### **V. Topic Three: Swallowing Problems (questions 8, 12)**

**OBJECTIVE:** To allow participants to experience the different sensations of modified food consistencies and to explain choking and aspiration.

**MATERIALS:** Apple slices, chopped apples, apple sauce or other modified consistency food available, station three sign.

**PROCEDURE:** OK, turn your attention to station three. Have you ever wondered why our residents are on diets where their food is altered. We've all looked at those yucky purees and wondered what causes a person to have to eat foods like that. Well, it is

because as you get older, in addition to your senses dulling, your ability to swallow may also change. For many older people it is hard to chew and swallow regular food, so the kitchen must do some of the "chewing" so to speak. Then the residents can swallow the food much easier. So, now I need a volunteer to do some tasting for me. First chew and swallow this apple slice.

Now eat some chopped apples. Finally, have some applesauce and tell us which one was the easiest to swallow? It is important to make sure that the right type of food is served to the resident because if they cannot swallow it easily they can aspirate. Aspirate means that pieces of food or fluid accidentally enter the lungs or air passages rather than going down the right way. It is a very serious condition that can be prevented by serving a resident the right diet and not letting them drink with a straw, because when residents use a straw they are more likely to choke and aspirate. So if you notice your patient is choking on foods maybe their diet needs to be altered.

#### **VI. Topic Four: Fluids (question 7,8,9)**

**OBJECTIVE:** To educate participants of the various foods considered fluids and the importance of encouraging fluids in elderly residents.

**MATERIALS:** Jell-O, soup, ice cream, beverages, watermelon (if in season), fruits in syrup

**PROCEDURE:** Lastly, we are going to take a look at station four. I have put out a variety of foods that are considered fluids. First, Jell-O and pudding, they look solid, but remember that Jell-O and pudding are made from water and a little box of power, as soon as it gets in your system it turns back to liquid. Next, we have ice cream which melts to become a liquid. Then look at this sample of beverages: cola, shakes, canned supplements, water, tea, coffee, they are all fluids. And soup is a fluid even if it is a stew or cream based soup. With canned fruit you must consider the syrup it is in as fluids, and finally, watermelon is considered a fluid because of its high fluid content.

#### **VII. Conclusion:**

In conclusion we have discussed guidelines for serving meals and feeding residents, How decreased senses can decrease your appetite, the importance of food modification to avoid aspiration, and to avoid using straws if your resident chokes easily, and finally those foods which are considered fluids. (all summarized on flip chart) Thank you for your attention during my last two inservices. At this point I am passing out the post-test for the inservices. By now you have heard the answers to all of the questions. I have attached a sticker to each questionnaire for you to place on your name badge or other item that you look at frequently. This is to show that you have completed this course, and to remind you of the importance of nutritional care in the elderly. Before you get started on the questions, please listen closely, I need for you to turn to the first page of the questionnaire and look at the top of the page where it has "ID". Please put your ID from

last time in the blank. Be sure it is the same ID from last time. Remember, this code ensures that I will not know who filled out which questionnaire. Once you have written your ID you may begin filling out the questionnaire. If you cannot remember your ID I have a list from last time to help you remember. Please circle an answer to each question and when you are finished I will collect them on the way out the door. Thank you.

By the end of the lesson staff will be able to:

1. Correctly serve meals and feed dependent residents
2. Identify that decreased senses alter taste and appetite
3. Explain modified consistency foods, choking, and aspiration
4. Identify foods that are considered fluids

**APPENDIX C**  
**COVER LETTER OF QUESTIONNAIRE**

**TITLE:** Enhancing care of the elderly through identification of nutritional knowledge before and after short term education of nursing home staff

**INVESTIGATOR:** Dana Cummings, R.D./L.D

Dear study participant:

As a student in the Master of Public Health Program at the University of North Texas Health Science Center, I am conducting research on the nutritional knowledge of long term care staff in nursing homes. This research is being conducted as a requirement for my master's thesis.

The purpose of this research is to identify nutritional knowledge before and after short term nutritional education inservices. The major goal is to help enhance the care of the elderly through involving the entire long term care staff team in nutritional therapy.

This research study is being done at approximately 3 nursing homes in the metroplex. At each center staff members will be asked to participate by filling out questionnaires before and after inservices. The attached questionnaire should take no longer then ten minutes to complete and all responses will remain anonymous. Neither your name or any other personal identifier will be placed on the questionnaire. Additionally, you may omit any questions you feel may indicate your identity. You will be asked to complete this same questionnaire after the nutritional inservices have all been given.

If at any time you wish to withdraw from participating in filling out the questionnaires you may do so with out penalty, however, as always you will be required to participate in all inservices.

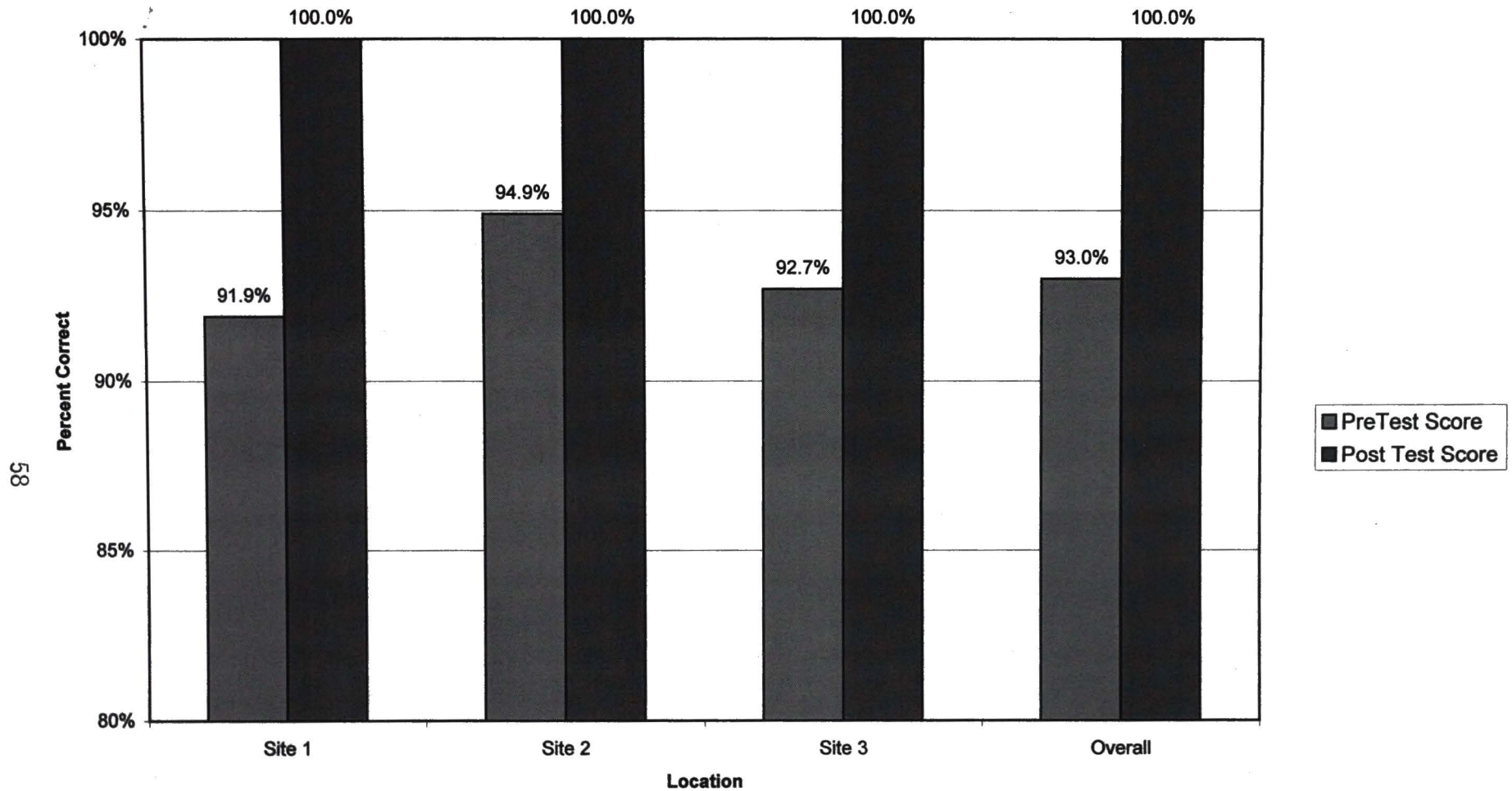
If you would like more information about this research or if any questions arise please contact Dana Cummings, R.D./L.D., principal investigator at (817) 923-8432. You may also ask questions or express concerns as a research subject to Jerry McGill, PhD, Chairman, Institutional Review Board, University of North Texas Health Science Center at Fort Worth, (817) 735-2561.

Thanks again for your participation.  
Sincerely,

Dana Cummings, R.D./L.D.

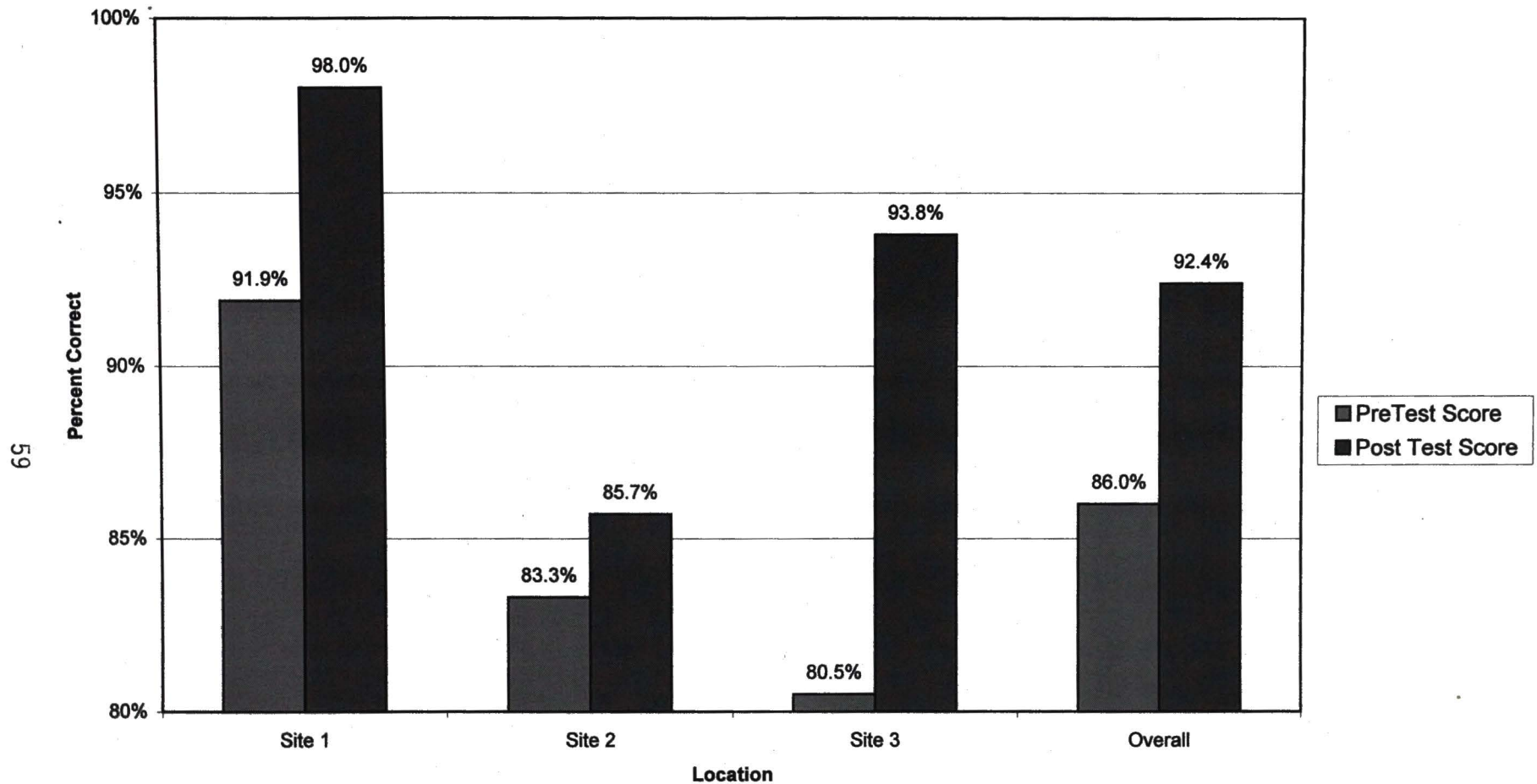
**APPENDIX D**  
**ITEM AND DOMAIN SPECIFIC KNOWLEDGE CHANGE**  
**19 CHARTS**

### Question One, Pre and Post Test Scores



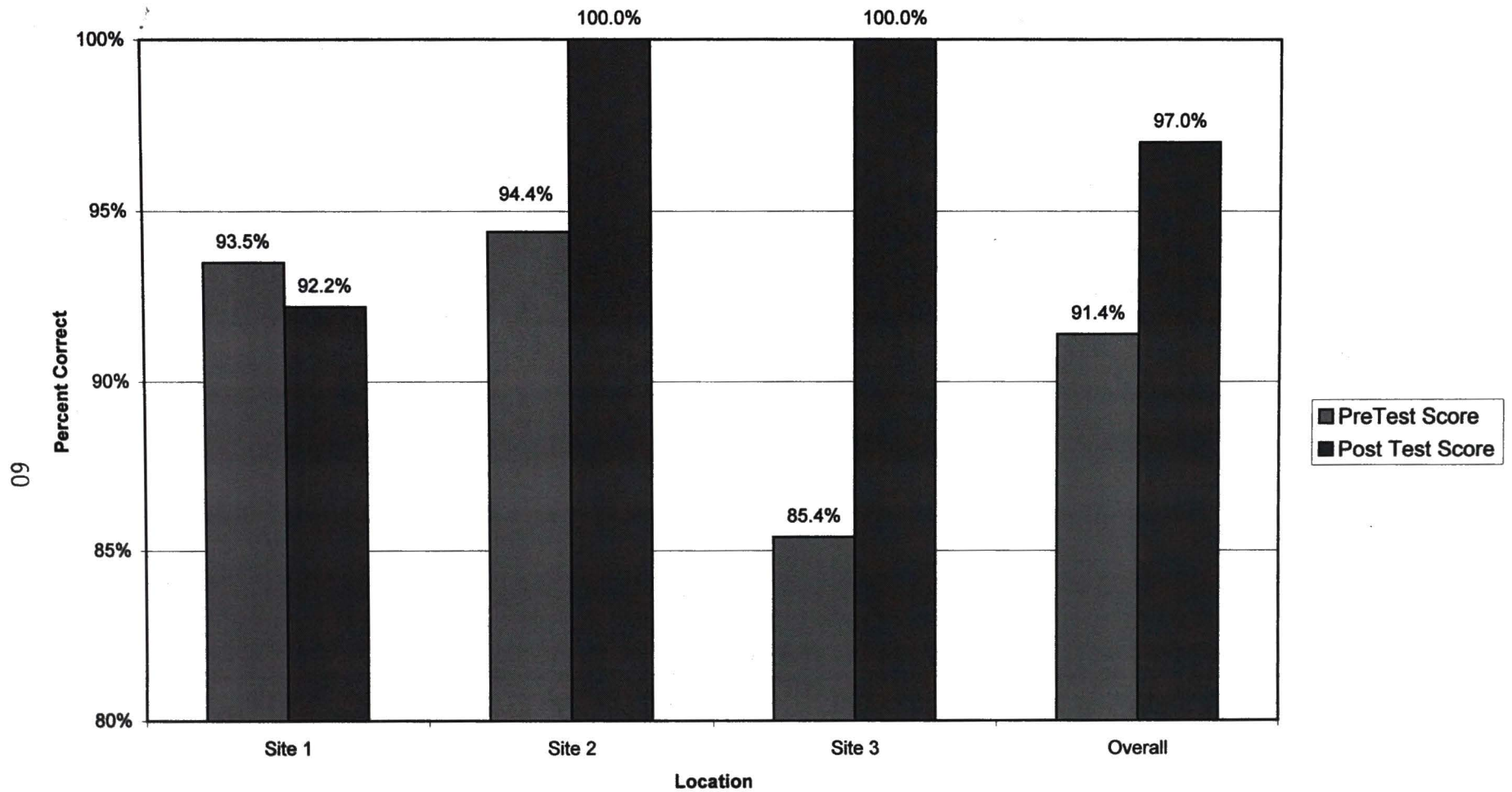
Question One: It is easier to prevent bedsores than it is to heal them, True or False.  
Correct Response = True

## Question Two, Pre and Post Test Scores



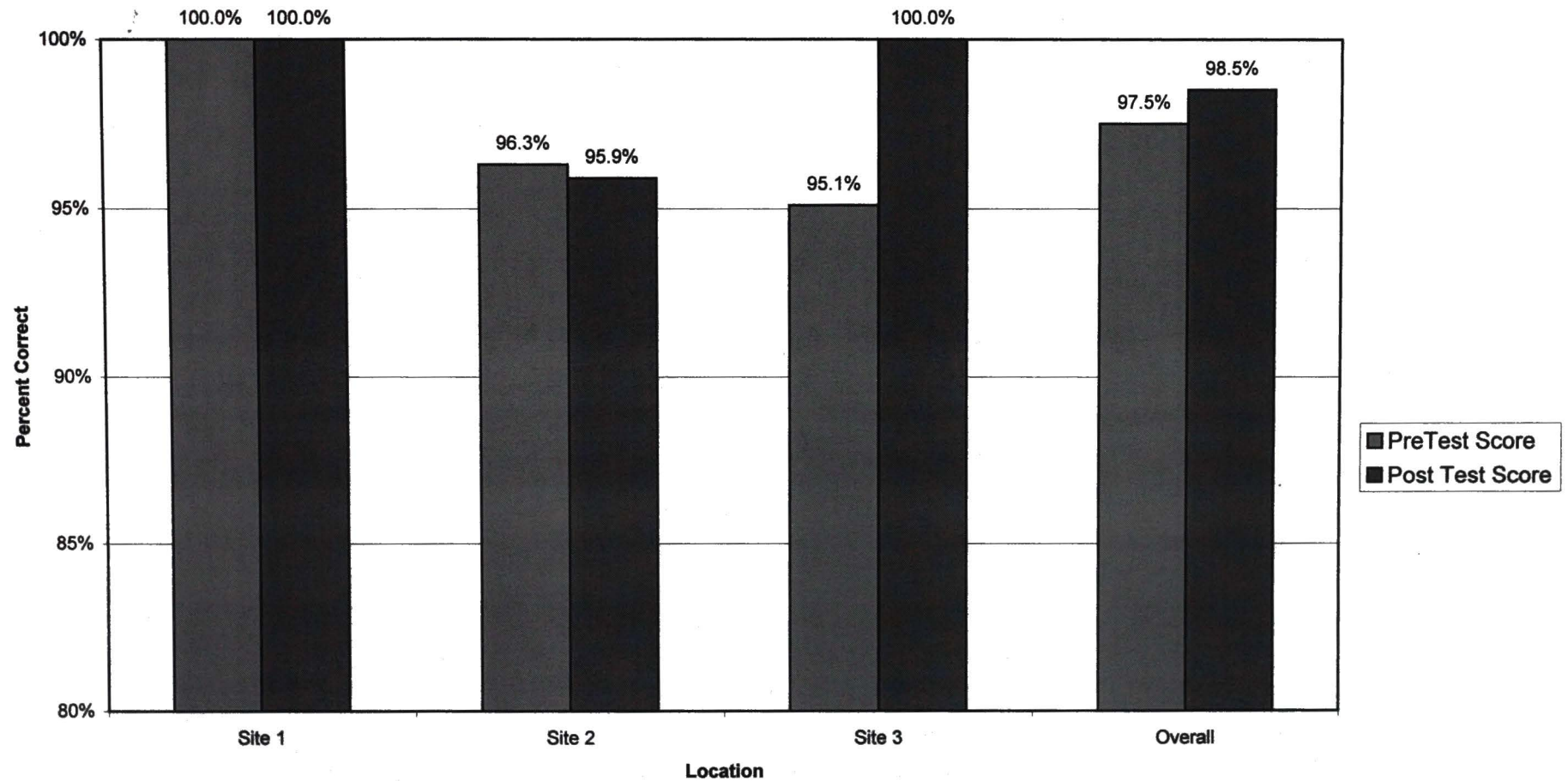
Question Two: Which of the following reduces constipation? A,B,C,D  
Correct Response = D. Eating more fruits and vegetables

### Question Three, Pre and Post Test Scores



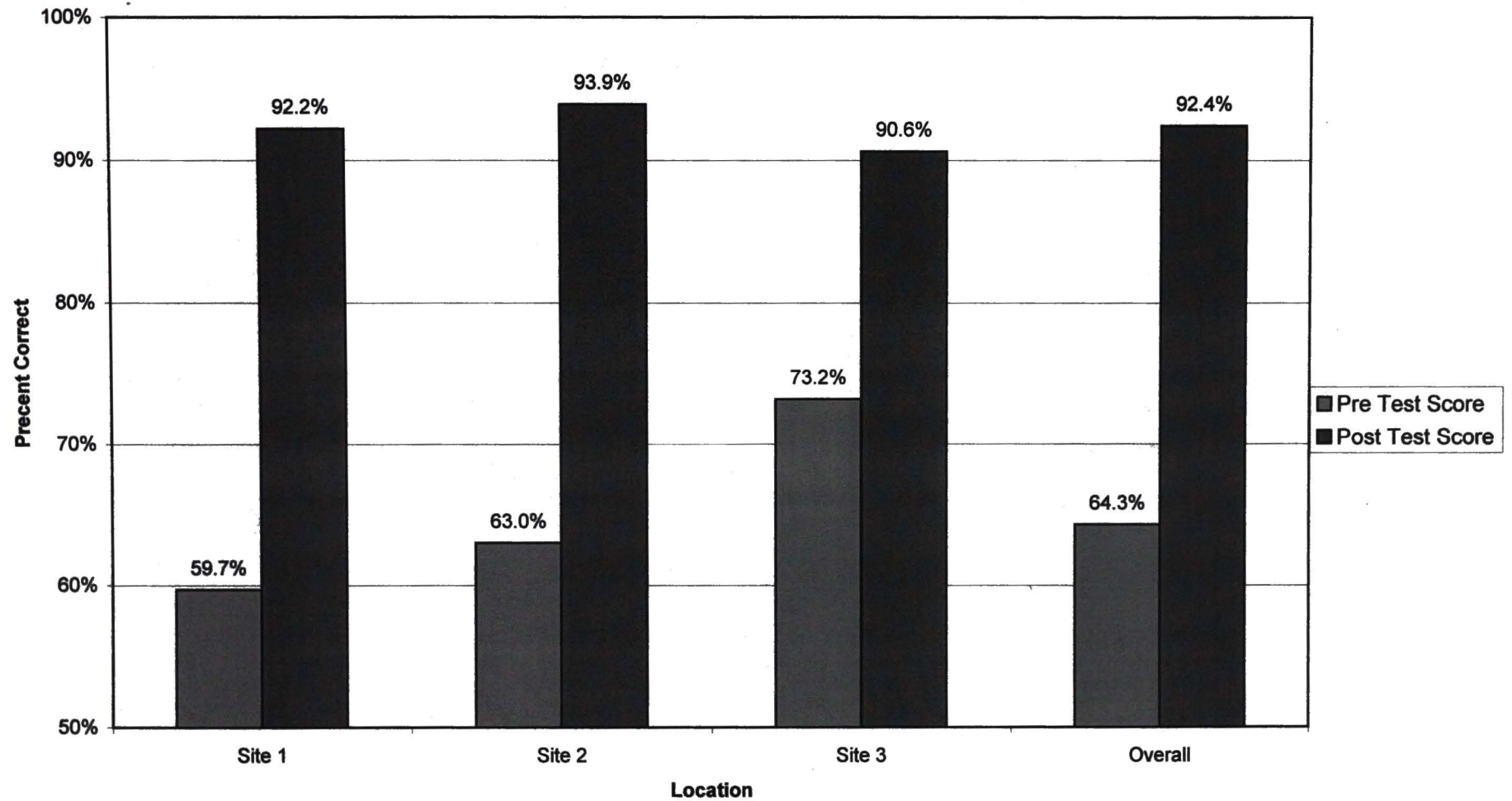
Question Three: Why is measuring the resident's weight important? A, B, C, D  
Correct Response = C. Weight changes can indicate medical and nutritional problems

### Question Four, Pre and Post Test Scores



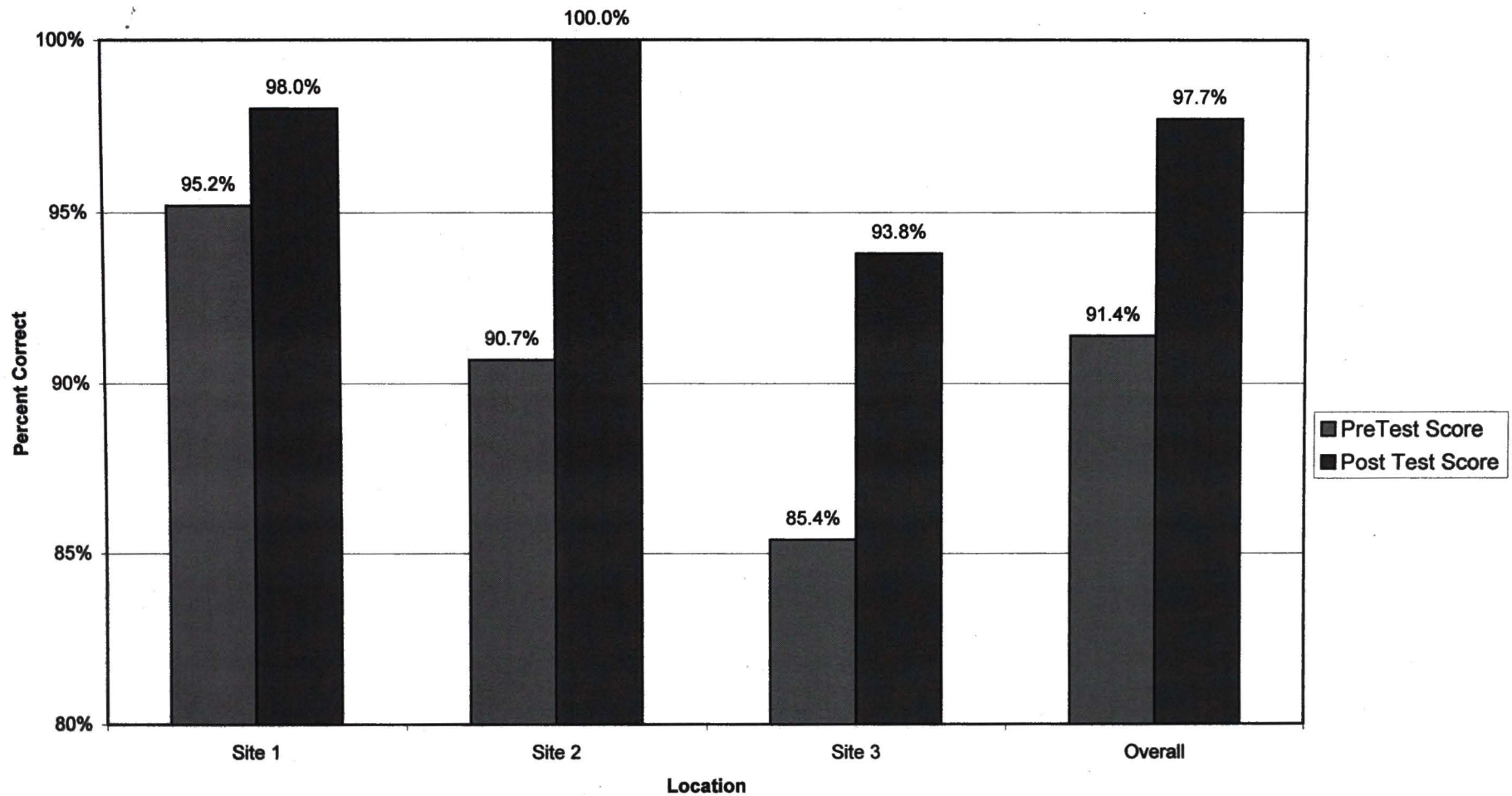
Question Four: Height and Weight should be recorded in the resident's chart at admission and throughout their stay, True or False.  
Correct Response = True

### Question Five, Pre and Post Test Scores



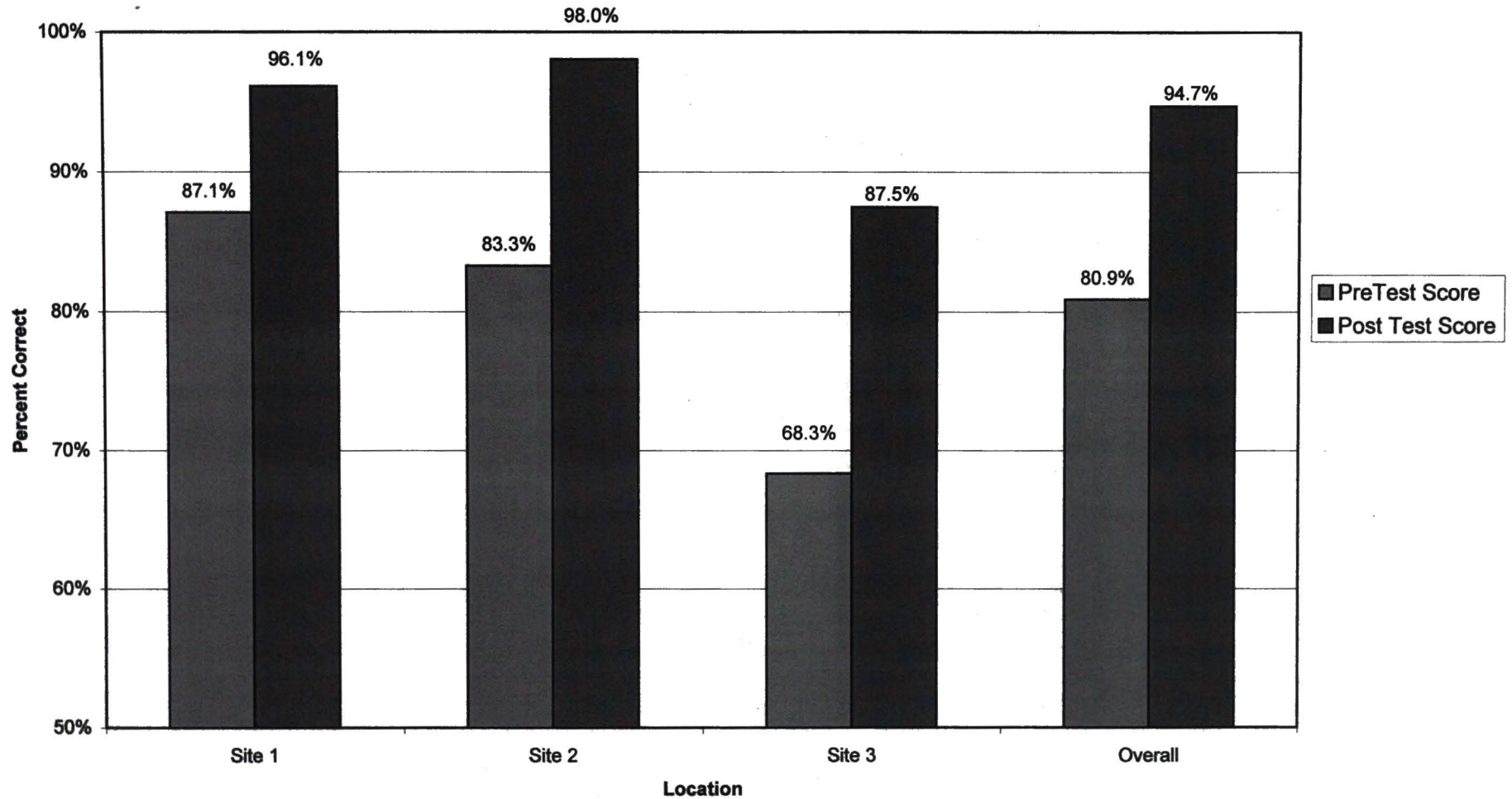
Question Five: The Proper position for eating includes: A, B, C, D  
Correct Response = D. all of the above, Hips slightly forward, 90 degree angles at hips, knees, ankles, and body 12 inches from the table.

### Question Six, Pre and Post Test Scores



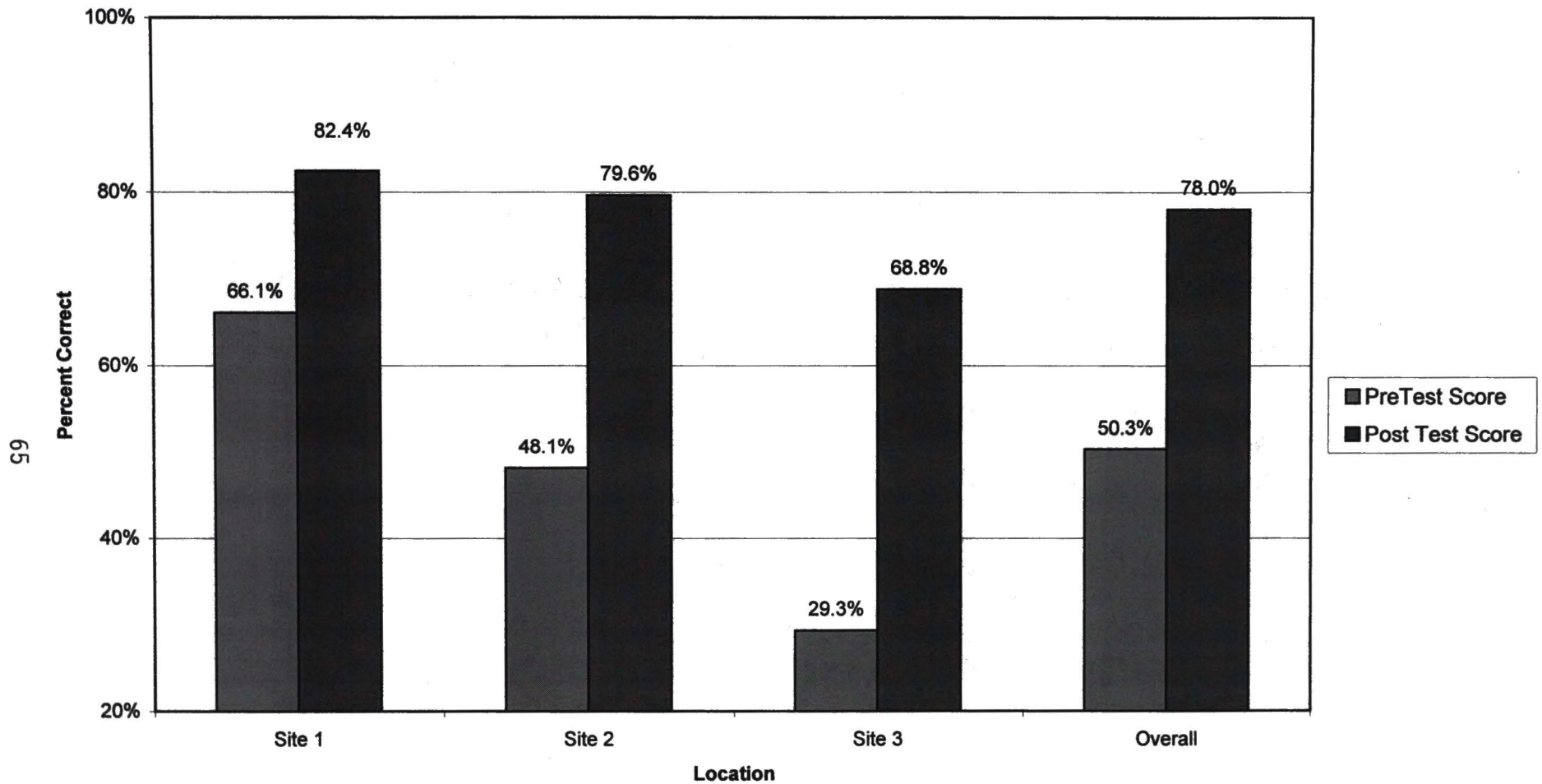
Question Six: How do staff members chart the amount of food and fluid consumed by the resident? A, B, C, D  
Correct Response = B. Observe the tray and note how much was eaten

### Question Seven, Pre and Post Test Scores



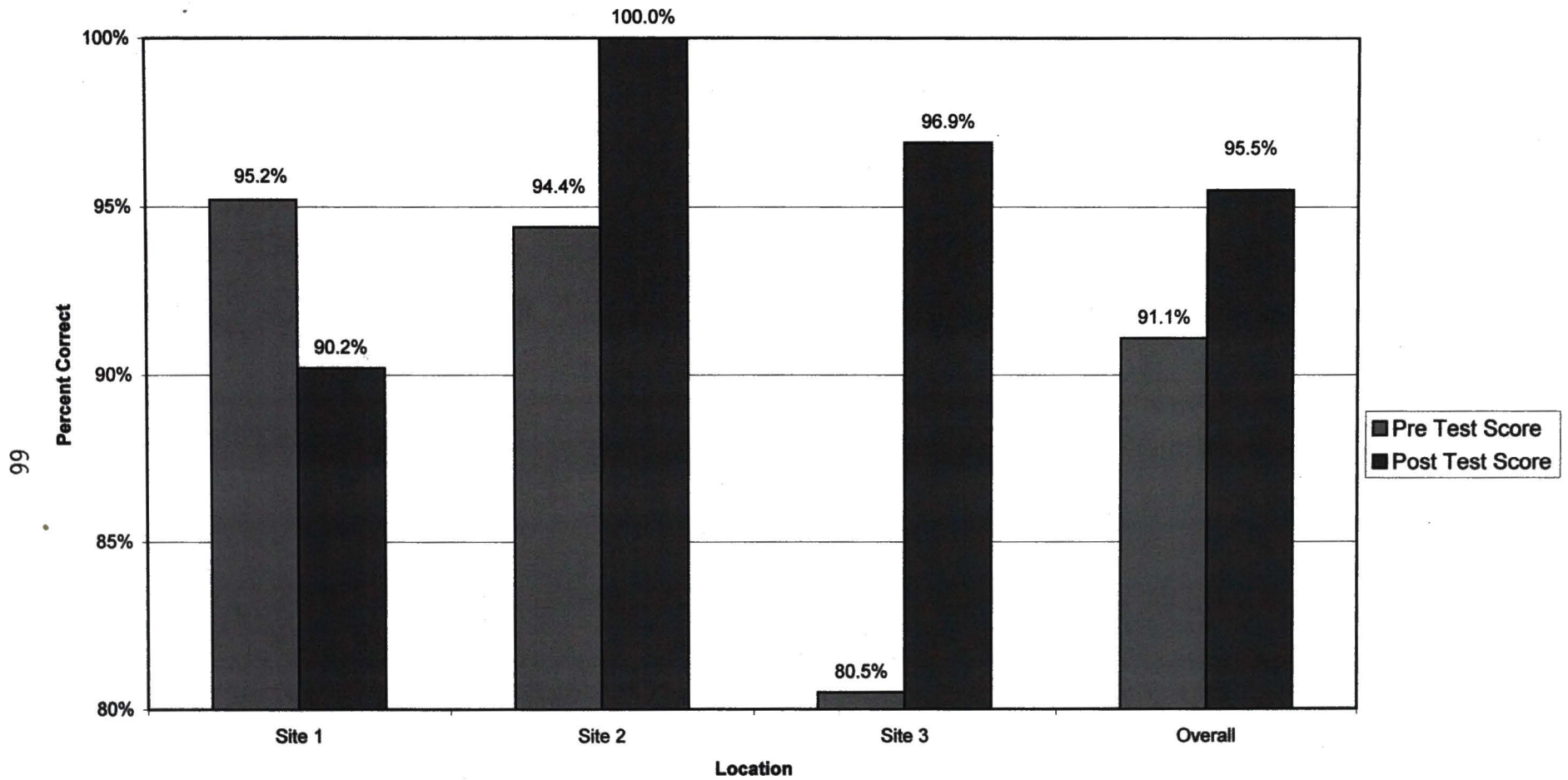
Question Seven: At Dinner, Ms. Jones eats soup, salad, chicken, jello, and ice cream.  
Which of the foods should be recorded as fluid intake? A, B, C, D  
Correct Response = C. Soup, Jello, Ice Cream

### Question Eight, Pre and Post Test Scores



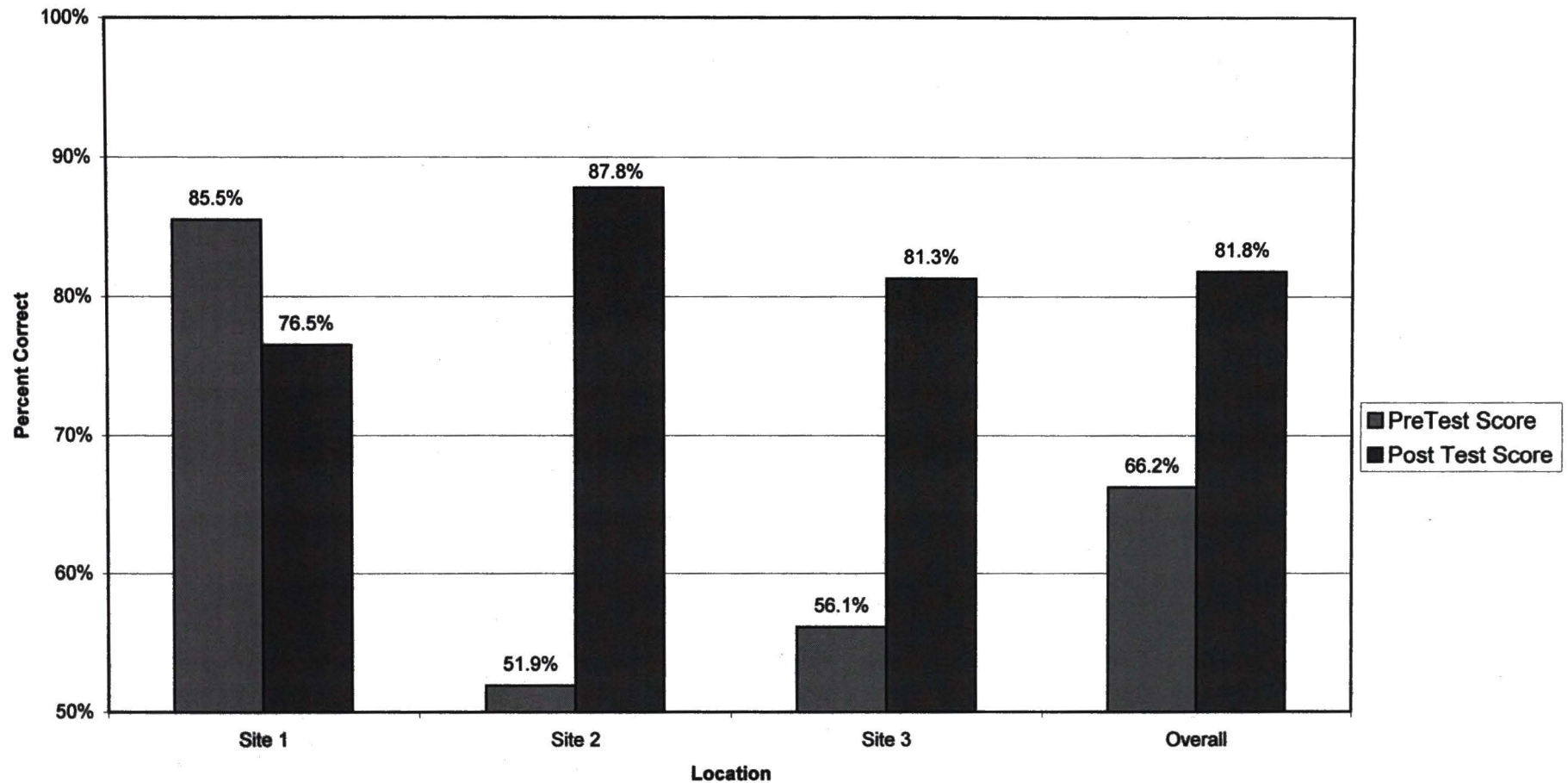
Question Eight: Drinking From a straw can prevent choking on fluids, True or False  
Correct Response = False

### Question Nine, Pre and Post Test Scores



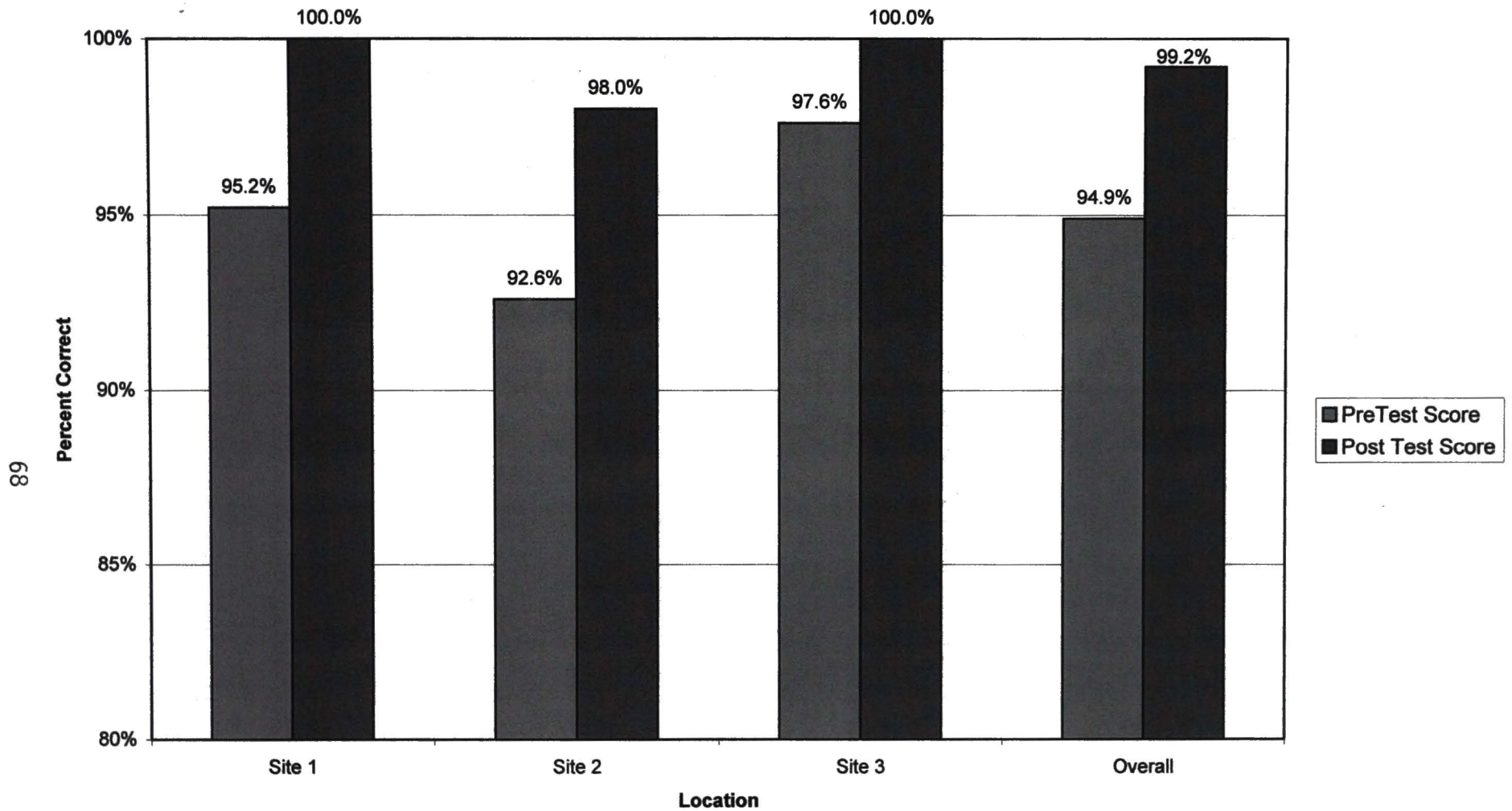
Question Nine: Staff members should discourage residents from taking too many fluids during the day, True or False  
Correct Response = False

### Question Ten, Pre and Post Test Scores



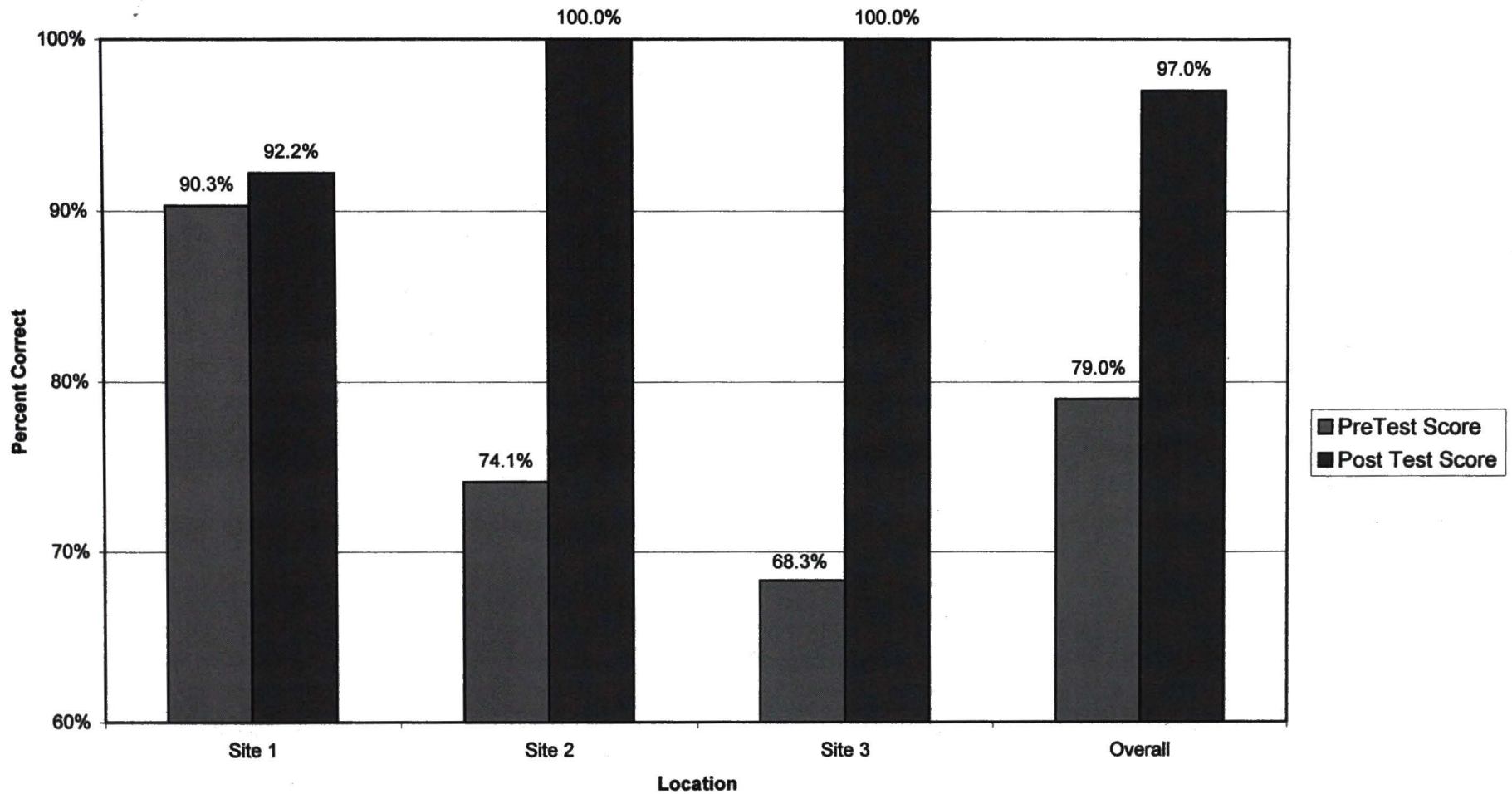
Question Ten: In one day Mr. Man eats slightly less than half of his breakfast, a fw bites of his lunch, and all of his dinner. At which meal(s) should a substitute or suplement be given? A, B, C, D  
Correct Response = C. Breakfast and Lunch

### Question Eleven, Pre and Post Test Scores



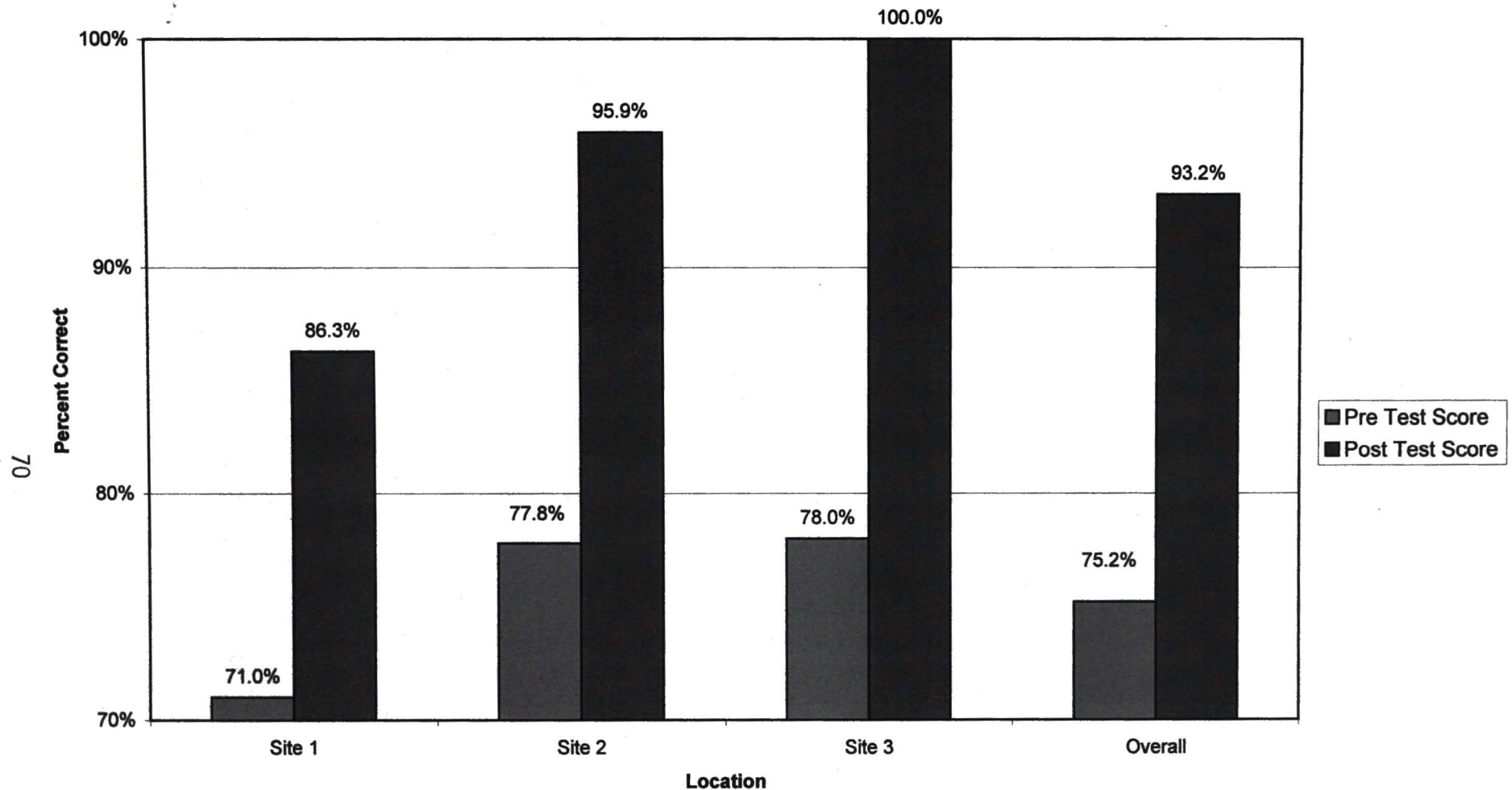
Question Eleven: Loss of taste often causes loss of appetite, True or False.  
Correct Response = True

### Question Twelve, Pre and Post Test Scores



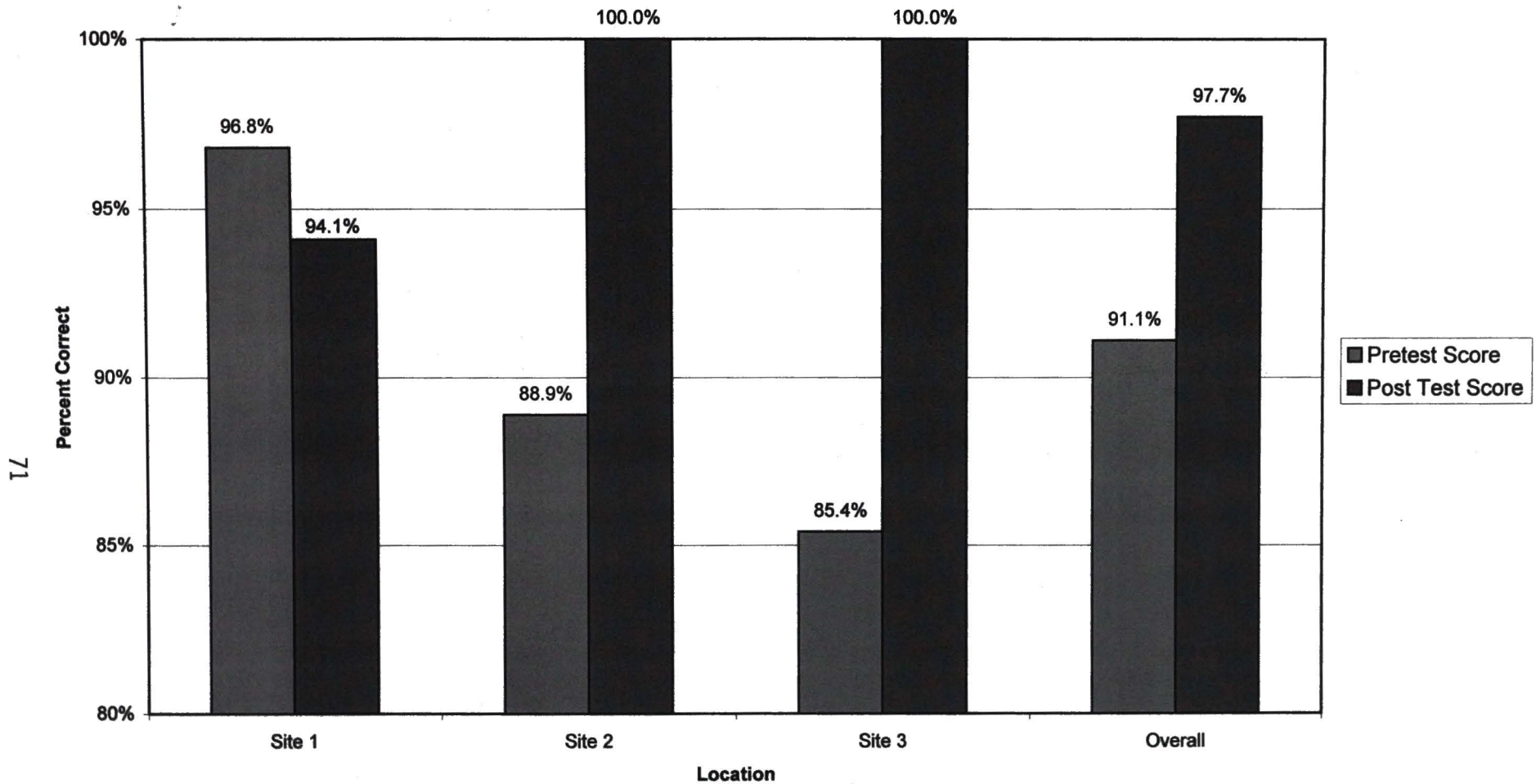
Question Twelve: When small pieces of food, liquid, mucus, or vomitus enter air passages what occurs? A, B, C, D  
Correct Response = C. Aspiration

### Question Thirteen, Pre and Post Test Scores



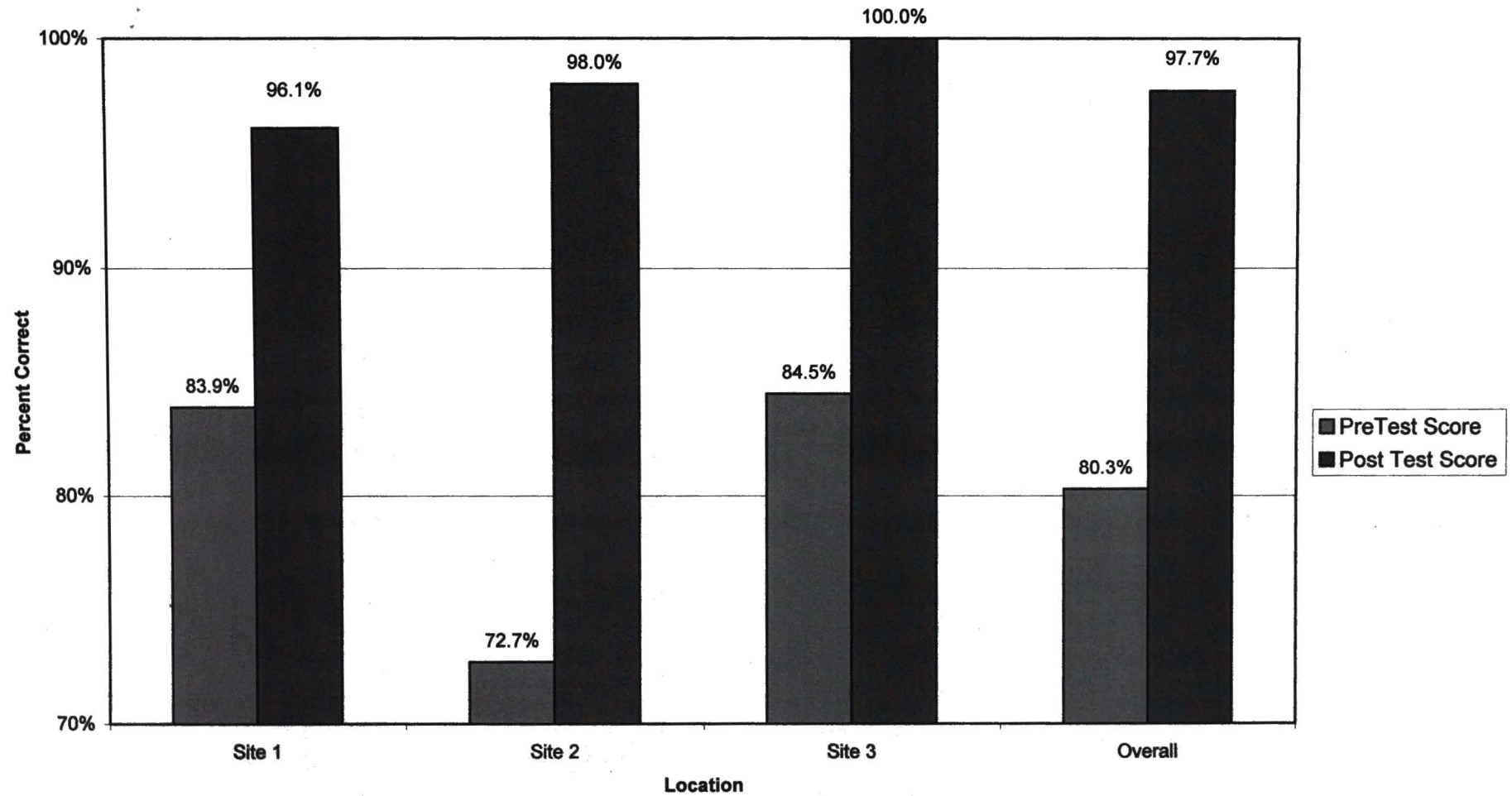
Question Thirteen: When feeding a dependent resident you should: A, B, C, D  
Correct Response = D. A and C, Allow adequate time to chew and swallow food, and alternate solid foods and fluids

### Question Fourteen. Pre and Post Test Scores



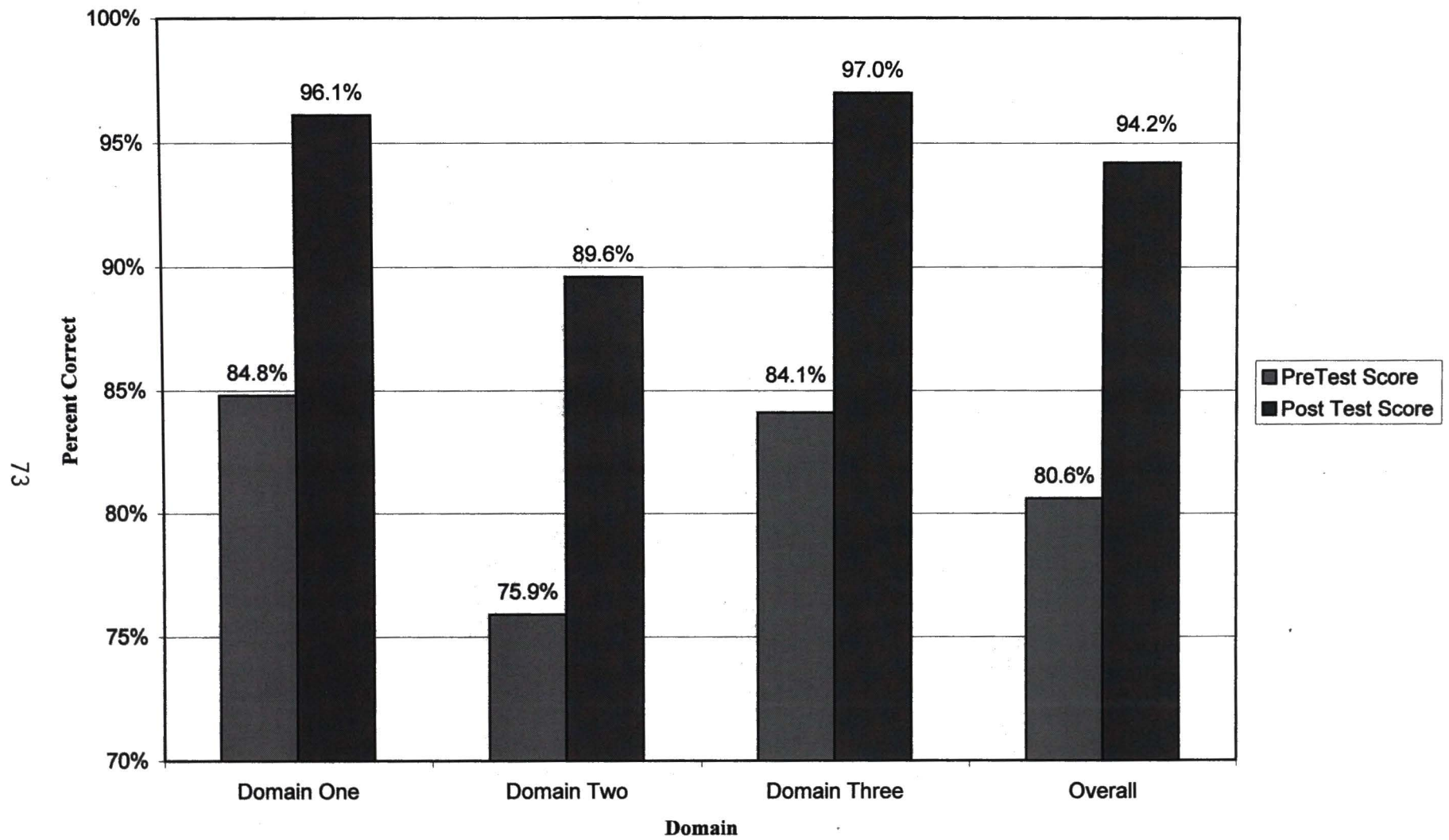
Question Fourteen: When residents eat in the dining room, what are some general guidelines to follow? A, B, C, D  
Correct Response =D. A and B, Wash your hands and the resident's hands, make sure resident gets proper tray and diet

### Question Fifteen, Pre and Post Test Scores

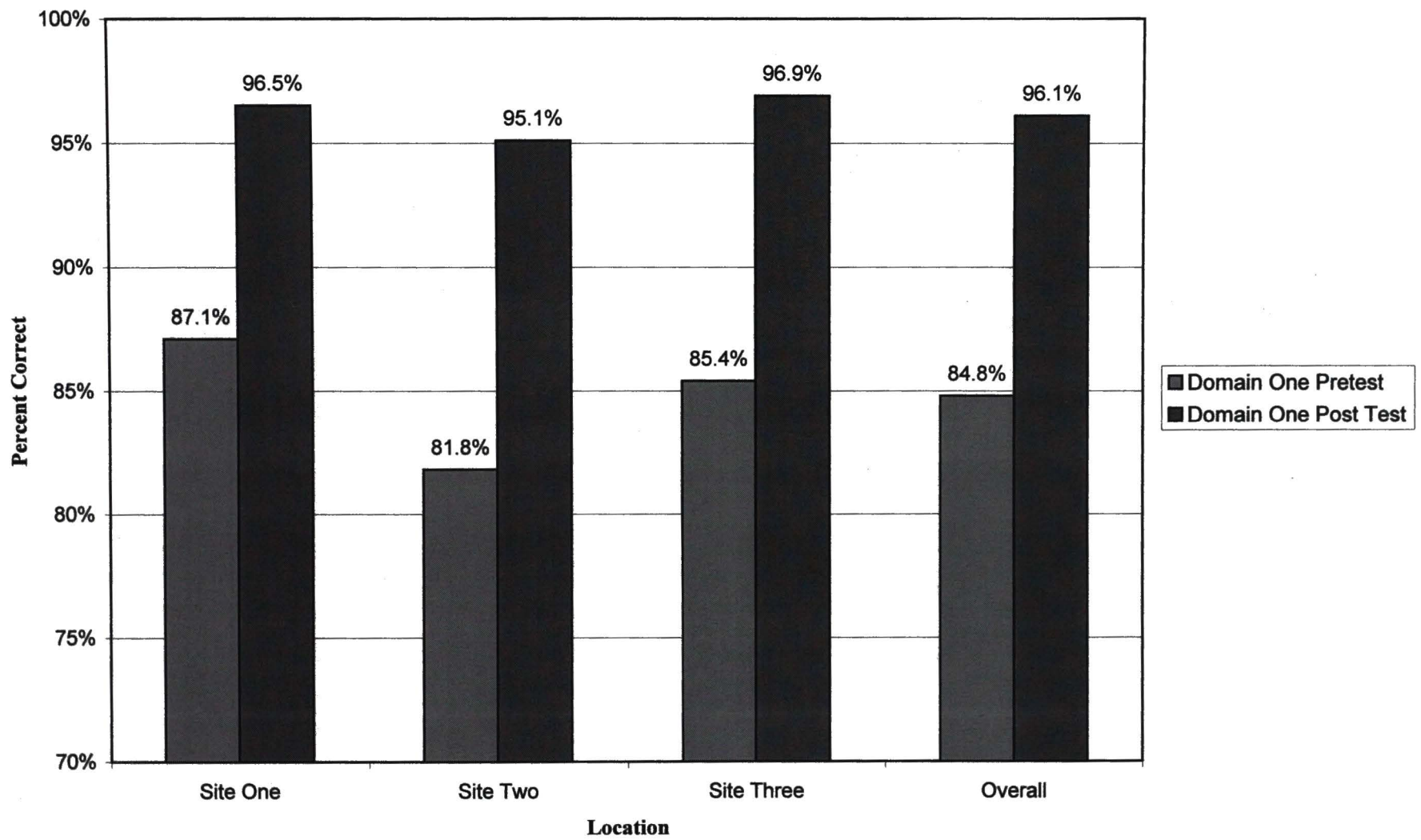


Question Fifteen: If a resident eats in their room and can feed themselves, staff should: A, B, C, D  
Correct Response = C. Watch the resident begin eating before leaving the room

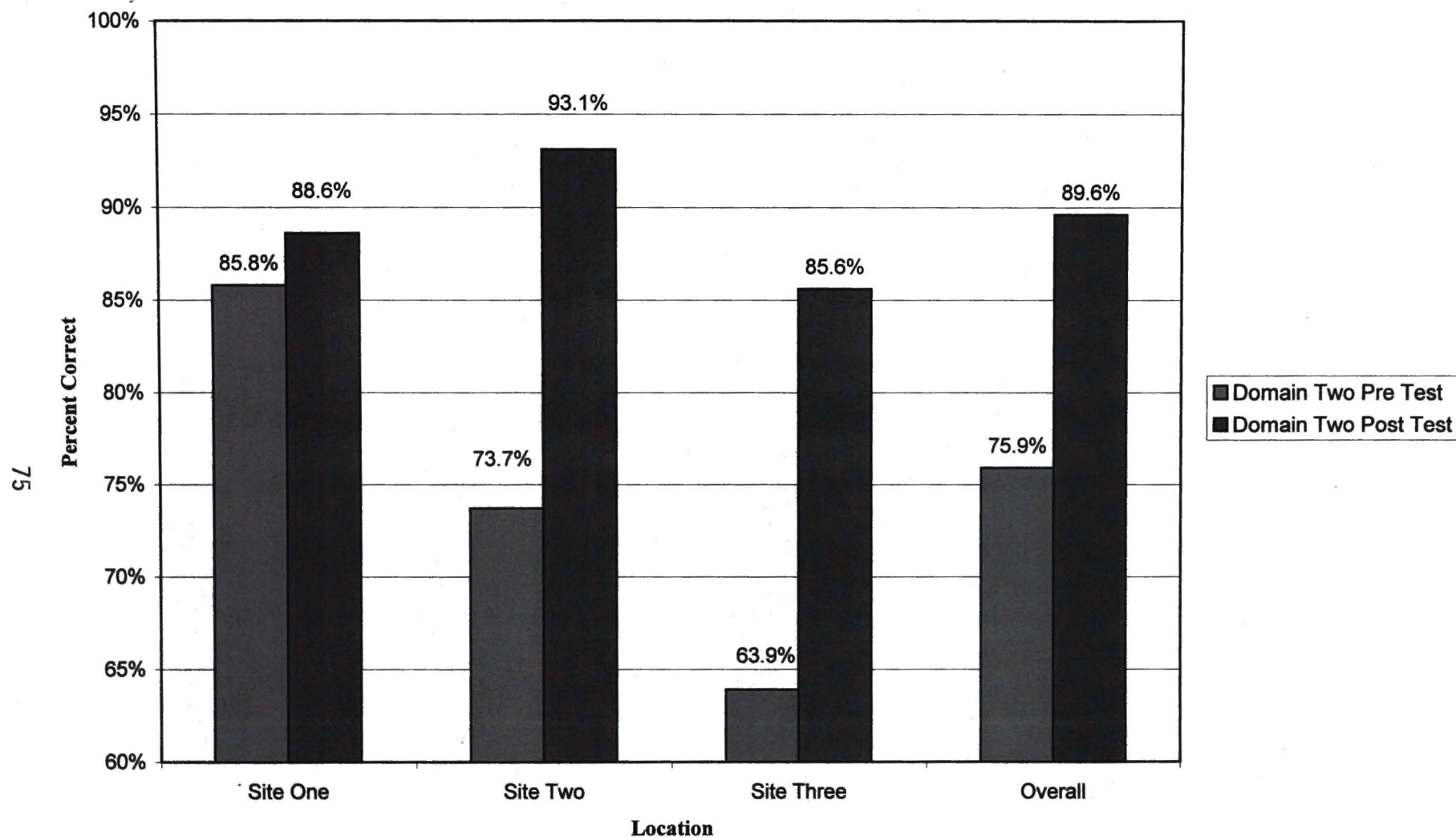
### Overall Knowledge; Pre and Post Test



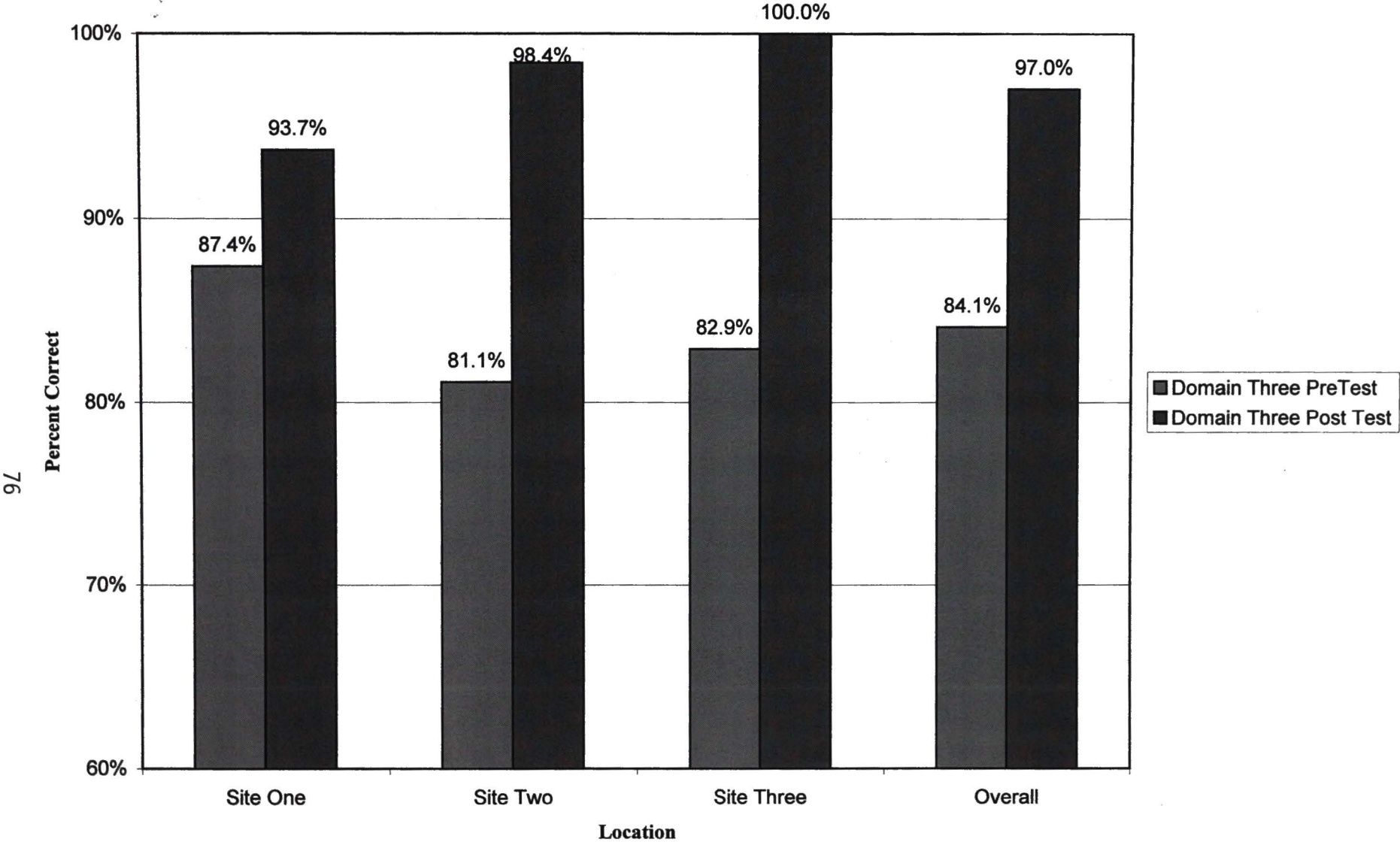
**Domain One; Pre and Post Test Scores by Site**



**Domain Two; Pre and Post Test Scores by Site**



Domain Three; Pre and Post Test Scores by Site



## REFERENCES

- Abbasi, A. & Rudman, D. (1994). Undernutrition in the Nursing Home: Prevalence, consequences, causes and prevention. Nutrition Reviews. 52(4), 113-122.
- Agency for Health Care Policy and Research. (1992). Pressure Ulcers in Adults: Prediction and Prevention. Washington, DC: U.S. Department of Health and Human Services.
- Bahl, SM. & Hamilton, S. (1993). Nutrition: A vital but neglected component in the allied health care curriculum. Loss, Grief, and Care. 7(1/2), 73-83.
- Bennett, J, et al. (1989). Training in the private sector. Nursing Times. 85(20), 60-62.
- Blystone, RV, et al. (1988). Learning through the ages, how we grow old. The Science Teacher 11, 30-35.
- Burton, JR. (1996). The evolution of nursing homes into comprehensive geriatric centers. Journal of the American Geriatric Society 42, 794-796.
- Burke, R. (1996). Yes, you can give an inservice with ease. RN. June, 17-22.
- Campbell SM. Pressure Ulcer Prevention and Intervention: A Role for Nutrition. National Pressure Ulcer Advisory Council; Ross Products Division, Abbott Laboratories, 1994.
- Chernoff, R. (1995). Baby boomers come of age: Nutrition in the 21st century. Journal of the American Dietetic Association. 95(6), 650-654.
- Clark, RD., & Lord, SR. (1996). Simple physiological and clinical tests for accurate prediction of falling in older people. Gerontology 42, 199-203.
- Conklin, J. (1995). Principles of adult learning: how can they help. New Jersey Nurse. 25(7), 7.
- Davis, B. (1993). Drama--A tool for nutrition education with older adults. Journal of Nutrition Education. 15(4), 138.
- Family Health Media Productions. (1994). Treating Urinary Incontinence (film). North Garden, Virginia: FHM Productions.

- Feldman, EB. (1995). Nutrition concepts for the primary care / generalist physician. Southern Medical Journal. 88(2), 204-207.
- Fishman, P. (1996). Healthy People 2000: What progress toward better nutrition? Geriatrics. 51(4), 38-42.
- Fitz, PA. (1997). Nutrition education of health care professionals and paraprofessionals. Topics in Clinical Nutrition. 12(3), 1-3.
- Gamble, CL. (1995). Osteoporosis: Making the diagnosis in patients at risk for fracture. Geriatrics. 51(7), 26-35.
- Glanz, G. & Scharf, M. (1985). A nutrition training program for social workers serving the homebound elderly. The Gerontologist. 25(5), 455-459.
- Gray, GE. (1989). Nutrition and Dementia. Journal of the American Dietetic Association 89, 1795-1802.
- Greenburg, S. (1997). The growth of America's older population. Administration on Aging. [Http://www.aoa.dhhs.gov/may97/growth.html](http://www.aoa.dhhs.gov/may97/growth.html).
- Hark, L. (1997). One program's experience in nutrition education of medical students. Topics in Clinical Nutrition. 12(3), 42-48.
- Henry, JM. (1997). Gaming: a teaching strategy to enhance adult learning. The Journal of Continuing Education in Nursing. 28(5), 231-234.
- Henry, RG. & Ceridan, B. (1994). Delivering dental care to nursing home and homebound patients. Dental Clinics of North America. 38(3), 537-551.
- Hersch, G. (1989). A nursing home inservice program: Characteristics and experiences. Physical & Occupational Therapy in Geriatrics. 6(3), 99-120.
- Houston, V. (1989). A nursing perspective on developing a nutritional assessment. Home Health Care Practice. 1(4), 15-25.
- Jackson, MM & Lynch, P. (1986). Education of the adult learner: A practical approach for the infection control practitioner. American Journal of Infection Control. 14(6), 257-270.
- Lazarus, K. (1997). Nutrition practices of family physicians after education by a physician nutrition specialist. American Journal of Clinical Nutrition. 65(suppl), 2007S-2009S.

- Lewis, DJ, et al. (1989). Gaming: a teaching strategy for adult learners. The Journal of Continuing Education in Nursing. 20(2) 80-83.
- Logemann, JA. Dysphagia: A review for health professionals. Melrose Park, Milani Foods, 1992.
- Mahan, KL. & Arlin, M. (1992). Food Nutrition, and Diet Therapy. Philadelphia: WB Saunders.
- Mason, P. (1994). Unhappy eaters. Nursing Times. 90(42), 37-38.
- Meckler, T & Volger, J. (1983). Nutrition Education and Gerontology Services Project: Los Angeles County Office of Education. Paper presented at the Annual Meeting of the American Educational Research Association.
- Menks, F. (1993). The use of a board game to simulate the experience of old age. The Gerontologist. 23(6), 565-568.
- Mojon, P., et al. (1995). Examiner agreement on caries detection and plaque accumulation during dental surveys of the elderly. Gerodontology. 12(1), 49-55.
- Morse, W. (1997). Incorporating nutrition in a baccalaureate nursing curriculum: One school's experience. Topics in Clinical Nutrition. 12(3), 15-22.
- Mykyta, LJ. (1997). The consequences of osteoporosis in the elderly. Australian Family Physician. 26(2), 115-121.
- National Center on Elder Abuse. (1997). What is elder abuse? Administration on Aging. [http://interinc.com/NCEA/Elder\\_Abuse](http://interinc.com/NCEA/Elder_Abuse)
- Nelson, LV., et al. (1997). Nutrition knowledge of acute care physical therapists. Topics in Clinical Nutrition. 12(3), 33-41.
- Nores, TH. (1997). What is most important for elders in institutional care in Finland? Geriatric Nursing, 18(2), 67-69.
- Oklahoma State Department of Vocational and Technical Education. (1990). Nutrition, Oklahoma practical nursing series: Stillwater Oklahoma.
- O'Sullivan-Malliet, J. (1998). Position of the American Dietetic Association: Nutrition education for health care professionals. Journal of the American Dietetic Association. 98(3), 343-346.

- O'Sullivan-Malliet, J., et al. (1997). What Physician Assistants should know about nutrition. Topics in Clinical Nutrition. 12(3), 49-57.
- Patenaude, J. (1997). Home health aide training: an opportunity for dietitians. Topics in Clinical Nutrition. 12(3), 69-75.
- Puckett, RP. (1997). Nutrition education of the dietary manager. Topics in Clinical Nutrition. 12(3), 63-68.
- Reisburg, B. (1995). "Senile Dementia." Encyclopedia of Aging. 2nd Edition, New York: Springer Publishers.
- Ritenbaugh, CK. (1996). Nutrition curriculum in medical education: A integrated and comprehensive approach. Teaching and Learning in Medicine. 8(2), 102-110.
- Roberts, H. & Philp, I. (1996). Prioritizing performance measures for geriatric medical services. Age and Aging. 25(4), 326-328.
- Shay, K. (1994). Identifying the needs of the elderly dental patient. Dental Clinics of North America. 38(3), 499-523.
- Sullivan, DH. (1995). Impact of nutritional status on health outcomes of nursing home residents. Journal of the American Geriatrics Society. 43 (2), 195- 196.
- Sutcliffe, L. (1993). An investigation into whether nurses change their learning style according to subject area studied. Journal of Advanced Nursing 18, 647-658.
- Weddle, D., et al. (1996). Position of the American Dietetic Association: Nutrition, aging, and the continuum of care. Journal of the American Dietetic Association, 96(10), 1048-1052.
- Weigley, ES. (1997). Nutrition in baccalaureate nursing education and beginning clinical nursing practice. Topics in Clinical Nutrition. 12(3), 8-14.
- Weinsier, RL. (1995). Medical / Dental nutrition education--factors important for developing a successful program. American Journal of Clinical Nutrition 69, 837-840.
- Wells, TJ. Urinary Incontinence in Alzheimer's Disease. Washington, D.C: Government Office of Technology Assessment; National Academy Press, 1986.

White, JV. (1994). Position of the American Dietetic Association: Nutrition--an essential component of medical education. Journal of the American Dietetic Association. 94(5), 555-557.

Wright, et al. (1997). Dietitians can and should communicate with older adults with hearing and vision impairments and communication disorders. Journal of the American Dietetic Association, 97(2), 174-176.





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