

NUTRIENT SUPPLEMENTATION HABITS
OF ACTIVE DUTY MILITARY
MEMBERS

By

JOANNE M. MASTERSON

Bachelor of Science

College of St. Elizabeth

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Thesis Approved:

William L. Johnston

Thesis Adviser

Carl Hall

Margaret J. Weber

Norman N. Durkan

Dean of the Graduate College

1251294

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CHAPTER I

INTRODUCTION

Past national surveys have found that between 47 percent and 54 percent of the general public use vitamin and mineral supplements (Food and Drug Administration Publication Nos. (FDA) 76-2058 and (FDA) 76-2059). The sale of nutrient supplements is a billion dollar business. Vitamin and mineral manufacturers reported sales of \$1.2 billion in 1980 and estimate sales of \$3.5 billion in 1988 (Stanford Research Institute, 1981).

Undoubtedly, the sale of supplements far exceeds the need for them. There is little government regulation; consequently, the composition of supplements is limited only by the manufacturer's imagination and the Federal Drug Administration's (FDA) ability to show toxicity. Only a truly informed consumer can be sure that he is getting value for his money and not compromising his health.

Because most consumers do not possess a broad knowledge of the science of nutrition, they make an easy target for nutrition misinformation. Lucrative businesses can create nutrition myths and expand upon them through the media. They create consumer wants even though an

actual need does not exist. These wants or desires are so strong that when the FDA attempted to protect the consumers by establishing regulations to limit the doses of vitamins that could be sold without a prescription, it was lobbying groups and irate consumers that blocked the action.

During the mid 1970's controversial legislation was passed concerning vitamins and minerals. On September 24, 1974, Congress passed Bill S2801 preventing the FDA from setting upper limits on over-the-counter vitamins. The upper limit proposed by the FDA was 150 percent of the Recommended Daily Allowance (RDA) per tablet. In April 1976, Congress amended the Food, Drug and Cosmetic Act to prevent the agency from regulating (other than for reasons of safety) the kinds or amounts of vitamins and minerals in supplements. The amendment prevents the FDA from: limiting potency; classifying a preparation as a "drug" because it exceeds a nutritionally rational or useful potency; requiring the presence in dietary supplements of nutritionally essential vitamins and minerals; or prohibiting preparations with useless ingredients with no nutritional value.

These restrictions do not apply to supplements sold for infants, children, pregnant and lactating women. The FDA may set lower limits for nutrients in supplements to avoid useless preparations but may not limit high doses unless it causes toxicity (White, 1976). This established

a state of "caveat emptor" (buyer beware) within the nutrient supplement business.

Health fraud is becoming more lucrative with little probability that public support will diminish. Supplement manufacturers identify three driving forces which will positively affect their business: (1) social factors, changing consumer values and lifestyles; (2) the absence of unpopular government intrusion; and (3) vigorous competition among private entrepreneurs (Stanford Research Institute, 1981).

An extensive survey sponsored by the federal government found that few Americans had an informed, systematic method of thinking about health and few had an organized set of valid health beliefs. The majority believed that anything is worth a try (National Analysis, Inc., Contract No. FDA 66-193, 1972). This attitude leaves the consumer prey for businessmen.

Unfortunately, the uninformed or misinformed consumer of nutrient supplements runs the risk of: economic waste, nutrient toxicity, causing a deficiency of one or more nutrients by overconsumption of another, and causing a dependence on an abnormally high intake of a nutrient.

The unwary may believe that synthetic vitamins are not as effective as vitamins derived from natural sources. They may pay exorbitant prices for a natural vitamin when a synthetic vitamin would do the same job for considerably less money (Krause and Mahan, 1979).

Ideally, a combination of education and government regulation would be the most effective way of controlling nutrition quackery. Unfortunately, the chief regulatory agencies for this area, the FDA, Federal Trade Commission (FTC) and Post Office, all lack the funding and manpower necessary to control the problem. This leaves consumer education as the principal means of protecting consumers from harming themselves or wasting their money.

A. Nature of the Problem

The researcher is the only dietitian or nutritionist assigned to the USAF Hospital Tinker, it is the dietitian's professional responsibility to ensure that active duty military members have access to reliable information to protect them from nutrition quackery. It is important that the science of nutrition be understood by the consumer since approximately 90 percent of all nutrition takes place in the home (Frankle and Yanochik, 1978).

Through work with outpatients from Tinker Hospital, the researcher has encountered many misconceptions regarding vitamin and mineral supplements. This is very understandable since military members are bombarded with nutrition misinformation. There is no reliable mechanism available to help evaluate misinformation and put it into proper perspective.

One solution to this problem would be the development

of a broad educational program focusing on nutrient supplements. Before developing a program of this type, it would be wise to determine whether or not a problem actually exists and if it does, to try to further define it.

It is very difficult to design a meaningful and effective educational program without understanding the needs of the community (Frankle and Yanochik, 1978). At the time of this study, there was no research examining the nutrient supplementation habits of active duty military members.

B. Purpose of the Research

There was a need to know the types of nutrient supplements used and what the military members perceive these supplements would do for them. The purpose of this study was to examine the use of nutrient supplements, the prevalence of use, types, frequency of use, sources where they are obtained, and the reasons for their use by active duty military members stationed at Tinker Air Force Base.

C. Research Questions

The research sought to answer the following questions:

1. What is the prevalence of nutrient supplement use among active duty military members?
2. What types of nutrient supplements are being taken by active duty military members?
3. What are the major reasons for supplementation by this population?

4. What sources of information are used to support the use of nutrient supplements?
5. Where do active duty military personnel purchase nutrient supplements?

D. Limitations of the Research

1. This was a cross-sectional study. Therefore, conclusions were based on a one-time observation.
2. Since it was impossible to obtain a list of population elements, non-probability sampling methods were used. These are regarded as less reliable and make it impossible to generalize back to a wider population.
3. The sampling method eliminated high-ranking officers.

E. Assumptions of the Research

This study involved the following assumptions:

1. Information gathered from the participants on the questionnaire was accurate.
2. It was recognized that some bias would be introduced since a non-probability sample was used. It was assumed that such bias, if any, would not materially affect the results of the study.
3. The interviewer's presence did not affect the respondents perception of a question or the answer given.

F. Definitions

The following is a list of terms which were used throughout the study.

Food and Drug Administration (FDA). The federal agency responsible for enforcing laws to protect consumers

of food, drugs, cosmetics, medical devices, chemical products, and other articles used in the home. The FDA establishes the necessary regulations and standards to enforce the laws passed by Congress.

Vitamins. Carbon compounds, essential in minute amounts for the maintenance of normal metabolic functions. These organic compounds are either not synthesized within the body or are generally not internally synthesized in adequate amounts so that exogenous sources of supply are usually necessary (Goodhart and Shils, 1980).

Nutrient Supplements. Substances necessary from an outside source (i.e. food) which are necessary for the body's nutritional and metabolic processes.

Nutritional Quackery. Information created by a person or persons pretending to possess special knowledge and skills for the express purpose of financial gain (Schaller and Carroll, 1976).

Recommended Daily Allowances (RDA). Levels of intake of essential nutrients considered, in the judgement of the Committee on Dietary Allowances of the Food and Nutrition Board on the basis of available scientific knowledge, to be adequate to meet the known nutritional needs of practically all healthy persons (Committee on Dietary Allowances, Food and Nutrition Board, 1980).

CHAPTER II

REVIEW OF LITERATURE

A. Prevalence of Nutrient Supplementation

It has been estimated that one half of all Americans have taken nutrient supplements at some time during their adult lives. A study conducted by the FDA from 1973 to 1974 revealed that 54 percent of the 1,500 households surveyed used nutrient supplements (FDA Publication No. (FDA) 76-2058). A similar FDA study in 1975 reported supplement use in 782 (47 percent) of 1,664 surveyed households (FDA Publication No. (FDA) 76-2059).

A study of college students by Bootman and Wertheimer (1980) reported the use of supplements to be 57 percent. Members of the Department of Food Science and Nutrition, Colorado State University, found 53 percent of a Colorado population used nutrient supplements (Bowerman and Harrill, 1983). In 1981, it was found in a study by English and Carl that 40 out of 60 (67 percent) of family practice patients used supplements, most not recommended by a physician.

A survey of a southern California retirement community in 1983 (Gray, Paganini-Hill and Ross) revealed that

72 percent took some type of nutrient supplement. Several recent studies have shown that 60 percent to 70 percent of older Americans supplement their diets (Garry, Goodwin, Hunt, Hooper and Leonard, 1982; Read and Graney, 1982; Kulhanek, 1978). This prevalence of supplementation suggests that many people believe claims which are in support of this practice.

B. Reasons for Supplementation

Popular misconceptions leading to this high rate of supplement use include such beliefs as our food supply is inferior because nutrients have been lost in food processing or if a person feels tired and run down, he probably needs some vitamins and minerals. Many people believe nutritional deficiencies cause diseases such as arthritis and cancer and use these claims to justify supplement use (National Analysts, Inc., 1972; Bowerman and Harrill, 1983). A common reason for taking Vitamin C is to prevent and treat colds, sore throats and flu despite a lack of evidence for its efficiency against these ailments (Dykes and Meier, 1975).

There is no evidence that nutrient supplements increase immunity in otherwise well-nourished individuals, nor will a supplement create an extra surge of energy (Krause and Mahan, 1979). The belief that the food supply is inferior contributes to an unfounded lack of confidence in the nutritional quality of a well-balanced diet (Suitot

and Crowley, 1984). Many people use standard strength vitamin supplements as a type of nutritional insurance-- just in case their diet is inadequate (Schutz et al., 1982; English and Carl, 1981). Herbert and Barrett (1981) point out that most individuals taking supplements for this reason do not need them and would be better off with a balanced diet. The American Medical Association (1981) agrees and says that ideally those who are doubtful about their nutrient intakes should improve their diets and forget the pills.

The routine vitamin supplementation of the diet is not justified except in cases where the diet is known to be chronically poor (i.e. alcoholics, persons in poverty, persons with gastrointestinal or mental disease and persons with very high nutrient requirements, such as burn patients and pregnant women). The large amounts of money spent on nutrient supplements would be better spent on foods providing these nutrients (Krause and Mahan, 1979).

In 1983, Bowerman and Harrill conducted a study of nutrient consumption of individuals taking or not taking nutrient supplements. They found no significant differences in dietary intakes of nutrients from food between users and nonusers of supplements. Both groups consumed nutrients and calories sufficient to meet their needs. Persons who consumed supplements did not, on the average, exhibit a need for additional intakes and some supplement users consumed levels of nutrients above those which the

body could utilize.

The ingestion of megadoses of vitamins (usually ten times the RDA or more) is not an uncommon occurrence in our society. Such doses are widely available in high potency vitamin mixtures (sometimes called stress formulas) and in individual supplements. Megavitamin therapy has been promoted for correction of certain psychiatric disorders and curing the common cold. (Committee on Nutrition, American Academy of Pediatrics, 1976; Suitot and Crowley, 1984). There is much evidence substantiating the dangers of megadoses of nutrient supplements. Bowerman and Harrill (1983, p. 299) list the following toxic effects megadoses may have.

Regular excessive intakes of vitamin A have been related to central nervous system disorders (4) bone and joint pain (5-7), and hepatic damage (8-12). Hypercalcemia and soft tissue calcification are well-documented adverse effects of long-term massive vitamin D ingestion (13-16). Regular megadoses of vitamin E may cause weakness and fatigue (17) or an elevation of serum triglycerides (18).

A variety of toxic effects have been described following chronic ingestion of large amounts of vitamin C. Alterations in cholesterol metabolism (19-21), urolithiases (22), and inhibition of copper (23) have been related to regular overdosage with ascorbic acid.

Both amide and nicotinic acid forms of niacin have been associated with abnormal liver function when regularly used in pharmacological doses (24, 25). Gastrointestinal distress and psychic disturbances have been associated with chronic megadose consumption of folic acid (26). Adverse effects in human beings have also been associated with long-term intakes of large amounts of supplemental iron (27) and zinc (28).

In addition to these, megadoses of Vitamin C have caused toxic effects including diarrhea, urinary tract stones and destruction of Vitamin B₁₂ (Hodges, 1980). Particularly troublesome for the elderly is the potential for high doses of Vitamin C to produce false-negative tests for blood in the stool, thereby inhibiting early detection of gastrointestinal cancer (Gray, Paganini-Hill and Ross, 1983). It may also cause a false positive clinical test result to urinary glucose (Frer and Frer, 1973). Persons at greatest risk for nutrient toxicity include infants and children, and individuals who take supplements upon the advice of a pseudonutritionist or door-to-door salesperson.

C. Types of Nutrient Supplements

Most Frequently Used

A study of individuals from seven Western states showed that multivitamins and Vitamin C were taken by at least one-third of all respondents and multiple vitamins plus iron and Vitamin E followed as the most frequently taken vitamin supplements (Schutz et al., 1982). English and Carl (1981) found the use of ascorbic acid to be the most frequently used supplement among family practice patients. Registered nurses were found to use multivitamins, Vitamin C, and Vitamin E most often (Willett et. al., 1981).

Washington State dietitians most frequently

supplemented with multivitamins and minerals and then Vitamin C (Worthington-Roberts and Breskin, 1984). Among the ambulatory elderly, vitamin products most commonly used were multivitamins, multivitamins with minerals, Vitamin E, Vitamin C, and Vitamin B complex (Hale, Stewart, Arda, Marks and May, 1982). Several other studies cited Vitamin C and multivitamins and multiminerals as the most commonly used supplements. Other supplements utilized quite frequently include Vitamins E and B complex (Bowerman and Harrill, 1983; Gray, Paganini-Hill and Ross, 1983).

One nutrition misconception which is exploited by many supplement marketers is that naturally derived vitamins are better than synthetic vitamins. The fact is that both have the same chemical structure and are not distinguishable by the body (Goodhart and Shils, 1980). The consumer can usually differentiate them at the cash register, because "natural" vitamins usually cost twice as much.

D. Sources of Information Supporting Use of Nutrient Supplements

Numerous studies have found that consumers often use nutrient supplements for irrational reasons and at times when no clear value is to be derived. The majority of this supplementation is suggested by friends, family, and lay publications (English and Carl, 1981; Bowerman and

Harrill, 1983; Gray, Paganini-Hill and Ross, 1983).

Enormous quantities of misleading information regarding nutrient supplements is available to the American public. One of the principal sources of this nutritional quackery is the pseudonutritionist termed "health hustler" by Herbert (1976). These self-ordained experts make their living peddling useless information. Since the therapeutic effects of vitamins on deficiency diseases are so spectacular, attention has been long captivated by vitamins. "Health hustlers" take advantage of this by endorsing vitamins and/or minerals to prevent or cure whatever disease or condition is currently puzzling the medical profession. Because of the undue respect these individuals receive from the media, the public is often unable to differentiate the hustler, with inappropriate credentials, from the qualified scientist (White and Mondeika, 1980).

E. Places Consumers Frequently Purchase Nutrient Supplements

When studying the use of nutritional supplements, English and Carl (1981) found that the majority of individuals purchased supplements in grocery stores or drug-stores. Health food stores or other sources associated with the health food movement accounted for 17.5 percent of supplement purchases.

CHAPTER III

METHODOLOGY AND PROCEDURES

The purpose of the study was to examine the use of nutrient supplements by active duty military members stationed at Tinker Air Force Base. The study was designed to determine the prevalence of nutrient supplementation by this population, the frequency of use, types of supplements being taken, sources from which they are obtained, and the major reasons for supplement use. The study also looked at demographic factors which may affect supplementation habits. This is a descriptive, cross-sectional study. The chapter describes the subjects, sampling process, methodology, the instrumentation utilized, and the analysis of data.

A. Population and Sample

The population studied were active duty military members stationed at Tinker Air Force Base in Oklahoma. An active duty military population is unique because all members are healthy individuals. Any individuals with major health problems are not permitted to serve in the armed forces (Air Force Regulation 160-43, 1983). There are approximately 8,000 active duty military members stationed at

Tinker Air Force Base. A sample consisting of the first 100 active duty military members receiving their annual dental examination after November 18, 1985, was taken.

B. Sampling Process

All military rosters of active duty personnel are protected by the Privacy Act which prohibits their use for the purpose of this research. Without access to this list a probability sample could not be collected because it was impossible to determine whether each element had the same opportunity of being selected. Since a nonprobability sample was used, inferences about the population could not be made based on the sample obtained (Adams and Schvaneveldt, 1985).

A sample composed of the first 100 active duty military members receiving annual dental examinations after November 18, 1985, was selected. In the opinion of the researcher, this was the most appropriate sample available since probability sampling techniques could not be used. The annual dental examination is a mandatory appointment that all active duty military members must attend. Scheduling for this appointment is based upon the date the member was appointed to his first duty station (Air Force Regulation 162-1, 1984, and Air Force Regulation 30-130, 1980). An exception to this is officers with the rank of general, whose appointments are made on an individual basis to fit into their business schedules.

Despite the fact that this incidental sample may not be used to generalize back to the population, it is still of considerable value. The sample provides insight and gives the researcher "a feel for how things are going." The data obtained gave the writer some ideas about supplementation habits of the military members surveyed. This information could be beneficial when designing future studies and could be valuable in guiding curriculum development for an educational program concerning nutrient supplements.

A sample of 100 individuals was used. The writer felt this would be an adequate sample size since it is not a probability sample and generalizations cannot be made back to the population of all active duty military members. Blalock (1979) indicates that in terms of statistics a sample of 50 is a minimum size, while Champion (1970) notes that 30 is the very minimum. In the opinion of the researcher a sample of 100 provided adequate information.

C. Methodology

A survey method was utilized to collect information for this study. An interview survey was decided upon because it could provide a great deal of information, in a short time, at relatively little expense. This method was used rather than a self-administered questionnaire because it ensured that the respondents followed the directions and answered all the questions. The interview technique

also guarded against confusing questionnaire items. The researcher preferred a tool which ensured that standardized questions would be asked of each participant.

The major drawback to this method of research is that it may be superficial in its coverage of complex issues. Because only a limited number of standardized questions are asked, valuable information which may affect the individual but is not asked about by the interviewer may be lost. As a result, a survey method may be strong on reliability, but weak in validity (Babbie, 1983). The researcher attempted to minimize this drawback by asking open-ended questions.

Permission to interview members reporting for their annual dental examinations was obtained from the Hospital Commander. A meeting was scheduled in October, 1985, with the Hospital Commander of Tinker United States Air Force Hospital. The objectives, proposed methods and procedures for the study were outlined at that time. Questions regarding the study were answered. A letter was sent requesting permission to conduct the study at Tinker U.S.A.F. Hospital. Permission was granted by the Commander to conduct the study (See Appendix A). A meeting was then held with the Base Dental Surgeon soliciting his support. Verbal permission was granted to proceed with the study.

D. Instrumentation

At first, a four-page, self-administered questionnaire was developed by the investigator to assess a variety of attitudes and behaviors toward the use of nutrient supplements. The questions were devised after a thorough review of literature. The questionnaire was then put into a format ready to be field tested.

The researcher was interested in supplementation habits over the past 24 months. Techniques for asking what supplements were being taken and why were derived from a research of supplementation habits of individuals residing in Western states (Schutz et al., 1982). The supplements listed in the questionnaire were chosen because according to past studies, these were the nutrients frequently taken by the civilian population (Bowerman and Harrill, 1983; English and Carl, 1981; Schutz et al., 1982; Worthington-Roberts and Breskin, 1984). An opportunity to write in any additional supplements was given in case the list was incomplete. Reasons cited for supplementation were in part derived from those cited in a past study (Schutz et al., 1982) and those frequently heard by the researcher from patients. Again, an opportunity to write in any additional reasons was given.

Two questions regarding natural versus synthetically produced vitamins were asked. A popular misconception, supported by many nutrient manufacturers, is that natural

vitamins are better than synthetically produced vitamin supplements. This belief costs consumers many extra dollars since natural vitamins often cost significantly more than those produced synthetically. These questions were included to determine if military members believe this misconception and to understand why they believe what they do.

Respondents were asked to identify the top three sources from which they obtain information regarding supplements and asked the primary source from which supplements are obtained. Common information sources and places of purchase were listed and additional space was provided for the respondents to add any additional answers if the ones listed did not apply to them.

Six demographic questions were asked. This information was utilized in the final analysis of data. The final question, "Are you on flying status?", was added at the request of the Chief, Aeromedical Medicine, who was Acting Hospital Commander when the survey was approved for use at Tinker Hospital. Since military members on flying status receive hospital care in a separate clinic from all other military members, physicians in the Flight Medicine Clinic were interested in data for flying personnel only. This question enabled the researcher to take the data applying to military members on flying status and analyze it separately. This separate analysis was not included in this paper since the researcher provides care to all

military members both on and off flying status.

The survey instrument was field tested and revised several times, and the method of administration was changed. Various professionals and nonprofessionals were asked to take the questionnaire and give feedback with regard to clarity, comprehension, and presentation or format. Originally, a total of 21 individuals pre-tested the questionnaire, and various changes were made as a result. (See Appendix B for the original and Appendix C for the final copy of the questionnaire.) Most of the revisions made were to improve clarity.

The numbering of the questions was changed. Letters were used only for responses and numbers only to indicate new questions. Directions were altered to increase clarity. Samples of nutrient supplements were given at the beginning of the questionnaire to clarify the term nutrient supplement. A sample response to question three was given to clarify the directions. One of the pretest participants had checked the reason for using supplements, but failed to write in the name of the supplement used for the stated reason. In further pretesting an example seemed to prevent this from occurring. In question 6 when requesting three sources of information, it was found that respondents did not read the entire question and did not circle three sources. The directions were reworded to request the three sources at the outset of the question.

Questions four and five were combined into question

three because when asked separately, the questions were biased. Question 6 was reworded to eliminate bias. The reason for their response to question six was also sought. The original question 13 was omitted because it did not provide valuable information. A new question was added upon the request of the Hospital Commander.

The self-administered questionnaire was distributed as planned through the dental clinic. The questionnaire was added to a clipboard of forms routinely filled out by personnel reporting for their dental appointments. The survey was completed along with three other forms. It was the last item on the clipboard.

After one day it was determined that this method of distribution was unsatisfactory. By the time respondents reached the questionnaire, they were tired of filling out forms. As a result, out of eleven completed questionnaires only six were filled out correctly. The major problem was that respondents did not take time to read the directions. Two respondents indicated that they did not take supplements in question one, and checked supplements that they used in question two. Two individuals failed to provide reasons for taking supplements in question three. One of the surveyed skipped question four, two skipped question five, and three skipped questions six and seven.

It was decided to switch to an interview survey technique. This method ensured that respondents followed the directions and answered all the questions.

Confusing items could be clarified immediately. The same questionnaire was used to record the respondents answers to the questions. The interviewer conducted all the interviews using techniques outlined in an interview guide (See Appendix D).

E. Analysis of Data

The analysis of data was performed by the use of descriptive statistics. Responses to demographic items, such as, sex, age, education, marital status, rank, and flying status, were analyzed by frequency and percentage to describe the characteristics of the sample. Age and rank were described in intervals. Frequency and percentages of those respondents who take or do not take nutrient supplements were determined along with frequency data relating to the type of supplements used, most common reasons for use, sources of information, source where supplements were obtained, and beliefs about synthetically and naturally produced vitamins.

Bivariate analysis was conducted on the data to determine if any relationships existed between use of nutrient supplements and demographic variables. The dependent variable, use of supplements, was compared with the following independent variables: sex, rank, education, age, and marital status. These relationships may not be generalized to the population, but exist only in the sample studied.

CHAPTER IV

PRESENTATION AND DISCUSSION OF FINDINGS

The content of this chapter is divided into five sections. The sections are presented in the following order: (1) characteristics of the respondents and prevalence of supplement use; (2) types of supplements used; (3) reasons for supplement use; (4) sources of information supporting the use of nutrient supplements; and (5) sources from which nutrient supplements are obtained.

A. Characteristics of the Respondents and Prevalence of Supplement Use

The overall response rate for the survey was one hundred percent. All one hundred individuals approached agreed to be interviewed. The distribution of respondents by sex, age and use of supplements is presented in Table I. Fifteen subjects were women and 85 were men. Fifty-five men were between the ages of 18 and 32 years and 30 were between the ages of 33 and 55 years. Thirteen women were between the ages of 18 and 32 years and 2 women were between 33 and 55 years of age. The range of ages of individuals who participated in this study was 18 to 55 years. Sixty-eight percent of the individuals surveyed

were less than 33 years of age. Only one subject was older than 45 years of age.

Forty-nine of the respondents consumed no supplements during the past 24 months. Fifty-one reported the use of some form of supplement. The frequency of supplement use is nearly identical with the value of 54 percent reported among the civilian population (FDA Publication No. (FDA) 76-2058). Forty-seven percent of the men interviewed used nutrient supplements while 73 percent of the women surveyed were found to use them. The women surveyed were more inclined to use nutrient supplements than the men. Fifty-six percent of the younger and 41 percent of the older individuals in the sample used dietary supplements. Supplementation was more frequently seen among individuals in the younger age group.

TABLE I
DISTRIBUTION OF RESPONDENTS BY SEX, AGE,
AND USE OF NUTRIENT SUPPLEMENTS

Sex	Age	Nonusers	Users	Total Sample
Men	18 to 32	27	28	55
	33 to 55	18	12	30
Subtotal		(45)	(40)	(85)
Women	18 to 32	3	10	13
	33 to 55	1	1	2
Subtotal		(4)	(11)	(15)
Total		49	51	100

(N=100)

The distribution of respondents by rank and use of supplements is presented in Table II. Eighty-five percent of the subjects interviewed were enlisted personnel and 15 percent were officers. Supplementation was more prevalent among enlisted troops than officers. Fifty-four percent of the enlisted members interviewed were supplement users and 33 percent of the officers interviewed used supplements.

TABLE II
DISTRIBUTION OF RESPONDENTS BY RANK
AND USE OF NUTRIENT SUPPLEMENTS

Rank	Nonusers	Users	Total Sample
E-1 to E-3	11	18	29
E-4 to E-6	23	23	46
E-7 to E-9	5	5	10
Subtotal	(39)	(46)	(85)
O-1 to O-3	7	4	11
O-4 to O-6	3	1	4
Subtotal	(10)	(5)	(15)
Total	49	51	100

(N=100)

Table III shows the distribution of respondents by level of education and use of supplements. All the individuals surveyed had at least a high school education.

Thirteen had a technical, vocational or associates degree; 13 had a bachelor's degree; and 4 had a master's degree. Of the individuals without a four-year college degree, 53 percent used supplements. Of the individuals with a bachelor's or master's degree, 41 percent use supplements. Supplementation was slightly more common among individuals without a bachelor's degree.

TABLE III
DISTRIBUTION OF RESPONDENTS BY LEVEL OF EDUCATION
AND USE OF NUTRIENT SUPPLEMENTS

Education	Nonuser	User	Total Sample
High School	33	37	70
Technical, Vocational or Associates Degree	6	7	13
Bachelor's Degree	8	5	13
Master's Degree	2	2	4
Doctorate, Medical, Judiciary Degree	0	0	0
Total	49	51	100

(N=100)

The distribution of respondents by marital status and use of supplements is presented in Table IV. Of those surveyed, 59 percent were married and 41 percent were

single. Of the supplement users, 53 percent were single and 47 percent were married. Marital status seemed to have little affect on an individual's supplementation habits.

TABLE IV
DISTRIBUTION OF RESPONDENTS BY MARITAL
STATUS AND USE OF NUTRIENT SUPPLEMENTS

Marital Status	Nonuser	User	Total Sample
Single	14	27	41
Married	35	24	59
Total	49	51	100

(N=100)

B. Types of Supplements Used

Supplement users were classified as such if they consumed one or more supplements on a regular basis. Thirty-three of the 51 supplement users (65 percent) used more than one supplement. The specific supplement preparations in use, listed in descending order of frequency, are presented in Table V.

TABLE V
 NUTRIENT SUPPLEMENTS TAKEN BY SUPPLEMENT
 USERS IN DESCENDING ORDER OF FREQUENCY

Supplement	Number of Supplement Users	% of Total Supplement Users
Vitamin C	29	56
Multivitamin	25	49
Vitamin E	15	29
Multivitamin plus iron	13	25
Iron	11	22
Calcium	10	20
Zinc	8	16
Vitamin D	7	14
Lecithin	6	12
Vitamin A	6	12
Vitamin B-complex	5	10
Liquid protein	5	10
Wheat germ	4	8
Potassium	4	8
Vitamin B ₁₂	3	6
Multimineral	3	6
Rose hips	2	4
Kelp	2	4
Synthetic protein powders	2	4
Choline	2	4
Dolomite/Bone meal	1	2
Yeast	1	2
Vitamin B-complex with iron	1	2
Gelatin	1	2
Protein tablets	1	2
Alfalfa tablets	0	0

(N=51)

Vitamin C was the most commonly used supplement, as has been reported previously (Bowerman and Harrill, 1983; Gray, Paganini-Hill and Ross, 1983; Worthington-Roberts and Breskin, 1984). The multivitamin was the next

most frequently used supplement, followed by Vitamin E, multivitamin plus iron, iron and calcium.

Fewer than 20 percent of users consumed lecithin, Vitamin A, zinc and Vitamin D. Less than 10 percent consumed Vitamin B-complex, Vitamin B₁₂, wheat germ, potassium, liquid protein and multiminerals. Fewer than 5 percent of those surveyed consumed rose hips, dolomite or bone meal, yeast, Vitamin B-complex with iron, kelp, synthetic protein powders or tablets, choline or gelatin. None of the respondents reported taking alfalfa tablets.

Individuals were asked whether synthetically produced or naturally produced vitamins were better or if there was no difference between the two. Table VI summarizes the responses to this question. Of those surveyed, 26 (51 percent) felt that naturally produced vitamins were better. One respondent (2 percent) thought synthetically produced vitamins were better, and 24 respondents (47 percent) felt that it did not make a difference.

TABLE VI
 RESPONDENT'S OPINIONS CONCERNING VITAMINS
 PRODUCED FROM NATURAL SOURCES VERSUS
 SYNTHETICALLY PRODUCED VITAMINS

Which Is Best For Individual	Number of Supplement Users	% of Total Supplement Users
Vitamins from natural sources	26	51
Synthetically produced vitamins	1	2
Does not make a difference	24	47

(N=51)

Table VII presents a summary of the reasons the surveyed answered question four the way they did. Nineteen individuals (37 percent) voiced a belief that "natural was always better", seventeen respondents (33 percent) believed the body treated natural and synthetically produced vitamins in the same way, and seven (14 percent) did not know why they answered the question the way they did. Five respondents (10 percent) expressed a fear of chemicals and too much processing, and three respondents (6 percent) stated that they answered the question based on information they had read or heard.

TABLE VII
REASONS FOR RESPONDENT'S OPINIONS ABOUT NATURAL
VERSUS SYNTHETICALLY PRODUCED VITAMINS

Respondent's Opinions	Number of Supplement Users	% of Total Supplement Users
Natural is always better	19	37
The body treats them the same way	17	33
Do not know	7	14
Fear of chemicals or too much processing	5	10
Belief based on information read or heard	3	6

(N=51)

C. Reasons For Supplement Use

During the interview supplement users were asked an open-ended question concerning the reason they used the particular supplements they cited in question two. Table VIII presents the results in the order of reasons most frequently cited and the most commonly cited vitamin supplement for that reason. "To prevent colds and other illnesses", as might be expected, was reported most frequently, with Vitamin C as the correspondent vitamin taken. The reasons "I feel my diet is inadequate" and "I do not know" followed in frequency, with a multivitamin supplement most often cited for both reasons.

TABLE VIII

REASONS FOR SUPPLEMENT USE LISTED IN DESCENDING ORDER
OF FREQUENCY WITH CORRESPONDING SUPPLEMENT CHOICE

Reason For Use	% of Users Indicating Reason	Most Frequently Cited Supplement Used For Cited Reason
To prevent colds and other illnesses	37	Vitamin C
I feel my diet is in- adequate	24	Multivitamin
I do not know	24	Multivitamin
To give me energy	16	Multivitamin
As a precaution	10	Multivitamin
To increase my strength	10	Synthetic protein
For bones, teeth and joints	10	Calcium
To make up for what is not in food	8	Vitamin C
For my skin	8	Vitamin E
Doctor prescribed it	6	Iron
I am anemic	6	Iron
I don't eat right	6	Multivitamin
For my hair	4	Vitamin E
For my nails	4	Vitamin E and gelatin

*For tiredness; food processing removes nutrients; because of pregnancy; a friend said it was good; to promote health; dietitian recommended it; because I am on a weight reduction diet; because I smoke; it helps cramps

*Reasons cited by less than 2 percent of users

D. Sources of Information Supporting the Use of Nutrient Supplements

Supplement users were asked to name the top three sources of information which were the most influential in

their decision to use nutrient supplements. The results are found in Table IX. Sources most frequently named and the percent of supplement users who refer to these information sources include: magazines (53 percent), television and radio (41 percent), family (39 percent), friends (39 percent), and a physician (37 percent).

TABLE IX
SOURCES OF INFORMATION INFLUENTIAL IN THE
DECISION TO USE NUTRIENT SUPPLEMENTS

Information Source	Number of Supplement Users	% of Total Supplement Users
Magazines	27	53
Television or radio	21	41
Family	20	39
Friends	20	39
Physician	19	37
Books	8	16
Health food stores	8	16
Newspapers	6	12
Dietitian	2	4
Pharmacist	1	2
Technical courses	1	2

(N=51)

E. Sources From Which Nutrient
Supplements Are Obtained

Supplement users were asked the source from which nutrient supplements were most often obtained. The results are found in Table X. The most frequently cited source was the Base Exchange or the Commissary, followed by the health food store.

TABLE X
SOURCES FROM WHICH NUTRIENT SUPPLEMENTS
ARE MOST OFTEN OBTAINED

Source	Number of Supplement Users	% of Total Supplement Users
Base Exchange or Commissary	19	37
Health food store	14	27
Grocery store	7	14
Drug store	7	14
Individual Salesperson	2	4
Hospital	1	2
Sporting goods store	1	2

(N=51)

F. Summary

Fifty-one percent of the 100 individuals surveyed used

nutrient supplements within the past 24 months. Sixty-five percent of these users consumed more than one type of supplement. Women were found to be more inclined to use nutrient supplements than men. Younger individuals used supplements more than older military members. Supplementation was more prevalent among enlisted troops than officers and slightly more common among individuals without a bachelor's degree. Marital status seemed to have little affect on an individual's supplementation habits. Vitamin C was the most commonly used nutrient added to the diet followed by multivitamins, Vitamin E, multivitamins plus iron, iron and calcium. Fifty-one percent of the supplement users felt that naturally produced vitamins were better than synthetically produced ones. Thirty-seven percent felt that anything natural would be better and 10 percent expressed a fear of chemicals or too much processing.

The most frequently reported reason for supplement use was to prevent colds and other illnesses, with Vitamin C as the nutrient most often taken for this purpose. The magazine was the information source most frequently cited as influential in an individual's decision to take nutrient supplements. The Base Exchange or Commissary was the source from which the supplements were most often obtained.

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

A. Summary

The purpose of this study was to examine the nutrient supplementation habits of active duty military members. Five objectives were specified to achieve that purpose: (1) determine the prevalence of nutrient supplement use; (2) determine what types of nutrient supplements are being taken; (3) determine the major reasons for supplementation; (4) determine what sources of information are used to support the use of nutrient supplements; and (5) determine where supplements are purchased. A corollary objective was to justify and make recommendations for the development of an educational program for active duty military members dealing with nutrient supplements.

A comprehensive review of literature was conducted by the researcher. Supplementation habits of the general population were investigated. Information obtained was helpful in the methodological development of this study.

The population studied were active duty military members stationed at Tinker Air Force Base in Oklahoma. A nonprobability sample of 100 active duty military members was selected to participate in the study. These

individuals were interviewed using a questionnaire which was designed to assess a variety of attitudes and behaviors toward the use of nutrient supplements. The response rate was 100 percent. Analysis of the data was performed using descriptive statistical techniques such as frequency, percentage and variant tables.

The major findings of this study were summarized as follows:

1. Fifty-one percent of the 100 individuals surveyed used nutrient supplements.
2. Sixty-five percent of the supplement users consumed more than one type of supplement.
3. More females were found to be supplement users than men (73 percent and 47 percent, respectively).
4. A greater percentage of younger military members included in the sample used supplements (56 percent) than older members (41 percent).
5. Supplementation was more prevalent among enlisted troops than officers (54 percent and 33 percent, respectively).
6. Supplementation was slightly more common among individuals without a four-year degree (53 percent) as compared with those holding a bachelor's degree (41 percent).
7. Marital status seemed to have little affect upon supplementation habits (53 percent of the supplement users were single and 47 percent were married).
8. The supplement most frequently consumed by the military members surveyed was Vitamin C, followed by multivitamins, Vitamin E, multivitamin plus iron, iron and calcium.
9. Approximately one-half of the supplement users (51 percent) felt that naturally produced vitamins were better than

synthetically produced ones.

10. Forty-seven percent of the supplement users felt that natural products were always better or expressed a fear of too many chemicals or too much processing in the production of synthetically made vitamins.
11. The most frequently reported reason for supplement use was to prevent colds and flu and Vitamin C was the nutrient often taken for this purpose. Other common reasons for supplement use were "I feel my diet is inadequate"; "I do not know"; and "To give me energy".
12. Magazines were most often cited as the information source which was the greatest influence on an individual's decision to use supplements (53 percent). This was followed by television and radio (41 percent), family (39 percent), friends (39 percent), and a physician (37 percent).
13. The Base Exchange or commissary was the most frequently cited place of purchase for nutrient supplements (37 percent), followed by the health food stores (27 percent).

B. Conclusions

Conclusions drawn from the data could not be generalized beyond the sample since nonprobability sampling techniques were used. Although these techniques were used, in reality, the sample turned out to be somewhat random. A representative sample of rank, sex and educational background was obtained. This sample may be stronger than the majority of nonprobability samples and may permit more generalization of the findings. The information does, however, provide some insight into military members

supplementation habits and may be beneficial when designing future studies. This data could also be valuable in guiding curriculum development for an educational program concerning nutrient supplements.

The prevalence of nutrient supplementation among members in the sample studied was a substandard 51 percent. This indicates a use of vitamin supplements at a level comparable to findings of other studies of the general population. For example, in 1973, the FDA found 54 percent of the general population took nutrient supplements (FDA Publication No. (FDA) 76-2058) and in 1975 found 47 percent of the population used supplements (FDA Publication No. (FDA) 76-2059). Bootman and Wertheimor (1980) found that 53 percent of a Colorado population utilized supplements.

A rough demographic description of supplement users within the sample may include the following characteristics: female, between the ages of 18 and 32 years of age, enlisted, and without a four-year degree. The supplements most commonly consumed by those surveyed included Vitamin C, multivitamins, Vitamin E, multivitamin plus iron, iron and calcium.

Comparisons of the reasons cited and the supplement taken reveals a degree of questionable use. For example, users often stated they took multivitamins "to give energy" and synthetic protein "to increase strength." Many individuals relied on supplements because they felt

their diets were inadequate or might be inadequate. A rather large group did not know why they took the supplements. This would certainly make them very susceptible to health fraud and quackery.

It is often reasoned that most users of nutrient supplements are at worst spending money needlessly and no bodily harm occurs from too many vitamins. There is accumulating evidence supporting the fact that excessive use of certain vitamins can provoke nutritional imbalances, produce clinical symptoms and interfere with diagnostic testing. Thus the unguided use of nutrient supplements can be a potential health hazard.

Information sources used by the military members surveyed which supported supplement use included: magazines, television, radio, family and friends. It was encouraging to see consumers actively seek nutrition knowledge. Unfortunately, information from these sources is often an intergration of popular folk health beliefs and those based on medical science. It is commonly difficult to distinguish the accurate information from the misleading. It would be important for an educator to first, be aware of what information consumers are receiving from these sources; second, be able to segregate that which is based on fact; and third, be able to teach consumers to distinguish between fact and myth.

The majority of members included in the study purchased their supplements at the Base Exchange or Commissary;

however, a relatively large percentage (27 percent) purchased their supplements from a health food store. Studies have found that vitamins sold by health food stores are quite a bit more expensive than those sold by their conventional counterparts. Of greater concern, however, is the fact that health food stores also sell a vast array of pseudo vitamins, diet aids and other non-food ingestible items. These items are nutritionally worthless and in some cases dangerous (Gourdine, Traiger and Cohen, 1983).

A large segment of the supplement users who participated in this study believed that vitamins produced naturally would be better than synthetically produced vitamins. This is a misconception which has cost consumers many extra dollars at the cash register.

C. Recommendations

The results of this study have recommendations for research and practice. These recommendations include:

1. Additional research should be conducted using a random sampling technique drawing from a larger population of military members stationed at various bases in the United States and abroad.
2. The methodological approach used in the study should be tested and refined in further research.
3. Future research should address the dosages of nutrient supplements taken, the nutrient content of the diet being consumed by members and the price being paid for the supplement.
4. A multifaceted educational program should be developed to inform consumers about nutrient supplements.

5. Research should be conducted on the types of information available concerning nutrient supplements. The goal of this research should be to identify the most accurate and reliable information sources available to consumers.
6. A study should be conducted comparing the cost of nutrient supplements sold at the Base Exchange and Commissary and those sold by health food stores in the area of the military base.
7. Another study should be conducted on fraudulent advertising schemes concerning supplements that have been investigated by the FDA and FTC. This study should examine these schemes to determine what they have in common, approximately how much they cost consumers financially, and what medical problems they have caused.

BIBLIOGRAPHY

- Adams, Gerald R. and Jay D. Schvaneveldt. Understanding Research Methods. New York: Longman, 1985.
- Air Force Manual 30-130. Base Level Military Personnel System. 1 January 1980.
- Air Force Regulation 162-1. Management and Administration of United States Air Force Dental Activities. 13 April 1984.
- Air Force Regulation 160-43. Medical Examination and Medical Standards. 10 November 1983.
- Babbie, Earl. The Practice of Social Research. 3rd Ed. California: Wadsworth Publishing Company, 1983.
- Bartz, Albert E. Basic Statistical Concept. 2nd Ed. Minneapolis: Burgess Publishing Company, 1981.
- Blalock, Jr., Herbert M. Social Statistics. New York: McGraw-Hill, 1979.
- Bootman, J. L. and A. I. Wertheimor. "Patterns of Vitamin Usage in a Sample of University Students." Journal of The American Dietetic Association, 77 (1980).
- Bowerman, Susan J. A. and Meg Harrill. "Nutrient Consumption of Individuals Taking or Not Taking Nutrient Supplements." Journal of The American Dietetic Association, 83 (1983), pp. 298-302.
- Champion, Dean J. Basic Statistics for Social Research. Scranton, Pennsylvania: Chandler, 1970.
- Committee on Dietary Allowances, Food and Nutrition Board. Recommended Dietary Allowances. 9th Ed. Washington, D. C.: National Academy of Sciences, 1980.
- Committee on Nutrition, American Academy of Pediatrics. "Megavitamin Therapy for Childhood Psychosis and Learning Disabilities." Pediatrics, 58 (1976), p. 910.

- Dykes, M. H. M. and P. Meier. "Ascorbic Acid and the Common Cold: Evaluation of Its Efficiency and Toxicity." Journal of the American Medical Association, 231 (1975), pp. 1073-1074.
- English, Eugenia C. and Jennifer W. Carl. "Use of Nutritional Supplements by Family Practice Patients." Journal of the American Medical Association, 246 (December 11, 1981), pp. 2719-2721.
- Frankle, Reva T. and Anita Janochik Owen. Nutrition in the Community. St. Louis: C. V. Mosby Company, 1978.
- Frer, H. M. and A. H. Frer. "Influence of Ascorbic Acid on Urinary Glucose Tests." Clinical Chemistry, 19 (1973), pp. 662-665.
- Garry, J. Phillip, James S. Goodwin, William C. Hunt, Elizabeth M. Hooper, Andrea G. Leonard. "Nutritional Status in a Healthy Elderly Population: Dietary and Supplement Intakes." The American Journal of Clinical Nutrition, 36 (1982), pp. 319-331.
- Goodhart, Robert S. and Maurice E. Shils. Modern Nutrition in Health and Disease. Philadelphia: Lea & Febiger, 1980.
- Gourdine, Simon P., Warren W. Traiger and David S. Cohen. "Health Food Stores Investigation." The Journal of The American Dietetic Association, 83 (September 1983), pp. 284-290.
- Gray, G. E., and A. Paganini-Hill, R. R. Ross. "Dietary Intake and Nutrient Supplement Use in a Southern California Retirement Community." The American Journal of Clinical Nutrition, 38 (July, 1983), pp. 122-128.
- Hale, William E., Ronald B. Stewart, James J. Arda, Ronald G. Marks and Franklin E. May. "Use of Nutritional Supplements in an Ambulatory Elderly Population." Journal of the American Geriatric Society. 30 (June, 1982), p. 401.
- Herbert, Victor. The Health Robbers. Edited by Steven Barrett and Gilda Knight. Philadelphia: G. F. Stickley, 1981.
- Herbert, Victor and Steven Barrett. Vitamin and "Health" Foods: The Great American Hustle. Philadelphia: G. F. Stickley, 1981.

- Krause, Marie V. and L. Kathleen Mahan. Food, Nutrition and Diet Therapy. 6th Ed. Philadelphia: W. B. Saunders Company, 1979.
- Kulhanek, L. "Dietary Evaluation of the Effectiveness of Congregate Meal Programs in Improving the Nutritional Status of Elderly Participants." (Unpublished Master's Thesis, California State University, 1978.)
- Minium, Edward W. Statistical Reasoning In Psychology and Education. New York: John Wiley & Sons, Inc., 1978.
- National Analysts, Inc. A Study of Health Practices and Opinions. Contract No. FDA 66-193. Springfield (Va.) National Technical Information Service, 1972.
- Read, M. H. and A. S. Graney. "Food Supplement Usage By the Elderly." Journal of The American Dietetic Association, 80 (1982), pp. 250-253.
- Schaller, Warren E. and Charles R. Carroll. Health, Quackery & the Consumer. Philadelphia: W. B. Saunders Company, 1976.
- Schutz, Howard G., M. Read, R. Bendel, V. S. Bhalla, I. Harrill, J. E. Monagle, E. T. Sheehan, B. R. Standal. "Food Supplement Usage in Seven Western States." The American Journal of Clinical Nutrition, 36 (November, 1982), pp. 897-901.
- Stanford Research Institute. "The Booming U. S. Vitamins and Minerals Business--Changes and Challenges." Nutrition Today. (November/December, 1981), p. 26.
- Suitot, Carol West and Merrily Forbes Crowley. Nutrition: Principles and Applications in Health Promotion. Philadelphia: J. B. Lippincott Company, 1984.
- U. S. Department of Health, Education, and Welfare. Consumer Nutrition Knowledge Survey: Report I: 1973-1974. Washington: Food and Drug Administration, Publication No. (FDA) 76-2058, 1974.
- U. S. Department of Health, Education, and Welfare. Consumer Nutrition Knowledge Survey: Report II: 1975. Washington: Food and Drug Administration, Publication No. (FDA) 76-2059, 1976.
- "Vitamin-Mineral Supplements and Their Correct Use." Chicago: American Medical Association, 1981.

White, Philip L. "Vitamin Preparations--Proper Use in Medical Practice." Postgraduate Medicine, 60 (October, 1976), p. 208.

Willet, Walter, Laura Sampson, Christopher Bain, Bernard Rosner, Charles H. Hennekins, Jehia Witschie and Frank E. Speizer. "Vitamin Supplement Use Among Registered Nurses." The American Journal of Clinical Nutrition. 34 (June, 1981), p. 1121.

Worthington-Roberts, Bonnie and Maryann Breskin. "Supplementation Patterns of Washington State Dietitians." Journal of The American Dietetic Association. 84 (July, 1984), pp. 795-800.

APPENDIX A

LETTER REQUESTING PERMISSION FOR SURVEY



DEPARTMENT OF THE AIR FORCE
 USAF HOSPITAL, TINKER (AFLC)
 TINKER AIR FORCE BASE, OKLAHOMA 73145-5300

REPLY TO
 ATTN OF: SGF

22 October 1985

SUBJECT: Request Permission to Distribute Survey

TO: SG

1. Request permission to distribute a questionnaire dealing with nutrient supplementation habits to 100 active duty military members reporting for their annual dental exam. The purpose of this questionnaire is to obtain information about the use of nutrient supplements, the prevalence of use, types, sources where they are obtained and the reason for their use by active duty military members. This information will then be used to design an education program for military members on vitamin and mineral supplements. The survey is a component of my masters thesis and the information obtained will be used to complete my research. The title of the thesis is "Nutrient Supplementation Habits of Active Duty Military Members."

2. Participation in this survey will be voluntary and members will be anonymous. If permitted, the survey will be distributed from the dental appointment desk and members will be asked to complete it while waiting. A copy of the questionnaire is attached for your review.

Joanne M. Masterson

JOANNE M. MASTERSON, 1Lt, USAF, BSC
 Chief, Nutritional Medicine Service

1 Atch:
 Questionnaire

APPROVED

Gordon K. Lochridge

GORDON K. LOCHRIDGE, Colonel, USAF, MC, CFS
 Hospital Commander

APPENDIX B

ORIGINAL QUESTIONNAIRE

NUTRIENT SUPPLEMENT QUESTIONNAIRE

The purpose of this questionnaire is to examine the use of nutrient supplements and the reasons for their use by active duty military personnel stationed at Tinker Air Force Base. PLEASE CIRCLE THE APPROPRIATE ANSWERS OR FILL IN THE BLANKS WHERE REQUESTED.

1. Have you taken any dietary supplements during the past 24 months?

1. Yes

2. No .. (If no, please skip to Question 9.)

2. Please circle the number in front of any supplement(s) consumed by you during the past 24-month period. Place a check in the appropriate column to indicate how often the supplement was taken.

Supplement	Daily	Several Times Per Week	As Needed	Tried But Discontinued Use
1. Multivitamin				
2. Vitamin C				
3. Multivitamin plus iron				
4. Vitamin E				
5. B-complex Vitamin				
6. Lecithin				
7. Vitamin B12				
8. Vitamin A				
9. Calcium				
10. Rose hips				
11. Wheat germ				
12. Zinc				
13. Dolomite/ Bone meal				
14. Iron				

2.

Supplement	Daily	Several Times Per Week	As Needed	Tried But Discontinued Use
15. Yeast				
16. B-complex with iron				
17. Alfalfa tablets				
18. Kelp				
19. Vitamin D				
20. Synthetic protein powders				
21. Potassium				
22. Choline				
23. Gelatin				
24. Liquid protein				
25. Other (Please specify)				

3. Below is a list of common reasons for nutrient supplementation. Circle the number next to the reason(s) which apply to your use of the supplement(s) and fill in the name of the supplement used for that particular reason.

<u>Reason</u>	<u>Supplement</u>
1. To prevent colds and other illnesses	_____
2. To give me energy	_____
3. For tiredness	_____
4. To make up for what is not in the food	_____
5. I feel my diet is inadequate	_____

3.

<u>Reason</u>	<u>Supplement</u>
6. As a precaution	_____
7. Doctor prescribed it	_____
8. For my skin	_____
9. For my hair	_____
10. For my nails	_____
11. Because of pregnancy	_____
12. I am anemic	_____
13. To help me lose weight	_____
14. A friend told me it was good	_____
15. To help me gain weight	_____
16. Other (Please specify)	_____

4. Do you believe nutrient supplements increase your strength?

1. Yes 2. No

5. Do you feel supplementation is necessary because modern processing techniques remove nutrients from food?

1. Yes 2. No

6. Do you believe vitamins from natural sources are much better than synthetic (artificially made) vitamins?

1. Yes 2. No

7. What sources of information are most influential in your decision to use nutrient supplements. Circle the top three sources.

- | | |
|------------------------|---------------------------------|
| 1. Magazines | 7. Friends |
| 2. Newspapers | 8. Physician |
| 3. Books | 9. Dietitian |
| 4. Health Food Stores | 10. Other health care providers |
| 5. Television or radio | (Please specify) _____ |
| 6. Family | _____ |

11. Other (Please specify) _____

4.

8. Where do you most often obtain your nutrient supplements?
Circle one.
1. Base Exchange or commissary
 2. Hospital
 3. Health food store
 4. Grocery store
 5. Drugstore
 6. Mail order
 7. Other (please specify) _____
9. You are
1. Male
 2. Female
10. Please circle military status—and fill in rank.
1. Active duty Military, Rank _____
 2. Retired, Rank _____
 3. Dependent of Active Duty, Rank _____
 4. Dependent of Retired, Rank _____
 5. Other (Please specify) _____
11. What is the highest level of education you have completed:
1. Eighth grade
 2. High school
 3. Technical or Vocational or Associates Degree
 4. Bachelor's degree
 5. Master's degree
 6. Doctorate or Judiciary degree
12. What is your age? _____
13. Current marital status
1. Single
 2. Married
 3. Separated/divorced
 4. Widowed
14. What was your income before 1984 taxes?
- | | |
|----------------------|----------------------|
| 1. Under \$10,000 | 4. \$30,000-\$39,999 |
| 2. \$10,000-\$19,999 | 5. \$40,000-\$49,999 |
| 3. \$20,000-\$29,999 | 6. \$50,000 or more |
15. What is your occupation? _____
-

APPENDIX C

FINAL QUESTIONNAIRE

NUTRIENT SUPPLEMENT QUESTIONNAIRE

The purpose of this questionnaire is to examine the use of nutrient supplements (i.e. vitamins, minerals, and protein powders) and the reasons for their use by active duty military members stationed at Tinker Air Force Base. PLEASE CIRCLE THE APPROPRIATE ANSWERS OR FILL IN THE BLANKS WHERE REQUESTED.

1. Have you taken any dietary supplements during the past 24 months?
 - a. Yes
 - b. No. (If no, please skip to Question 8)

2. Please circle the letter in front of any supplement(s) consumed by you during the past 24-month period. Place a check in the appropriate column to indicate how often the supplement was taken.

Supplement	Daily	Several Times Per Week	As Needed	Tried But Discontinued Use
a. Multivitamin				
b. Vitamin C				
c. Multivitamin plus iron				
d. Vitamin E				
e. B-complex Vitamin				
f. Lecithin				
g. Vitamin B ₁₂				
h. Vitamin A				
i. Calcium				
j. Rose hips				
k. Wheat germ				
l. Zinc				
m. Dolomite/ Bone Meal				

2.

Supplement	Daily	Several Times Per Week	As Needed	Tried But Discontinued Use
n. Iron				
o. Yeast				
p. B-complex with iron				
q. Alfalfa tablets				
r. Kelp				
s. Vitamin D				
t. Synthetic protein powders				
u. Potassium				
v. Choline				
w. Gelatin				
x. Liquid protein				
y. Other (Please specify)				

3. Below is a list of common reasons for nutrient supplementation. Circle the letter next to the reason(s) which apply to your use of the supplement(s) and fill in the name of the supplement used for that particular reason. (See example below).

Sample

Reason

Supplement

(z)

To make me rich

Vitamin G

Reason

Supplement

a. To prevent colds and other illnesses _____

b. To give me energy _____

3.

<u>Reason</u>	<u>Supplement</u>
c. For tiredness	_____
d. To make up for what is not in the food	_____
e. I feel my diet is inadequate	_____
f. Food processing removes nutrients from food	_____
g. As a precaution	_____
h. Doctor prescribed it	_____
i. For my skin	_____
j. For my hair	_____
k. For my nails	_____
l. Because of pregnancy	_____
m. I am anemic	_____
n. To help me lose weight	_____
o. A friend told me it was good	_____
p. To help me gain weight	_____
q. To increase my strength	_____
r. Other (Please specify) _____	_____

4. Vitamins can be processed from natural sources or synthetically (artificially) produced. Which do you feel is better for the individual?
- Vitamins from natural sources
 - Synthetically produced vitamins
 - Does not make a difference
5. Please give the reason for your answer to Question 4.

4.

6. Circle the top three sources of information which are most influential in your decision to use nutrient supplements.

- | | |
|------------------------|--------------------------------|
| a. Magazines | g. Friends |
| b. Newspapers | h. Physician |
| c. Books | i. Dietitian |
| d. Health Food Stores | j. Other health care providers |
| e. Television or radio | (Please specify) _____ |
| f. Family | _____ |

k. Other (Please specify) _____

7. Where do you most often obtain your nutrient supplements?
Circle one.

- | | |
|---------------------------------|------------------|
| a. Base Exchange or Commissary | d. Grocery store |
| b. Hospital | e. Drugstore |
| c. Health food store | f. Mail order |
| g. Other (Please specify) _____ | _____ |

8. You are

- | | |
|---------|-----------|
| a. Male | b. Female |
|---------|-----------|

9. Please circle the letter in front of your current rank.

- | | |
|--------|---------|
| a. E-1 | j. O-1 |
| b. E-2 | k. O-2 |
| c. E-3 | l. O-3 |
| d. E-4 | m. O-4 |
| e. E-5 | n. O-5 |
| f. E-6 | o. O-6 |
| g. E-7 | p. O-7 |
| h. E-8 | q. O-8 |
| i. E-9 | r. O-9 |
| | s. O-10 |

10. What is the highest level of education you have completed?

- | | |
|---|---|
| a. High School | b. Technical or Vocational or Associates Degree |
| c. Bachelor's Degree | d. Master's Degree |
| e. Doctorate, Medical or Judiciary Degree | |

11. What is your age? _____

12. Current marital status:

- | | | | |
|-----------|------------|-----------------------|------------|
| a. Single | b. Married | c. Separated/divorced | d. Widowed |
|-----------|------------|-----------------------|------------|

13. Are you on flying status? a. Yes b. No

APPENDIX D
INTERVIEW GUIDE

INTERVIEW GUIDE

INTRODUCTION

Hello, my name is _____ from the hospital Nutritional Medicine Service. I am conducting a survey concerning nutrient supplementation habits of active duty military members. We are trying to determine the prevalence of supplement use, the types of supplements used, reasons for their use and the place where they are most often obtained. The results of this survey will be used to design an educational program on nutrient supplement use. It takes less than two minutes to complete the survey. Would you be willing to participate?

Q 1 Question is asked as written.

Q2a What types of supplements have you taken? Allow respondent time to answer. After answering, allow respondent to read down the supplement list as printed to be sure he/she did not forget any supplements. Forgotten supplements are recorded.

Q2b Ask respondent how often he/she takes each of the supplements named and check the correct column.

Q 3 For each supplement named, ask the reason why it is taken and either check the reason or write it next to the name of the supplement.

Q 4 Read questions and answers as written.

Q 5 Ask why they believe the way they do.

Q 6 What are the top 3 sources of information which most influenced your decision to use nutrient supplements? Pause for respondent to answer. If respondent has difficulty answering, read the responses printed.

Q 7 Where do you most often obtain nutrient supplements? Pause for respondent to answer. If respondent has difficulty answering, read the responses printed.

Q 8 Circle the respondent's sex.

Q 9 Circle respondent's rank.

Q10 Ask the question as it is written.

Q11 What is your age?

Q12 Ask respondent's current marital status.

Q13 Ask question as it is written.

VITA

Joanne Mary Masterson
Candidate for the Degree of
Master of Science

Thesis: NUTRIENT SUPPLEMENTATION HABITS OF ACTIVE DUTY
MILITARY MEMBERS

Major Field: Housing, Interior Design and Consumer Studies

Biographical:

Personal Data: Born in Staten Island, New York,
September 14, 1960, the daughter of Francis C.
and Viola H. Masterson.

Education: Graduated from St. Joseph Hill Academy,
Staten Island, New York, in June, 1978; received
Bachelor of Science Degree in Home Economics/
Foods and Nutrition from the College of St.
Elizabeth, Convent Station, New Jersey, in May,
1982; completed a Dietetic Internship at Malcolm
Grow USAF Medical Center, Andrews Air Force Base,
Washington, D.C., in May, 1983; completed re-
quirements for the Master of Science degree at
Oklahoma State University in May, 1986.

Professional Experience: Chief, Nutritional Medicine
Service Division, Tinker USAF Hospital, June,
1983, to present. Member of the American
Dietetic Association.