

A PROFILE OF DIETARY SUPPLEMENT USE OF
ELDERLY IN TWO WISCONSIN COUNTIES

by

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Abstract

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The use of alternative therapies in the United States is growing rapidly. (Studdert et al 1998) Herbal and dietary supplements are used by more than fifty percent of the U.S. population. The most commonly used supplements are vitamin and mineral preparations, but a wide variety of other substances, like herbals and metabolites are being used in increasing amounts. (Nesheim 1998)

Today, the elderly population is at an all time high. It is estimated that the population of those 65 years and older will double to nearly twenty-five percent of the U.S. population by the year 2030. Greater life expectancy represents our ability as a society to make advances in technology, health care, and delivery of nutrition. The elderly are keeping up with these advances by choosing to use various supplements to inhibit or delay health problems associated with advancing age. (Houston et al 1998)

Although many dietary supplements are showing positive effects, they can cause multiple problems if consumers are misinformed or undereducated about these products.

By profiling supplement use by the elderly, professionals can be armed with knowledge to teach consumers about potential problems that coincide with use of supplements.

The purpose of this study was to profile supplement use of the elderly in two Wisconsin counties to identify practice issues for health care providers. The study sought to: 1) identify the most popular supplements used, 2) determine if supplement practices were healthy, 3) identify unhealthy practices and 4) identify the primary information sources for elderly supplement users.

The sample population was taken from the Nutrition Intervention Program (NIP) in Eau Claire and Dunn counties. A total of 52 subjects were recruited from congregate meal sites and the Meals on Wheels program. The seniors in this sample noted multivitamins, vitamin E, C and calcium as the most common supplements used. Dietary supplement practices were found to be healthy in the population studied, subsequently, no unhealthy practices were identified. A majority of the elderly persons (30) obtained supplement information primarily from physicians. Other popular information sources included friends/relatives and television. Overall, elderly supplement practices were considered healthy. Subjects were using responsible dosages and most were consulting a physician regarding supplements.

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List of Abbreviations

CAM - Complementary and Alternative Medicine

DSHEA – Dietary Supplement Health and Education Act

FDA – Food and Drug Administration

HM- Herb/Metabolite

HMN- Herbal, Metabolite, Nutrient

IU – International Units

JADA – Journal of the American Dietetic Association

JAMA – Journal of the American Medical Association

MV - Multivitamin

mg - milligrams

MOW- Meals on Wheels Program

NHANES – National Health and Nutrition Examination Survey

NIP- Nutrition Intervention Program

NVNM – Non-vitamin, non-mineral

VM – Vitamin/Mineral

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Chapter 1

Introduction

Americans today are looking toward what have been labeled “complementary” or “alternative” therapies to overcome and combat health problems or diseases. Consumers, especially the elderly are vulnerable to unconventional practices to enhance quality and longevity of life. (Strasen 1999, Probart et al 1989, Houston et al 1998) Despite alternative therapies not being very accepted by the medical profession, one of the many growing categories of alternative therapies is consumption of dietary supplements. (Studdert et al 1998) Dietary supplements are a vague category that describes vitamins, minerals, herbs, metabolites, and hormones used to supplement the diet for a desired outcome of improving health status or preventing various illnesses or conditions. (Ervin, Wright, and Kennedy-Stephenson 1999) These supplements may have positive and/or negative outcomes. Due to the lenient guidelines set by the FDA for manufacturers, consumers may be at risk for adverse effects or toxicity of these supplements if not properly educated about them. Consumers, especially elders being in a more compromised state and at higher risk for negative health conditions, benefit from having educated resources to turn to for questions and advice. (Tripp 1997)

According to recent national surveys, more than forty percent of Americans take some form of dietary supplement. (Sarubin 2000, 3) This means that more than one hundred million Americans use dietary supplements including vitamin, mineral and herbals. (Dickinson 1998) The US Food and Drug Administration (FDA) estimates that more than 29,000 different supplements are on the market, with an average of 1,000 new products introduced yearly. (Sarubin 2000, 3) According to the National Business Journal, supplement sales reached \$14.7 billion in 1999. Just one year before, the

supplement industry managed to obtain 13.9 billion of consumer's dollars. The use of supplements is increasing by about fifteen percent per year. (Strasen 1999) These growing numbers show that consumers today are interested in supplementation.

Supplements are being taken to improve nutrition, to make up for lost nutrients missing in the food supply, to decrease susceptibility to or severity of disease, or to increase energy to improve performance. (Ervin, Wright, and Kennedy-Stephenson 1999)

Another factor that may contribute to increased interest in supplements is evidence linking diets high in certain nutrients (for example ascorbic acid, tocopherol, folic acid and calcium) will lower the risk for certain diseases or other conditions. (Ervin, Wright, and Kennedy-Stephenson 1999) Four out of five adults have chronic diseases that are affected by diet. (Wellman et al 1997) Many elders may take supplements to help compensate for deficits.

While some consumers are turning to supplements in hopes of relief others feel conventional medicine is the only choice. In a survey conducted by *Consumer Reports Magazine*, fifty-eight percent of 46,000 respondents used conventional therapy to relieve their symptoms. Readers reported that twenty-five percent used conventional and alternative therapies concurrently for relief. Only nine percent used solely alternative therapies of any type. One of the writer's findings was that despite the "boom" in alternatives, mainstream medicine is still the consumer's choice. When consumers were asked to rate the effectiveness of the supplements they had tried, twenty-three percent they felt much better by taking the remedies, and twenty-nine percent said they felt somewhat better. Little if any improvement was seen by more than four of ten readers. (Consumer Reports 2000b) This confusion about what treatments are working, and

which are the best is forcing health professionals to be aware of the various supplements being used. Supplement manufacturers target the elderly promising improved symptoms of the natural aging process. Elders have also concluded that consumption of supplements is beneficial. (Tripp 1997) The vulnerability of many in the elderly population encourages the need for health professionals to possess current information regarding supplements to help seniors make beneficial health decisions. By profiling supplement usage by the elderly, professionals can be kept abreast of the trends and serve as good resources for the elderly population to come to for advice concerning treatment options.

This research project was conducted in an attempt to profile dietary supplement users in an elderly sample. A survey instrument was developed and distributed to participants of the Elderly Nutrition Intervention Program in two Wisconsin counties. The outcomes can assist area health care providers in targeting educational needs of the community. The primary objective of the study was to profile elderly dietary supplement users in the two counties. The study specifically sought to: 1) identify the most popular supplements used by this sample, 2) determine if the practices were healthy, 3) identify unhealthy practices, and 4) identify popular information sources that the elderly use to obtain facts about dietary supplements.

Assumptions of the Study

It was assumed that participants completing the questionnaires were honest and recorded credible responses that truly reflected their practices and feelings.

Delimitations

The scope of the study was limited to elderly persons in Eau Claire or Dunn Counties. Volunteer elders had to be sixty-five years or older who were using or had used some type of dietary supplement(s) in the past.

Limitations

Limitations identified include:

1. The study sample consisted of senior volunteers who were willing to participate.
2. Choosing only persons involved in the Nutrition Intervention Program (NIP) may have formed a biased sample. Subjects in the NIP obviously had access to community resources and were assumed to be fairly healthy if they were receiving at least one nutritional meal 5 days per week.
3. Sample size was small, consisting of 52 subjects. A larger sample size may have helped in identifying trends.
4. A large number of participants (31) were recruited Dunn County Meals on Wheels (MOW) Program. A majority of the subjects came from Dunn County, which may limit generalizations.

Organization of the Report

This report is divided into five sections. A review of literature is presented in chapter two. Research methods are described in chapter three. Chapter four presents the results of this research including demographic data of the subjects, the most common supplements used by this sample, and how elders obtain supplement information. Discussion, conclusions, and recommendations are presented in chapter five. References and Appendices follow.

Chapter 2

Review of Literature

Introduction

The interest and use of alternative therapies in the United States is widespread and growing. (Studdert et al 1998) The use of dietary supplements is considered one type of alternative therapy. Americans, including the elderly are taking supplements to improve nutrition and decrease their susceptibility or severity of disease. (Ervin, Wright, and Kennedy-Stephenson 1999) Since elders are especially susceptible to nutrition misinformation, it is important for professionals to be armed with correct information about supplementation. (Probart et al 1989)

The main objective of this study is to profile dietary supplement use among elders of two counties in Wisconsin. Specifically, this study sought to 1) identify the supplements used most by elders in this sample, 2) determine if supplement practices were healthy, 3) identify unhealthy practices, 4) and identify common sources elders obtain supplement information.

DSHEA and the Definition of a Dietary Supplement

To profile supplement users, it is vital to know what constitutes a dietary supplement. For many years, the Food and Drug Administration (FDA) regulated dietary supplements as foods. (U.S. FDA 1995) Due to dietary supplements being regulated similar to foods, the Dietary Supplement Health Education Act (DSHEA) of 1994 was implemented to establish new provisions for assuring safety, establish guidelines for the sale of supplements, provide the use of claims and nutritional support statements, require ingredient and nutrition labeling, and grant the FDA the authority to set good manufacturing practice (GMP) regulations. (U.S. FDA 1995, Mason 1998) According to

the DSHEA of 1994, a dietary supplement is “a product (other than tobacco) that is intended to supplement the diet that bears or contains one or more of the following dietary ingredients: vitamin, mineral, an herb or other botanical, an amino acid, a dietary substance for use by man to supplement the diet by increasing the total daily intake, or concentrate, metabolite, constituent, extract, or combinations of these ingredients. A dietary supplement is intended for ingestion in pill, capsule, tablet, or liquid form.” (U.S. FDA 1995)

Herbs are considered “non-woody, seed producing plants that die at the end of growing season”. (Radimer, Subar, and Thompson 2000) The use of herbals has increased 380 percent compared to a 1990 survey. (Smolinske 1999) Herbal is a term generally used loosely, as in this study, the term herbal will be considered any supplement that is not a vitamin or mineral. (Radimer, Subar, and Thompson 2000) Like vitamin and mineral preparations, herbal supplements come in many various forms including teas, powders, tablets and capsules. (Kurtzweil 1998) According to the National Institutes of Health, 24,000 to 30,000 supplements in these various forms are currently being sold in pharmacies, health food and grocery stores, over the Internet and in physician’s offices. (Shelton 2000)

Where Consumers Obtain Supplement Information

Along with knowing what constitutes a supplement, knowing where consumers get information about supplements is also important. It is crucial for professionals to know where the public obtains information about dietary supplements to protect them from misinformation. Consumers are looking for quick solutions to their health and nutrition problems, so instead of turning toward traditional methods they are being lured in by the marketers. Because most of the general public does not read scientific studies,

most believe information about supplements released on the radio or by television. Those most vulnerable to supplement claims of products that improve health include the elderly. (Short 1994) In reviewing the literature, there are conflicting conclusions about where consumers get information about nutrition and supplements. In a 1989 study, elderly mentioned they were most likely to get nutritional information from physicians with dietitians and health food stores being second choice. (Probart et al 1989) More recent studies conclude that consumers are using the traditional health care system but do not typically consult their physician about supplements. (Eliason 1997, 1999) Today, people are using advancing technologies to obtain information about nutrition. Twenty-nine percent of Americans use the Internet as a major source of health information, and seventy percent do so before seeing a health care professional. (Trissler 1999) Health professionals are concerned that consumers are being misinformed about supplements from media such as television and the Internet. (Short 1994) Because elderly are vulnerable to nutrition misinformation, inappropriate supplementation is high among this age group. (Probart et al 1989)

Elderly and Aging-Defined

To study elderly persons as a population, it is necessary to understand who the elderly are and what aging is. Rather than classifying the elderly as anyone over sixty-five years old, these individuals can be further subdivided into different age groups and specific terms used to identify them. People 65 to 74 years old are referred to as the young-old. Old-old or aged are terms used to describe persons 75 to 84 years, and the oldest-old are those 85 years or older. (Hobbs 1992) With the divided age groups, more specific conclusions can be drawn associating supplement usage to various age groups.

Aging is a process adults experience marked by progressive deterioration in bodily functions and an accumulation of chronic disabilities and diseases. (Nelson 1994, 58) This process of aging puts most elderly in a compromised state. Many elders are nutritionally at risk due to various diseases causing malnutrition or malnutrition causing the disease states. (Wellman et al 1997) Elders may be advised or tempted to take various supplements to compensate for these deficits to resolve the symptoms and states malnutrition places on them. (Neidert 1998)

Demographic Characteristics of the Elderly Population

Today's older population is different from the older population of the past. Researchers are predicting an increase in educational level, financial status, and life expectancy. All of these factors are likely to have a direct impact on the abilities and needs of elders and their access to and knowledge of health care and nutrition. (Hobbs 1992) Due to educational attainment being positively correlated to dietary supplement use, increases in the level of education will result in a rise in dietary supplement use. (Eisenberg et al 1998, Ervin, Wright, and Kennedy-Stephenson 1999) An improvement in education attainment, financial status and life expectancy is likely to directly influence the abilities and interests of the future elderly.

What will happen to our aging in the 21st century? The answer will depend on our ability to be successful in improving the health of future older Americans. Not only are elderly living longer, but they also represent the most rapidly growing segment of the population. Between now and the year 2030, the population of people over sixty-five will almost double. (Cox 1985, 7) According to current population reports, as a result of the aging of current baby boomers and the projected continuing increase in life expectancy, the number of Americans aged sixty-five and above is projected to increase from thirty-

five million in 2000 to seventy-eight million in 2050. (Houston et al 1998) Even more astonishing, the four million Americans aged eighty-five and above in 2000 are projected by the Census Bureau Middle Series to grow to almost eighteen million by the year 2050. Many demographers believe that these projections are underestimates. Newsweek quoted that people 100 or older are the fastest-growing segment of the U.S. population. There are now 61,000 members of the 100-plus club; by 2020, there will be an estimated 214,000. (Schneider 1999) The reason why these projected numbers are important to look at is because Americans can anticipate changes in Medicare and other resources that affect the health status of elderly people. An increase in out-of-pocket expenses may be a change Americans would experience, which would directly effect prevention and treatment options for many individuals. Today and into the future, seniors may be forced to turn toward alternative therapies that are cheaper than conventional medicine. The use of vitamin/mineral supplements and herbs to prevent, treat or reduce symptoms of diseases is quickly becoming mainstream. (Schneider 1999)

Demographic studies today, primarily in developed countries, indicate that females live longer than men. (Timiras 1994, 9) The longer life expectancy for women may be a result of females being more likely than males to take dietary supplements. (Ervin, Wright, and Kennedy-Stephenson 1999, Eisenberg et al 1998) Today, elders of both sexes are suffering from declining health at an earlier age than that predicted for the generations upcoming. (Hobbs 1992) By improving the nutritional and health status of elders, it consequently will allow for living longer lives.

Health Status of the Aging, Why Elders Use Supplements and Recommendations of Supplement Use in the Elderly

Poor nutritional status has been identified as one of the risks of the aging population. (Wellman et al 1997) Dietary supplement use to reduce the risk for poor nutritional status is considered controversial, although the level of controversy is not the same for all supplements. As people age their energy intake decreases, but because of reduced intakes, sometimes protein and micronutrient intakes are also compromised. Some nutrients are actually needed in higher amounts in the elderly because of their decreased ability to absorb them, the intake of medications and increased risk for diseases. Studies are showing that it is getting more difficult for the elderly population to consume the nutrients they need from food alone. (Tripp 1997, Wellman et al 1997) Since these studies, the daily reference intakes (DRI) for a few vitamins and minerals have increased. For example, the new DRI for folate is 400 micrograms (ug) for men and women 17-70+ years. (Hudnall 1999, 88) Because of the low intake and other factors that affect the nutritional status of elder's, this level may not be achievable for many through food alone. Supplements are sometimes recommended.

Health and vitality are constantly improving as a result of exercise, better medicine, and much better prevention. Despite improving health status of the elderly, chronic and acute disease states remain prevalent in this population. (Ervin, Wright, and Kennedy-Stephenson 1999) Decreases in food consumption may cause various deficiencies in elders including macro and micronutrient deficits, which can lead to chronic and acute disease states. (Tripp 1997) Memory deficits and loss of appetite can make it difficult for elders to remember what, when, and if they have eaten. Poor oral health is yet another challenge for the elderly to receive proper nutrients. Choosing a tolerable texture and the right amount of food can make eating difficult. (Wellman et al

1997) Many times it is often easier to take a supplement in the form of a pill or liquid to compensate for deficits due to decreased appetite or the inability to eat certain foods. (Tripp 1997) Physicians, nurses and dietitians may encourage compromised individuals to consume the necessary nutrients by supplementing the diet with single vitamin, multivitamin or mineral sources to achieve recommended levels of the nutrients. (Tripp 1997, Wellman et al 1997)

As chronological age increases, so does the probability of having multiple chronic illnesses and the rates of sense impairments increase rapidly. Heart disease is a major threat to the health of the elderly, and is the leading cause of death within the elderly population. (Hobbs 1992) Atherosclerosis (including hypertension and myocardial and cerebral vascular accidents) is a major cause of hospitalization and death. (Timiras 1994, 199) Cancer, stroke, chronic obstructive pulmonary disease, influenza, and pneumonia are also prevalent causes of death among the elderly. (Hobbs 1992) Today, alternative medicine practices are becoming more prevalent to treat these disease states. Researchers suggest failure to eat enough of certain types of foods ranks as one of the most significant contributors to the risk of these chronic diseases. (Hudnall 1999, 12) Even though nutrition experts urge consumers to get the needed nutrients from whole foods, many insist on taking supplements instead. (Hudnall 1999, 31) Today, many anti-aging supplements are being tested and analyzed by researchers to evaluate the effectiveness or non-effectiveness that individual nutrients have on the body.

Ageing persons may suffer from impaired immune response and increased infection-related diseases. Due to infection being a major cause of illness and the fourth most common cause of death in the elderly population, seniors are searching for

treatment measures to improve immunity. (Chandra 1992) A strong positive correlation between the maximum life span and the concentrations of antioxidants has been shown in research. (Meydani et al 1998) As a result of the findings, antioxidants are being promoted for health benefits and to increase longevity. (Meydani et al 1998) Although antioxidant supplements are proving to have many benefits, caution is warned with very high doses because of the risk of impairing immunity. (Chandra 1992) Researchers are also concluding that supplementation with a daily multivitamin-mineral combination improves immune function in apparently healthy, active seniors. (Chandra 1992, Wellman et al 1997)

The antioxidant, ascorbic acid also may have positive effects on the immune. According to recent research, certain subpopulations, including the elderly, tend to have low plasma ascorbic acid levels. (Sarubin 2000, 352) As an antioxidant, ascorbic acid may play a beneficial role in conditions that the elderly suffer from including a decreased immune system, cataracts, and other diseases resulting from oxidative damage. (Meydani et al 1998) For those elders who fail to consume adequate amounts of ascorbic acid through the diet, a vitamin C supplement (200 mg to 500 mg) may be appropriate. (Sarubin 2000, 353)

In reviewing current literature, alpha-tocopherol is another antioxidant making headline claims. Alpha-tocopherol may be beneficial to help prevent or delay chronic conditions often times seen in many elderly. (Sarubin 2000, 367) Preliminary evidence of studies on tocopherol reveals that high-doses of these supplements improve some immune function parameters in elderly subjects. (Meydani et al 1997, Butler et al 2000) A Boston-area study concluded alpha-tocopherol is safe for elderly with no side effects

and no effects on bleeding time. (Meydani et al 1997) Studies are showing the benefits of alpha-tocopherol, which include: Reducing the risk of cardiovascular disease in some individuals, playing a strong protective role against cancer, improving immune function in the elderly, slowing the progression of Alzheimer's disease, improving lung function in elderly subjects, and reducing the incidence of cataracts. (Sarubin 2000, 377-378)

Although there is no reason to discourage the supplementation of alpha-tocopherol, the advice commonly given is to try to consume antioxidants from food. (Ward 1998, Butler et al 2000) Consumers are encouraged to consult their physician when supplementing with pharmacologic doses of tocopherol or any other single nutrient supplement.

(Wellman et al 1997)

Another disabling disease of aging is Alzheimer's and varying degrees of dementia, which are also, frequent causes of hospitalization and death in the aging. (Timiras 1994, 93) Supplements that promise to enhance memory or improve blood flow to the brain target elders with various forms of dementia and Alzheimer's. (Sarubin 2000, 171) One study found that a supplement combination of ginkgo biloba and ginseng significantly improved memory of elders. (Brown University 2000) Other research being concluded on Alzheimer's disease is showing promising evidence that alpha-tocopherol also helps in slowing the progression of the disease. (Sarubin 2000, 377)

Vitamin B12 deficiency often increases with age, especially over sixty-five years, and is frequently associated with Alzheimer's disease. (Chernoff 1999, 495)

Approximately ten to thirty percent of the elderly population (>50 y) suffers from vitamin B12 deficiency. (Sarubin 2000, 348) Because B12 deficiency is so prevalent, elderly

may be recommended to supplement with B12 to meet the reference intake of 2.4 ug. (Russell and Mason 1999)

Other diseases that are primarily limited to the elderly include osteoporosis, osteoarthritis, temporal arthritis, and polymyalgia rheumatica. (Timiras 1994, 259) In 1993, the FDA reviewed research that showed the benefit of supplemental calcium and approved a health claim for food and supplement labels that states “calcium can help reduce the risk of osteoporosis. Significant evidence is linking calcium supplementation to increased bone mineral density in the elderly population. (Sarubin 2000, 61) Supplement claims stating calcium is necessary for bone maintenance are undoubtedly true. Although research has found calcium supplements may be unsafe with long-term use, because of the risks of hypercalciuria and kidney stones, studies indicate that a supplementation of the recommended daily amount has very positive benefits for elderly persons. (Chapuy et al 1992, Dawson-Hughes et al 1997) Because the elderly are at greater risk for hip and other bone fractures, supplementation is usually recommended of 1000-1200 mg per day of calcium and 600 IU per day of vitamin D. (Russell and Mason 1999)

Vitamin D is considered both a hormone and a vitamin. Its primary function is to maintain calcium homeostasis. (Ziegler 1996, 120) Defects in vitamin D metabolism, lack of sun exposure, insufficient dietary intake, or a combination of these can cause rickets or osteomalacia, a disease prevalent in the elderly. Due to the above factors, vitamin D deficiency is fairly common among the elderly population. (Sarubin 2000, 362) Supplement claims stating that vitamin D optimizes bone health are one hundred percent accurate. Many elderly are recommended a vitamin D supplement to compensate

for deficits if they are at high risk for deficiency. Recommendations for the use of single nutrient supplements are limited to calcium and vitamin D, if a multivitamin-mineral is contraindicated. (Wellman et al 1997)

National surveys have reported that elderly individuals may often have decreased intakes of carotenoids, riboflavin, pyridoxine, and ascorbic acid. Other studies indicate low intakes of thiamin, cobalamin, folate, niacin, zinc, and calcium. (Nelson 1994, 64) All of these nutrients are necessary for growth and maintenance of health. Supplements may be recommended by a health care provider to assure adequate amounts are provided to the body.

Food is definitely the best way to consume the necessary nutrients. However, some nutrition authorities, based on evidence from studies have found reason to recommend a daily multivitamin-mineral supplement for the elderly as a reasonable way to assure adequate micronutrient intake. (Wellman et al 1997, Duyff 1998) Because elderly tend to have an increased need for vitamins and minerals for many reasons, the American Medical Association (AMA) recommends a supplement such as a multivitamin/mineral combination for seniors who have decreased food intake. The American Dietetic Association added to AMA's recommendation, stating use of multivitamin and/or mineral supplements should be based on individualized dietary assessment. (Wellman et al 1997, Chernoff 1999, 494) People are unique. The supplements and amounts recommended for one person are most likely not the same for another. (Duyff 1998) More research is needed before specific recommendations of supplementation can be made for the elderly population.

Herb/metabolite (HM) preparations are being used in increasing amounts as a result of publicity claims and personal testimonies persuading individuals to buy the products relieve symptoms or cure diseases. Eisenberg et al (1998) reported an increase in the consumption of herbal medicine from three percent in 1990 to twelve percent in 1997. Fugh-Bergman (1997) claims these figures are underestimates because the study was only completed on English speaking individuals who owned a telephone. One of the most popular herbs being consumed by the elderly is ginkgo biloba because of its promising outcomes for improving memory or treating dementia. (Fugh-Bergman 1997) Some research is showing that improvements in attention, memory and assessment scores are being seen in individuals taking ginkgo. (Sarubin 2000, 171-172) Other herbs consumed by elderly include garlic for improved cardiovascular health, St. John's wort to treat depression or "lift mood", and saw palmetto to protect against prostate cancer. (Fugh-Bergman 2000, Sarubin 2000, 276, 280) Today, people seem to be willing to make their own decisions regarding the supplement consumption and need to know the possible consequences of ingesting products that aren't closely controlled or regulated by the FDA. (Mason 1998, Nesheim 1998)

Recommendations for the consumption of herbs encourage consumers to consult their physician before taking any of the herbal/metabolite preparations. (Radimer, Subar, and Thompson 2000) Nutrition and health care professionals need to have at least some basic understanding and knowledge of what types of products patients are using. (Cirigliano 1998) Because consumers are not reporting the use of supplements or nonprescription medications to their physicians, professionals should be asking the patients specifically if they are taking any supplements. (Hensrud, Engle, and Scheitel

1999) Crone and Wise (1998) reported that herbal products should be avoided in persons who have decreased metabolizing capability like the elderly, who might be more prone to the adverse effects of herbs and preparations.

Nutrition education and counseling are often very important when recommending supplements, especially for the elderly. Since seniors are at greater risk for toxicity, drug-nutrient interactions, susceptibility to misinformation, education and/or counseling are necessary for the safe use of supplements. (Tripp 1997) By profiling the use of various dietary supplements, professionals will become aware of the common doses elders are consuming and be able to make recommendations on the various types and amounts needed, if any.

Safety Concerns of Elderly and Supplementation

Consumers usually assume the food they eat and the medicines that they are prescribed are safe. Federal law states that these substances are to be accurately labeled and presumed safe if consumed before they are marketed. (Consumer Reports 2000) Toxicity studies have only been conducted on a few flowering plant species in the world. Supplement poisoning can occur with misidentification, overdose, or interactions between other substances. (Huxtable 1990) Recent surveys show that eighteen percent of adults in the United States use prescription drugs in addition to herbs or vitamin products. (Smolinske 1999) Even though twenty-five percent of prescriptions are written for plant products and another twenty-five percent are agents based on plant products, these plant constituents have been tested safe for use at recommended doses and conditions. (Huxtable 1990) Many herbs and drugs can be therapeutic at one dose and toxic at another. (Fugh-Bergman 2000, Mason 1998) Adverse health effects being caused by herb/herb and herb/drug interactions are a major concern in the elderly. (Mattews, Lucier

and Fisher 1999) Elderly taking various supplements have suffered from hepatotoxicity, hypertension/tachycardia, and even coma. (Palmer et al 1999) Over-the-counter supplements may be toxic and can cause these significant adverse side effects when misused. (Matthews, Lucier and Fisher 1999, Mason 1998) Health care providers are being faced with questions and issues by patients as a result of the increasing interest and use of dietary supplements. This study attempts to assist professionals by profiling supplement use by elders in Eau Claire and Dunn County.

Chapter 3

Methodology

Introduction

The use of dietary supplements is rapidly growing in the United States. (Ervin, Wright, and Kennedy-Stephenson 1999) Consumers of today are focusing on staying well and are more aware of preventative measures including some of the major trends of alternative therapies such as vitamins, minerals and herbal therapies. (Niebert 1998, 105) Maintaining good nutritional status is a part of staying well and preventing illness. The elderly is a population that has been identified at increased risk for poor nutritional status. (Tripp 1997) Vitamin and mineral deficiency is a major contributor to illnesses and disease states in the elderly population. (Shils et al 1999, 872) To compensate for these deficiencies, the elderly have the option of choosing dietary supplements to improve health status. (Tripp1997) Herbs and other non-vitamin/mineral supplements are being taken alone or along with vitamin and minerals in hopes to improve well-being. (Ervin, Wright, and Kennedy-Stephenson 1999)

The objective of this study was to profile the use of dietary supplements of the elderly in Eau Claire and Dunn Counties. By supplying health care professionals with the results of this study, it will allow them to serve as good resources for elders. From the conclusions, education techniques and counseling practices can be introduced to avoid potential complications resulting from elders consuming dietary supplements.

Research Design

This study is a descriptive study to profile the dietary supplement users in an elderly sample of two counties. The results will provide a description of the use of supplements among members of an elderly sample.

Study Sample

The sample surveyed was persons age sixty-five years or older. The study was conducted in the state of Wisconsin in the counties of Eau Claire and Dunn. Subjects were recruited from the Nutrition Intervention Program (NIP). NIP consists of two components, Senior Dining (congregate sites) and Meals on Wheels (MOW). The MOW program and a total of seven congregate meal sites in Eau Claire and Dunn Counties were used to recruit subjects. The seniors completed a questionnaire, called a Nutrition Checklist, which was distributed by the aging agencies. The Nutrition Checklist included this question: “Do you take any vitamins, minerals or herbal products? If so, which ones?” If the subjects answered ‘yes’ to this question, the surveyor asked the seniors if they were willing to participate in the study.

Confidentiality

The Institution Review Board for the Protection of Human Subjects in the Graduate Research at the University of Wisconsin-Stout approved this study. The privacy of individuals was respected throughout the study and involvement was strictly voluntary. Subjects were not asked any identifying questions and an envelope was available for subjects to put completed surveys to respect privacy.

Study Instrument

A survey instrument was developed for this study, which is shown in appendix A. Readability and understandability were important for thorough collection of data. Factors that were considered in the development of the survey included font and paper size, the font needed to be big enough for the senior participants to read the survey themselves. Reading level was also a consideration in the development of the survey. The survey

needed to accommodate all education levels and be easily understood. Data questions were answered by only having to circle or mark an “X” in spaces provided so minimal writing was necessary for participants.

A consent form was included on the survey, which stated that by filling out the survey the participants were agreeing to be a volunteer participate in the study. The survey consisted of two sections: Demographic data and description of supplement use.

Demographic data were collected as noted in Appendix A. Demographic questions consisted of:

- Age
- Sex
- Education Level
- If Coumadin was used
- If aspirin was used
- If and how much counseling the subject received for supplement/herb use
- From whom the counseling was received by
- How the subjects were informed about supplement products

Demographic data were included to assure eligibility and provide further information to draw conclusions about the study sample.

Descriptive data were collected by providing a list of seventeen supplement products. The supplements selected were products that were popular among elders or specifically older men or women according to the literature. (Ervin, Wright, and Kennedy-Stephenson 1999, Radimer, Subar, and Thompson 2000, Tripp 1997) Supplements, which possessed manufacturer’s claims that targeted elders, were included and ranged from a multivitamin to herbal/metabolite supplements. (Appendix A) For each supplement selected, the subjects were asked:

- Dosage
- Brand
- Reason for discontinuing, if they had done so

- If the supplement was working
- Side effects

Data Collection

A pilot study was conducted for one week in November 1999, which involved five volunteer subjects who evaluated the tool for readability and understandability. The pilot study was also to evaluate the instrument tool for ease of administration by surveyors. Three dietitians, who work with the elderly on a daily basis, reviewed and evaluated the survey tool prior to the actual study. Changes made to the original questionnaire included adjustments in font size, clarity of the questions and paper size. The pilot study revealed that the supplement list was somewhat confusing and it was hard to locate the supplements. Revisions were made and agreed upon by the involved surveyors.

Sixty of the revised surveys were distributed to the two Aging Agencies by the researcher in December 1999. Congregate meal site participants in Eau Claire and Dunn Counties completed a total of fifteen surveys. Between December 1999 and October 2000 data collection took place. The final surveys were collected in October 2000.

Data were collected using one of two techniques: Self-report and structured interview. The selected technique was based on subject preference. The procedure for self-reporting was the subject read and was able to answer questions on the survey independently with a surveyor available in case of any questions. The procedure for the structured interview technique was the surveyor read and asked the subject the same questions in the same order as was on the survey tool.

To differentiate data sources, surveys were color-coded. Three different colored copies were made of the survey instrument. The surveys were colored to differentiate

between the two counties and whether the participants were from meal sites or home, and the results analyzed to determine supplement practices of each. Ivory was designated for the congregate meal sites. At this site one surveyor, the researcher collected the data. The data were obtained just before the elders ate a noon meal. The subjects completed the survey at their dining seat in the dining area. If the subject chose the structured interview technique, an area near the dining hall was available to conduct the interview to protect subject's privacy. At the time of data collection, there was also another survey the seniors were asked to fill out that was initiated by the Department on Aging, which assessed the nutritional risk level of the individuals. If the participant indicated they were consuming dietary supplements, the researcher asked if they were willing to fill out a questionnaire for this study. Green copies of the instrument tool were designated for the Meals on Wheels program in Dunn County and pink for the Meals on Wheels program in Eau Claire. There were two other surveyors besides the researcher, an RD, and a Nutrition Intervention Specialist, who was a graduate of the UW-Stout dietetics program and a graduate student in Food and Nutritional Sciences. Both surveyors were employed by the Aging Agencies in the two counties. During home visits of Meals on Wheels participants, individuals were asked questions to evaluate the need for further nutrition intervention. If the participant indicated they were consuming dietary supplements, the individual was asked if they would like to participate in this study.

Surveyor Training

Both of the other surveyors were given full explanation of the study and the objectives by means of a one-on-one training session with the researcher. Verbal explanation of the objectives and purpose was given, as well as specific written

instructions to guide and standardize data collection. (Appendix B) The surveyors were asked to return the surveys to the conductor of the study when they had approximately ten completed so data entry could begin.

Data Analysis

Demographic data were entered and results analyzed using SPSS 6.1.3. (SPSS Inc. 1996) Demographic information and HMN use were examined using descriptive statistics such as frequencies, means, and percentages. Independent t-tests were used to assess the difference between supplement use by location, report style (survey or interview), and gender. Chi square analyses were used to test the association between supplement use and age; also gender and how subjects obtained supplement information. Finally, Pearson's correlation coefficient was used to evaluate the association between age and number of supplements used. For all tests a probability of less than .05 was considered significant.

Chapter 4

Results

Introduction

Alternative medicine use, including dietary supplements, has dramatically increased in recent years. (Eisenberg et al 1998) This trend might be a result of the rapidly growing number of elderly over sixty-five and their desire to stay and feel young. (Dickinson 1998) Many elders are trying to achieve adequate intake of vitamins and minerals through supplementation. (Chernoff 1999, 418) Research also suggests non-vitamin, non-mineral supplements, such as herbs, metabolites and hormones are being used to assist in living more healthy lifestyles. (Radimer, Subar, and Thompson 2000)

The purpose of this study was to profile supplement use among elders in Eau Claire and Dunn County. The study specifically sought to 1) identify the most popular supplements being used, 2) determine if supplement practices are healthy, 3) identify unhealthy practices, 4) identify the most popular information sources used by the elderly to obtain supplement facts. Data were obtained by a self-report questionnaire or structured interview conducted by the researcher, an RD or a Nutrition intervention Specialist, who is a graduate of the UW-Stout Dietetic program. The participants were asked a series of demographic questions along with descriptive questions about past and present supplement usage.

Supplement Usage Reported by Subject's Location

A summary of demographic data and supplement usage are shown in Table 1. Fifty-two self-identified herbal, metabolite, nutrient (HMN) supplement users completed the survey; thirty-eight were women, fourteen men. The participants were from two

Wisconsin counties, thirteen (25%) from Eau Claire and thirty-nine (75%) from Dunn County. All fifty-two subjects were involved in the Nutrition Intervention Program through the Department on Aging. Fifteen (28.8%) were included from the congregate sites and thirty-seven (71.2%) from MOW in both counties. Overall, the Dunn county congregate meal participants used more supplements (mean=3) than those of the three other sites although the difference was not significant. (F1.81, p1.58) In Dunn County subjects used an average of 2.8 supplements, which was significantly different than participants of Eau Claire County where subjects used an average of 1.6 supplements. (t 2.29, df 50, p .026) The types of HMN supplements being used by the clients at the four sites did not differ.

Supplement Consumption Reported by Subjects Who Used One of Two Data Collection Techniques

The reported amount and types of supplements were similar among the two data collection techniques. Of those subjects who self-reported (25) use of supplements, an average of 2.6 were being used; twenty-five subjects used vitamins or minerals (VM) and three used herbs/metabolite (HM) supplements. Three subjects were using VM and HM concurrently. Subjects who chose a structured interview method (27) used an average of 2.3 supplements. Twenty-five subjects used VM and four used herbs. Two were using VM and HM concurrently. A significant difference exists between the two collection techniques and the number of supplements reported. (Chi square 5.29, df 1, p .043)

The Distribution of Supplement Use by Age

Subjects ranged in age from 65-92 years, average age being 78.4 years. Age was classified into three groups: young-old (65-74 years), old (75-84 years), and oldest-old (85+ years) for more specific analysis of data. (Table 1) Only a slight variation exists

between age and the amount of supplements used; the difference was not significant. (Chi square 1.45, df 4, p .83)(r .022, p .877) VM supplement use between the age groups varied little. In the old group (75-84 years), twenty-one (40.4%) of subjects took VM supplements. Of the young-old (65-74 years), sixteen (32.7%), and of the oldest-old (85+ years) thirteen (26.7%) were consuming VM supplements. Herb/metabolite (HM) supplement use also varied somewhat between the age groups. Of the young-old, four subjects were currently taking HM supplements and two had discontinued them. Only one subject was taking a HM supplement in the old group and two in the oldest-old group.

Supplement Usage Patterns by Subjects of Various Education Level

Participant educational levels were evenly dispersed among four levels as shown in Table 1. Three subjects who had some post high school education reported taking herbs. Of the three remaining levels of education, a total of three people reported taking herbs. No significance exists between education level and the number of supplements currently being used by subjects. (F 1.24, df 3, p .392)

Coumadin or Aspirin Used Concurrently With Selected Supplements

Six (11.5%) of the participants reported taking coumadin and eighteen (34.6%) were taking aspirin. None of the subjects were taking coumadin and aspirin concurrently. Two subjects used coumadin and alpha-tocopherol simultaneously. The doses were no more than 400 IU and physicians were cited as information sources. Six participants were using aspirin and alpha-tocopherol. The doses of tocopherol used by subjects using aspirin ranged from an undetermined amount to 800 IU and a physician, again, was cited as an information source. None of the subjects were taking coumadin and HM

Table 1. Supplement Use Classified by Demographic and Practice Characteristics

Demographic Information	Total (n)	Percent (%)	Mean supplement usage	Vitamin/Mineral (VM)	Herb/Metabolite (HM)
Age: (N=52)					
Groups:					
65-74	17	32.7	2.5	16	4
75-84	21	40.4	2.5	21	1
85+	14	26.9	2.4	13	2
Gender:					
Male	14	26.9	2.4	13	3
Female	38	73.1	2.5	37	4
Location: (county)					
Dunn – congregate	8	15.4	3	8	1
Dunn – MOW*	31	59.6	2.7	29	6
Eau Claire – congregate	7	13.5	1.4	7	0
Eau Claire – MOW*	6	11.5	1.8	6	0
Education:					
Less than high school	10	19.2	2.0	9	1
High school/GED	15	28.8	2.5	15	1
Some post high school	12	23.1	3.2	12	3
Completed college	12	23.1	2.1	11	1
Undetermined	3	5.8		3	1
Survey Style:					
Self-report	25	48.1	2.6	25	3
Structured interview	27	51.9	2.3	25	4
Amount of counseling:					
Yes – a lot	6	11.5	3.7	6	1
Yes – some	5	9.6	2.2	5	1
Yes	1	1.9	2.0	1	0
None	34	65.4	2.4	32	4
Undetermined	6	11.5		6	1
Informed by:					
Friends/relatives only	7	13.5	2.1	6	1
Health care provider only	18	34.6	2.1	18	1
Media only	4	7.7	2.5	3	2
Friends & health care provider	11	21.2	2.8	11	1
Health care provider & media	3	5.8	2.3	3	0
Media & Friends/Relatives	2	3.8	1.0	2	0
All	3	5.8	2.9	3	2
Undetermined	4	7.7		4	0

* Meals on Wheels

supplements concurrently. One subject was taking aspirin and ginkgo concurrently and a physician was cited as a source for supplement information.

Supplement Counseling Experience Reported by Subjects

Experience with counseling about dietary supplements was low. Only six (9.6%) had noted receiving a lot of counseling, five (11.5%) reported receipt of some counseling and thirty-four (65.4%) had not received any counseling. (Table 1) Sources of counseling could not be discerned due to a large number of incomplete surveys.

Sources of Supplement Information Reported by Subjects

Subjects reported receiving supplement information from multiple sources. (Table 1 and 2) Ten revealed they received information from the media, 21 noted friends and relatives and 33 reported using health care providers. Health care providers noted include dietitians, chiropractor, dentists, pharmacists, optometrists, and physicians see Table 2 for frequencies. None of the subjects indicated nurses or podiatrists as information sources, which were also choices on the survey. A larger number of women (24) obtained supplement information from physicians than men (6), but the difference was not significant. (Chi square 1.73, df 1, p .189)

Supplement Usage by Total Sample

A summary of the number of supplements used by subjects is included in Table 3. An average of 2.6 HMN supplements were used; 32 (61.5%) subjects were currently using only one or two supplements. The number of supplements used summed to 130. (Table 4) Consumption of supplements in this sample, on average, was about the same for men and women. (Table 1) No significant difference was found between gender and the amount of supplements being consumed. (t -.18, df 50, p .854) Males reported using

an average of 2.4 supplements; 2.5 by females. No significant difference existed between gender and VM use ($t = .74$, $df = 50$, $p = .463$) or HM use ($t = -1.01$, $df = 50$, $p = .316$).

Table 2. Frequencies of How Subjects Obtained Supplement Information

How subjects were informed	N Subjects	% Subjects*
Physician	30	57.7
Optometrist	7	13.5
Pharmacist	6	11.5
Dentist	2	3.8
Dietitian	1	1.9
Chiropractor	1	1.9
Podiatrist	0	0
Nurse	0	0
Television	10	19.2
Newspaper	4	7.7
Books	4	7.7
Magazine	5	9.6
Radio	1	1.9

*The percentage is greater than one hundred because the subjects were able to check more than one information source for demographic question, “Informed about products by?”

Table 3. Number of Supplements Currently Being Used by Subjects

Number of supplements Mean = 2.6	N	%
1	16	30.8
2	16	30.8
3	7	13.5
4	6	11.5
5	3	5.8
6	3	5.8
9	1	1.9

Vitamin/Mineral Supplement Usage by Sample

Supplement usage by the total sample is displayed in Table 4. Fifty (96.2%) subjects noted taking vitamins or mineral supplements. The three most popular

Table 4. Supplements Usage by Total Sample

Supplement	Present use		Past	
	N	%	N	%
Any	130	100	148	100
Vitamin/mineral	118	90.7	130	87.8
Herb/metabolite	11	8.4	17	11.4
Vitamins	86	66.1	91	61.4
Multivitamin	35	26.9	35	23.6
Vitamin E	23	17.7	24	16.2
Vitamin C	16	12.3	19	12.8
Vitamin B complex	1	<1	2	1.4
Vitamin B12	1	<1	1	<1
Vitamin D	1	<1	1	<1
Niacin	2	1.5	2	1.4
Folic acid	3	2.3	3	2
Beta Carotene	2	1.5	3	2
Ocu-vit Extra	2	1.5	2	1.4
Minerals	24	18.4	30	20.3
Calcium	17	13.0	18	12.2
Calcium with Magnesium	1	<1	2	1.4
Calcium/magesium/zinc combo	2	2.3	4	2.7
Zinc	1	<1	1	<1
Potassium	3	2.3	5	3.4
Vitamin/Mineral	8	6.2	9	6.1
Calcium with vitamin D	7	5.3	8	5.4
Vitamin C/ K+/magnesium/zinc	1	<1	1	<1
Herb/Metabolites	11	8.5	17	11.5
Gingko Biloba	3	2.3	3	2
Glucosamine				
Chondroitin Sulfate	2	1.5	3	2
Garlic	0	0	1	<1
Alfalfa	1	<1	1	<1
Lecithin	0	0	2	1.4
Flax Seed Oil	0	0	1	<1
Echinacea	2	1.5	2	1.4
Saw Palmetto	1	<1	1	<1
St. John's wort	0	0	1	<1
Valerian	1	<1	1	<1
Kelp	1	<1	1	<1
Others	1	<1	1	<1
Honey	1	<1	1	<1

supplements used by this population were multivitamins, vitamin E, and calcium. The most commonly reported supplement was a multivitamin (MV); fifty (96.2%) subjects reported taking a MV alone or with other supplements. Alpha-tocopherol was being used by twenty-three (44.5%) of subjects with one who discontinued because of switching to a MV. Seventeen (32.7%) were presently using calcium. Three subjects discontinued the mineral because they switched to a MV or they ran out. Eight subjects reported discontinuing VM supplements. These included vitamin A, B complex, E, C, D, calcium and potassium. If subjects had discontinued products, they were asked to report why. Some of the reasons given for the discontinuation were they switched to another product, such as a multivitamin, they were experiencing side effects with the product, their health professional recommended them to discontinue the supplement, or they ran out of the product and weren't taking the supplement at all.

Herbal/Metabolite Supplement Usage by Sample

Five subjects noted presently using a vitamin or mineral concurrently with HM supplements; three reported past use of this combination of supplements. Two participants were taking only a HM supplement. Ten (19.2%) subjects noted taking or had taken one or more herbs in the past. The most popular HM product in this sample was ginkgo biloba being used by three subjects. (Table 4) Other HM products currently being used include: glucosamine (2), kelp (1), alfalfa (1), echinacea (2), valerian (1), and saw palmetto (1). Four subjects had discontinued a total of 5 HM including glucosamine (1), flax seed oil (1), lecithin (2), garlic (1), and St. Johns wort (1). Those participants who discontinued flax seed oil, lecithin, garlic and St. John's wort stated the products didn't work. St. John's wort also was associated with having side effects of

undetermined etiology for the subject who discontinued it.

Reported Efficacy of Supplements

Twenty-one (40.4%) subjects felt that all the supplements they were taking worked. Twelve (23%) subjects reported not knowing if the supplements were working. One subject felt the 400 IU of vitamin E she was taking was not working and five (9.6%) felt that at least one of the supplements they were taking worked but were not sure of the others. Thirteen participants gave no answer for this question.

Dosages of Alpha-Tocopherol, Ascorbic Acid, and Calcium Supplements Reported by Sample

The frequencies of the doses of alpha-tocopherol, ascorbic acid, and calcium were calculated to determine if subjects were using megadoses of these products. Dosages of these products are illustrated in Table 5. A majority of the subjects (15) taking supplemental tocopherol were taking 400 IU. The highest dose of tocopherol observed was 1,000 IU by one subject. A dose of 500 milligrams (mg) of ascorbic acid was observed in 11 of 16 cases. The greatest amount reported was 1,000 mg by 2 participants. Subjects noted a wide variation in calcium doses that ranged from 300 mg to 2400 mg.

Table 5. Reported Dosages of Alpha-Tocopherol, Ascorbic Acid, and Calcium Being Taken by Subjects

Dose	N	%
Alpha-tocopherol (IU)		
200	1	1.9
300	1	1.9
400	15	28.8
500	1	1.9
800	1	1.9
1,000	1	1.9
None	28	53.8
Discontinued	1	1.9
Undetermined	3	5.8
Total	52	100
Ascorbic Acid (mg)		
400	1	1.9
500	11	21.2
1000	2	3.8
None	34	65.4
Discontinued	2	3.8
Undetermined	2	3.8
Total	52	100
Calcium (mg)		
300	1	1.9
400-800	1	1.9
500	3	5.8
600	2	3.8
1500	3	5.8
2400	1	1.9
1 squirt in nose	1	1.9
None	34	65.4
Discontinued	1	1.9
Undetermined	5	9.6
Total	52	100

Chapter 5

Discussion, Conclusions and Recommendations

Introduction

Dietary supplement use is dramatically rising with a 380 percent rise in the use of herbal therapies and a 130 percent increase in the use of vitamins between 1990-1997. (Eisenberg et al 1998) If physicians, dietitians and other health care professionals choose to ignore the growing use of supplements this will expand the communication gap between consumers and the professions that serve them. (Jonas 1998) As a result of the increased use and potential for adverse reaction dietary supplements can cause, professionals are slowly realizing the need to keep abreast of the common supplements and outcomes of their use. This study was conducted in an attempt to assist area professionals by studying supplement practices in this area.

A survey was developed that included demographic and supplement usage questions to assist in profiling supplement use in an elderly sample. Study subjects were recruited from congregate meal sites and the Meals on Wheels (MOW) program in the two Wisconsin counties of Eau Claire and Dunn County; fifty-two subjects participated. Data were collected and results were analyzed to achieve the primary objective of profiling supplement use among area elders. Other objectives of this study were to: 1) identify the most common supplements consumed, 2) determine if supplement practices were healthy, 3) identify unhealthy practices and 4) identify supplement information sources used by the elderly. Exploration of the patterns of supplement use by the elderly and how they obtain supplement information will assist professionals and community health professionals in identifying educational needs of elderly supplement users.

Discussion

This study was consistent with other research studying supplement use in the elderly. Multivitamins, vitamin E, C and calcium were among the most common supplements consumed. (Houston et al 1998) Similar to Ervin, Wright, and Kennedy-Stephenson's (1999) findings, multivitamins were the most common supplement reported, which also agrees with Smith (1985). In the NHANES III, one in twelve supplement users reported using one or more herbs. In this study, one in five reported currently using HM supplements. (Ervin, Wright, and Kennedy-Stephenson 1999) These findings were also in agreement with Radimer, Subar, and Thompson (2000), which also concluded that one in five supplement users were using herbs.

Supplement use between the two Wisconsin counties varied. The average number of supplements used by this elderly sample in Dunn County was 2.8 and Eau Claire County 1.6. This difference may be due to variations in medical advice or because the participants in Dunn County may be more exposed to dietary supplements. No difference was noted in the types of supplements used.

Supplement use through the three age groups appeared to be slightly higher in the old group (75-84 years), and the oldest-old (85+ years) consuming the least amount of vitamin/mineral (VM) supplements. Age is considered to be an important factor in classifying supplement users with highest usage being in the later middle and earlier older ages. (Radimer, Subar, and Thompson 2000) Consistent with research, herb use in this study was more prevalent in the young-old group (65-74 years) compared to the two older groups (75-84 and 85+ years) but the difference was not significant.

Gender is often a characteristic associated with supplement use, women being more likely to take supplements than men. (Houston et al 1998, Chernoff 1999, 495) Findings of this project indicated men were just as likely as women to take VM and HM supplements. This research also indicated that men and women were just as likely to take the same amount of supplements. These findings were contrary to Ervin, Wright and Kennedy-Stephenson's (1999), who reported that males were more likely than females to take only one supplement, and subsequently females were more likely to take two or more supplements. Results of this study may have differed because in this sample men might have been just as concerned about their health and interested in prevention and reduction of disease as women. Therefore, just as likely to take supplements.

Another characteristic examined when studying supplement use is education level. According to Ervin, Wright, and Kennedy-Stephenson (1999), individuals with more years of education were more likely to take supplements. In this sample, level of education obtained by an individual was not associated with supplement usage patterns. However, herb/metabolite (HM) supplement use varied slightly among education levels. Radimer, Subar, and Thompson (2000) concluded that the use of herbs tends to be higher in those with higher education levels. This proves true in this study with four of the six subjects consuming HM supplements having greater than a high school education, however the difference was not significant.

One of the objectives of the study was to identify how elders obtained supplement information. A majority of the sample, thirty (57.7 percent) of the fifty-two subjects obtained information regarding supplements from their physician. In a 1989 study, the elderly reported they were most likely to get nutritional information from physicians with

dietitians and health food stores being second choice. (Probart et al 1989) More recent studies conclude that consumers are using the traditional health care system, but do not typically consult their physician about supplements. (Eliason, Huebner, and Marchand 1999) This study did not include health food stores or the Internet as choices in the demographic question about supplement information on the survey instrument; these choices should be included in future studies.

Ideally, all consumers should consult their physician before taking any type of supplements. The results of this study show 58 percent of elders in this sample obtained supplement information from their physician, which was the most common source. Professionals need to encourage consumers to consult their physician when thinking about taking supplements, to achieve the desired 100 percent. Unfortunately, only one subject in this sample obtained supplement information from a dietitian. Dietitians need to become more visible and effective disseminators of nutrition, specifically, supplement information through all available channels of communication. Services of nutrition professionals should be more available to elderly persons in the community. Economic and educational factors may play a part in the hesitation or failure of elders to seek counseling or nutrition education. Budget constraints are a concern of elders and may affect senior's ability to receive needed nutrition counseling. Counseling completed by registered dietitians is necessary for elders to receive the current scientific knowledge regarding supplement use after individual dietary and nutrition assessment. Dietitians are uniquely qualified to educate and counsel people for the promotion of good health. An individual trained in health and nutrition such as a registered dietitian, should evaluate

dietary supplement intake and provide counseling to prevent excessive intakes or adverse reactions caused by the products. (Hunt 1995)

Certain prescription and over-the-counter drugs used in conjunction with herbs or high doses of vitamins may cause adverse effects. (Consumer Reports 2000) The survey instrument included questions about the use of two drugs, coumadin and aspirin. Alpha-tocopherol when consumed possesses blood-thinning effects and increases bleeding time. These are the same effects coumadin and aspirin have on blood. The frequencies of subjects taking tocopherol and coumadin or aspirin were studied to help determine if supplement practices were healthy. In this sample, the doses of tocopherol used concurrently with coumadin or aspirin were considered safe. Doses of tocopherol did not exceed 400 IU and these individuals cited physicians as supplement information sources. Some herbs such as ginkgo biloba and garlic are also contraindicated for people on anticoagulant therapy such as coumadin or daily aspirin. (Fugh-Bergman 2000) A physician was identified as the source of supplement information for one subject who reported taking the herb, ginkgo, concurrently with daily aspirin. Since the recommendation for persons taking aspirin and ginkgo concurrently is to do so under medical supervision, this practice was considered healthy. Therefore, use of coumadin or aspirin used concurrently with herbs were considered safe in this sample.

Doses of alpha-tocopherol, ascorbic acid, and calcium were analyzed to assist in determining if practices of supplement use were healthy. The most common dose of tocopherol was 400 international units (IU), which is the recommended dose. (Schirmer 2000) Of the twenty-three subjects taking tocopherol in this sample, fifteen were taking 400 IU. All other doses being consumed were considered safe. Recommended

supplement intake dose for ascorbic acid is 500-1000 milligrams (mg), of the sixteen subjects, eleven were consuming 500 mg. Two subjects were taking up to 1000 mg, which is considered safe. Reported dosages of calcium supplements were also safe.

Conclusions

The small sample size, involvement of only those seniors in the Nutrition Intervention Program (NIP), and geographical location of this study limit the generalization to other populations of elders. The mission of the Nutrition Intervention Program is to offer elders the opportunity to improve nutritional status by offering a range of interventions and referrals to community agencies. (VanKampen 2000) The program also allows professionals to distribute accurate nutrition information to seniors. The findings indicate that the community nutrition programs in this area are doing a good job of helping elders maintain good nutritional status. Safe and healthy supplement practices ultimately contribute to the nutritional well-being of elderly individuals. The subjects in the NIP were taking types, combinations and amounts of supplements considered to be safe, which is just one reason to encourage elders to participate in the community nutrition programs.

Finally, consulting a physician is important for elders on prescription or over-the-counter drugs to prevent adverse effects, but dietetics professionals should be consulted to ultimately evaluate if and what kind of supplement is needed, if any. Thus, dietetics professionals need to be educated about supplements including population groups of high usage, reasons for supplement use and the implications of supplement use in the diet. (Radimer, Subar, and Thompson 2000)

The objectives of this study were met.

Objective 1: To identify the most common supplements used.

Outcome: The most common supplements used by this sample of elders, sixty-five years or older, residing in either Eau Claire or Dunn County were identified to be multivitamins, vitamin E, C and calcium.

Objective 2: To determine if supplement practices were healthy among this sample.

Outcome: Supplementation practices analyzed by this study appear to be healthy.

Objective 3: To identify any unhealthy supplement practices being used by this sample.

Outcome: Subjects were using supplements in doses and conditions that were considered safe according to the FDA and other studies suggesting safe supplement consumption, therefore, no unhealthy practices were identified.

Objective 4: To identify sources where elderly obtain supplement information.

Outcome: The elderly in this sample obtained supplement information from a variety of sources. The majority obtained supplement information from physicians. From the reported sources, professionals will be able to warn consumers of sources of potential misinformation and encourage seniors to consult their physician if they intend to consume dietary supplements.

The conclusions drawn from this study can ultimately help area health care and community professionals. By researching this sample, communication channels utilized by the elderly were identified and community educators will be able to offer further supplement education. This study also should assist educators in realizing the potential need to expand efforts of supplement education beyond area NIP.

Recommendations for Future Studies

1. A larger study sample would have been more helpful in showing trends of supplement practices and identifying some unhealthy supplement practices. This study showed that healthy supplement practices were utilized in this sample, but a larger sample may help in identifying unhealthy practices, and targeting individuals or groups at risk for supplement misuse.
2. Including elderly individuals beyond the NIP may also have been more helpful in showing trends for the elderly as a group. Being involved in a community nutrition program indicates participants have some degree of access to nutrition resources. Including persons beyond the NIP may assist professionals in knowing how to access other senior citizens in the community to educate and distribute information regarding dietary supplements.
3. Having supplement labels available for surveyors to read would have helped in recording actual dosages and other substances included in the supplements to ensure accuracy of reports. Some supplements have “hidden” ingredients listed that could potentially cause adverse effects. Knowing exactly what constitutes the supplement according to the label may help identify further educational needs for elders.

References

- Brown University GeroPsych Report*. 2000. NCDEU studies on antidepressants, herbal supplements in elderly. 4 (July): 1-3.
- Butler, R. N., M. Fossel, C. X. Pan, D. Rothman, and S. M. Rothman. 2000. Anti-aging medicine. What makes it different from geriatrics? *Geriatrics* 55 (June): 36, 39-43.
- Chandra, R. K. 1992. Effect of vitamin and trace-element supplementation on the immune responses and infection in the elderly. *Lancet* 340, (Nov): 1124-27.
- Chapuy, M. C., M. E. Arolt, F. Duboeuf, J. Brun, B. Crouzet, S. Arnaud, P. D. Delmas, and P. J. Meunier. 1992. Vitamin D3 and calcium to prevent hip fractures in elderly women. *New England Journal of Medicine* 327: 1637-42.
- Chernoff, R. 1999. *Geriatric Nutrition: The health professional's handbook*. 2nd ed. Maryland: Aspen Publishers.
- Cirigliano, M. 1998. Advising patients about herbal therapies. *Journal of the American Medical Association* 280 (Nov): 1565-1566.
- Consumer Reports*. 2000. Alternative-medicine safeguards. 65, no. 5 (May): 7.
- _____. 2000b. The mainstreaming of alternative medicine. 65, no. 5 (May): 17-25.
- Cox, H. 1985. *Aging*. Connecticut: The Dushkin Publishing Group, Inc.
- Crone, C. C., and T. N. Wise. 1998. Use of herbal medicines among consultation-liaison populations: A review of current information regarding risks, interactions, and efficacy. *Psychosomatics* 39: 3-13.
- Dawson-Hughes, B., S. S. Harris, E. A. Krall, and G. E. Dallal. 1997. Effect of calcium and vitamin D supplementation on bone density in men and women 65 years of age and older. *New England Journal of Medicine* 337: 670-6.
- Dickinson, A. 1998. Benefits of Nutritional Supplements. [on line] Council for Responsible Nutrition available from; http://www.crnusa.org/ben_full.htm; Internet; accessed 17 July 2000.
- Duyff, R. L. 1998. *The American Dietetic Association's Complete Food & Nutrition Guide*. Minnesota: Chronimed Publishing.
- Eisenberg et al, D. M., R. B. Davis, S. L. Ettner, S. Appel, S. Wilkey, M. V. Rompay, and D. C. Kessler. 1998. Trends in alternative medicine use in the United States, 1990-1997. *Journal of the American Medical Association* 280 (Nov): 1569-75.

Eliason B. C., J. Kruger, and D. N. Rasmann. 1997. Dietary supplement users: Demographics, product use, and medical system interaction. *Journal of the American Board of Family Practice* 10, no. 4: 265-271.

_____, J. Huebner, and L. Marchand. 1999. What physicians can learn from consumers of dietary supplements. *Journal of Family Practice* 48 (June): 459-463.

Ervin, R. B., J. D. Wright, J. Kennedy-Stephenson. 1999. Use of Dietary Supplements in the United States 1988-1994. National Center for Health Statistics. *Vital and Health Stat* 11, no. 244 (June): 1-14.

Fugh-Bergman, A. 1997. Complementary and alternative therapies in primary care. *Primary Care; Clinics in Office Practice* 24, no. 4: 1-16.

_____. 2000. Herb-drug interactions. *Lancet* 355 (Jan): 134-138.

Hensrud, D. H., D. D. Engle, and S. M. Scheitel. 1999. Dietary supplement, nonprescription drug use underreported. *Geriatrics* 54, no. 8 (Aug): 70.

Hobbs, F. 1992. Sixty-five plus in the US. [on line]. U.S. Census Bureau; available from <http://www.census.gov/prod/1/pop/p23-190/p23-190.html>; Internet; accessed 3 January 2000.

Houston, D. K., T. D. Daniel, M. A. Johnson and L.W. Poon. 1998. Demographic characteristics of supplement users in an elderly population. *Journal of Applied Gerontology* 17, no. 1 (Mar): 79-97.

Hudnall, M. 1999. *Vitamins, minerals, and dietary supplements*. Minnesota: Chronimed Publishing.

Hunt, J. R. 1995. Position of the American Dietetic Association: Vitamin and mineral supplementation. [on-line]. JADA; available from <http://www.eatright.org/asupple.html>; Internet; accessed 1 March 1999.

Huxtable, R. J. 1990. The harmful potential of herbal and other plant products. *Drug Safety* 5 (supplement 1): 126-36.

Jonas, W. B. 1998. Alternative medicine—learning from the past, examining the present, advancing to the future. *Journal of the American Medical Association* 280, no. 18 (Nov): 1616-20.

Kurtzweil, Paula. 1998. An FDA Guide to Dietary Supplements [on-line]. FDA Consumer; available from http://www.fda.gov/fdac/features/1998/598_guid.html; Internet; accessed 19 July 2000.

- Mason, M. J. 1998. Drugs or dietary supplements: FDA's enforcement of DSHEA. *Journal of Public Policy & Marketing* 17, no. 2: 296-302.
- Meydani, M., R. D. Lipman, S. N. Han, D. Wu, A. Beharka, K. R. Martin, R. Bronson, G. Cao, D. Smith, and S. N. Meydani. 1998. The effect of long-term dietary supplementation with antioxidants. *Annals of the New York Academy of Sciences* 854 (Nov): 352-60.
- Meydani, S. N., M. Meydani, J. B. Blumberg, L. S. Leka, G. Siber, R. Loszewski, C. Thompson, M. C. Pedrosa, R. D. Diamond, and B. D. Stollar. 1997. Vitamin E supplementation and in vivo immune response in healthy elderly subjects. *Journal of the American Medical Association* 277, no. 17 (May): 1380-1386.
- Nelson, J., K. Moxness, M. Jensen, and C. Gastineau. 1994. *Mayo Clinic Diet Manual: A Handbook of Nutrition Practices* 7th ed. Missouri: Mosby-Year Book, Inc.
- Nesheim, M. C. 1998. Regulation of dietary supplements. *Nutrition Today* 33, no. 2: 62-67.
- Niedert, K. 1998. *Nutrition Care of the Older Adult: a handbook for dietetics*. The American Dietetic Association. Library of Congress: USA.
- Palmer, M., C. Haller, P. McKinney, A. Tschirigi, W. Klein-Schwartz, S. Smolinske, G. Everson, L. Nelson, A. Woolf, D. Bartlett, B. Dahl, and T. Dodd-Butera. 1999. Botanicals and other dietary supplements: adverse events by age. *Journal of Toxicology: Clinical Toxicology* 37 (Aug): 609.
- Probart, C. K., L. G. Davis, J. H. Hibbard, and R. E. Kime. 1989. Factors that influence elderly to use traditional or nontraditional nutrition information sources. *Journal of the American Dietetic Association* 89, no. 12 (Dec): 1758-62.
- Radimer, K., A. F. Subar, F. E. Thompson. 2000. Nonvitamin, nonmineral dietary supplements: Issues and findings from NHANES III. *Journal of the American Dietetic Association* 100, no. 4 (April): 447-454.
- Russell, R. M., and J. B. Mason. 1999. Future health needs: Nutrition and aging. Available from <http://www.cyberounds.com/conferences/nutrition/conferences/current/conference.html>; Internet; accessed 8 September 1999.
- Sarubin, A. 2000. *The Health Professional's Guide to Popular Dietary Supplements*. Library of Congress. USA: The American Dietetic Association.
- Schneider, E. L. 1999. Aging in the third millennium. *Science* 283, no. 5403 (Feb): 796-797.
- Schirmer, G. 2000. Lecture. *Complementary & Alternative Medicine*. Med2000. 6 November 2000. Minneapolis, Minnesota.

- Shelton, D. 2000. Herbal Hype. *American Medical News* 21 (Aug): 27.
- Shils, M. E., J. A. Olsen, M. Shike, and A. C. Ross. 1999. *Modern Nutrition in Health and Disease*. 9th ed. Maryland: Williams & Wilkins.
- Short, S. H. 1994. Health quackery: Our role as professionals. *Journal of the American Dietetic Association* 94, no. 6 (June): 607-611.
- Smith, P. P. 1985. Reliance of the elderly upon nutritional supplements. Masters Thesis. University of Wisconsin-Stout.
- Smolinske, S. C. 1999. Dietary supplement-drug interactions. *Journal of the American Medical Women's Association* 54, no. 4: 191-192.
- SPSS Inc. 1996. SPSS for windows student version 6.1.3. Chicago.
- Strasen, L. 1999. The silent health care revolution: the rising demand for complementary medicine. *Nursing Economics* 17, no. 5: 246-53.
- Studdert, D. M., D. M. Eisenberg et al, F. H. Miller, D. A. Curto, T. J. Kaptachuk, and T. A. Brennan. 1998. Medical malpractice implication of alternative medicine. *Journal of the American Medical Association* 280, no. 18 (Nov): 1610-1615.
- Timiras, P. S. 1994. *Physiologic basis of aging and genetics*. Boca Raton: CRC Press.
- Trissler, R. J. 1999. Drug and supplement sales on the Web: Novel marketing method or potential time bomb? *Journal of the American Dietetic Association* 99 (Oct): 1194.
- Tripp, F. 1997. The use of dietary supplements in the elderly: Current issues and recommendations. *Journal of the American Dietetic Association* 97 (suppl 2): S181-S183.
- U.S. Food and Drug Administration. 1995. Dietary Supplement Health and Education Act of 1994. [on-line]. Center for Food Safety and Applied Nutrition; available from <http://vm.cfsan.fda.gov/dms/dietsupp.html>; Internet; accessed 19 July 2000.
- VanKampen, P. 2000. Mission of Nutrition Intervention Program (NIP). Newsletter distributed to area aging agencies dated 29 February 2000.
- Wellman, N. S., D. O. Weddle, S. Kranz, and C. T. Brian. Elder insecurities: Poverty, hunger, and malnutrition. *Journal of the American Dietetic Association* 97, no. 10 (supplement 2): S120-S122.
- Ward, J. A. 1998. Should antioxidant vitamins be routinely recommended for older people? *Drugs Aging* 12 (Mar): 169-175.

Ziegler, E. E., and L. J. Filer. 1996. *Present knowledge in nutrition*. ILSI Press: Washington, DC.

APPENDIX A

Survey Instrument

My name is Lesa Amy. I have a Bachelor of Science degree in Dietetics and I am currently working on my Masters degree in Food and Nutritional Sciences. I am collecting information to study dietary supplement use in the elderly. This information will be used to help develop educational and counseling materials about these supplements. You can help me by taking a few minutes to fill out both sides of this questionnaire.

By returning this completed questionnaire, you will be giving your informed consent to be a participant volunteer in this study. The information being collected will be held strictly confidential and will not identify you individually in any way.

For any questions or complaints first, call the researcher, Lesa Amy at (715)232-8370 and second contact Dr. Ted Knous, Chair, UW-Stout Institutional Review Board for the Protection of Human Subjects in Research, 11 HH, UW-Stout, Menomonie, WI. 54751, phone (715)232-1126.

Thank you so much for completing this form and allowing my research project to continue.

<p>AGE: _____</p> <p>SEX: M F</p> <p>Education Level: (check one)</p> <p>___ 1. Less than 12th grade</p> <p>___ 2. High school diploma/GED</p> <p>___ 3. Some post high school</p> <p>___ 4. Completed college</p>	<p>Using Coumadin? Yes No</p> <p>Using aspirin regularly? Yes No</p> <p>Received counseling for supplement/herb use? ___ No ___ Yes ___ Some (1-2 times) ___ A lot (>2 times)</p> <p>Counseling received by whom? _____</p>	<p>Informed about products by: (check all that apply)</p> <p>__ Friends/Relatives</p> <p>__ Television</p> <p>__ Dentist</p> <p>__ Pharmacist</p> <p>__ Radio</p> <p>__ Newspaper</p> <p>__ Books</p> <p>__ Magazines</p> <p>__ Dietitian</p> <p>__ Chiropractor</p> <p>__ Nurse</p> <p>__ Physician</p> <p>__ Podiatrist</p> <p>__ Eye Doctor</p> <p>__ Other _____</p>
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Please turn page over

For products you are currently using, complete all columns to the right of the product name except the shaded column.

For any products used in the past, fill out only the shaded column using a number shown below, along with the brand and dosage.

*For past usage, why did you stop using them?

1. Expense/Cost
2. Didn't work
3. Switched to another product
4. Side effects
5. Health professional recommended to discontinue
6. Other: _____

Supplement/ Herb	Dosage	Brand	*Reason for Discontinuing	Is it working yet? (1=yes, 2=no, 3=don't know)	Side Effects Experiencing
1. Multivitamin					
2. Vitamin B12					
3. Vitamin B12, folate, B6 complex					
4. Vitamin C					
5. Vitamin E					
6. Calcium					
7. Calcium with Vitamin D					
8. Garlic					
9. Glucosamine Chondroitin Sulfate					
10. Coenzyme Q10					
11. Ginkgo Biloba					
12. Ginseng					
13. Echinacea					
14. St. John's Wort					
15. Saw Palmetto					
16. Kava Kava					
17. Valerian					
Others:					

Comments:

Thank You For Your Help!

APPENDIX B

Surveyor Written Instructions

Surveyor instructions:

- 1.) Indicate if you interviewed the participant (if you asked them the questions) by marking it on the space provided on the front of the questionnaire.
- 2.) Make sure the participant writes the brand name of the supplement and be sure they give the doses of each in milligrams, one pill or tablet is not much information.
- 3.) In the comments section, write if there is any other information given, for example, if they tell you why they are taking the supplement.