NUTRITION EDUCATION IN THE CURRICULA OF SELECTED HEALTH CARE PROFESSIONALS: NUTRITIONAL CARE COMPETENCIES FOR PHYSICIANS, DENTISTS, NURSES, AND CLINICAL DIETITIANS

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CHAPTER I

INTRODUCTION

The teaching of nutrition is meager in most health professional curricula. This deficiency in nutrition education is difficult to overcome once professionals are in practice. Members of health professions, nutrition educators, and members of Congress have become alarmed at this lack of nutrition training. The U.S. Senate Subcommittee of the Committee on Agriculture, Nutrition, and Forestry began meeting in September of 1978, and subsequent hearings unequivocally documented the need for nutrition training for health professionals. One result of these Senate hearings was an outcry of dismay as facts concerning the state of the art were presented. Senator McGovern, Chairman of the Subcommittee, wrote:

> In particular, it is disturbing to discover that our priorities in medical education are still so heavily weighted toward curative or ameliorative practices. For example, an examination of medical school core curricula reveals that 120 out of 129 schools include a required course in nutrition that averages 20 hours. This is all the more discouraging when one knows that 40 percent of all deaths in this Nation are caused by diet-related illnesses which could be delayed, if not prevented altogether.
>
> It is distressing when witnesses tell the subcommittee that two million patients a year suffer from hospital-caused malnutrition, much of which goes undiagnosed and therefore untreated (cited in U. S. Senate Subcommittee Hearings, 1978, p. 1).

A review of the literature indicates health professional educators recognize that arming practitioners with biochemical formulae is not enough; there is an absolute need for health care students to learn concepts of nutrition, clinical awareness of nutritional deficiencies, and

human factors involved in insuring good nutrition of patients (Baumslag, Gatins, Watson, and Englund, 1976). Physicians, dentists, nurses, and clinical dietitians need sufficient knowledge and skills in nutritional care to provide their patients with the nutrition information and care needed for health maintenance and disease prevention.

Although dietitians/nutritionists are the health professionals specifically educated to have information and skills for the delivery of nutritional care, other health professionals such as medical doctors, nurses, and dentists are frequently involved in nutritional management of patients. These providers of health care often include a nutrition component in the therapeutic regimen of their patients, even though they may have had little nutrition education.

The relation of nutritional factors to the outcome of disease and to total health has gained increased attention and concern among health professionals. Six of the ten leading causes of death in the United States have been linked to poor nutrition. These include: heart disease, cancer, cerebrovascular disease, diabetes, arteriosclerosis, and cirrhosis. Various nonfatal diseases also have been traced to poor nutrition, such as dental caries.

Television, radio, newspapers, and magazines carry an increasing amount of information related to nutrition and health. There exists a multimillion dollar health food industry and literally hundreds of books proclaiming the magical curative powers of various diets or nutrients. The public asks many questions concerning what should be eaten, how much of certain foods, and whether or not popular diets "work."

Nutrition in medicine has been considered important to preserve health and to cure illness since Hippocrates stated, in 400 B.C.:

> For the art of medicine would not have been invented at first, nor would it have been made a subject of investigation . . . if, when man were indisposed, the same food and other articles of regimen which they ate and drank when in good health were proper for them, and if no others were preferable to these. But now necessity itself made medicine to be sought out and discovered by men, since the same things when administered to the sick, neither did, nor do, agree with them (cited in Darby, 1977, p. 33).

Hippocrates discussed food or diet in 37 different treatises (cited in Darby, 1977). Darby reported a 1928 definition of nutrition by Graham Lusk, a distinguished American physiologist: ". . . the sum of processes concerned in the growth, maintenance, and repair of the living body as a whole or of its constituent parts" (Darby, 1977, p. 34).

During the decades following Lusk's definition, nutrition held an important place in medicine because the treatment and control of the classic nutritional deficiency diseases (beriberi, pellagra, scurvy, rickets, xerophthalmia) had been discovered. Following closely on these discoveries, an explosion of knowledge and exciting advances in other medical cures, surgery, pharmacology, immunology, physiology, and genetics occurred.

On the other hand, nutrition as a subject became lost in the curriculum for preparation of medical personnel due to the increasing amount of other basic science and clinical material to be covered in the medical school curriculum. It has been difficult to restore its place of recognition and significance in the curriculum. Yet, physicians are still expected to be the authority on any topic related to health or illness. As recently as 1985, there was sufficient national concern to warrant a major study of nutrition education in medical schools. The Food and Nutrition Board of the National Research Council formed a Committee on Nutrition in Medical Education to question the role of nutrition in medical education and to make recommendations with strategies for implementing them (Nutrition Education in U.S. Medical Schools, 1985).

Over 100 years ago, Florence Nightingale insisted that a nutritious diet appropriate to the patient's condition was part of nursing care (Lohr and Carruth, 1979). Since then, nurses have been interested in food and nutrition. One function of their practice has been the delivery of meal trays to hospitalized patients, or supervision of volunteers or nurses' aides who may actually deliver the trays. Furthermore, nurses are often the first and only contact with patients besides the doctor.

The teaching of nutrition has not been compulsory in most schools of dentistry, nor have future dentists been examined about nutrition. Nutritional implications in the control of dental caries and indications of the relationship between nutrition and oral health have stimulated recommendations for the inclusion of nutrition in dental curricula. An international panel of experts in nutrition education in medicine, dentistry, and pharmacy met in May of 1977 at Vevey, Switzerland ("Report on Nutrition Education in Medical Facilities," 1978). They recommended that nutrition teaching should be made compulsory for dental students, and that official bodies and governments should be used to bring about this change.

There are, however, health care professionals educated to deliver nutritional care--the dietitians. The American Dietetic Association (ADA) was founded in 1927, and since then dietitians have been the primary health care professionals trained uniquely in the art and science of nutritional care. Dietitians are prepared to deliver nutritional care to both well and ill persons. Since other health care practitioners often see clients before a dietitian does, they need to be equipped to convey sound nutrition advice and to recognize the need for referral to a dietitian.

Deficiencies in nutrition education among these health professionals have been identified in numerous studies reported in the literature. The role in nutritional care of each of the health care professions is not

clear because specific competencies for each have not been defined. A review of literature brought insight into this problem of lack of adequate and appropriate nutrition education in the curricula of various health care providers (doctors, dentists, and nurses). Also, it should be known whether or not the education of clinical dietitians is adequate.

If the importance of nutrition education for these primary health care professionals has been accepted, then there must be a body of knowledge and a set of skills they need to have. Although existing studies and reports support the need for investigation into the knowledge and skills necessary for these health professionals to be able to include nutritional care in their practices, there is a woeful lack of information concerning what to teach health care students about nutrition and nutritonal care. For those educators responsible for implementing this subject in a curriculum, there are no empirical studies to contribute evidence one way or the other about topics, depth of content, or required skills in nutrition. Specific questions about nutrition education for health professionals which warrant research include the following:

1. What knowledge and skills do doctors, nurses, and dentists need to enable them to provide nutritional care for their patients or clients?

2. What nutritional care competencies are unique and what nutritional care competencies are common to the practice of the separate professions?

3. How do this knowledge and these skills which comprise the nutritional care competencies compare to the practice of nutritional care by clinical dietitians?

4. How well do the health professions' education curricula prepare students and graduates in nutritional care competencies?

This study was concerned with: (1) analyzing the present state of the art of nutrition knowledge and skills taught in the curricula of selected

health professionals, and (2) identifying nutritional care competencies perceived to be sufficient for each of these health care professionals, medical doctors, dentists, nurses, and clinical dietitions to provide comprehensive patient care. Implications for role delineation in nutritional care and for interdisciplinary instructional programs seem to be inherent in a study of this nature. No previous study of this nature has been reported in the literature.

Purpose and Objectives

The overall purpose of the study was to identify nutrition content and skills both common and unique to the practice of medicine, nursing, dentistry, and clinical dietetics in order to be able to suggest recommendations for the nutrition education component of their curricula. The following objectives guided the research study:

1. Assess nutrition knowledge competencies taught in health professions' curricula and competencies considered necessary for comprehensive health care.

2. Assess nutrition skills competencies taught in health professions' curricula and competencies considered necessary for comprehensive health care.

3. Assess the difference in perceptions of health care students and alumni of nutrition knowledge competencies taught and competencies considered necessary for comprehensive health care.

4. Assess the difference in perceptions of health care students and alumni of nutrition skills competencies taught and competencies considered necessary for comprehensive health care.

Hypotheses

The research data from this study were used to test the following null hypotheses:

H_1: There is no significant difference in nutrition knowledge competencies taught in health professions' curricula and competencies considered necessary for comprehensive health care.

H_2: There is no significant difference in nutrition skills competencies taught in health professions' curricula and competencies considered necessary for comprehensive health care.

H_3: There is no significant difference in perceptions of health care students and alumni of nutrition knowledge competencies taught and competencies necessary for comprehensive health care.

H_4: There is no significant difference in perceptions of health care students and alumni of nutrition skills competencies taught and competencies necessary for comprehensive health care.

Assumptions

The following assumptions were accepted for this research study. A lack of nutrition education in medical schools as well as in dental schools has been documented. Over 15 years ago, White, Mahan, and Moore (1972) indicated that the graduating medical student was seldom prepared to address effectively the nutrition problems encountered in practice. Although there have been various attempts to improve this deficiency, the teaching of nutrition in most medical schools has remained inadequate. Since nutrition has been a required subject for accredited schools of nursing, it can be assumed a course in nutrition is part of the curricula in all nursing schools.

Dietitians are the health care professionals educated to provide nutrition care as their primary responsibility. The practice of dietetics has been based on knowledge of nutrition and diet therapy and skills in behavior modificaton and nutrition education. Nutritional care competencies for dietitians have been determined by validated studies; however, nutritional care competencies for doctors, dentists, and nurses have not been identified.

Limitations

The following limitations were recognized in this research. A population of convenience was used (Emory University students and graduates); furthermore, the entire population was used rather than a random sample. Seniors, graduates of one year, and graduates of five years from the School of Medicine, the School of Dentistry, the School of Nursing, and the interns in Clinical Dietetics were selected for the study. Generalizability of the study is, therefore, limited.

Cost of the study would have been prohibitive had special project monies from a federal grant not been available for duplication and postage costs. The length of the questionnaire and, consequently, the time required to complete it could have limited the number of responses. Also, it is not known whether only those persons especially interested in nutrition returned the questionnaire.

Definitions

Competency. The presence of characteristics that will allow a person to perform specified tasks or to assume a defined role. To be competent is to possess sufficient knowledge and performance skills needed to meet

specified requirements demanded by a profession (College of Education Newsletter, 1974).

Nutritional Care. Nutritional care is integration and application of scientific principles of food, nutrition, biochemistry, physiology, management, and social sciences to achieve and maintain health of people. The delivery of nutrition care may be in individual or combined functions; in foodservice management of groups; in extending knowledge of food and nutrition principles through research; in teaching these principles for application according to particular situations; and in dietary counseling.

Dietitian. A translator of the science of nutrition into the skill of furnishing optimal nutrition to people (Profession of Dietetics, 1972).

Clinical Dietitian. A dietitian with an educational emphasis in clinical dietetics, who is prepared to deliver nutritional care in a hospital, clinic, or other health care setting.

Comprehensive Health Care. Preventive, therapeutic, and rehabilitative care carried out to meet optimally individual health needs within the constraints of existing health status and related environmental influences (Trooboff, 1975).

Primary Health Care. Basic or fundamental health care delivered by a health professional; care first given for a reported condition or illness.

Practice. The continuous exercise of a profession; to be professionally engaged in, as in medicine (Webster's New Collegiate Dictionary, 1976).

Patient or Client. Any person, well or sick, who receives health care services for the purpose of maintaining or restoring health (Trooboff, 1975). The terms are used interchangeably.

Dietetic Internship. Postbaccalaureate programs, usually in hospitals accredited by the Joint Commission on Accreditation of Hospitals,

accredited by the ADA. Interns must have baccalaureate degrees and have satisfied the minimum academic requirements set by the ADA (A New Look, at the Profession of Dietetics, 1985).

Nutritional Experience. Any nutrition-related work, professional, or educational experience that includes information and guidance about food and diet related to health maintenance and disease prevention.

S.O.A.P. An anacronym for Subjective Objective Assessment Plan, terms used to describe the process of recording in a medical record.

CHAPTER II

REVIEW OF LITERATURE

The need to improve nutrition education in health professional schools has been expressed in numerous conferences, Congressional hearings, and reports of surveys and studies. At the same time, advances in nutrition science have stimulated consumer demands for sound advice on matters of diet and disease. New scientific evidence addresses the role of nutrition in prevention of disease and maintenance of health. Providers of health care need to be prepared to respond to their patients or clients, or those same persons will turn to the many unqualified peddlers of nutrition information found in the marketplace today.

In the early decades of this century, when nutritional deficiencies were common, nutrition was a subject widely taught in medical and nursing schools. As deficiency diseases virtually were eliminated, emphasis on nutrition diminished. More recently, clinical application of nutrition knowledge has improved health status, alleviated chronic diseases, and helped increase life expectancy. Recognition of the importance of nutrition to the health and well-being of the population makes it imperative for professionals providing health care (such as doctors, nurses, dentists, and dietitians) to be competent in nutritional care.

Dietitians are the health professionals uniquely educated to deliver nutritional care to both well and sick persons. Since other health care practitioners often see clients before a dietitian does, they should be

equipped to convey sound nutrition advice and to recognize the need for referral to a dietitian.

Deficiencies in nutrition education among these health professionals have been identified in numerous studies reported in the literature. At the Medical University of South Carolina, a nutrition course has been required for dental hygienists and pharmacists. A separate course has not been offered to medical students (Robson, Mendelson, Jonsson, Goode, Jenkinson, and Benmaman, 1979). Provision of more appropriate education in nutrition in colleges of medicine may depend less on the development of curricula and more on demonstrating to students and faculty that their present efforts are not working. Ng and Hargreaves (1984) conducted a survey of nutrition education programs in Canadian dental and medical schools. The academic year 1982-83 was surveyed. Seventy percent of the dental schools and 44% of the medical schools had a separate nutrition course, and 60% of the dental schools and 50% of the medical schools employed a nutritionist/ dietitian to teach nutrition. Biochemists, physiologists, physicians, and dentists also taught nutrition.

Hain, Howell, Crosby, and Mullen (1982), at the University of Pennsylvania, surveyed 100 dietitians, 100 nurses, 100 pharmacists, and 100 physicians to assess degree of agreement on relative importance of 35 various areas of nutrition knowledge. These data could be useful for continuing education programs for professionals already delivering health care, but may not be indicative of what should be taught in respective professional curricula. Other attempts have been made to identify nutrition content necessary for practice or to provide assistance to those responsible for integrating nutrition into health professions curricula. An example is a publication by the American Society for Clinical Nutrition. This publication is a guide to reference resources, general textbooks, specialized

textbooks, popular texts, selected publications from industry, teaching modules, and journals used by individuals actively engaged in teaching nutrition to students or clinicians (Read, 1983).

The role in nutritional care of each of the health care professions is not clear because specific competencies for each have not been defined. A review of the literature brings insight into this problem of lack of adequate and appropriate nutrition education in the curricula of various primary health care providers, medical doctors, nurses, and dentists. The education of dietitians may need improvement as well if they are to be seen as indispensable for the care and treatment of patients with special nutritional problems. The 1984 report of the study of the profession of dietetics suggests that, to some extent, physicians, nurses, and pharmacists are encroaching upon the "turf" of dietitians and may be seen as competing for patients or clients (A New Look at the Profession of Dietetics, 1985).

Nutrition Education in Medical Schools

The lack of nutrition education in medical schools has been deplored for several years by legislators, the lay public, nutritionists and dietitians, and the medical profession. Medical schools have neglected to teach nutrition and its clinical manifestations (Phillips, 1971; Christakis, 1972; Wen, Weerasinghe, and Dwyer, 1973; Dutra deOliviera, 1974; Cyborski, 1977). Over 15 years ago, White and his colleagues, Mahan and Moore (1972) indicated that the graduating medical student is seldom prepared to deal effectively with the nutritional problems encountered in practice. Results of a 1978 survey of medical schools demonstrated a significant increase in the amount of nutrition that had been incorporated into the medical school curriculum (Geiger, 1979). However, of 118 schools in the survey, only 25%

reported a required course in nutrition with an average length of 20 hours in the nutrition courses (Geiger, 1979).

There have been various attempts to improve this deficiency in medical students' education. One of the first serious attempts was a nationwide conference on nutrition education in medical schools in 1962 which was sponsored by the Council on Foods and Nutrition of the American Medical Association (AMA) (Geiger, 1979). Forty-seven participants attended the Chicopee Conference, among them were practicing physicians, teaching and research scientists, administrators from medical schools, and representatives of federal-granting agencies. The principles of nutrition that are an integral part of the practice of medicine were identified. Furthermore, the Council recommended improvement and expansion of existing nutrition education and expansion of additional clinical teaching and nutrition research in medical and dental schools.

The follow-up to this conference was the Williamsburg Conference in 1972 (White, Mahan, and Moore, 1972). During this time, essential nutritional principles for a physician were classified as belonging in two areas: (1) the Science of Nutrition and (2) the Sociology of Nutrition. Although there were 87 participants at this conference, only six viable programs in nutrition education in medical schools were represented.

In 1971, the International Union of Nutritional Sciences Committee on Nutrition Education in Medical Facilities found that there was inadequate recognition, support, and attention given to nutrition in medical curricula ("Report on Nutrition Education in Medical Facilities," 1971). The overall recommendation of the committee was that nutrition should be introduced at both the preclinical and clinical level, thereby reflecting its comprehensive nature.

The Council on Foods and Nutrition of the AMA has been a leader in furthering the science of nutrition since 1919 (Geiger, 1979). Besides sponsoring the Chicopee Conference of 1962 and the Williamsburg Conference of 1972, scholarships in nutrition have been offered to medical students for 23 years and many conferences and publications on nutrition have been sponsored.

The Nutrition Foundation has given a high priority to encouraging an awareness of the importance of nutrition in medical education by awarding a number of educational grants to assist in establishing teaching programs in medical centers (Darby, 1977). Also, the Nutrition Foundation has sponsored regional, national, and international workshops, seminars, and publications with faculty, curriculum planners, and administrators from medical and health professional schools participating (Darby, 1977).

The first federal monies for establishing programs of nutrition education in medical schools were granted to six institutions in 1976 (Darby, 1977). In 1979, 13 curriculum development grants were awarded to develop interdisciplinary programs in applied nutrition in medical centers (Nutrition Education in U.S. Medical Schools, 1985). Since physicians are seen as the gatekeepers for the services of other health professionals, guidelines for awards of the monies specified that medical students must be included in the proposed nutrition education program. At least two other health care disciplines had to be included because it has been a commonly held belief that patient care can best be provided by a team.

Up to now, review of the literature has made it clear that, although there is general agreement among educators and legislators that nutrition education is imperative for future physicians, very little has been done to see that nutrition education is included in medical school curricula. However, there has been indications of a trend toward increasing numbers of

medical schools attempting to implement nutrition education or to improve existing nutrition teaching in medical schools. Dunphy and Bratton (1980) of the University of Iowa, reported a general nutrition course which was provided for second-year students, plus an elective course on infant nutrition which was offered during the fourth year. A nutrition education luncheon program was developed. The voluntary program for third-year medical students was offered one hour each week during the six-week internal medicine rotation. The students sampled a therapeutic diet, heard a lecture by a dietitian during each meal, and were given a section of the University of Iowa Hospital Nutrition Reference Handbook at each luncheon. Cost was absorbed by the dietary department (Dunphy and Bratton, 1980). Feldman, Levy, and Curry (1980), professors of medicine at the Medical College of Georgia, started requiring nutrition education courses and offering an elective course in interdisciplinary clinical nutrition education. The faculty team consisted of a physician, nutritionist, and nurse.

Some educators have studied the effectiveness of required and elective courses. Cohen, Hunsley, Wattler, Karsten, and Olson (1981) conducted a study comparing nutrition knowledge of medical students having nutrition integrated in existing courses and students having a required course in clinical nutrition. Students in the required course had significantly greater knowledge. It was concluded that a required nutrition course, in the first or second year, was the most efficient and effective way to teach nutrition to medical students. Brennan (1982), professor of nutrition at Washington University in St. Louis, where for five years first-year medical students petitioned for nutrition instruction, has offered a series of lectures and seminars during the second semester of the first year. This

was offered as an elective. Also, blocks of time identified as courses in nutrition have been recommended for both preclinical and clinical years.

Iber (1984), at the University of Maryland, increased nutrition awareness and involved faculty from many departments. A separate and enlarged section on nutrition was provided in biochemistry. Drug and nutrient interactions was provided in pharmacology. Visiting professors in clinical departments were invited to speak on nutrition. Specific diet meals have been offered free to ward teams who eat with dietitians. Every patient in this teaching hospital has been assessed nutritionally by physicians and dietitians.

Although some educators such as Montandon (1984) at Baylor University in Texas advocated a separate course in nutrition so that medical students would recognize nutrition as a science, others have attempted innovative approaches to teaching. Carroll, Hain, Howell, Crosby, and Rombeau (1983), at the University of Pennsylvania School of Medicine, used live actors to portray patient roles in scenarios written by an interdisciplinary faculty group. Faculty members interviewed actors in training sessions, and students interviewed actors. Videotapes were made and compared. No conclusions were made as to effectiveness of this technique. Recently, Hoting and Littlefield (1985) presented an alternative approach to a course in nutrition. They called it the "unobtrusive approach," or "tracer method," which integrates nutrition into other courses throughout the four-year curriculum. Abernathy (1983) suggested including nutrition and food sciences in the premedical and predental curriculums. This has been done at Purdue and the University of Minnesota.

If the importance of nutrition education for physicians is accepted, there exists a body of knowledge and a set of skills physicians must have to provide comprehensive health care. Further review of the literature

reveals few attempts to identify either. Gallagher and Vivian (1979) conducted a study to identify nutrition concepts that physicians and medical nutrition educators considered essential to medical students' education. Twenty-three nutrition concepts were deemed necessary for mastery by the medical student. In that same year, Gautreau and Monsen (1979) have reported the results of a survey of medical faculty, practicing physicians, medical students, and dietitians/nutritionists. Ten nutritional concepts were rated "essential" by this group.

A number of medical schools has arrived at their own notion of nutritional concepts to be included in their curriculum and decided where in the curriculum the content would be placed, as well as how the concepts would be taught. Young and Weser (1975) have incorporated nutrition into the medical education curriculum at the University of Texas by using a variety of approaches to integrate nutrition throughout the four years. Baumslag et al. (1976) described a course for sophomore medical students at Emory University in Atlanta. Nutrition programs that have been initiated at several other medical centers (including Columbia University, Vanderbilt University School of Medicine, Boston University Medical School, University of Michigan School of Medicine, and the University of Southern California School of Medicine) ("American Medical Association Concepts of Nutrition," 1979) have been reported in the literature. Several papers supported reasons why nutrition must become an integral part of certain medical specialty training, such as pediatrics (Gould, 1977), internal medicine (Callaway, 1977), and the education of the family physician (Flynn, Keithly, and Colwill, 1975).

Weinsier (1983), a well-known nutrition educator at the University of Alabama Medical School, cited experiences of scattering nutrition among several basic science courses, followed by making nutrition a part of

gastroenterology, then metabolism-endocrinology, and finally in 1978, a freshman course, "Introduction to Clinical Nutrition," was developed. This course was taught by a physician-nutritionist, and 67% of the students gave it a top ranking. A fourth-year clerkship in Nutrition Support Services has been offered and it has been the most requested elective. Weinsier stated that he considered relevance of course material and being a positive role model of physician-nutritionist as most important in the success of Alabama's nutrition in medical school. Nutrition is somewhat unique among the medical subspecialties in that it is not limited to a single organ system. That is why many schools have preferred to integrate it. Philosophically, Weinsier (1982) stated that he believed nutrition should be presented as a separately identifiable course so that future physicians will be aware that nutrition is distinct and vitally relevant.

Some medical educators have discussed when nutrition should be taught. Guthrie and Teply (1979) suggested a premedical nutrition course, while Vitale (1977) supported nutrition education within the preclinical years. Hodges (1977), at the University of California School of Medicine focused on teaching the application of nutritional principles during the clinical (third and fourth) years.

One of the most well-known curriculum designs for nutrition education in medical schools is the "Frankle model" (Frankle, 1976). It involved a sequential teaching-learning unit encompassing three academic years, with the following themes: Year One--the science of nutrition with clinical correlation that is program-oriented; Year Two--the sociology of nutrition and community problems leading to family medicine; and Year Three--the application of the science and sociology of nutrition to the clinical clerkship. This work by Frankle was preceded by previous work she and others did at Mount Sinai School of Medicine before the approach taken in 1976

was finalized (Frankle, Williams, and Christakis, 1972; Christakis, 1972; Frankle, 1974). Frankle (1974) said that each medical school should design its own curriculum to meet the needs of its institution rather than following one model. Almost 10 years later, models were still being proposed.

In 1979, Gautreau and Monsen, at the University of Washington in Seattle, made recommendations of specific nutritional concepts to be taught at medical schools. They recommended 10 essential concepts to be taught in early clinical years where they would relate to nutrition throughout the life cycle and information important in clinical practice. The nutritional role of vitamins and intestinal absorption should be presented in biochemistry and physiology, according to Gautreau. Other concepts should be incorporated in an elective nutrition course for interested students.

Ozerol (1982), at Howard University, advocated teaching procedures, methods, and techniques of nutritional assessment to medical students. He suggested biochemical and physiological aspects of nutrients during the first year, a clinical nutrition program emphasizing the relation of diet and nutrition to preventable health hazards during the second year, and a course in nutritional assessment during the third year of medical school.

There has been a woeful lack of information concerning what to teach medical students about nutrition and nutritional care. For those educators responsible for implementing this subject in a curriculum, there have been no empirical studies to contribute evidence one way or the other about topics, depth of content, or required skills in nutrition. Stephenson and Theologides (1981) surveyed fourth-year medical students and family practitioners in Minnesota regarding nutrition of cancer patients. Most practicing physicians had little or no nutrition training in medical school. Physicians scored 50% and medical students 70% on knowledge questions. Fifty-one percent used a dietitian/nutritionist as their primary source of

nutrition information. However, they did not want a dietitian to be responsible for providing nutritional instructions and for monitoring the nutritional status of patients. Many said they would benefit from continuing medical education in this area.

Other researchers (Davies, Gormican, and Verby, 1981), reported a study on nutritional knowledge of third-year medical students, full-time academic specialty faculty, and rural practicing physicians in Minnesota. The majority of physicians and students had received no formal classes in nutrition. Both academic and practicing physicians utilized services of dietitians and nutritionists. Furthermore, undergraduate physician associate program students were taped doing complete histories on patients. In over 700 tapes, not one student included a nutritional component to the history-taking.

Cardulla (1982), a nutritionist who became a medical student, was in a unique position to criticize nutrition education in medical curricula. In 1980-81, when she was a student, only 14 of the 125 medical schools in the United States had a nutrition course. According to Cardulla, when nutrition is not presented as a specific entity, only peripheral references are made and only peripheral understanding is obtained. Food and nutrition are too fundamental to health and disease not to be highlighted in physicians' training, Cardullor emphasized.

As recently as 1984, Lloyd, at St. George's Hospital Medical School in London, summarized findings of a task force set up by the British Nutrition Foundation to survey the current status of courses of nutrition in undergraduate and postgraduate medical training. There are 31 medical schools in the United Kingdom. In just over one-half of the schools there were bridges between preclinical and clinical teaching. There was very little time spent on nutrition; indeed, some doctors did not even think it

desirable. There was little interest in nutrition as a subject for post-graduate education. Also in 1984, Geyman, in an editorial in the Journal of Family Practice, deplored the low levels of nutrition knowledge among medical students. Nutrition was now a required part of the curriculum for family practice residencies in the United States, as defined by the current Special Requirements for Residency Training in Family Practice, which took effect in 1983. Geyman also suggested clinical nutrition in medical schools, clerkships, residencies, and ongoing consultative-teaching relationships in family practice centers with dietitians or clinical nutritionists.

Increased public demand for nutrition information and a growing recognition of the importance of nutrition to health has helped heighten awareness among medical educators and doctors about the need for adequate training in nutrition. A certification process was begun in 1983 to recognize nutrition as a specialty by the American Board of Specialties (Howard and Bigaouette, 1983). Weinsier, Brooks, Boker, Heimburger, and Young (1983) and others developed a prototype nutrition test-item bank at the University of Alabama Medical School that could be used nationally. Such a test-item bank could be used to establish standards of nutrition education and certification of competency in nutritional care.

One of the latest developments in efforts to improve nutrition education in medical school curricula has been a curriculum guide published by a committee of the Food and Nutrition Board of the National Research Council (Nutrition Education in U.S. Medical Schools, 1985). These recommendations were based on a study of 46 medical schools' curricula, a survey of medical school deans and assicate deans, medical school nutrition course coordinators, and testimony from the American Medical Student Association. The guide presents an outline of core concepts which identify the basic body of

nutrition knowledge all graduates of medical school should acquire during professional training.

Nutrition Education in Dental Schools

Nutrition education in dental schools is not a new idea. A conference on Nutrition Teaching in Dental Schools was held in 1966 (Gaverick, Deluca, and Knight, 1978). Those who attended were concerned with the course content for nutrition and its position in the curriculum. In 1966, a survey showed an increase in the percentage of schools including nutrition in their curriculum, from 12 in 1956, to 61 in 1968 (Nizel and Shulman, 1969). According to Nizel and Shulman, nutrition education should be made compulsory because of the effect of improved nutrition in the control of dental caries. In 1968, only six dental schools employed a full-time nutritionist as a staff member, and 26 of 55 schools offered lectures in nutrition (Nizel and Shulman, 1969).

In 1982, 62% of the dental schools in the United States required a separate, formal course in nutrition. Thirty-four percent of the U.S. dental schools employed a full-time nutritionist or dietitian. The clinical component of nutrition programs in dental schools has involved nutrition assessment and evaluation. Dental schools have emphasized preventive health programs and thus nutrition is emphasized (Depaola, Jacobs, and Slim, 1982).

Dr. Wallace Mann, president of the American Association of Dental Schools (AADS), stated in 1981 that the dental school curriculum was so overcrowded that schools must add a fifth year or a general practice residency. Because of major reduction in caries, increased retention of teeth, and decreases in severe periodontal disease, Mann predicted a greater focus

on patient care and caring and more concern for the overall health of the patient.

Several approaches to integrating nutrition education into the dental school curriculum have been published. One approach involved teams of dental students and dietetic interns for counseling patients about dietary needs (Odom, Depaola, and Robbins, 1978). This approach not only provided for counseling, but also gave each health discipline student the opportunity to bring his/her individual expertise to the situation and to share role functions with each other. Lee, Wight, and Stanmeuer (1981), at the University of North Carolina, developed and tested five self-instructional programs on nutrition and dentistry. The results of comparing 41 students who had the self-instructional programs and 39 who had traditional lectures demonstrated no significant difference in test scores.

A search of the literature revealed that after the early 1980s, almost nothing has been published about nutrition education in dental schools. Since that time, financial and programmatic retrenchment has occurred. Perhaps this has been a further impediment to integrating nutrition into dental school curricula--overcrowded curricula, scheduling problems, and limited numbers of strong nutrition departments to develop and support nutrition instruction on a permanent basis were cited as impediments (Nestle, 1982).

Nutrition Education in Nursing Schools

Although the subject of nutrition has long had a place of importance in the curricula of nursing students, there is evidence in the literature that nutrition education for nurses could be improved. In 1969, a survey of medical interns and residents in two Harvard-affiliated hospitals revealed that the house officers felt that nurses should be properly trained

in nutrition and that many nurses had insufficient training (Mayer and Dwyer, 1969). The literature described various attempts at achieving an optimal method of presenting nutrition subject matter to nursing students (Grant and McCarthy, 1971; Henneman, 1978). Grant and McCarthy (p. 26) stated, "Today, nutrition education for students of nursing is not a question of to be or not to be, but of where, when, and how it will be included in the curriculum." Prior to 1972, graduate schools of nursing had to be prepared to pass the achievement test on nutrition of the National League for Nursing (NLN). An expanded nutrition component of the School of Nursing curricula at the University of Miami resulted in students being well prepared for the NLN tests (Grant and McCarthy, 1971). Furthermore, the nursing faculty as a whole felt that the most desirable approach to nutrition education should be an integrative one and that a full-time nutritionist should be a permanent member of the nursing faculty (Grant and McCarthy, 1971).

A study conducted in 1970 attempted to learn whether health science students could answer questions about nutrition frequently asked by the public (Poplin, 1980). Students in registered nursing, dental hygiene, early childhood specialist, dental assisting, and licensed vocational nursing were questioned. A control group of persons in a neighborhood of socioeconomic level comparable to that of the students was used. Results showed that knowledge was highest for students who had taken a nutrition course. Furthermore, it was found that scores increased as the time and depth of nutritional instruction increased.

Lohr and Carruth (1979) developed an attitude questionnaire concerning nutrition and gave it to students in a baccalaureate nursing program, a diploma nursing program, and a practical nursing program. The majority of all students agreed that nutrition should be required. Undergraduate

students had more positive feelings about nutrition than reported for graduate nurses. Henneman, Houfek, Morin, and Wiese (1981) developed a data collection tool to teach first- and second-year nursing students basic principles of nutritional assessment. Since the nurse is one of the primary nutrition educators in hospital and community health settings, this is a positive and relevant learning activity. Cook (1980) showed that a one-day program of human nutrition given to nurses in a Food and Drug Administration workshop did increase their level of knowledge. Ross (1984) showed that the nutrition attitudes of nursing students did not change, but their knowledge increased significantly after completing a nutrition course in baccalaureate nursing.

A master's thesis at the University of Tennessee in 1970 reported a study of nutrition education in nursing schools in Tennessee. Twenty-four schools were surveyed to determine the state of the art of nutrition in nursing, and directors of nursing in 60 general hospitals were asked about the nutrition responsibilities of nurses (Williams, 1970). Wide disparity in many aspects of the programs was found. Length of courses, time spent on topics, and instructor qualifications all varied. Directors of nursing all agreed that all nurses would benefit from additional nutrition education.

Later, in 1974, another thesis at the University of Tennessee presented the results of an investigation of the diet therapy responsibilities of registered nurses in the United States (McDaniel, 1974). Questionnaires were sent to 315 registered nurses in seven states. Data indicated that from 1960 to the present time there had been a decrease in the number of hours devoted to diet therapy education. Ninety-nine percent of the nurses thought that diet therapy has a place in the nursing school curriculum.

Trooboff's (1975) dissertation study was concerned with nutrition competencies considered essential for comprehensive nursing practice. Faculties in the 26 nursing programs in Georgia were surveyed. Results indicated that nutrition competencies considered essential should be included in both levels, baccalaureate and associate degree, of nursing programs.

The most recent survey of nutrition education in baccalaureate degree nursing schools was conducted in 1983 by Cutler (1986) in Boston at the College of Nursing, Northeastern University. Three hundred and thirty-three programs were studied to document the nutrition component of the nursing curricula. In 1972, the Division of Accreditation Services of the NLN deleted the requirement for including nutrition in the nursing curriculum. Subsequently, programs implemented a variety of plans.

In a majority of schools, basic nutrition was a required three-credit course, taught by a registered dietitian. Diet therapy, defined as nutrition care in illness, was integrated within other nursing courses. Schools with a full-time dietitian tended to include more nutrition than schools with no faculty dietitian. The researcher concluded that it is important to monitor the nutrition education of nursing students, who as graduate nurses will be perceived by the public as credible authorities on nutrition.

Nutrition in Dietetic Education

While dietitians are the health professionals uniquely educated in foods, nutrition and the application of that knowledge to promote the optimal health and nutritional status of the population, they consider themselves the most highly qualified nutrition experts. Unfortunately, neither the public nor other health professionals recognize the services

of dietitians as crucial components in the care and treatment of special nutritional problems to the extent dietitians desire (A New Look at the Profession of Dietetics, 1985). Although education and training of dietitians have been designed to provide the background for them to be expert in the field of nutritional care, there have not been any conclusive studies to evaluate performance on the job or in the marketplace.

There are no documented comparisons of dietitians' performances trained in the several professional educational alternatives. A 1984 Task Force on Education made major recommendations for improving the education of dietitians, and the Council on Education of The American Dietetic Association has set new standards for dietetic education programs (A New Look at the Profession of Dietetics, 1985). Also, the necessity for graduate education is being debated as well as whether or not specialties in dietetics should be established.

Clinical dietetics is one of the four areas of educational emphases recognized by the profession and by the Commission on Accreditation. Clinical dietitians have developed, either through education or experience, expertise in diet therapy, nutrition, and patient care. Most of them are employed by health care institutions, particularly acute care hospitals. There is a small but growing number who are self-employed in private practice (A New Look at the Profession of Dietetics, 1985).

Since dietitians are not considered primary care health professionals, it is therefore necessary for them to work in concert with those who deliver primary care, physicians, nurses, and dentists. They may be a part of a health care team; they may be employed by physicians; or, their services may be available through a referral system. Modrow, Miles, Koerin, Dobek, Book, and Honaker (1980) surveyed physicians in Virginia as to patient need for nutrition education and how this need was filled.

Eighty-nine percent of the physicians had patients who needed a dietitian. Of these, 40% referred patients to dietitians in private practice and 10% employed a dietitian on their staff.

Often, dietitians are trained in medical centers devoted to training in health sciences such as the University of California at San Francisco (Nestle, 1982). Educational programs there include the Schools of Dentistry, Medicine, Nursing, Pharmacy, and 20 other health professional fields, including dietetics. The questions become those of how nutrition instruction can be incorporated into these training programs and what each professional group needs to know about nutrition.

Whether or not health professionals are trained together or merely side-by-side, they usually work in the same health care setting. Some physicians and dentists are employed in solo practice; nevertheless, they may perform part of their services in a hospital where there are other health care professionals, or they may be involved in consultation with other health professionals. In increasing numbers, a multidisciplinary team approach to treatment is being used. Peterson, Washington, and Rathbun (1984) reported how a team has addressed the problem of infant failure to thrive. At Children's Hospital Medical Center in Boston, the team consisted of a registered dietitian, physician, nurse, and social worker. They provided an integrated evaluation and nutritional management of infants who had been diagnosed with "failure to thrive" syndrome. Coordination among the team members permitted an interface between nutritional, psychological, and medical factors for optimal treatment of this complex syndrome.

If the profession of dietetics is to keep pace with changing society, health care, and professional practice, education and training of dietitians must keep pace. Identification of nutritional care competencies for

other health professionals and a comparison to those considered essential for dietitians could contribute to decisions about dietetic education in the future.

CHAPTER III

PROCEDURES

The methodology for this research study is presented in this chapter. A survey method was selected. Kerlinger (1973) viewed survey research as a focus on people, ". . . the vital facts of people, and their beliefs, opinions, attitudes, motivations, and behavior" (p. 411). The mail questionnaire is one method of obtaining information in survey research. It was used to collect data about competencies needed by various health care professionals in meeting nutritional needs of people, well or sick, and to assess the level of those competencies taught in health professions' curricula. Medicine, dentistry, nursing, and clinical dietetics were the health care disciplines chosen for this study.

Students and alumni of Emory University in Atlanta, Georgia, were studied. Emory University is a private university of approximately 8,000 students, with a ratio of five graduate students to one undergraduate student. It has a number of professional schools--medicine, dentistry, nursing, law, and theology. Within the School of Medicine various health professionals, besides physicians, are educated. Among them are clinical dietitians.

Research Design

The research design was a survey by questionnaire of students and graduates of the Schools of Medicine, Dentistry, Nursing, and the Clinical Dietetic Internship at Emory University. The purpose of the survey was to

identify the level of nutritional care competencies thought to be included in the individual curricula and the level of nutritional care competency considered necessary for comprehensive care of patients or clients. Nutritional care competencies for clinical dietitians were used as the basis for nutritional care competencies used in the questionnaire for this survey.

Demographic data were collected: age, practice setting, past nutrition-related education or experience, and overall rating of individual nutrition education programs. Comments concerning recommendations for improvement in the nutrition education curricula of individual health professionals, as well as perceptions of preparedness in nutritional care were collected.

Population and Sample

A population of Emory University health care professions students and graduates was used. All seniors, graduates of one year, and graduates of five years in medicine, dentistry, nursing, and clinical dietetics were surveyed. Medical school and dental school are four-year, postbaccalaureate programs; nursing school is a baccalaureate program; and clinical dietetics is a one-year, postbaccalaureate internship program. Seniors and dietetic interns in 1980, 1981, and 1982 were surveyed. Alumni who graduated in 1979 and 1975 were surveyed in 1980, alumni who graduated in 1980 and 1976 were surveyed in 1981, and alumni who graduated in 1981 and 1977 were surveyed in 1982. All members of each class were used in the research. Table I provides the number of persons in each class to whom questionnaires were mailed.

Instrumentation

A questionnaire was used based on nutritional care competencies that

TABLE I

NUMBER OF QUESTIONNAIRES MAILED BY YEAR OF GRADUATION

Profession	Year							Total
	1975	1976	1977	1979	1980	1981	1982	
Medicine								
Seniors					115	118	121	354
Alumni	93	113	109	109	115	118		657
Dentistry								
Seniors					98	109	91	298
Alumni	75	106	89	79	98	109		556
Nursing								
Seniors					94	81	88	263
Alumni	78	82	81	91	94	81		507
Dietetics								
Interns					16	19	20	55
Alumni	15	17	18	20	16	19		105
Grand Total								2795

had been identified for graduates of the Emory University Dietetic Internship, which prepares clinical dietitians. Twenty-one program competencies for the Emory University Dietetic Internship for clinical dietitians had been developed and validated following the model for Developing Program Competencies, Competency-Based Instructional Project, Emory University School of Medicine, 1978 (Appendix A). An examination of existing internship programs materials from a nationwide collection of dietetic curricula, a review of the literature on competency-based education programs, and a task analysis of dietetic practitioners in the Atlanta area had been used as the basis for generation of the Dietetic Internship nutritional care competencies.

In January of 1978, a questionnaire was sent to all basic educational preparation programs in dietetics, and training programs for dietetic technicians and assistants. One hundred and thirty-eight of the 326 dietetic education programs shared information on competencies and evaluation forms. An initial draft of competencies was developed utilizing the statements of competence that were consistently repeated.

In order to test these competencies, a task analysis was conducted with clinical dietetic practitioners in the Atlanta hospitals participating in the Emory Dietetic Internship. The sample for the task analysis consisted of 19 clinical dietitians in teaching hospitals and 14 clinical dietitians in nonteaching hospitals. Further responses were divided between hospitals with more than 300 beds and hospitals with less than 300 beds.

The results of the task analysis assisted in the final development of internship competencies. This list of competency statements was reviewed by the internship faculty prior to outside review. Faculty comments were incorporated into the list of statements and a second draft was sent to a

group of four "readers" and two consultants. Recommendations of these experts were used to revise the competency statements.

A Delphi process was used to validate the competencies. The two groups for the Delphi consisted of 78 dietitians employed in hospitals affiliated with the internship and a control group consisting of 79 dietitians. The control group was established by matching hospitals in the southeast region to those used in the Emory Dietetic Internship, using number of patient beds and teaching or nonteaching status as the criteria for selection. Follow-up of nonrespondents consisted of sending the questionnaire a second time.

Analysis of returns indicated a 77% response from the Emory-affiliated group and 63.5% from the control group. Analysis of the results revealed only three competency statements judged as nonessential by more than 10% of the Emory-affiliated respondents and only one as nonessential by the control group.

Based on the high return rate and the high degree of agreement on the first round of the Delphi, a second round was not issued. Results of the survey were used to revise the curriculum of the dietetic internship and, subsequently, to develop the questionnaire for the survey of medical doctors, nurses, dentists, and clinical dietitians.

Validated nutritional care competencies from the Emory Dietetic Internship, course objectives of the School of Nursing curriculum, and nutrition and basic science course descriptions from all five disciplines were compiled. Nutrition committees from each school, medicine, nursing, dentistry, and the dietetic internship reviewed and approved the final competency statements to be used in the questionnaire.

In the questionnaire, respondents were asked to rate to what extent their respective curricula taught the nutritional care competency (<u>real</u>)

and to what extent the competency is needed (ideal) for comprehensive health care practice. A Likert-like scale of one (no emphasis placed on competency) to four (great emphasis placed on competency) was used. The left response column represented real and the column on the right represented ideal. The questionnaire (Appendix B) had a total of 69 competency statements, divided into 15 knowledge competencies and 54 skill competencies.

A data sheet for respondents (Appendix C) was attached to each survey form. Information about the respondents included age, a description of practice setting, past nutritional experience, and an overall assessment of nutrition education in the curriculum. A comments section was included.

Data Collection

The survey instruments, together with cover letters signed by the respective deans of the various professional schools, were distributed during the spring quarter in each of the three survey years (1980, 1981, and 1982). They were delivered to all senior students in medicine, dentistry, nursing, and clinical dietetics via student mail boxes. The instruments were mailed to all respective alumni of one year and of five years. The cover letter (Appendix D) was intended to encourage response. Follow-up postcards were delivered or mailed approximately six or seven weeks after the response deadline to those who had not responded.

Statistical Analysis

The hypotheses tested were that there would be no significant difference in the way various health professions perceived nutritional care competencies taught in the professional curricula and competencies considered necessary for comprehensive health care, and that there would be no

significant difference in the way students and alumni of the various health professions perceived nutritional care competencies taught and those necessary for practice. The means of the two response columns, real and ideal, were calculated by career profession for each of the 69 competency statements. Students and alumni of each profession (medicine, dentistry, nursing, and dietetics) were treated both together and separately in order to test the hypotheses. The real and ideal means represented the relative amount of nutritional care competencies obtained and needed. The higher the mean, the greater the level of competency. The mean difference between real and ideal for each competency statement was tested for statistical significance with the Student t-test procedure in the Statistical Analysis System using a probability of $\leq .05$. The direction of the difference was noted. If the real mean was greater than the ideal mean, the t-value was positive; if the real mean was less than the ideal mean, the t-value was negative. (Appendix E is a record of the data from the surveys for all professions, for students and for alumni.)

CHAPTER IV

FINDINGS

Chapter IV presents the findings from the three-year (1980, 1981, and 1982) survey of seniors and alumni in medicine, dentistry, nursing, and clinical dietetics at Emory University in Atlanta. Nutritional care competencies were studied to determine the level of competency, on a scale of 1-4, taught in the various professional curricula and the level of competency considered necessary for comprehensive practice. Data were collected by mailed questionnaire. Student, alumni, and overall perceptions of each profession were assessed.

Response Rate to Survey Questionnaires

The overall average rate of response to the survey was 25%. The dietitians' response rate was 56%. The average rate of response for medicine, dentistry, and nursing was 24%, 26%, and 24%, respectively. Tables II and III represent the rate of response from the students and alumni for each of the three years. In Table II, years 1975 and 1979 represent five-year and one-year alumni for the 1980 study; 1976 and 1980 represent five-year and one-year alumni for the 1981 study; 1977 and 1981 represent five-year and one-year alumni for the 1982 study. Table IV summarizes the rate of response from students and graduates for three years.

TABLE II

QUESTIONNAIRES MAILED AND RETURNED BY STUDENTS OF HEALTH PROFESSIONS

Senior Year	Medicine		Dentistry		Nursing		Dietetics	
	M*	R(%)**	M	R(%)	M	R(%)	M	R(%)
1980	115	62(54)	98	36(37)	94	21(22)	16	16(100)
1981	118	11(9)	109	33(30)	81	32(40)	19	10(53)
1982	121	12(9)	91	8(8)	88	10(11)	20	9(45)
Total	354	85(24)	298	77(26)	263	63(24)	55	35(64)

*M=Number of questionnaires mailed

**R=Number of questionnaires returned

Personal Data

In order to establish the characteristics of participants, information was requested about themselves. The profile of respondents serves as background for readers of the study and may supply a measure of comparability for future studies. This information was compiled from 686 respondents from the population surveyed, a 25% sample.

Ages of Respondents

Of 686 total respondents to the survey, 613 recorded age. Eighty-five percent of those recording age were between 20 and 29 years of age. The age distribution of all respondents is shown in Tables V and VI. Only nine persons reported their age to be 40 years or over (1%).

TABLE III

QUESTIONNAIRES MAILED AND RETURNED BY ALUMNI OF HEALTH PROFESSIONS

Year of Graduation	Medicine		Dentistry		Nursing		Dietetics	
	M*	R(%)**	M	R(%)	M	R(%)	M	R(%)
1975 (5 yr.)	93	28(30)	75	25(33)	78	27(35)	15	9(60)
1979 (1 yr.)	109	25(23)	79	32(40)	91	24(26)	20	15(75)
1976 (5 yr.)	113	19(17)	106	19(18)	82	16(20)	17	6(35)
1980 (1 yr.)	115	11(10)	98	14(14)	94	14(15)	16	8(50)
1977 (5 yr.)	109	13(12)	89	18(20)	81	23(28)	18	6(33)
1981 (1 yr.)	118	18(15)	109	26(24)	81	20(25)	19	10(53)
Total	657	114(17)	556	134(24)	507	124(24)	105	54(51)

*M=Number of questionnaires mailed

**R=Number of questionnaires returned

TABLE IV

SUMMARY OF QUESTIONNAIRES RETURNED BY PROFESSION

	Medicine R(%)*	Dentistry R(%)	Nursing R(%)	Dietetics R(%)	Total R(%)
Students	85(24)	77(26)	63(24)	35(64)	260(38)
Alumni	114(17)	134(24)	124(24)	54(51)	426(62)
Total	199(20)	211(25)	187(19)	89(56)	686(100)

*R=Number of questionnaires returned

TABLE V

AGE CATEGORIES OF ALUMNI RESPONDENTS

Age Range	Number of Alumni				Total No.	%
	Medicine	Dentistry	Nursing	Dietetics		
20-24	4	8	41	23	76	21
25-29	59	68	60	23	210	58
30-34	20	38	5	1	64	18
35-39	4	1	1	0	6	1.5
> 40	3	1	2	0	6	1.5

TABLE VI

AGE CATEGORIES OF STUDENT RESPONDENTS

Age Range	Number of Students				Total No.	%
	Medicine	Dentistry	Nursing	Dietetics		
20-24	31	18	49	29	127	51
25-29	43	50	10	3	106	42
30-34	8	2	1	2	13	5
35-39	1	0	0	1	2	1
> 40	0	0	3	0	3	1

Sex of Respondents

Of 686 respondents, 581 recorded sex (85%). Of those reporting sex, 285 persons (49%) were male and 296 (51%) were female. The distribution of gender among persons responding to the survey can be seen in Table VII.

TABLE VII

SEX OF ALL PERSONS RESPONDING

Profession	Sex	Number	%
Medicine	Male	131	23
	Female	32	6
Dentistry	Male	142	24
	Female	18	3
Nursing	Male	6	1
	Female	163	28
Dietetics	Male	6	1
	Female	83	14
Total		581	100

Practice Settings

Alumni were asked to check the health care practice setting in which they were employed at that time. Of 426 alumni, 413 reported practice setting. Forty-two percent of all physicians, nurses, and dietitians were employed in a hospital setting. Since many physicians are in internships or residencies for up to eight years following graduation from medical

school, the number reporting employment in hospitals may be unusually high. Ninety dentists (69% of all dentists reporting) were employed in group or solo practice. Table VIII presents the number of alumni reporting employment in various health care practice settings.

TABLE VIII

NUMBER OF ALUMNI EMPLOYED IN VARIOUS PRACTICE SETTINGS

Practice Setting	Number of Alumni				Total	%
	Medicine	Dentistry	Nursing	Dietetics		
Group Practice	10	41	2	7	60	15
Solo Practice	28	49	0	6	83	20
Industrial	0	0	1	0	1	.002
Government	4	4	1	1	10	2
Armed Forces	8	13	2	3	26	6
Educational Facility	10	6	2	4	22	5
Clinic	6	0	5	7	18	4
Hospital	42	11	99	22	174	42
Public Health Agency Clinic	1	7	12	1	21	5
Total	109	131	123	50	413	99

Previous Nutrition Experience

Responses to the request for whether or not students had previous nutritional experience and whether it was obtained through education or from work experience, showed that only 33 medical, dental, and nursing students had had any previous nutrition training or experience. On the other hand, all clinical dietetic students reported previous nutritional experience, either through an educational program or during previous employment, or both. Of 35 dietetic students in the survey, there were 55 reports of previous nutrition education or work experience. Twenty-two percent of the students in the survey had previous nutrition education, and 12% had previous nutrition-related work experience. The results are found in Table IX.

TABLE IX

NUMBER OF STUDENTS HAVING PREVIOUS NUTRITION EXPERIENCE

Nutrition-Related Education/ Work	Number of Students					% of n*=260
	Medicine	Dentistry	Nursing	Dietetics	Total	
Education	1	1	21	34	57	22
Work	5	2	3	3	31	12

*n=Number of students in survey

Overall Rating of Nutrition in Curricula

Students and alumni rated nutrition taught in the individual health professions curricula on a six-level scale: excellent, good, good/fair, fair, fair/poor, and poor. The question asked for an "overall rating of the program's nutritional component." Of 260 students, 243 responded, and of 426 alumni, 361 rated their program. Forty-eight percent of the students rated the nutrition component of the curricula as "fair." Forty percent of all alumni rated the nutrition component in the curricula at "fair." At the extreme ends of the scale, 8% of the students and 12% of the alumni rated the nutrition component "excellent," and 14% of the students and 22% of the alumni gave a rating of "poor." Overall ratings of the nutrition component of each professional curricula are in Tables X and XI.

Real and Ideal Means by Profession for Each Competency

Means were calculated for each profession (medicine, dentistry, nursing, and dietetics) using all students and all alumni who returned the questionnaires. Means were calculated for responses to each competency for both real and ideal, real being an assessment of the level of competency taught in the professional curricula and ideal being the level of competency considered necessary for comprehensive health care by each respondent in each profession. A scale of 1-4 was used, one being none or low and 4 being high. The rating scale for real, an assessment of competencies taught in the program, was as follows:

My program of study:

1. did not prepare me to perform this competency

2. somewhat prepared me to perform this competency

3. prepared me to perform this competency

4. prepared me extremely well to perform this competency

The rating scale for ideal, an opinion of competencies needed for practice in health care, was as follows:

In practice:

1. I do not find this competency necessary

2. I find this competency somewhat necessary

3. I find this competency necessary

4. I find this competency extremely necessary

TABLE X

OVERALL RATING OF NUTRITION IN CURRICULUM BY STUDENTS

Rating of Nutrition Education	Number of Students				Total Students Reporting	%
	Medicine	Dentistry	Nursing	Dietetics		
Excellent	1	0	2	16	19	8
Good	9	16	19	17	61	25
Good/Fair	4	3	2	0	9	4
Fair	47	39	30	2	118	48
Fair/Poor	1	1	1	0	3	1
Poor	17	11	5	0	33	14
Total	79	70	59	35	243	100

TABLE XI

OVERALL RATING OF NUTRITION IN THE CURRICULUM BY ALUMNI

Rating of Nutrition Education	Number of Alumni				Total Alumni Reporting	%
	Medicine	Dentistry	Nursing	Dietetics		
Excellent	4	1	6	31	42	12
Good	12	19	25	20	76	21
Good/Fair	5	2	0	0	7	2
Fair	51	47	47	0	145	40
Fair/Poor	4	4	3	0	11	3
Poor	36	27	15	0	78	22
Total	112	100	98	51	361	100

Means are reported in Tables XII and XIII. In every instance, except two, the dietetics profession thought they should have (ideal) a higher level of competency than any of the other professions. The two exceptions were knowledge competency (Differentiate alternate nutrient sources: total parenteral nutrition), and skills competency (Interpret the nutritional significance of the following data: physical examination). Physicians and nurses (means of 3.13 and 3.27, respectively), thought they should have a higher level of knowledge competency for total parenteral nutrition. Doctors, mean of 3.04, thought they should have a higher level of skill competency for interpreting the nutritional significance of the physical examination than did any of the other professionals.

TABLE XII

OVERALL MEANS OF RATINGS OF KNOWLEDGE COMPETENCIES BY PROFESSION

Nutrition Knowledge Competencies	Medicine n=199		Dentistry n=211		Nursing n=187		Dietetics n=89	
	Real	Ideal	Real	Ideal	Real	Ideal	Real	Ideal
Identify the major functions of specific nutrients.	2.40	2.71	2.39	2.58	2.49	3.00	3.13	3.52
Differentiate food sources of specific nutrients.	2.09	2.61	2.48	2.65	2.58	3.09	2.91	3.65
Describe the process of digestion, absorption transport, metabolism, and excretion of nutrients in the well individual.	3.05	2.95	2.95	2.46	2.97	3.11	3.45	3.60
Relate growth and development to nutrient requirements and utilization.	2.28	2.63	2.40	2.66	2.72	3.17	3.13	3.43
Relate the nutrient requirements and utilization throughout the life cycle.	1.93	2.43	2.07	2.38	2.55	3.09	2.90	3.43
Examine the physiologic and sensory changes of aging that influence nutrient intake and utilization.	1.65	2.47	1.78	2.62	2.61	2.93	2.35	3.09
Relate the pathophysiology of disease to metabolic changes affecting nutrient requirements, intake, and utilization.	2.27	3.07	2.36	2.73	2.59	3.34	3.36	3.70

TABLE XII (Continued)

Nutrition Knowledge Competencies	Medicine n=199		Dentistry n=211		Nursing n=187		Dietetics n=89	
	Real	Ideal	Real	Ideal	Real	Ideal	Real	Ideal
Determine the religious, ethnic, economic, philosophical, psychological, and community factors that may influence:								
1. food habits and behavior	1.80	2.32	1.69	2.21	2.50	2.91	3.05	3.47
2. vulnerability to food faddism	1.75	2.24	1.90	2.16	2.39	2.66	2.59	3.26
3. food availability	1.85	2.31	1.78	2.13	2.34	2.85	2.76	3.17
Determine the influence of the following therapies on nutrient requirements, intake, and utilization:								
1. drug therapy	2.08	2.96	2.25	2.97	2.23	2.38	2.53	3.47
2. radiation therapy	1.79	2.69	2.16	2.48	2.09	3.13	2.68	3.14
3. surgical therapy	2.30	3.03	2.41	3.09	2.48	2.34	2.93	3.40
Define clinical signs and symptoms characteristic of specific nutrition disease processes.	2.47	3.10	2.53	3.04	2.34	3.06	3.22	3.57
Identify nutritionally significant laboratory tests.	2.30	3.03	1.82	2.43	1.88	2.95	3.36	3.66

TABLE XII (Continued)

Nutrition Knowledge Competencies	Medicine n=199		Dentistry n=211		Nursing n=187		Dietetics n=89	
	Real	Ideal	Real	Ideal	Real	Ideal	Real	Ideal
Explain the rationale of therapeutic diets.	2.23	2.90	1.92	2.47	2.68	3.32	2.53	3.47
Recognize drug-nutrient interrelations.	1.93	2.84	2.02	2.80	1.95	3.20	2.68	3.14
Differentiate alternate nutrient sources:								
1. total parenteral nutrition	2.32	3.13	1.66	2.13	2.50	3.27	2.74	2.39
2. nutritionally complete enteral products, i.e., Vivonex, Sustacal	2.12	3.08	1.54	2.07	2.19	3.21	3.19	3.59
3. supplemental enteral products, i.e., Controlyte, MCT	1.84	2.90	1.43	2.01	1.84	2.98	3.08	3.52
4. diet products, i.e., low protein bread, sodium free foods, gluten free foods	1.99	2.90	1.60	2.23	2.27	3.16	2.84	3.48
Refer patient to the appropriate nutrition resources for information and materials.	2.23	2.92	2.18	2.76	2.64	3.19	2.82	3.45

*First mean=real; second mean=ideal

TABLE XIII

OVERALL MEANS OF RATINGS OF SKILLS COMPETENCIES BY PROFESSION

Nutrition Skills Competencies	Medicine n=199		Dentistry n=211		Nursing n=187		Dietetics n=89	
	Real	Ideal	Real	Ideal	Real	Ideal	Real	Ideal
Interview patient following established criteria for effective communication for nutrition history.	1.96	2.37	2.10	2.25	2.89	2.97	3.73	3.78
Interview family members or significant others to obtain family, social, medical, and historical information and relate to nutritional status of the patients.	2.12	2.34	1.90	2.17	2.87	2.94	3.47	3.67
Consult with other health professionals to obtain nutritionally significant data.	2.41	2.74	2.14	2.48	2.81	3.06	3.33	3.71
Utilize the medical record or other available health record to obtain nutritionally significant data.	2.21	2.49	2.05	2.47	2.84	3.00	3.65	3.84
Identify the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	2.31	2.91	1.73	2.36	1.97	2.62	2.93	3.51

TABLE XIII (Continued)

Nutrition Skills Competencies	Medicine n=199		Dentistry n=211		Nursing n=187		Dietetics n=89	
	Real	Ideal	Real	Ideal	Real	Ideal	Real	Ideal
Order the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	2.27	2.90	1.60	2.22	1.59	2.20	2.35	3.21
Perform the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	2.12	2.77	1.47	2.09	1.55	2.16	2.50	3.13
Perform anthropometric measurements to obtain assessment data.	1.64	2.08	1.21	1.60	1.89	2.17	3.15	3.78
Interpret the nutritional significance of the following data:								
1. laboratory data	2.55	3.07	1.84	2.41	2.07	2.97	3.26	3.70
2. nutritional history	2.21	2.73	2.10	2.45	2.68	2.89	3.65	3.71
3. other historical data	2.33	2.77	1.96	2.40	2.50	2.81	3.25	3.49
4. physical examination	2.70	3.04	1.91	2.48	2.23	2.89	2.70	2.30
Compare food intake data to estimated nutrient requirements.	1.91	2.41	2.18	2.27	2.54	2.77	3.35	3.33

TABLE XIII (Continued)

Nutrition Skills Competencies	Medicine n=199		Dentistry n=211		Nursing n=187		Dietetics n=89	
	Real	Ideal	Real	Ideal	Real	Ideal	Real	Ideal
Perform nutrient analysis using:								
1. food composition tables	1.49	1.90	1.79	1.99	2.06	2.33	3.42	3.26
2. food product labels	1.50	1.92	1.83	2.02	2.17	2.38	3.08	3.32
Determine the influence of physical activity on nutrient requirements.	2.02	2.50	1.90	2.19	2.06	2.33	2.80	3.42
Define nutritional needs based on the interpretation of the following data:								
1. laboratory tests	2.17	2.80	1.70	2.20	2.17	2.38	3.21	3.71
2. nutritional history	2.02	2.62	1.96	2.31	2.50	2.78	3.52	3.71
3. other historical data	2.03	2.57	1.80	2.23	2.31	2.70	3.19	3.47
4. physical examination	2.35	2.81	1.74	2.36	2.10	2.74	2.70	3.37
Determine patient's ability and willingness to assume responsibility for his own nutritional care.	2.32	2.62	2.13	2.59	2.96	3.15	3.29	3.67

TABLE XIII (Continued)

Nutrition Skills Competencies	Medicine n=199		Dentistry n=211		Nursing n=187		Dietetics n=89	
	Real	Ideal	Real	Ideal	Real	Ideal	Real	Ideal
Evaluate patient's learning ability, considering education, level of motivation, acceptance of the medical condition, and possible changes in lifestyle.	2.37	2.56	2.11	2.61	3.17	3.22	3.36	3.67
Utilize the U.S. Recommended Dietary Allowances to estimate nutrient requirements.	1.85	2.28	2.35	2.39	2.69	2.68	3.26	3.24
Calculate nutrient requirements for individuals in various states of health and disease.	1.93	2.82	1.57	2.36	2.14	2.68	3.27	3.65
Determine dietary modifications that will promote maintenance of health and prevention of disease.	2.08	2.83	1.90	2.59	2.49	2.97	3.46	3.75
Determine nutrient requirements necessary to treat specific disorders.	2.13	2.87	1.70	2.38	2.04	2.61	3.18	3.65
Determine appropriate method(s) (i.e., parenteral, enteral, or oral) to provide adequate intake based on assessment.	2.30	3.03	1.44	2.13	2.15	2.73	3.19	3.57

TABLE XIII (Continued)

Nutrition Skills Competencies	Medicine n=199		Dentistry n=211		Nursing n=187		Dietetics n=89	
	Real	Ideal	Real	Ideal	Real	Ideal	Real	Ideal
Prescribe appropriate nutritional feedings:								
1. total parenteral nutrition solutions	1.98	2.97	1.26	1.80	1.60	2.24	2.16	3.23
2. nutritionally complete enteral feedings products	1.98	2.95	1.29	1.83	1.60	2.24	2.99	3.57
3. supplemental enteral feedings products	1.95	2.90	1.37	1.90	1.61	2.26	3.09	3.61
4. diet products	1.79	2.68	1.45	2.01	1.73	2.33	2.87	3.60
Design diets for the prevention and treatment of disease states based on patient's needs and food preferences.	1.72	2.37	1.52	2.15	1.95	2.44	3.52	3.69
Plan nutritionally adequate meal patterns considering food preferences, beliefs, customs, and health status of the patient.	1.62	2.07	1.60	1.98	2.33	2.54	3.51	3.68
Coordinate the nutritional requirements of the patients with the food service system.	1.65	2.05	1.38	1.72	2.21	2.70	3.24	3.30

TABLE XIII (Continued)

Nutrition Skills Competencies	Medicine n=199		Dentistry n=211		Nursing n=187		Dietetics n=89	
	Real	Ideal	Real	Ideal	Real	Ideal	Real	Ideal
Plan nutrition-related learning experiences based on knowledge of the teaching-learning process and educational strategies.	1.44	1.77	1.53	1.82	2.37	2.55	3.61	3.52
Design nutrition education materials to meet specified needs of patients.	1.39	1.75	1.56	1.92	2.13	2.45	3.34	3.46
Implement nutrition-related learning experiences to meet identified needs of individuals or groups.	1.35	1.77	1.51	1.86	2.18	2.45	3.46	3.59
Counsel patient, family, or significant others on normal and/or therapeutic nutrition.	1.94	2.40	1.90	2.33	2.45	2.85	3.71	3.80
Elicit feedback from the patient regarding his response to the established plan of nutritional care.	1.90	2.34	1.75	2.23	2.77	2.97	3.62	3.72
Evaluate the effectiveness of nutrition-related learning experiences.	1.57	1.98	1.57	1.97	2.54	2.74	3.43	3.65
Determine the need for dietary intervention based on:								
1. course of illness	2.14	2.75	1.71	2.34	2.29	2.92	3.19	3.63

TABLE XIII (Continued)

Nutrition Skills Competencies	Medicine n=199		Dentistry n=211		Nursing n=187		Dietetics n=89	
	Real	Ideal	Real	Ideal	Real	Ideal	Real	Ideal
2. patient's physical response to previous diet modifications	2.05	2.60	1.60	2.21	2.25	2.84	3.09	3.57
3. patient's attitude to previous diet modifications	2.01	2.44	1.65	2.15	2.51	2.90	3.31	3.56
Integrate counsultation with health care and community personnel to coordinate nutritional management of the patient.	1.98	2.44	1.65	2.14	2.40	2.74	2.80	3.44
Participate in multidisciplinary health team activities, i.e., case conferences, medical rounds, and educational programs in the provision of optimal nutritional care.	1.99	2.34	1.64	2.11	2.52	2.90	3.34	3.55
Integrate established nutrition care plans and schedules of other health services.	1.76	2.13	1.47	1.94	2.38	2.76	3.20	3.30
Monitor response to nutrition interventions.	1.95	2.44	1.47	1.96	2.40	2.95	3.24	3.62
Verify the authenticity of patient's response to nutrition care plan using laboratory and clinical assessment data.	2.01	2.51	1.36	1.96	1.96	2.70	3.07	3.51

TABLE XIII (Continued)

Nutrition Skills Competencies	Medicine n=199		Dentistry n=211		Nursing n=187		Dietetics n=89	
	Real	Ideal	Real	Ideal	Real	Ideal	Real	Ideal
Recognize any deviations from the expected outcomes of nutrition care.	1.93	2.51	1.40	2.12	2.18	2.80	2.93	3.51
Modify plan of nutritional care based on patient's progress.	1.95	2.54	1.46	2.08	2.27	2.81	3.22	3.58
Determine the human resources (health professionals, auxiliary personnel, family, and/or significant others) that can facilitate nutritional care.	2.09	2.47	1.85	2.41	2.85	3.02	3.35	3.54
Establish a plan for the follow-up care utilizing appropriate human resources.	1.88	2.37	1.59	2.12	2.54	2.72	2.94	3.39
Interact with community health services and other health professionals to provide follow-up nutritional care of the patient.	1.89	2.34	1.61	2.21	2.50	2.65	2.59	3.20
Document in the S.O.A.P format clear, concise, and relevant nutrition progress notes, including diagnostic, therapeutic, and patient education plans.	2.12	2.25	1.46	2.05	2.83	2.81	3.68	3.61
Critique nutrition-related literature that is published and marketed for professional and public consumers.	1.76	2.23	1.86	2.25	1.85	2.28	2.72	3.36

TABLE XIII (Continued)

Nutrition Skills Competencies	Medicine n=199		Dentistry n=211		Nursing n=187		Dietetics n=89	
	Real	Ideal	Real	Ideal	Real	Ideal	Real	Ideal
Critique media programming (radio, television, films) on nutrition-related topics.	1.76	2.19	1.95	2.33	1.94	2.35	2.43	3.11
Determine availability and scope of community health services that provide nutrition information.	1.61	2.17	1.72	2.18	2.28	2.49	2.60	3.24
Determine material resources available to the providers and recipients of nutrition care.	1.60	2.15	1.69	2.13	2.22	2.53	2.69	3.38
Interpret health care legislation and regulatory guidelines as they influence nutrition welfare of patients.	1.48	2.02	1.61	2.02	1.72	2.17	2.54	3.00
Maintain current knowledge of health care legislation and regulatory guidelines affecting nutrition welfare of patients, i.e., PSRO, Medicare, and Maternal Child Health.	1.47	2.09	1.58	2.06	1.68	2.30	2.58	2.95
Evaluate the quality of nutrition research.	1.60	1.98	1.72	2.04	1.58	1.96	2.40	3.28
Interpret research findings as they relate to nutrition care.	1.73	2.12	1.82	2.05	1.72	2.10	2.53	3.43

TABLE XIII (Continued)

Nutrition Skills Competencies	Medicine n=199		Dentistry n=211		Nursing n=187		Dietetics n=89	
	Real	Ideal	Real	Ideal	Real	Ideal	Real	Ideal
Utilize current research data to promote progressive practices in the provision of nutrition care.	1.61	2.13	1.67	2.05	1.69	2.21	2.79	3.48
Provide nutrition education and consultation service to personnel within the health care system.	1.52	1.95	1.67	2.08	1.82	2.26	3.18	3.38
Organize nutritional information for accurate, clear, and concise presentation (oral and written).	1.61	1.89	1.79	2.15	2.09	2.36	2.30	3.64
Deliver presentations on nutrition information.	1.51	1.78	1.74	2.12	1.98	2.27	3.31	3.69

*First mean=real; second mean=ideal

Dietitians gave all competencies considered necessary for practice (ideal) above a 3.0 rating, except for the physical examination skill, which they rated 3.0, the lowest mean for that competency among all professions. A skills competency for maintaining current knowledge of health care legislation and regulatory guidelines affecting the nutritional welfare of patients (PSRO, Medicare, maternal child health) was given an overall mean of 2.95 by dietitians. This was the highest mean given by any of the professions to this competency.

There were no ratings of 4 for any competency, either real or ideal, and there were no ratings of 1.00 for any competency, either real or ideal, by any of the professions. In every instance, the real mean was lower than the ideal mean for the nutrition knowledge competencies, except physicians and dentists rated the level of competency 3 considered necessary for practice (ideal) lower than the level taught in the curriculum (real). Among 54 nutrition skills competencies, the means for ideal were higher than means for real, except in four instances. Dietitians rated real higher than ideal for the skills competencies of physical examination, comparing food intake data to estimated nutrient requirements, performing nutrient analysis using food composition tables, and planning nutrition-related learning experiences based on knowledge of the teaching-learning process and educational strategies.

Nutrition Knowledge Competencies

Data showed a significant difference between real (level of competency taught) and ideal (level of competency considered necessary for practice) among all professions (medicine, dentistry, nursing, and dietetics) for all 15 competency statements except one. There was no significant difference among dietitians' real and ideal perceptions of the nutrition knowledge

statement asking for a description of the process of digestion, absorption transport, metabolism, and excretion of nutrients in the well individual.

In all cases, the real mean was lower than the ideal mean, except among respondents in dentistry who reported a mean of 2.95 for real and 2.46 for ideal and in medicine who reported a mean of 3.05 for real and 2.96 for ideal for the competency asking for a description of the process of digestion, absorption transport, metabolism, and excretion of nutrients in the well individual. Results of all observations reported for nutrition knowledge competencies are in Appendix E.

Null Hypothesis

Hypothesis H_1 stated that there is no significant difference in nutrition knowledge competencies taught in health professions' curricula and competencies considered necessary for comprehensive health care. This hypothesis was rejected. Data shows a significant difference between real (level of competency taught) and ideal (level of competency considered necessary for practice) among all professions for all 15 competency statements except one.

Nutrition Skills Competencies

Medicine

Among the 54 nutrition skills competency statements, respondents in medicine found no significant difference between real and ideal for one competency. That competency statement concerned documenting in the S.O.A.P. format clear, concise, and relevant nutrition progress notes, including diagnostic, therapeutic, and patient education plans. Although there was no significant difference, the ideal mean 2.25 was higher

than the real mean 2.12, indicating a need for a higher level of competency in practice than that being taught. For all nutrition skills competencies, respondents in medicine expressed a higher level of competency needed for practice (ideal) than the level of competency perceived to be taught (real) in the professional curricula.

Dentistry

Among the 54 nutrition skills competency statements, respondents in dentistry found no significant difference between real and ideal for two competencies. Those statements were: Compare food intake data to estimated nutrient requirements; and utilize the U.S. Recommended Dietary allowances to estimate nutrient requirements.

Those respondents in the profession of dentistry indicated a higher level of all nutrition skills competencies for practice (ideal) than the level taught in the dental school curricula. Complete data from respondents in dentistry are in Appendix E.

Nursing

Among the 54 nutrition skills competencies, those students and alumni in the profession of nursing found no significant difference between the real and ideal for 10 competencies. They were:

- Interview patient following establishing criteria for effective communication for nutrition history.

- Interview family members or significant others to obtain family, social, medical, and historical information and relate to nutritional status of the patient.

- Utilize the medical record or other available health record to obtain nutritionally significant data.

- Evaluate patient's learning ability considering education, level of motivation, acceptance of medical condition, and possible changes in lifestyle.

- Utilize the U.S. Recommended Dietary Allowances to estimate nutrient requirements.

- Plan nutrition-related learning experiences based on knowledge of the teaching-learning process and educational strategies.

- Determine human resources (health professionals, auxiliary personnel, family and/or significant others) that can facilitate nutritional care.

- Establish a plan for the follow-up care utilizing appropriate human resources.

- Interact with community health services and other health professionals to provide follow-up nutritional care of the patient.

- Document in the S.O.A.P. format clear, concise, and relevant nutrition progress notes, including diagnostic, therapeutic, and patient education plans.

For all nutrition skills competencies, respondents in nursing considered a higher level of competency necessary for practice than the level of competency taught in nursing school.

Dietetics

Among the 54 nutrition skills competencies, students and alumni in dietetics found no significant difference between real and ideal for 21 competencies (39%) of the nutrition skills. They were:

- Interview patient following established criteria for effective communication for nutrition history.

- Interview family members or significant others to obtain family, social, medical, or historical information and relate to nutritional status of the patient.

- Interpret the nutritional significance of the following data: nutritional history.

- Compare food intake data to estimated nutrient requirements.

- Perform nutrient analysis using: (a) food composition tables, (b) food product labels.

- Utilize the U.S. Recommended Dietary Allowances to estimate nutrient requirements.

- Design diets for the prevention and treatment of disease states based on patient's needs and food preferences.

- Plan nutritionally adequate meal patterns considering food preferences, beliefs, customs, and health status of the patient.

- Coordinate the nutritional requirements of the patients with the food service system.

- Plan nutrition-related learning experiences based on knowledge of the teaching-learning process and educational strategies.

- Design nutrition education materials to meet specified needs of patients.

- Implement nutrition-related learning experiences to meet identified needs of individuals or groups.

- Counsel patient, family, or significant others on normal and/or therapeutic nutrition.

- Elicit feedback from the patient regarding his response to the established plan of nutritional care.

- Participate in multidisciplinary health team activities (case conferences, medical rounds, and educational programs) in the provision of optimal nutritional care.

- Integrate established nutrition care plans and schedules of other health services.

- Determine the human resources (health professionals, auxiliary personnel, family and/or significant others) that can facilitate nutritional care.

- Document in the S.O.A.P. format clear, concise, and relevant nutrition progress notes, including diagnostic, therapeutic, and patient education plans.

- Provide nutrition education and consultation service to personnel within the health care system.

Dietetic respondents responded with a higher level of competency necessary for practice than that taught in the dietetic internship, except for competencies that showed no significant difference between real and ideal.

All Professions

Data from respondents in medicine, nursing, and dietetics showed no significant difference in real and ideal for the statement which required documenting in the S.O.A.P. format clear, concise, and relevant nutrition progress notes, including diagnostic, therapeutic, and patient education plans. Dentists and dietitians found no significant difference in real and ideal for the competency which required food intake data to be compared to estimated nutrient requirements; nor for the competency requiring utilization of the U.S. Recommended Dietary Allowances to estimate nutrient requirements. Nurses and dietitians found no significant difference in real

and ideal for the following competency statements:

- Interview patient following established criteria for effective communication for nutrition history.

- Interview family members or significant others to obtain family, social, medical, and historical information and relate to nutritional status of the patient.

- Utilize the U.S. Recommended Dietary Allowances to estimate nutrient requirements.

- Plan nutrition education materials to meet specified needs of patients.

- Determine human resources (health professionals, auxiliary personnel, family and/or significant others) that can facilitate nutritional care.

- Document in the S.O.A.P. format clear, concise, and relevant nutrition progress notes, including diagnostic, therapeutic, and patient education plans.

Null Hypothesis

Hypothesis H_2 stated: There is no significant difference in nutrition skills competencies taught in health professions' curricula and competencies considered necessary for comprehensive health care. This hypothesis was rejected. Data showed a significant difference between real (level of competency taught) and ideal (level of competency considered necessary for practice) among all professions for 53 of 54 competencies for medicine, 52 of 54 competencies for dentistry, 44 of 54 competencies for nursing, and 33 of 54 competencies for dietetics.

Nutrition Knowledge Competencies Assessed by Students and Alumni

Students and alumnae groups were compared for their perceptions of nutrition knowledge competencies taught (real) and nutrition knowledge competencies for health care practice (ideal). Students and alumni in each profession (medicine, dentistry, nursing, and dietetics) were included. Four hundred and twenty-six questionnaires were returned by alumni of all professions (23% of the questionnaires mailed to alumni). Two hundred and sixty questionnaires were returned by students (27% of all questionnaires mailed to students). The response rate by student and alumni groups to questionnaires mailed is presented in Table XIV. Tables XV and XVI report the probability figures at the $\leq .05$ level of significance.

Medicine: Students and Alumni

For both groups in medicine (students and alumni) there was a significant difference between nutrition knowledge competencies taught (real) and those needed for practice (ideal) for 13 of the 15 competencies. Tables XV and XVI show a comparison of student and alumni perceptions of competencies taught with competencies needed for practice. The competencies where there was no significant difference were the following:

- Describe the process of digestion, absorption, transport, metabolism, and excretion of nutrients in the well individual.

- Relate growth and development to nutrient requirements and utilization throughout the life cycle.

Dentistry: Students and Alumni

For dental students there was a significant difference between

TABLE XIV

STUDENT AND ALUMNI RESPONSE RATE TO
MAILED QUESTIONNAIRES

Profession	Questionnaires Mailed		Questionnaires Returned		Percentage Returned	
	Students	Alumni	Students	Alumni	Students	Alumni
Medicine	354	657	85	114	24	17
Dentistry	298	556	77	134	26	24
Nursing	263	507	63	124	24	24
Dietetics	55	105	35	54	64	51
Totals	970	1825	260	426	--	--

TABLE XV

STUDENT AND ALUMNI PERCEPTIONS OF NUTRITION KNOWLEDGE COMPETENCIES TAUGHT COMPARED TO COMPETENCIES NEEDED *

	Medicine		Dentistry		Nursing		Dietetics	
	n=85	n=114	n=77	n=134	n=63	n=124	n=35	n=54
Nutrition Knowledge Competencies	Students	Alumni	Students	Alumni	Students	Alumni	Students	Alumni
Identify the major functions of specific nutrients.	.0001	.0400	.0001	.7701	.0001	.0001	.0001	.3043
Differentiate food sources of specific nutrients.	.0001	.0009	.0075	.1932	.0001	.0003	.0001	.0039
Describe the process of digestion, absorption transport, metabolism, and excretion of nutrients in the well individual.	.4535	.0384	.0246	.0001	.0138	.6569	.0001	.2321
Relate growth and development to nutrient requirements and utilization.	.0001	.1778	.0004	.1032	.0005	.0003	.0001	.7301
Relate the nutrient requirements and utilization throughout the life cycle.	.0001	.0008	.0006	.0130	.0001	.0001	.0001	.3214
Examine the physiologic and sensory changes of aging that influence nutrient intake and utilization.	.0001	.0001	.0001	.0001	.0496	.0076	.0001	.0102
Relate the pathophysiology of disease to metabolic changes affecting nutrient requirements, intake, and utilization.	.0001	.0001	.0001	.0033	.0001	.0001	.0001	.5906

TABLE XV (Continued)

Nutrition Knowledge Competencies	Medicine n=85 Students	Medicine n=114 Alumni	Dentistry n=77 Students	Dentistry n=134 Alumni	Nursing n=63 Students	Nursing n=124 Alumni	Dietetics n=35 Students	Dietetics n=54 Alumni
Determine the religious, ethnic, economic, philosophical, psychological, and community factors that may influence:								
1. food habits and behavior	.0001	.0001	.0001	.0001	.0121	.0004	.0001	.1240
2. vulnerability to food faddism	.0001	.0001	.0151	.0310	.0079	.0896	.0001	.0018
3. food availability	.0001	.0001	.0012	.0066	.0001	.0026	.0002	.2553
Determine the influence of the following therapies on nutrient requirements, intake, and utilization:								
1. drug therapy	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
2. radiation therapy	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.1892
3. surgical therapy	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.3079
Define clinical signs and symptoms characteristic of specific nutrition disease processes.	.0001	.0001	.0001	.0001	.0001	.0001	.0013	.2325
Identify nutritionally significant laboratory tests.	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.7004

TABLE XV (Continued)

Nutrition Knowledge Competencies	Medicine n=85 Students	Medicine n=114 Alumni	Dentistry n=77 Students	Dentistry n=134 Alumni	Nursing n=63 Students	Nursing n=124 Alumni	Dietetics n=35 Students	Dietetics n=54 Alumni
Explain the rationale of therapeutic diets.	.0001	.0001	.0009	.0001	.0006	.0001	.0001	.7107
Recognize drug-nutrient interrelations.	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
Differentiate alternate nutrient sources:								
1. total parenteral nutrition	.0001	.0001	.0001	.0001	.0053	.0001	.0001	.0073
2. nutritionally complete enteral products, i.e., Vivonex, Sustacal	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.2281
3. supplemental enteral products, i.e., Controlyte, MCT	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.1838
4. diet products, i.e., low protein bread, sodium free foods, gluten free foods	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0205
Refer patient to the appropriate nutrition resources for information and materials.	.0001	.0001	.0015	.0001	.0001	.0001	.0001	.0450

Note: First mean=real; second mean=ideal

*Level of Significance $\leq .05$

TABLE XVI

STUDENT AND ALUMNI PERCEPTIONS OF NUTRITION SKILLS COMPETENCIES TAUGHT COMPARED TO COMPETENCIES NEEDED

Nutrition Skills Competencies	Medicine n=85 Students	Medicine n=114 Alumni	Dentistry n=77 Students	Dentistry n=134 Alumni	Nursing n=63 Students	Nursing n=124 Alumni	Dietetics n=35 Students	Dietetics n=54 Alumni
Interview patient following established criteria for effective communication for nutrition history.	.0005	.0003	.2727	.0770	.0274	.7691	.0442	.2071
Interview family members or significant others to obtain family, social, medical, and historical information and relate to nutritional status of the patients.	.0832	.0393	.0061	.0391	.0221	.7033	.0099	.9306
Consult with other health professionals to obtain nutritionally significant data.	.0124	.0006	.0019	.0088	.0009	.2530	.0001	.2319
Utilize the medical record or other available health record to obtain nutritionally significant data.	.0810	.0023	.0007	.0004	.0140	.4808	.0078	.7735
Identify the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	.0001	.0001	.0006	.0001	.0001	.0001	.0001	.0220

TABLE XVI (Continued)

Nutrition Skills Competencies	Medicine n=85 Students	Medicine n=114 Alumni	Dentistry n=77 Students	Dentistry n=134 Alumni	Nursing n=63 Students	Nursing n=124 Alumni	Dietetics n=35 Students	Dietetics n=54 Alumni
Order the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	.0001	.0001	.0004	.0001	.0001	.0001	.0001	.0028
Perform the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0197
Perform anthropometric measurements to obtain assessment data.	.0001	.0007	.0002	.0001	.0001	.7531	.1257	.2260
Interpret the nutritional significance of the following data:								
1. laboratory data	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0609
2. nutritional history	.0001	.0001	.0072	.0015	.1725	.0785	.1120	.5979
3. other historical data	.0001	.0001	.0046	.0001	.0329	.0205	.0062	.9630
4. physical examination	.0007	.0097	.0002	.0001	.0001	.0001	.0007	.0151
Compare food intake data to estimated nutrient requirements.	.0001	.0002	.1313	.7420	.0014	.3383	.8491	.8193

TABLE XVI (Continued)

Nutrition Skills Competencies	Medicine n=85 Students	Medicine n=114 Alumni	Dentistry n=77 Students	Dentistry n=134 Alumni	Nursing n=63 Students	Nursing n=124 Alumni	Dietetics n=35 Students	Dietetics n=54 Alumni
Perform nutrient analysis using:								
1. food composition tables	.0001	.0012	.0137	.2005	.0030	.2195	.5048	.0672
2. food product labels	.0001	.0002	.0069	.3084	.0068	.5034	.0326	.4860
Determine the influence of physical activity on nutrient requirements.	.0001	.0002	.0237	.0006	.0034	.0818	.0001	.0014
Define nutritional needs based on the interpretation of the following data:								
1. laboratory tests	.0001	.0001	.0044	.0001	.0001	.0001	.0001	.0310
2. nutritional history	.0001	.0001	.0976	.0001	.0039	.0127	.0185	.5873
3. other historical data	.0001	.0001	.0078	.0001	.0017	.0035	.0651	.1609
4. physical examination	.0003	.0001	.0009	.0001	.0001	.0001	.0001	.0043
Determine patient's ability and willingness to assume responsibility for his own nutritional care.	.1479	.0014	.0402	.0001	.0188	.1537	.0032	.1185

TABLE XVI (Continued)

Nutrition Skills Competencies	Medicine n=85 Students	Medicine n=114 Alumni	Dentistry n=77 Students	Dentistry n=134 Alumni	Nursing n=63 Students	Nursing n=124 Alumni	Dietetics n=35 Students	Dietetics n=54 Alumni
Evaluate patient's learning ability, considering education, level of motivation, acceptance of the medical condition, and possible changes in lifestyle.	.5484	.0110	.0246	.0001	.5020	.7451	.0094	.1602
Utilize the U.S. Recommended Dietary Allowances to estimate nutrient requirements.	.0001	.0011	.5506	.8200	.0773	.2466	.6596	.6376
Calculate nutrient requirements for individuals in various states of health and disease.	.0001	.0001	.0001	.0001	.0001	.0002	.0016	.0231
Determine dietary modifications that will promote maintenance of health and prevention of disease.	.0001	.0001	.0001	.0001	.0005	.0001	.0202	.1009
Determine nutrient requirements necessary to treat specific disorders.	.0001	.0001	.0002	.0001	.0001	.0001	.0002	.0176
Determine appropriate method(s) (i.e., parenteral, enteral, or oral) to provide adequate intake based on assessment.	.0001	.0001	.0001	.0001	.0006	.0001	.0001	.1430

TABLE XVI (Continued)

Nutrition Skills Competencies	Medicine n=85 Students	Medicine n=114 Alumni	Dentistry n=77 Students	Dentistry n=134 Alumni	Nursing n=63 Students	Nursing n=124 Alumni	Dietetics n=35 Students	Dietetics n=54 Alumni
Prescribe appropriate nutritional feedings:								
1. total parenteral nutrition solutions	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
2. nutritionally complete enteral feedings products	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0568
3. supplemental enteral feedings products	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0069
4. diet products	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002
Design diets for the prevention and treatment of disease states based on patient's needs and food preferences.	.0001	.0001	.0001	.0001	.0001	.0046	.0091	.9379
Plan nutritionally adequate meal patterns considering food preferences, beliefs, customs, and health status of the patient.	.0002	.0001	.0013	.0004	.0003	.7476	.1682	.3235
Coordinate the nutritional requirements of the patients with the food service system.	.0088	.0001	.0067	.0004	.0001	.0093	.0606	.3517

TABLE XVI (Continued)

Nutrition Skills Competencies	Medicine n=85 Students	Medicine n=114 Alumni	Dentistry n=77 Students	Dentistry n=134 Alumni	Nursing n=63 Students	Nursing n=124 Alumni	Dietetics n=35 Students	Dietetics n=54 Alumni
Plan nutrition-related learning experiences based on knowledge of the teaching-learning process and educational strategies.	.0009	.0026	.1527	.0003	.0090	.6999	1.0000	.2737
Design nutrition education materials to meet specified needs of patients.	.0004	.0019	.0213	.0002	.0001	.1655	.0864	.8352
Implement nutrition-related learning experiences to meet identified needs of individuals or groups.	.0001	.0001	.0256	.0001	.0003	.4324	.0730	.8233
Counsel patient, family, or significant others on normal and/or therapeutic nutrition.	.0005	.0001	.0119	.0001	.0001	.0046	.1876	.8900
Elicit feedback from the patient regarding his response to the established plan of nutritional care.	.0020	.0001	.0065	.0001	.0031	.3384	.0827	.7370
Evaluate the effectiveness of nutrition-related learning experiences.	.0001	.0002	.0063	.0001	.0095	.3796	.0719	.3021
Determine the need for dietary intervention based on:								
1. course of illness	.0001	.0001	.0002	.0001	.0001	.0001	.0014	.0180

TABLE XVI (Continued)

Nutrition Skills Competencies	Medicine n=85 Students	Medicine n=114 Alumni	Dentistry n=77 Students	Dentistry n=134 Alumni	Nursing n=63 Students	Nursing n=124 Alumni	Dietetics n=35 Students	Dietetics n=54 Alumni
2. patient's physical response to previous diet modifications	.0001	.0001	.0001	.0001	.0001	.0001	.0085	.0021
3. patient's attitude to previous diet modifications	.0008	.0001	.0006	.0001	.0002	.0048	.0848	.1235
Integrate counsultation with health care and community personnel to coordinate nutritional management of the patient.	.0001	.0002	.0069	.0001	.0021	.0436	.0001	.0888
Participate in multidisciplinary health team activities, i.e., case conferences, medical rounds, and educational programs in the provision of optimal nutritional care.	.1716	.0001	.0226	.0001	.0013	.0216	.0010	.9388
Integrate established nutrition care plans and schedules of other health services.	.0071	.0006	.0010	.0001	.0016	.0146	.0508	.7384
Monitor response to nutrition interventions.	.0008	.0001	.0002	.0001	.0002	.0001	.0136	.0252
Verify the authenticity of patient's response to nutrition care plan using laboratory and clinical assessment data.	.0007	.0001	.0001	.0001	.0001	.0001	.0036	.0151

TABLE XVI (Continued)

Nutrition Skills Competencies	Medicine n=85 Students	Medicine n=114 Alumni	Dentistry n=77 Students	Dentistry n=134 Alumni	Nursing n=63 Students	Nursing n=124 Alumni	Dietetics n=35 Students	Dietetics n=54 Alumni
Recognize any deviations from the expected outcomes of nutrition care.	.0002	.0001	.0001	.0001	.0001	.0001	.0006	.0089
Modify plan of nutritional care based on patient's progress.	.0001	.0001	.0001	.0001	.0001	.0001	.0120	.0485
Determine the human resources (health professionals, auxiliary personnel, family, and/or significant others) that can facilitate nutritional care.	.0246	.0001	.0036	.0001	.0343	.3756	.0252	.6429
Establish a plan for the follow-up care utilizing appropriate human resources.	.0014	.0001	.0035	.0001	.0036	.5349	.0018	.0800
Interact with community health services and other health professionals to provide follow-up nutritional care of the patient.	.0013	.0001	.0001	.0001	.0095	.8948	.0001	.1740
Document in the S.O.A.P format clear, concise, and relevant nutrition progress notes, including diagnostic, therapeutic, and patient education plans.	.4101	.3496	.0001	.0001	.0025	.0301	.2192	.2013
Critique nutrition-related literature that is published and marketed for professional and public consumers.	.0003	.0001	.0107	.0004	.0001	.0142	.0010	.0005

TABLE XVI (Continued)

Nutrition Skills Competencies	Medicine		Dentistry		Nursing		Dietetics	
	n=85	n=114	n=77	n=134	n=63	n=124	n=35	n=54
	Students	Alumni	Students	Alumni	Students	Alumni	Students	Alumni
Critique media programming (radio, television, films) on nutrition-related topics.	.0033	.0001	.0154	.0009	.0036	.0072	.0001	.0040
Determine availability and scope of community health services that provide nutrition information.	.0001	.0001	.0017	.0001	.0005	.7374	.0001	.0417
Determine material resources available to the providers and recipients of nutrition care.	.0001	.0001	.0048	.0001	.0005	.1102	.0001	.0200
Interpret health care legislation and regulatory guidelines as they influence nutrition welfare of patients.	.0001	.0001	.0044	.0001	.0001	.0062	.0021	.0561
Maintain current knowledge of health care legislation and regulatory guidelines affecting nutrition welfare of patients, i.e., PSRO, Medicare, and Maternal Child Health.	.0001	.0001	.0053	.0001	.0001	.0003	.0137	.1986
Evaluate the quality of nutrition research.	.0010	.0008	.0368	.0015	.0001	.0435	.0001	.0001
Interpret research findings as they relate to nutrition care.	.0035	.0003	.1554	.0310	.0006	.0084	.0001	.0001

TABLE XVI (Continued)

Nutrition Skills Competencies	Medicine n=85 Students	Medicine n=114 Alumni	Dentistry n=77 Students	Dentistry n=134 Alumni	Nursing n=63 Students	Nursing n=124 Alumni	Dietetics n=35 Students	Dietetics n=54 Alumni
Utilize current research data to promote progressive practices in the provision of nutrition care.	.0001	.0001	.0167	.0001	.0001	.0003	.0001	.0002
Provide nutrition education and consultation service to personnel within the health care system.	.0010	.0002	.0052	.0001	.0001	.0291	.0085	.7823
Organize nutritional information for accurate, clear, and concise presentation (oral and written).	.1037	.0016	.0492	.0001	.0017	.2378	.0631	.0215
Deliver presentations on nutrition information.	.0307	.0068	.0426	.0001	.0001	.3627	.0604	.0034

*First mean=real; second mean=ideal

nutrition knowledge competencies taught (real) and nutrition knowledge competencies needed (ideal) for all of the 15 competencies. For dental alumni, there was a significant difference in 12 of 15 competencies (Tables XV and XVI.) There was no significant difference in the following three competencies:

- Identify the major function of specific nutrients.
- Differentiate food sources of specific nutrients.
- Relate growth and development to nutrient requirements and utilization throughout the life cycle.

Nursing: Students and Alumni

For nursing students there was a significant difference between nutrition knowledge competencies taught (real) and nutrition knowledge competencies needed for practice (ideal) for all of the 15 competencies. For nursing alumni there was a significant difference in 14 of 15 competencies (Tables XV and XVI). There was no significant difference in the following competency:

- Describe the process of digestion, absorption, transport, metabolism, and excretion of nutrients in the well individual.

Dietetics: Students and Alumni

For dietetic students there was a significant difference between nutrition knowledge competencies taught (real) and nutrition knowledge competencies needed for practice (ideal) for all 15 competencies. For alumni in dietetics there was a significant difference in 5 of 15 competencies. Those five competencies were concerned with food sources of nutrients, influence of aging, drug-nutrient interaction, and parenteral/enteral nutrition.

All Professions

The difference in all student perceptions between nutrition knowledge competencies taught (real) and nutrition knowledge competencies needed for practice (ideal) was significant in all 15 competencies, except for medical students, who reported no significant difference between real and ideal for competency four (Relate growth and development to nutrient requirements and utilization).

For alumni in medicine, dentistry, and nursing data showed a significant difference in all but 4 of the 15 competencies. For alumni in dietetics there was a significant difference between real and ideal for only 5 of the 15 competencies. Those in which there was a significant difference were knowledge statements about pathophysiology of disease, drug and nutrient interactions, parenteral nutrition, diet supplements, and referral services.

Null Hypotheses

H_3, which stated: There is no significant difference in perceptions of health care students and alumni of nutrition knowledge competencies taught and competencies necessary for comprehensive health care, was rejected. For both students and alumni there was a significant difference between real (taught) and ideal (needed), except for dietetic alumni who saw no significant difference in 10 of the 15 competencies.

Nutrition Skills Competencies Assessed
by Students and Alumni

Student and alumnae groups were compared for their perceptions of nutrition skills competencies taught (real) and nutrition skills competencies

needed (ideal) for health care practice. Students and alumni in each profession (medicine, dentistry, nursing, and dietetics) were included. Twenty-three percent of all questionnaires to alumni were returned, and 27% of all questionnaires mailed to students were returned.

Medicine: Students and Alumni

For medical students there was a significant difference in real and ideal for 47 of 54 skills competencies. Those competencies that showed no significant difference were in the areas of skills related to documentation, team activities, and patient education.

For alumni in medicine there was a significant difference in 53 of 54 skills competencies between those taught in their curriculum and skills necessary for practice. There was no significant difference in only one competency. That competency addressed documentation in the medical record.

Dentistry: Students and Alumni

For dental students there was a significant difference in 49 of the 54 skills competencies. The five competencies that showed no significant difference between competencies taught (real) and competencies needed for practice (ideal) related to nutrient information and patient education.

For dental alumni there was a significant difference in real and ideal for 50 of the 54 skills competencies. Three competencies that showed no significant difference were the same as those in which the dental students found no significant difference (those related to nutrient information and patient education).

Nursing: Students and Alumni

For students in nursing there was a significant difference in mean

scores for 52 of 54 nutrition skills competencies taught and those considered necessary for practice. For alumni in nursing there was a significant difference in 30 of 54 skills competencies. The 24 competencies in which there was no significant difference between real and ideal for nursing alumni were concerned mainly with psychosocial skills, patient education, and nutrient information.

Dietetics: Students and Alumni

For students in dietetics there was a significant difference between real and ideal in 38 of 54 skills competencies. The 16 competencies showing no significant difference were concerned with nutrient information, nutrition knowledge, and patient education.

For alumni in dietetics there was a significant difference between real and ideal in 20 of 54 skills competencies. The 20 competencies in which dietetic alumni perceived a significant difference between real and ideal were concerned with diagnosis, physical examination, nutrient requirements for physical activity, disease conditions or specific disorders, laboratory tests and clinical data, referral and resource information, and critique of nutrition-related materials and programs. The 34 competencies with no significant difference between competencies taught (real) and competencies needed (ideal) were concerned with psychosocial skills, documentation, nutrient information, patient education, food service, health care legislation, and nutrition care plans.

All Professions

The difference in all student perceptions between nutrition skills competencies taught (real) and nutrition skills competencies needed for practice (ideal) was significant in 47 of 54 for medicine, 49 of 54 for

dentistry, 52 of 54 for nursing, and 38 of 54 for dietetics. In general, competencies that had no significant difference between real and ideal were those concerned with skills in psychosocial aspects of nutritional care, patient education, nutrient information, and documentation.

For alumni there were significant differences among the professions--53 of 54 in medicine, 50 of 54 in dentistry, 30 of 54 in nursing, and 20 of 54 in dietetics. Alumni in medicine and dentistry perceived a significant difference in two times the number of competencies as did nursing and dietetic alumni. Dietetic alumni (dietitians in practice) were the only ones who perceived their curriculum as preparing them for practice. All the other health professionals who answered the questionnaire saw a need for more competency to practice than what they had been taught in their respective curricula.

Null Hypothesis

H_4, which stated: There is no significant difference in perceptions of health care students and alumni of nutrition skills competencies taught and competencies necessary for comprehensive health care, was rejected. For both students and alumni data showed a significant difference between real (taught) and ideal (needed), except for dietetic alumni who saw no significant difference in 34 of 54 skills competencies.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter provides a general summary of the findings of the study undertaken to identify nutritional care competencies for physicians, dentists, nurses, and clinical dietitians. Conclusions drawn from the findings are presented and recommendations for further study are suggested. A review of the literature revealed that the lack of nutrition education in most health professional curricula has been of serious concern to members of health professions, nutrition educators, Congress, and the Food and Nutrition Board of the National Research Council since the mid-1970s (Nutrition Education in U.S. Medical Schools, 1985). At the same time, awareness of the need for health professionals to have adequate preparation in nutritional care causes questions to be raised about how much nutrition is included in various professional curricula and what should be taught to develop nutritional care knowledge and skills competencies for comprehensive health care.

Summary

The overall purpose of the study was to identify nutrition knowledge and skills, both common and unique to the practice of medicine, dentistry, nursing, and clinical dietetics in order to suggest recommendations for the nutrition education component of their curricula.

The following null hypotheses were tested for significance at the .05 level:

H_1: There is no significant difference in nutrition knowledge competencies taught in health professions' curricula and competencies considered necessary for comprehensive health care.

H_2: There is no significant difference in nutrition skills competencies taught in health professions' curricula and competencies considered necessary for comprehensive health care.

H_3: There is no significant difference in perceptions of health care students and alumni of nutrition knowledge competencies taught and competencies necessary for comprehensive health care.

H_4: There is no significant difference in perceptions of health care students and alumni of nutrition skills competencies taught and competencies necessary for comprehensive health care.

The study population was composed of 970 students and 1825 alumni in medicine, dentistry, nursing, and clinical dietetics from Emory University in Atlanta. A total of 260 students and 426 alumni returned the questionnaire (27% of the students and 23% of the alumni).

The instrument used to collect the data was a questionnaire based on nutritional care competencies that had been validated for the Emory University Dietetic Internship, which prepares clinical dietitians. The questionnaire contained 15 knowledge statements and 54 skills statements (Appendix E). The respondents were asked to rate each statement on the basis of competency taught in the professional curricula and competency considered necessary for practice. A four-point rating scale was used to rate the level of competency. The collected data were analyzed with the Student t-test procedure in the Statistical Analysis System.

In testing H_1, the following results were obtained: Data showed a significant difference between <u>real</u> (level of competency taught) and <u>ideal</u> (level of competency considered necessary for practice) among the four

professions for all 15 knowledge competency statements except one. In testing H_2, statistical analysis of the data indicated a significant difference in real and ideal of 54 skills competency statements, except that respondents in medicine reported no difference in one competency; in dentistry, no difference in two competencies; and in nursing and medicine, no difference in six competencies.

Statistical analysis of data to test H_3 indicated that for both students and alumni there was a significant difference between real and ideal perceptions of nutrition knowledge competencies, except that dietetic alumni saw no significant difference in 10 of the 15 knowledge competencies. Statistical analysis of data to test H_4 indicated a significant difference for students and alumni between real and ideal perceptions of nutrition skills competencies, except for dietetic alumni, who saw no significant difference in 34 of 54 skills competencies.

Conclusions

The following conclusions are based upon the findings of this study:

1. Students and alumni, except for dietetic alumni, rated all competencies considered necessary for practice higher than the level of competency obtained in their curricula. Thus, the dietetic curricula may need only minimal improvement, whereas curricula in medicine, dentistry, and nursing need to include more nutrition education.

2. All nutrition knowledge competencies were rated above 2.0 for ideal, the level necessary for practice. Curriculum planners, therefore, should consider inclusion of the following concepts which are embodied in the knowledge statements in a nutrition course for all health care professionals:

   a. functions and sources of nutrients

b. requirements, utilization, and metabolism of nutrients
c. relationship of nutrition to growth and development throughout the life cycle, including the aging process
d. pathophysiology of disease, including clinical signs and symptoms
e. effect of various therapies on nutrient utilization
f. drug-nutrient interactions
g. enteral/parenteral nutrition
h. psychosocial influences on nutrient intake
i. educational resources and referral services

3. Alumni in medicine and dentistry rated 19 of 54 nutrition skills competencies between 1.0 and 2.0, a low level of competency considered necessary for practice. Curriculum planners, therefore, should not be concerned about inclusion of those competencies for medical or dental students. Competencies that rated between 1.0 and 2.0 related to nutrition education for patients. This may have been viewed as the unique domain of the dietitians. Dietitians rated nutrition education competencies between 3.0 and 4.0.

4. Students and alumni in medicine rated competencies related to the religious, ethnic, economic, philosophical, psychological, and community factors that may influence food habits and behavior or vulnerability to food faddism, at a lower level of competency to practice than the other competencies. Nor were they interested in anthropometric measurements for assessment. Food composition tables and food labeling rated low as necessary for practice. The competencies that rated lowest for practice were those related to providing nutrition education or materials to individuals or groups, or to other health care personnel. Competencies related to nutrition education may become more important to physicians as they move

from an acute care to a prevention mode of practice. Also, a low rating was assigned to the need to interpret nutrition research, which may partially explain why physicians sometimes may be gullible to new food and diet fads.

5. Dental students and alumni rated what they had been taught (real) lower than the other three professions rated their curricula. They also rated the levels of competencies needed for practice (ideal) lower than the other professions. Only recently has there been a notable advance in the appreciation of nutrition in the field of dentistry ("Nutrition training within medicine, dentistry, and pharmacy," 1978). This may be an indication of dentistry's developing interest in preventive health care.

6. Nursing and dietetic respondents gave similar ratings to competencies, although dietitians consistently gave higher ratings to both the competencies taught in their curriculum and the competencies needed for practice. Curriculum planners may need to take these competency ratings into account and be prepared to assist in further role delineation between nurses and dietitians.

Overall, data obtained from this study support the need for expanded and improved nutrition education in the curricula of health professions students. Educators responsible for curriculum planning can now come up with an approach to teaching nutrition knowledge and skills to students in medicine, dentistry, nursing, and dietetics that meets their needs in future practice. Furthermore, continuing education programs for persons already in the practice of their separate professions could be designed based on the findings of this study.

Recommendations

The following recommendations are suggested based upon the findings

and conclusions from this study:

1. Further research concerning nutritional care competencies for health care professionals should be undertaken with students and alumni from other colleges or universities in order to test the validity of the findings of this study.

2. Identification and verification of core nutritional care competencies for all health professionals would assist curriculum planners and open the door to development of interdisciplinary nutrition courses.

3. Competency studies such as this could assist the Council on Education of The American Dietetic Association with future role delineation studies for clinical dietitians.

4. Further statistical analysis of the data collected in this study is needed to provide additional insight into the relationship among the various health professionals' perceptions of need for nutritional care competencies.

5. A longitudinal follow-up study of alumni in medicine, dentistry, nursing, and dietetics is needed to provide evaluative data concerning changes in the nutrition component of the various curricula.

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APPENDIXES

APPENDIX A

MODEL FOR DEVELOPING PROGRAM COMPETENCIES

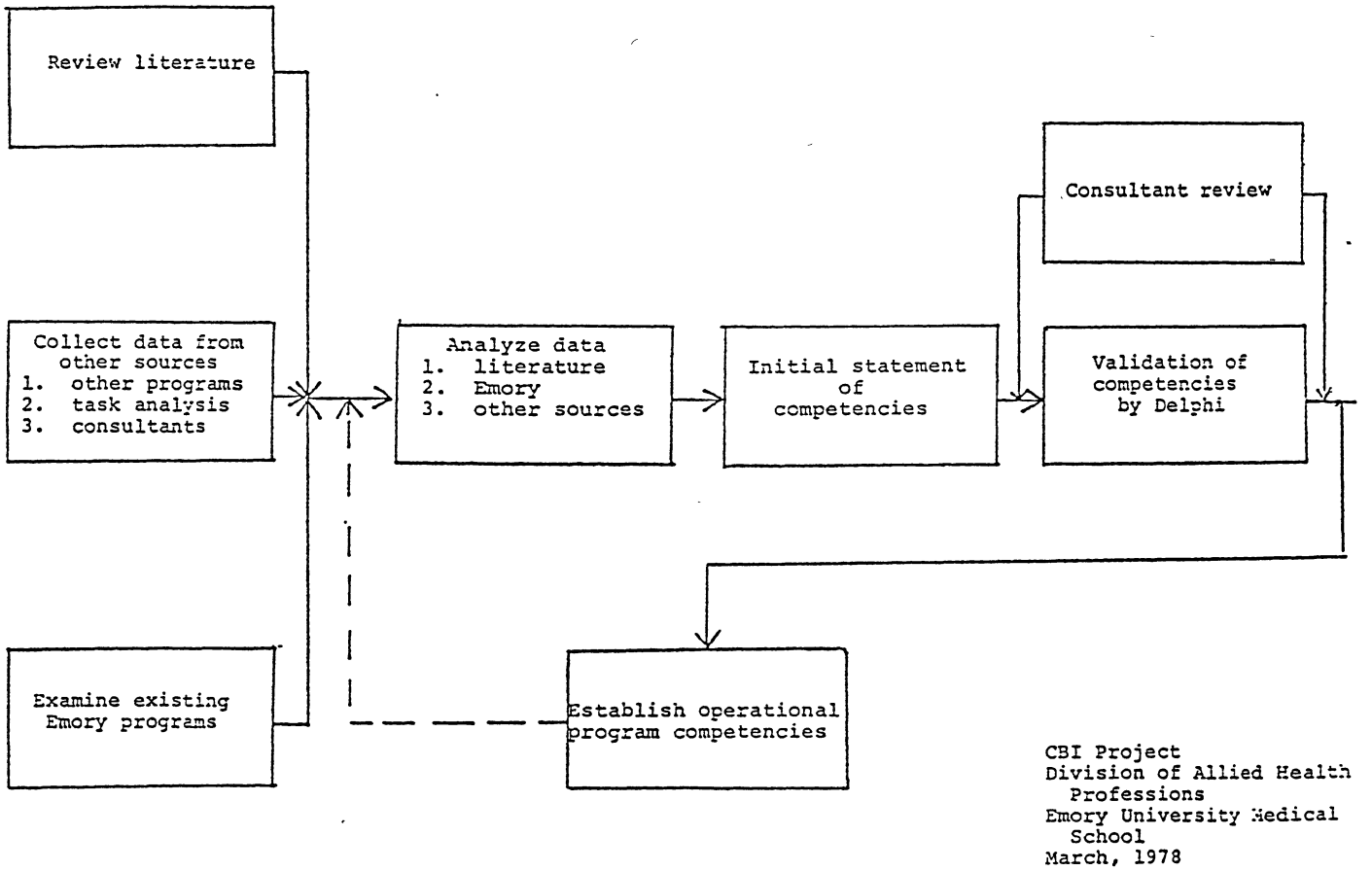

Figure 1. Developing Program Competencies

APPENDIX B

PERSONAL DATA FORM

DEMOGRAPHIC DATA

I. General Information

A. Name of School _____

B. Name of Program _____

C. What is the title of the person answering this survey? _____

_____

D. How many students are presently enrolled in your program (per class/year)?

_____

E. How many quarters/semesters are required to complete the program? _____

_____

II. Nutrition Information

A. Do you have an identified nutrition course or courses for your students?
Yes ____ No ____

1. If so, are any required? Yes ____ No ____
2. How many students are enrolled? _____
3. Who teaches the course(s)? (title and profession of instructor)

_____

4. Is (are) the course(s) didactic? ____ Clinical? ____ Both? ____
5. Are other types of teaching methods used, e.g. self-instructional units, etc.? Yes ____ No ____ If so, what are they? _____

_____

B. Do you offer nutrition topics in combination with other related topics?
Yes ____ No ____

1. If so, what other courses include nutrition topics? _____

_____

_____

2. Who teaches this (these) course(s)? (title and profession) _____

_____

C. Do you offer any nutrition related topics in an interdisciplinary course or courses? Yes ____ No ____

1. If so, what nutrition topics are covered? _____

_____

_____

2. Who teaches this (these) course(s)? (title and profession) _____

_____

3. What other disciplines participate in this (these) course(s)?

_____

4. What type of teaching methods are used? Didactic ____ Clinical _____
   Other (specify) _____
5. Is (are) the course(s) required? Yes ____ No ___
6. If such a course is not offered is there interest in offering such a course? Yes ____ No ____

D. Do you have a committee on nutrition responsible for review of current nutrition offerings? Yes ____ No ____

E. Do you have computer resources available for your students to use, e.g. nutrient analysis? Yes ____ No ____ If so, what are they? _____

_____

F. Do your students participate in nutrition care teams established in community settings? Yes ____ No ____
   1. If so, are they interdisciplinary? Yes ____ No ____
   2. What disciplines participate on these teams? _____

_____

G. Does your school operate nutrition counseling clinics or facilities available on campus? Yes ____ No ____
   Who or what school operates the clinic? _____

_____

APPENDIX C

SURVEY QUESTIONNAIRE: NUTRITIONAL KNOWLEDGE COMPETENCIES AND NUTRITIONAL SKILLS COMPETENCIES

Nutrition Knowledge

Rate these competencies by circling 1, 2, 3, or 4 to the left and right of the appropriate competency.

To what extent do you place emphasis on this competency in your program of study?	To what extent should this competency be emphasized in your program of study?
1. No emphasis is given.	1. No emphasis should be given.
2. Some emphasis is given.	2. Some emphasis should be given.
3. Adequate emphasis is given.	3. Adequate emphasis should be given.
4. Great emphasis is given.	4. Great emphasis should be given.

1 2 3 4	1. Identify the major functions of specific nutrients.	1 2 3 4
1 2 3 4	2. Differentiate food sources of specific nutrients.	1 2 3 4
1 2 3 4	3. Describe the process of digestion, absorption transport, metabolism, and excretion of nutrients in the well individual.	1 2 3 4
1 2 3 4	4. Relate growth and development to nutrient requirements and utilization.	1 2 3 4
1 2 3 4	5. Relate the nutrient requirements and utilization throughout the life cycle.	1 2 3 4
1 2 3 4	6. Examine the physiologic and sensory changes of aging that influence nutrient intake and utilization.	1 2 3 4
1 2 3 4	7. Relate the pathophysiology of disease to metabolic changes affecting nutrient requirements, intake, and utilization.	1 2 3 4
	8. Determine the religious, ethnic, economic, philosophical, psychological, and community factors that may influence:	
1 2 3 4	(a) food habits and behavior	1 2 3 4
1 2 3 4	(b) vulnerability to food faddism	1 2 3 4
1 2 3 4	(c) food availability	1 2 3 4
	9. Determine the influence of the following therapies on nutrient requirements, intake, and utilization:	
1 2 3 4	(a) drug therapy	1 2 3 4
1 2 3 4	(b) radiation therapy	1 2 3 4
1 2 3 4	(c) surgical therapy	1 2 3 4

To what extent do you place emphasis on this competency in your program of study? 1. No emphasis is given. 2. Some emphasis is given. 3. Adequate emphasis is given. 4. Great emphasis is given.		To what extent should this competency be emphasized in your program of study? 1. No emphasis should be given. 2. Some emphasis should be given. 3. Adequate emphasis should be given. 4. Great emphasis should be given.
1 2 3 4	10. Define clinical signs and symptoms characteristic of specific nutrition disease precesses.	1 2 3 4
1 2 3 4	11. Identify nutritionally significant laboratory tests.	1 2 3 4
1 2 3 4	12. Explain the rationale of therapeutic diets.	1 2 3 4
1 2 3 4	13. Recognize drug-nutrient interrelations.	1 2 3 4
	14. Differentiate alternate nutrient sources:	
1 2 3 4	(a) total parenteral nutrition	1 2 3 4
1 2 3 4	(b) nutritionally complete enteral products, i.e. Vivonex, Sustacal	1 2 3 4
1 2 3 4	(c) supplemental enteral products, i.e. Controlyte, MCT	1 2 3 4
1 2 3 4	(d) diet products, i.e. low protein bread, sodium free foods, gluten free foods	1 2 3 4
1 2 3 4	15. Refer patient to the appropriate nutrition resources for information and materials.	1 2 3 4

Nutrition Skills

Rate these skills by circling 1, 2, 3, or 4 to the left and right of the appropriate skill.

To what extent do you place emphasis on this skill in your program of study?
1. No emphasis is given.
2. Some emphasis is given.
3. Adequate emphasis is given.
4. Great emphasis is given.

To what extent should this skill be emphasized in your program of study?
1. No emphasis should be given.
2. Some emphasis should be given.
3. Adequate emphasis should be given.
4. Great emphasis should be given.

1	2	3	4	1. Interview patient following established criteria for effective communication for nutrition history.	1	2	3	4
1	2	3	4	2. Interview family members or significant others to obtain family, social, medical and historical information and relate to nutritional status of the patient.	1	2	3	4
1	2	3	4	3. Consult with other health professionals to obtain nutritionally significant data.	1	2	3	4
1	2	3	4	4. Utilize the medical record or other available health record to obtain nutritionally significant data.	1	2	3	4
1	2	3	4	5. Identify the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	1	2	3	4
1	2	3	4	6. Order the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	1	2	3	4
1	2	3	4	7. Perform the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	1	2	3	4
1	2	3	4	8. Perform anthropometric measurements to obtain assessment data.	1	2	3	4
				9. Interpret the nutritional significance of the following data:				
1	2	3	4	(a) laboratory data	1	2	3	4
1	2	3	4	(b) nutritional history	1	2	3	4
1	2	3	4	(c) other historical data	1	2	3	4
1	2	3	4	(d) physical exam	1	2	3	4

To what extent do you place emphasis on this skill in your program of study? 1. No emphasis is given. 2. Some emphasis is given. 3. Adequate emphasis is given. 4. Great emphasis is given.		To what extent should this skill be emphasized in your program of study? 1. No emphasis should be given. 2. Some emphasis should be given. 3. Adequate emphasis should be given. 4. Great emphasis should be given.
1 2 3 4	10. Compare food intake data to estimated nutrient requirements.	1 2 3 4
	11. Perform nutrient analysis using:	
1 2 3 4	(a) food composition tables	1 2 3 4
1 2 3 4	(b) food product labels	1 2 3 4
1 2 3 4	12. Determine the influence of physical activity on nutrient requirements.	1 2 3 4
	13. Define nutritional needs based on the interpretation of the following data:	
1 2 3 4	(a) laboratory tests	1 2 3 4
1 2 3 4	(b) nutritional history	1 2 3 4
1 2 3 4	(c) other historical data	1 2 3 4
1 2 3 4	(d) physical exam	1 2 3 4
1 2 3 4	14. Determine patient's ability and willingness to assume responsibility for his own nutritional care.	1 2 3 4
1 2 3 4	15. Evaluate the patient's learning ability considering education, level of motivation, acceptance of the medical condition, and possible changes in life style.	1 2 3 4
1 2 3 4	16. Utilize the U.S. Recommended Dietary Allowances to estimate nutrient requirements.	1 2 3 4
1 2 3 4	17. Calculate nutrient requirements for individuals in various states of health and disease.	1 2 3 4
1 2 3 4	18. Determine dietary modifications that will promote maintenance of health and prevention of disease.	1 2 3 4
1 2 3 4	19. Determine nutrient requirements necessary to treat specific disorders.	1 2 3 4
1 2 3 4	20. Determine the appropriate method(s) (i.e. parenteral, enteral, or oral) to provide adequate intake based on assessment.	1 2 3 4

To what extent do you place emphasis on this skill in your program of study?	To what extent should this skill be emphasized in your program of study?
1. No emphasis is given.	1. No emphasis should be given.
2. Some emphasis is given.	2. Some emphasis should be given.
3. Adequate emphasis is given.	3. Adequate emphasis should be given.
4. Great emphasis is given.	4. Great emphasis should be given.

		21. Prescribe appropriate nutritional feedings:	
1 2 3 4		(a) total parenteral nutrition solutions	1 2 3 4
1 2 3 4		(b) nutritionally complete enteral feedings products	1 2 3 4
1 2 3 4		(c) supplemental enteral feedings products	1 2 3 4
1 2 3 4		(d) diet products	1 2 3 4
1 2 3 4	22.	Design diets for the prevention and treatment of disease states based on patient's needs and food preferences.	1 2 3 4
1 2 3 4	23.	Plan nutritionally adequate meal patterns considering food preferences, beliefs, customs, and health status of the patient.	1 2 3 4
1 2 3 4	24.	Coordinate the nutritional requirements of the patients with the food service system.	1 2 3 4
1 2 3 4	25.	Plan nutrition related learning experiences based on knowledge of the teaching-learning process and educational strategies.	1 2 3 4
1 2 3 4	26.	Design nutrition education materials to meet specified needs of patients.	1 2 3 4
1 2 3 4	27.	Implement nutrition related learning experiences to meet identified needs of individuals or groups.	1 2 3 4
1 2 3 4	28.	Counsel patient, family, or significant others on normal and/or therapeutic nutrition.	1 2 3 4
1 2 3 4	29.	Elicit feedback from the patient regarding his response to the established plan of nutritional care.	1 2 3 4
1 2 3 4	30.	Evaluate the effectiveness of nutrition related learning experiences.	1 2 3 4
	31.	Determine the need for dietary intervention based on:	
1 2 3 4		(a) course of illness	1 2 3 4
1 2 3 4		(b) patient's physical response to previous diet modifications	1 2 3 4
1 2 3 4		(c) patient's attitude to previous diet modifications	1 2 3 4

To what extent do you place emphasis on this skill in your program of study? 1. No emphasis is given. 2. Some emphasis is given. 3. Adequate emphasis is given. 4. Great emphasis is given.		To what extent should this skill be emphasized in your program of study? 1. No emphasis should be given. 2. Some emphasis should be given. 3. Adequate emphasis should be given. 4. Great emphasis should be given.
1 2 3 4	32. Integrate consultation with health care and community personnel to coordinate nutritional management of the patient.	1 2 3 4
1 2 3 4	33. Participate in multidisciplinary health team activities, i.e. case conferences, medical rounds and educational programs in the provision of optimal nutritional care.	1 2 3 4
1 2 3 4	34. Integrate established nutrition care plans and schedules of other health services.	1 2 3 4
1 2 3 4	35. Monitor response to nutrition interventions.	1 2 3 4
1 2 3 4	36. Verify the authenticity of patient's response to nutrition care plan using laboratory and clinical assessment data.	1 2 3 4
1 2 3 4	37. Recognize any deviations from the expected outcomes of nutrition care.	1 2 3 4
1 2 3 4	38. Modify plan of nutritional care based on patient's progress.	1 2 3 4
1 2 3 4	39. Determine the human resources (health professionals, auxiliary personnel, family and/or significant others) that can facilitate nutritional care.	1 2 3 4
1 2 3 4	40. Establish a plan for the follow-up care utilizing appropriate human resources.	1 2 3 4
1 2 3 4	41. Interact with community health services and other health professionals to provide follow-up nutritional care of the patient.	1 2 3 4
1 2 3 4	42. Document in the S.O.A.P. format clear, concise, and relevant nutrition progress notes including diagnostic, therapeutic, and patient education plans.	1 2 3 4
1 2 3 4	43. Critique nutrition related literature that is published and marketed for professional and public consumers.	1 2 3 4
1 2 3 4	44. Critique media programing (radio, television, films) on nutrition related topics.	1 2 3 4

To what extent do you place emphasis on this skill in your program of study?	To what extent should this skill be emphasized in your program of study?
1. No emphasis is given.	1. No emphasis should be given.
2. Some emphasis is given.	2. Some emphasis should be given.
3. Adequate emphasis is given.	3. Adequate emphasis should be given.
4. Great emphasis is given.	4. Great emphasis should be given.

1	2	3	4	45. Determine the availability and scope of community health services that provide nutrition information.	1	2	3	4
1	2	3	4	46. Determine material resources available to the providers and recipients of nutrition care.	1	2	3	4
1	2	3	4	47. Interpret health care legislation and regulatory guidelines as they influence the nutrition welfare of patients.	1	2	3	4
1	2	3	4	48. Maintain current knowledge of health care legislation and regulatory guidelines affecting the nutrition welfare of patients, i.e. PSRO, Medicare, Maternal Child Health.	1	2	3	4
1	2	3	4	49. Evaluate the quality of nutrition research.	1	2	3	4
1	2	3	4	50. Interpret research findings as they relate to nutrition care.	1	2	3	4
1	2	3	4	51. Utilize current research data to promote progressive practices in the provision of nutrition care.	1	2	3	4
1	2	3	4	52. Provide nutrition education and consultation service to personnel within the health care system.	1	2	3	4
1	2	3	4	53. Organize nutritional information for accurate, clear and concise presentation (oral and written).	1	2	3	4
1	2	3	4	54. Deliver presentations on nutrition information.	1	2	3	4

Additional Comments:

1. If you were entering the Nursing Program this fall, what recommendations would you make for improvement in the nutrition education curriculum as compared to the program in which you are presently enrolled?

2. Rate your overall preparation in nutrition:

   Excellent____ Good____ Fair____ Poor____

APPENDIX D

SAMPLE LETTER TO PERSONS IN SURVEY

NELL HODGSON WOODRUFF
SCHOOL OF NURSING
EMORY UNIVERSITY
Atlanta, Georgia 30322

In October 1979 an HEW curriculum development grant was awarded to Emory University to expand and improve education in applied nutrition in the curricula as it pertains to nurses, physicians, dentists, dietitians and physical associates. The major purpose of the three-year project is to develop interdisciplinary learning experiences in applied nutrition for these students.

One of the activities for the project is to survey nursing, medical, dental, dietetic and physician associate schools to determine how much emphasis is given to nutrition in their curricula; also to determine what specific nutrition related topics are covered and the emphasis given to these topics. The results of the survey will be used as baseline information to delineate the various roles of the individual disciplines in applied nutrition and to plan new course offerings and learning experiences.

Your evaluation will help us in making revisions and improvements in the existing nutrition education of the various programs and to establish standards and criteria for the students. Please complete the survey at your earliest convenience. Feel free to make additional observations in the "comment" space provided on the final page.

After completing the form, please return it in the enclosed, addressed, stamped envelope. Your prompt mailing of the questionnaire will be appreciated. Thank you for your assistance. We are looking forward to hearing from you.

Sincerely yours,

Edna M. Grexton, ~~Dr. P.H.~~
Dean and Professor

EMG:l
Encls.

APPENDIX E

NUTRITION KNOWLEDGE AND SKILLS COMPETENCY SURVEY RESULTS TABLES

TABLE XVII

NUTRITION KNOWLEDGE COMPETENCY SURVEY RESULTS--
STUDENTS AND ALUMNI IN MEDICINE

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Identify the major functions of specific nutrients.	219 209	2.41 2.71	-4.31	.0001
Differentiate food sources of specific nutrients.	210 209	2.09 2.61	-6.88	.0001
Describe the process of digestion, absorption transport, metabolism, and excretion of nutrients in the well individual.	219 209	3.05 2.96	1.28	.0001
Relate growth and development to nutrient requirements and utilization.	218 209	2.29 2.64	-4.43	.0001
Relate the nutrient requirements and utilization throughout the life cycle.	218 209	1.93 2.44	-6.54	.0001
Examine the physiologic and sensory changes of aging that influence nutrient intake and utilization.	217 209	1.65 2.47	-10.13	.0001
Relate the pathophysiology of disease to metabolic changes affecting nutrient requirements, intake, and utilization.	216 205	2.27 3.07	-10.29	.0001
Determine the religious, ethnic, economic, philosophical, psychological, and community factors that may influence:				
1. food habits and behavior	218 209	1.80 2.31	-6.37	.0001
2. vulnerability to food faddism	218 209	1.75 2.23	-6.12	.0001
3. food availability	218 208	1.85 2.31	-5.77	.0001

TABLE XVII (Continued)

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Determine the influence of the following therapies on nutrient requirements, intake, and utilization:				
1. drug therapy	218 209	2.08 2.96	-11.66	.0001
2. radiation therapy	218 209	1.79 2.69	-11.01	.0001
3. surgical therapy	218 208	2.30 3.03	-9.22	.0001
Define clinical signs and symptoms characteristic of specific nutrition disease processes.	218 207	2.47 3.10	-8.78	.0001
Identify nutritionally significant laboratory tests.	218 205	2.30 3.03	-9.53	.0001
Explain the rationale of therapeutic diets.	216 206	2.23 2.90	-8.32	.0001
Recognize drug-nutrient interrelations.	217 205	1.93 2.84	-12.18	.0001
Differentiate alternate nutrient sources:				
1. total parenteral nutrition	217 207	2.32 3.13	-9.02	.0001
2. nutritionally complete enteral products, i.e., Vivonex, Sustacal	218 208	2.12 3.08	-11.11	.0001
3. supplemental enteral products, i.e., Controlyte, MCT	216 206	1.84 2.90	-12.08	.0001
4. diet products, i.e., low protein bread, sodium free foods, gluten free foods	214 205	1.99 2.90	-10.99	.0001
Refer patient to the appropriate nutrition resources for information and materials.	217 208	2.23 2.92	-7.94	.0001

*First mean=real; second mean=ideal

TABLE XVIII

NUTRITION SKILLS COMPETENCY SURVEY RESULTS--
STUDENTS AND ALUMNI IN MEDICINE

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Interview patient following established criteria for effective communication for nutrition history.	217 208	1.96 2.37	-5.17	.0001
Interview family members or significant others to obtain family, social, medical, and historical information and relate to nutritional status of the patients.	217 207	2.12 2.34	-2.67	.0001
Consult with other health professionals to obtain nutritionally significant data.	216 205	2.41 2.74	-4.23	.0001
Utilize the medical record or other available health record to obtain nutritionally significant data.	217 205	2.21 2.49	-3.52	.0001
Identify the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	215 205	2.31 2.91	-7.66	.0001
Order the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	212 201	2.27 2.90	-7.70	.0001
Perform the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	210 198	2.12 2.77	-7.77	.0001
Perform anthropometric measurements to obtain assessment data.	211 197	1.64 2.08	-5.49	.0001
Interpret the nutritional significance of the following data:				
1. laboratory data	216 206	2.55 3.07	-6.82	.0001
2. nutritional history	216 209	2.21 2.73	-6.68	.0001

TABLE XVIII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
	218	2.33		
3. other historical data	209	2.77	-5.25	.0001
	218	2.70		
4. physical examination	209	3.04	-4.03	.0001
Compare food intake data to estimated nutrient requirements.	211	1.91		
	200	2.41	-6.18	.0001
Perform nutrient analysis using:				
	211	1.49		
1. food composition tables	199	1.90	-5.69	.0001
	211	1.50		
2. food product labels	199	1.92	-5.69	.0001
Determine the influence of physical activity on nutrient requirements.	209	2.02		
	195	2.50	-5.85	.0001
Define nutritional needs based on the interpretation of the following data:				
	209	2.17		
1. laboratory tests	196	2.80	-7.96	.0001
	208	2.02		
2. nutritional history	196	2.62	-7.92	.0001
	208	2.03		
3. other historical data	196	2.57	-6.76	.0001
	207	2.35		
4. physical examination	196	2.81	-5.58	.0001
Determine patient's ability and willingness to assume responsibility for his own nutritional care.	210	2.32		
	200	2.62	-3.39	.0001
Evaluate patient's learning ability, considering education, level of motivation, acceptance of the medical condition, and possible changes in lifestyle.	208	2.37		
	199	2.56	-2.21	.0001
Utilize the U.S. Recommended Dietary Allowances to estimate nutrient requirements.	211	1.85		
	201	2.28	-5.45	.0001

TABLE XVIII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Calculate nutrient requirements for individuals in various states of health and disease.	211 201	1.93 2.82	-10.46	.0001
Determine dietary modifications that will promote maintenance of health and prevention of disease.	211 201	2.08 2.83	-9.28	.0001
Determine nutrient requirements necessary to treat specific disorders.	211 201	2.13 2.87	-9.02	.0001
Determine appropriate method(s) (i.e., parenteral, enteral, or oral) to provide adequate intake based on assessment.	210 201	2.30 3.03	-8.33	.0001
Prescribe appropriate nutritional feedings:				
1. total parenteral nutrition solutions	210 202	1.98 2.97	-10.53	.0001
2. nutritionally complete enteral feedings products	210 202	1.98 2.95	-10.88	.0001
3. supplemental enteral feedings products	210 202	1.95 2.90	-10.83	.0001
4. diet products	209 201	1.79 2.68	-10.67	.0001
Design diets for the prevention and treatment of disease states based on patient's needs and food preferences.	209 199	1.72 2.37	-7.78	.0001
Plan nutritionally adequate meal patterns considering food preferences, beliefs, customs, and health status of the patient.	209 199	1.62 2.07	-5.68	.0001
Coordinate the nutritional requirements of the patients with the food service system.	211 201	1.65 2.05	-4.97	.0001

TABLE XVIII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Plan nutrition-related learning experiences based on knowledge of the teaching-learning process and educational strategies.	210 201	1.44 1.77	-4.60	.0001
Design nutrition education materials to meet specified needs of patients.	211 202	1.39 1.75	-4.90	.0001
Implement nutrition-related learning experiences to meet identified needs of individuals or groups.	211 201	1.35 1.77	-5.89	.0001
Counsel patient, family, or significant others on normal and/or therapeutic nutrition.	211 202	1.94 2.40	-5.70	.0001
Elicit feedback from the patient regarding his response to the established plan of nutritional care.	211 202	1.90 2.34	-5.24	.0001
Evaluate the effectiveness of nutrition-related learning experiences.	210 201	1.57 1.98	-5.44	.0001
Determine the need for dietary intervention based on:				
1. course of illness	210 201	2.14 2.75	-7.90	.0001
2. patient's physical response to previous diet modifications	209 200	2.05 2.60	-6.87	.0001
3. patient's attitude to previous diet modifications	210 201	2.01 2.44	-5.35	.0001
Integrate counsultation with health care and community personnel to coordinate nutritional management of the patient.	208 199	1.98 2.44	-5.24	.0001
Participate in multidisciplinary health team activities, i.e., case conferences, medical rounds, and educational programs in the provision of optimal nutritional care.	207 199	1.99 2.34	-4.18	.0001

TABLE XVIII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Integrate established nutrition care plans and schedules of other health services.	207 198	1.76 2.13	-4.36	.0001
Monitor response to nutrition interventions.	208 199	1.95 2.44	-6.00	.0001
Verify the authenticity of patient's response to nutrition care plan using laboratory and clinical assessment data.	209 200	2.01 2.51	-5.74	.0001
Recognize any deviations from the expected outcomes of nutrition care.	208 198	1.93 2.51	-6.97	.0001
Modify plan of nutritional care based on patient's progress.	208 199	1.95 2.54	-7.39	.0001
Determine the human resources (health professionals, auxiliary personnel, family, and/or significant others) that can facilitate nutritional care.	207 199	2.09 2.47	-4.27	.0001
Establish a plan for the follow-up care utilizing appropriate human resources.	208 199	1.88 2.37	-5.73	.0001
Interact with community health services and other health professionals to provide follow-up nutritional care of the patient.	208 199	1.89 2.34	-5.03	.0001
Document in the S.O.A.P format clear, concise, and relevant nutrition progress notes, including diagnostic, therapeutic, and patient education plans.	207 199	2.12 2.25	-1.40	.1621
Critique nutrition-related literature that is published and marketed for professional and public consumers.	209 200	1.76 2.23	-5.25	.0001
Critique media programming (radio, television, films) on nutrition-related topics.	208 199	1.76 2.19	-4.86	.0001

TABLE XVIII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Determine availability and scope of community health services that provide nutrition information.	208 198	1.61 2.17	-7.21	.0001
Determine material resources available to the providers and recipients of nutrition care.	207 197	1.60 2.14	-7.02	.0001
Interpret health care legislation and regulatory guidelines as they influence nutrition welfare of patients.	208 198	1.48 2.02	-6.89	.0001
Maintain current knowledge of health care legislation and regulatory guidelines affecting nutrition welfare of patients, i.e., PSRO, Medicare, and Maternal Child Health.	207 198	1.47 2.09	-7.91	.0001
Evaluate the quality of nutrition research.	208 197	1.60 1.98	-7.91	.0001
Interpret research findings as they relate to nutrition care.	208 198	1.73 2.12	-4.61	.0001
Utilize current research data to promote progressive practices in the provision of nutrition care.	208 198	1.61 2.13	-6.50	.0001
Provide nutrition education and consultation service to personnel within the health care system.	208 197	1.52 1.95	-5.34	.0001
Organize nutritional information for accurate, clear, and concise presentation (oral and written).	208 198	1.61 1.89	-3.53	.0005
Deliver presentations on nutrition information.	208 198	1.51 1.78	-3.58	.0004

*First mean=real; second mean=ideal

TABLE XIX

NUTRITION KNOWLEDGE COMPETENCY SURVEY RESULTS--
STUDENTS AND ALUMNI IN DENTISTRY

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Identify the major functions of specific nutrients.	210 208	2.39 2.58	-2.73	.0066
Differentiate food sources of specific nutrients.	210 208	2.48 2.65	-2.44	.0150
Describe the process of digestion, absorption transport, metabolism, and excretion of nutrients in the well individual.	211 206	2.95 2.46	5.82	.0001
Relate growth and development to nutrient requirements and utilization.	210 207	2.40 2.66	-3.22	.0014
Relate the nutrient requirements and utilization throughout the life cycle.	209 207	2.07 2.38	-4.00	.0001
Examine the physiologic and sensory changes of aging that influence nutrient intake and utilization.	209 206	1.78 2.62	-6.09	.0001
Relate the pathophysiology of disease to metabolic changes affecting nutrient requirements, intake, and utilization.	210 026	2.36 2.73	-4.84	.0001
Determine the religious, ethnic, economic, philosophical, psychological, and community factors that may influence:				
1. food habits and behavior	210 208	1.69 2.21	-6.77	.0001
2. vulnerability to food faddism	210 208	1.90 2.16	-3.24	.0012
3. food availability	210 208	1.78 2.13	-4.23	.0001

TABLE XIX (Continued)

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Determine the influence of the following therapies on nutrient requirements, intake, and utilization:				
1. drug therapy	211 206	2.25 2.97	-8.83	.0001
2. radiation therapy	211 206	2.16 2.48	-6.51	.0001
3. surgical therapy	210 207	2.41 3.09	-8.08	.0001
Define clinical signs and symptoms characteristic of specific nutrition disease processes.	211 207	2.53 3.04	-6.77	.0001
Identify nutritionally significant laboratory tests.	211 207	1.82 2.43	-7.33	.0001
Explain the rationale of therapeutic diets.	210 206	1.92 2.47	-6.88	.0001
Recognize drug-nutrient interrelations.	209 206	2.02 2.80	-10.10	.0001
Differentiate alternate nutrient sources:				
1. total parenteral nutrition	211 207	1.66 2.13	-5.89	.0001
2. nutritionally complete enteral products, i.e., Vivonex, Sustacal	211 207	1.54 2.07	-6.57	.0001
3. supplemental enteral products, i.e., Controlyte, MCT	211 207	1.43 2.01	-7.58	.0001
4. diet products, i.e., low protein bread, sodium free foods, gluten free foods	211 207	1.60 2.23	-8.40	.0001
Refer patient to the appropriate nutrition resources for information and materials.	210 206	2.18 2.76	-6.48	.0001

*First mean=real; second mean=ideal

TABLE XX

NUTRITION SKILLS COMPETENCY SURVEY RESULTS--
STUDENTS AND ALUMNI IN DENTISTRY

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Interview patient following established criteria for effective communication for nutrition history.	210 205	2.10 2.25	-2.00	.0462
Interview family members or significant others to obtain family, social, medical, and historical information and relate to nutritional status of the patients.	210 205	1.90 2.17	-3.25	.0013
Consult with other health professionals to obtain nutritionally significant data.	211 206	2.14 2.48	-3.98	.0001
Utilize the medical record or other available health record to obtain nutritionally significant data.	211 206	2.05 2.47	-4.87	.0001
Identify the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	211 206	1.73 2.36	-7.83	.0001
Order the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	210 205	1.60 2.22	-7.45	.0001
Perform the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	209 204	1.47 2.09	-7.59	.0001
Perform anthropometric measurements to obtain assessment data.	209 197	1.21 1.60	-5.85	.0001
Interpret the nutritional significance of the following data:				
1. laboratory data	210 205	1.84 2.41	-6.93	.0001
2. nutritional history	210 207	2.10 2.45	-4.14	.0001

TABLE XX (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
3. other historical data	210 207	1.96 2.40	-5.27	.0001
4. physical examination	210 207	1.91 2.48	-6.25	.0001
Compare food intake data to estimated nutrient requirements.	207 201	2.18 2.27	-1.05	.2933
Perform nutrient analysis using:				
1. food composition tables	207 200	1.79 1.99	-2.49	.0132
2. food product labels	207 200	1.83 2.02	-2.39	.0171
Determine the influence of physical activity on nutrient requirements.	207 200	1.90 2.17	-4.05	.0001
Define nutritional needs based on the interpretation of the following data:				
1. laboratory tests	206 198	1.70 2.20	-6.08	.0001
2. nutritional history	206 199	1.96 2.31	-4.23	.0001
3. other historical data	206 199	1.80 2.23	-5.17	.0001
4. physical examination	206 198	1.74 2.36	-7.16	.0001
Determine patient's ability and willingness to assume responsibility for his own nutritional care.	206 199	2.13 2.59	-5.73	.0001
Evaluate patient's learning ability, considering education, level of motivation, acceptance of the medical condition, and possible changes in lifestyle.	205 199	2.11 2.61	-6.08	.0001
Utilize the U.S. Recommended Dietary Allowances to estimate nutrient requirements.	206 201	2.36 2.39	-0.47	.6407

TABLE XX (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Calculate nutrient requirements for individuals in various states of health and disease.	207 202	1.57 2.36	-10.07	.0001
Determine dietary modifications that will promote maintenance of health and prevention of disease.	206 201	1.90 2.59	-8.92	.0001
Determine nutrient requirements necessary to treat specific disorders.	206 201	1.70 2.38	-8.04	.0001
Determine appropriate method(s) (i.e., parenteral, enteral, or oral) to provide adequate intake based on assessment.	205 200	1.44 2.13	-8.61	.0001
Prescribe appropriate nutritional feedings:				
1. total parenteral nutrition solutions	205 201	1.26 1.80	-7.74	.0001
2. nutritionally complete enteral feedings products	205 201	1.29 1.83	-7.48	.0001
3. supplemental enteral feedings products	205 201	1.37 1.90	-7.04	.0001
4. diet products	204 201	1.45 2.01	-7.64	.0001
Design diets for the prevention and treatment of disease states based on patient's needs and food preferences.	203 199	1.52 2.15	-7.78	.0001
Plan nutritionally adequate meal patterns considering food preferences, beliefs, customs, and health status of the patient.	204 200	1.60 1.98	-4.72	.0001
Coordinate the nutritional requirements of the patients with the food service system.	204 200	1.38 1.72	-4.56	.0001

TABLE XX (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Plan nutrition-related learning experiences based on knowledge of the teaching-learning process and educational strategies.	203 200	1.53 1.82	-3.73	.0002
Design nutrition education materials to meet specified needs of patients.	204 199	1.56 1.92	-4.41	.0001
Implement nutrition-related learning experiences to meet identified needs of individuals or groups.	204 199	1.51 1.86	-4.56	.0001
Counsel patient, family, or significant others on normal and/or therapeutic nutrition.	204 200	1.90 2.33	-5.18	.0001
Elicit feedback from the patient regarding his response to the established plan of nutritional care.	204 200	1.75 2.23	-6.15	.0001
Evaluate the effectiveness of nutrition-related learning experiences.	204 200	1.57 1.97	-5.48	.0001
Determine the need for dietary intervention based on:				
1. course of illness	203 199	1.71 2.34	-7.54	.0001
2. patient's physical response to previous diet modifications	203 198	1.60 2.21	-7.69	.0001
3. patient's attitude to previous diet modifications	203 198	1.65 2.15	-6.21	.0001
Integrate counsultation with health care and community personnel to coordinate nutritional management of the patient.	207 203	1.65 2.14	-5.97	.0001
Participate in multidisciplinary health team activities, i.e., case conferences, medical rounds, and educational programs in the provision of optimal nutritional care.	207 203	1.64 2.11	-5.30	.0001

TABLE XX (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Integrate established nutrition care plans and schedules of other health services.	205 200	1.47 1.94	-6.08	.0001
Monitor response to nutrition interventions.	207 201	1.47 1.96	-6.55	
Verify the authenticity of patient's response to nutrition care plan using laboratory and clinical assessment data.	207 201	1.36 1.96	-8.02	.0001
Recognize any deviations from the expected outcomes of nutrition care.	207 202	1.40 2.12	-8.70	.0001
Modify plan of nutritional care based on patient's progress.	206 201	1.46 2.08	-8.23	.0001
Determine the human resources (health professionals, auxiliary personnel, family, and/or significant others) that can facilitate nutritional care.	206 200	1.85 2.41	-6.59	.0001
Establish a plan for the follow-up care utilizing appropriate human resources.	206 199	1.59 2.12	-6.47	.0001
Interact with community health services and other health professionals to provide follow-up nutritional care of the patient.	206 201	1.61 2.21	-7.35	.0001
Document in the S.O.A.P format clear, concise, and relevant nutrition progress notes, including diagnostic, therapeutic, and patient education plans.	204 201	1.46 2.05	-7.13	.0001
Critique nutrition-related literature that is published and marketed for professional and public consumers.	205 202	1.86 2.25	-4.52	.0001
Critique media programming (radio, television, films) on nutrition-related topics.	205 202	1.95 2.33	-4.25	.0001

TABLE XX (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Determine availability and scope of community health services that provide nutrition information.	202 200	1.72 2.18	-5.79	.0001
Determine material resources available to the providers and recipients of nutrition care.	201 200	1.69 2.13	-5.49	.0001
Interpret health care legislation and regulatory guidelines as they influence nutrition welfare of patients.	204 201	1.61 2.02	-4.98	.0001
Maintain current knowledge of health care legislation and regulatory guidelines affecting nutrition welfare of patients, i.e., PSRO, Medicare, and Maternal Child Health.	203 200	1.58 2.06	-6.15	.0001
Evaluate the quality of nutrition research.	204 200	1.72 2.04	-3.81	.0002
Interpret research findings as they relate to nutrition care.	203 198	1.82 2.05	-2.63	.0088
Utilize current research data to promote progressive practices in the provision of nutrition care.	204 200	1.67 2.05	-4.64	.0001
Provide nutrition education and consultation service to personnel within the health care system.	204 200	1.67 2.08	-5.07	.0001
Organize nutritional information for accurate, clear, and concise presentation (oral and written).	203 201	1.79 2.15	-4.65	.0001
Deliver presentations on nutrition information.	204 200	1.74 2.12	-4.40	.0001

*First mean=real; second mean=ideal

TABLE XXI

NUTRITION KNOWLEDGE COMPETENCY SURVEY RESULTS--
STUDENTS AND ALUMNI IN NURSING

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Identify the major functions of specific nutrients.	185 182	2.49 3.00	-6.63	.0001
Differentiate food sources of specific nutrients.	183 181	2.58 3.09	-6.32	.0001
Describe the process of digestion, absorption transport, metabolism, and excretion of nutrients in the well individual.	184 180	2.97 3.11	-1.69	.0001
Relate growth and development to nutrient requirements and utilization.	185 182	2.72 3.17	-5.11	.0001
Relate the nutrient requirements and utilization throughout the life cycle.	183 181	2.55 3.09	-6.32	.0001
Examine the physiologic and sensory changes of aging that influence nutrient intake and utilization.	184 181	2.61 2.93	-3.37	.0008
Relate the pathophysiology of disease to metabolic changes affecting nutrient requirements, intake, and utilization.	181 178	2.59 3.34	-8.80	.0001
Determine the religious, ethnic, economic, philosophical, psychological, and community factors that may influence:				
1. food habits and behavior	185 181	2.50 2.91	-4.36	.0001
2. vulnerability to food faddism	185 182	2.39 2.66	-2.92	.0037
3. food availability	185 181	2.34 2.85	-5.49	.0001

TABLE XXI (Continued)

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Determine the influence of the following therapies on nutrient requirements, intake, and utilization:				
1. drug therapy	185 182	2.23 2.38	-13.99	.0001
2. radiation therapy	184 179	2.09 3.13	-11.14	.0001
3. surgical therapy	184 180	2.48 2.34	-9.73	.0001
Define clinical signs and symptoms characteristic of specific nutrition disease processes.	184 180	2.34 3.06	-9.14	.0001
Identify nutritionally significant laboratory tests.	183 179	1.88 2.95	-12.17	.0001
Explain the rationale of therapeutic diets.	184 181	2.68 3.32	-8.11	.0001
Recognize drug-nutrient interrelations.	184 181	1.95 3.20	-16.21	.0001
Differentiate alternate nutrient sources:				
1. total parenteral nutrition	184 181	2.50 3.27	-7.72	.0001
2. nutritionally complete enteral products, i.e., Vivonex, Sustacal	184 181	2.19 3.21	-11.12	.0001
3. supplemental enteral products, i.e., Controlyte, MCT	184 181	1.84 2.98	-12.04	.0001
4. diet products, i.e., low protein bread, sodium free foods, gluten free foods	284 178	2.27 3.16	-10.48	.0001
Refer patient to the appropriate nutrition resources for information and materials.	183 180	2.64 3.19	-5.81	.0001

*First mean=real; second mean=ideal

TABLE XXII

NUTRITION SKILLS COMPETENCY SURVEY RESULTS--
STUDENTS AND ALUMNI IN NURSING

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Interview patient following established criteria for effective communication for nutrition history.	183 178	2.89 2.97	-0.91	.3629
Interview family members or significant others to obtain family, social, medical, and historical information and relate to nutritional status of the patients.	183 176	2.87 2.94	-0.81	.4190
Consult with other health professionals to obtain nutritionally significant data.	183 179	2.81 3.06	-2.77	.0058
Utilize the medical record or other available health record to obtain nutritionally significant data.	183 178	2.84 3.00	-1.85	.0659
Identify the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	182 178	1.97 2.62	-7.46	.0001
Order the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	180 174	1.59 2.20	-6.76	.0001
Perform the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	179 175	1.55 2.16	-6.65	.0001
Perform anthropometric measurements to obtain assessment data.	171 166	1.89 2.17	-2.61	.0094
Interpret the nutritional significance of the following data:				
1. laboratory data	181 177	2.07 2.97	-10.26	.0001
2. nutritional history	182 181	2.68 2.89	-2.24	.0256

TABLE XXII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
	185	2.50		
3. other historical data	181	2.81	-3.10	.0021
	185	2.23		
4. physical examination	181	2.89	-6.63	.0001
Compare food intake data to estimated nutrient requirements.	181	2.54		
	176	2.77	-2.42	.0159
Perform nutrient analysis using:				
	181	2.06		
1. food composition tables	175	2.33	-2.73	.0066
	181	2.17		
2. food product labels	176	2.38	-2.12	.0341
Determine the influence of physical activity on nutrient requirements.	181	2.06		
	175	2.33	-2.73	.0066
Define nutritional needs based on the interpretation of the following data:				
	181	2.17		
1. laboratory tests	176	2.38	-2.13	.0341
	181	2.50		
2. nutritional history	177	2.78	-3.14	.0018
	178	2.31		
3. other historical data	174	2.70	-4.34	.0001
	180	2.10		
4. physical examination	176	2.74	-7.24	.0001
Determine patient's ability and willingness to assume responsibility for his own nutritional care.	181	2.96		
	175	3.15	-2.34	.0198
Evaluate patient's learning ability, considering education, level of motivation, acceptance of the medical condition, and possible changes in lifestyle.	181	3.17		
	177	3.22	-0.57	.5690
Utilize the U.S. Recommended Dietary Allowances to estimate nutrient requirements.	181	2.69		
	177	2.68	-0.07	.9409

TABLE XXII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Calculate nutrient requirements for individuals in various states of health and disease.	181 176	2.14 2.68	-5.87	.0001
Determine dietary modifications that will promote maintenance of health and prevention of disease.	181 177	2.49 2.97	-5.57	.0001
Determine nutrient requirements necessary to treat specific disorders.	181 177	2.04 2.61	-6.36	.0001
Determine appropriate method(s) (i.e., parenteral, enteral, or oral) to provide adequate intake based on assessment.	181 177	2.15 2.73	-6.08	.0001
Prescribe appropriate nutritional feedings:				
1. total parenteral nutrition solutions	181 178	1.60 2.24	-6.61	.0001
2. nutritionally complete enteral feedings products	181 178	1.60 2.24	-6.60	.0001
3. supplemental enteral feedings products	181 178	1.61 2.26	-6.80	.0001
4. diet products	181 178	1.73 2.33	-6.30	.0001
Design diets for the prevention and treatment of disease states based on patient's needs and food preferences.	183 178	1.95 2.44	-5.50	.0001
Plan nutritionally adequate meal patterns considering food preferences, beliefs, customs, and health status of the patient.	183 179	2.33 2.54	-2.35	.0194
Coordinate the nutritional requirements of the patients with the food service system.	182 179	2.21 2.70	-4.95	.0001

TABLE XXII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Plan nutrition-related learning experiences based on knowledge of the teaching-learning process and educational strategies.	178 173	2.37 2.55	-1.86	.0631
Design nutrition education materials to meet specified needs of patients.	183 179	2.13 2.45	-3.39	.0008
Implement nutrition-related learning experiences to meet identified needs of individuals or groups.	181 177	2.18 2.45	-2.78	.0057
Counsel patient, family, or significant others on normal and/or therapeutic nutrition.	183 179	2.45 2.85	-4.47	.0001
Elicit feedback from the patient regarding his response to the established plan of nutritional care.	181 177	2.77 2.97	-2.28	.0234
Evaluate the effectiveness of nutrition-related learning experiences.	182 176	2.54 2.74	-2.17	.0307
Determine the need for dietary intervention based on:				
	181	2.29		
1. course of illness	177	2.92	-7.40	.0001
2. patient's physical response to previous diet modifications	182 178	2.25 2.84	-6.69	.0001
3. patient's attitude to previous diet modifications	182 178	2.51 2.90	-4.44	.0001
Integrate counsultation with health care and community personnel to coordinate nutritional management of the patient.	180 177	2.40 2.74	-3.88	.0008
Participate in multidisciplinary health team activities, i.e., case conferences, medical rounds, and educational programs in the provision of optimal nutritional care.	180 177	2.52 2.90	-3.73	.0002

TABLE XXII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Integrate established nutrition care plans and schedules of other health services.	180 177	2.38 2.76	-3.74	.0002
Monitor response to nutrition interventions.	180 177	2.40 2.95	-6.15	.0001
Verify the authenticity of patient's response to nutrition care plan using laboratory and clinical assessment data.	180 176	1.96 2.70	-7.97	.0001
Recognize any deviations from the expected outcomes of nutrition care.	181 176	2.18 2.80	-7.12	.0001
Modify plan of nutritional care based on patient's progress.	180 176	2.27 2.81	-6.17	.0001
Determine the human resources (health professionals, auxiliary personnel, family, and/or significant others) that can facilitate nutritional care.	181 177	2.85 3.02	-1.85	.0657
Establish a plan for the follow-up care utilizing appropriate human resources.	181 176	2.54 2.72	-1.95	.0523
Interact with community health services and other health professionals to provide follow-up nutritional care of the patient.	181 176	2.50 2.65	-1.52	.1298
Document in the S.O.A.P format clear, concise, and relevant nutrition progress notes, including diagnostic, therapeutic, and patient education plans.	180 175	2.83 2.81	0.20	.8386
Critique nutrition-related literature that is published and marketed for professional and public consumers.	181 177	1.85 2.28	-4.38	.0001
Critique media programming (radio, television, films) on nutrition-related topics.	181 177	1.94 2.35	-4.14	.0001

TABLE XXII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Determine availability and scope of community health services that provide nutrition information.	178 176	2.28 2.49	-2.21	.0275
Determine material resources available to the providers and recipients of nutrition care.	180 176	2.22 2.53	-3.36	.0008
Interpret health care legislation and regulatory guidelines as they influence nutrition welfare of patients.	180 174	1.72 2.17	-4.83	.0001
Maintain current knowledge of health care legislation and regulatory guidelines affecting nutrition welfare of patients, i.e., PSRO, Medicare, and Maternal Child Health.	180 176	1.68 2.30	-6.70	.0001
Evaluate the quality of nutrition research.	180 176	1.58 1.96	-4.30	.0001
Interpret research findings as they relate to nutrition care.	180 175	1.72 2.10	-4.27	.0001
Utilize current research data to promote progressive practices in the provision of nutrition care.	180 176	1.69 2.21	-5.80	.0001
Provide nutrition education and consultation service to personnel within the health care system.	180 176	1.82 2.26	-4.64	.0001
Organize nutritional information for accurate, clear, and concise presentation (oral and written).	180 175	2.09 2.36	-2.81	.0052
Deliver presentations on nutrition information.	180 175	1.98 2.27	-2.98	.0031

*First mean=real; second mean=ideal

TABLE XXIII

NUTRITION KNOWLEDGE COMPETENCY SURVEY RESULTS--
STUDENTS AND ALUMNI IN DIETETICS

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Identify the major functions of specific nutrients.	89 89	3.13 3.52	-3.44	.0007
Differentiate food sources of specific nutrients.	89 89	2.91 3.65	-6.33	.0001
Describe the process of digestion, absorption transport, metabolism, and excretion of nutrients in the well individual.	89 89	3.45 3.60	-1.40	.1638
Relate growth and development to nutrient requirements and utilization.	89 89	3.13 3.43	-2.42	.0165
Relate the nutrient requirements and utilization throughout the life cycle.	89 89	2.90 3.43	-4.68	.0001
Examine the physiologic and sensory changes of aging that influence nutrient intake and utilization.	89 89	2.35 3.09	-5.64	.0001
Relate the pathophysiology of disease to metabolic changes affecting nutrient requirements, intake, and utilization.	89 89	3.36 3.70	-3.35	.0010
Determine the religious, ethnic, economic, philosophical, psychological, and community factors that may influence:				
1. food habits and behavior	88 88	3.05 3.47	-3.93	.0001
2. vulnerability to food faddism	88 88	2.59 3.26	-5.54	.0001
3. food availability	88 88	2.76 3.17	-3.16	.0019

TABLE XXIII (Continued)

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Determine the influence of the following therapies on nutrient requirements, intake, and utilization:				
1. drug therapy	89 89	2.53 3.47	-7.26	.0001
2. radiation therapy	88 88	2.68 3.14	-3.17	.0018
3. surgical therapy	89 88	2.93 3.40	-3.87	.0002
Define clinical signs and symptoms characteristic of specific nutrition disease processes.	88 87	3.22 3.57	-3.08	.0023
Identify nutritionally significant laboratory tests.	89 88	3.36 3.66	-2.47	.0146
Explain the rationale of therapeutic diets.	89 89	2.53 3.47	-7.26	.0001
Recognize drug-nutrient interrelations.	88 88	2.68 3.14	-3.17	.0018
Differentiate alternate nutrient sources:				
1. total parenteral nutrition	89 88	2.74 2.39	-4.43	.0001
2. nutritionally complete enteral products, i.e., Vivonex, Sustacal	89 87	3.19 3.59	-3.23	.0015
3. supplemental enteral products, i.e., Controlyte, MCT	89 88	3.08 3.52	-3.45	.0007
4. diet products, i.e., low protein bread, sodium free foods, gluten free foods	89 88	2.84 3.48	-4.90	.0001
Refer patient to the appropriate nutrition resources for information and materials.	89 88	2.82 3.45	-5.08	.0001

*First mean=real; second mean=ideal

TABLE XXIV

NUTRITION SKILLS COMPETENCY SURVEY RESULTS--
STUDENTS AND ALUMNI IN DIETETICS

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Interview patient following established criteria for effective communication for nutrition history.	88 87	3.73 3.78	-0.60	.5500
Interview family members or significant others to obtain family, social, medical, and historical information and relate to nutritional status of the patients.	89 88	3.47 3.67	-1.89	.0607
Consult with other health professionals to obtain nutritionally significant data.	89 88	3.33 3.71	-3.71	.0003
Utilize the medical record or other available health record to obtain nutritionally significant data.	89 88	3.65 3.84	-2.08	.0388
Identify the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	87 87	2.93 3.51	-4.94	.0001
Order the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	88 86	2.35 3.21	-6.13	.0001
Perform the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	86 85	2.50 3.13	-4.57	.0001
Perform anthropometric measurements to obtain assessment data.	89 87	3.15 3.78	-1.75	.0814
Interpret the nutritional significance of the following data:				
1. laboratory data	89 88	3.26 3.70	-4.07	.0001
2. nutritional history	89 88	3.65 3.71	-0.71	.4812

TABLE XXIV (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
	89	3.25		
3. other historical data	88	3.49	-2.12	.0355
	89	2.70		
4. physical examination	88	2.30	-4.33	.0001
Compare food intake data to estimated nutrient requirements.	88	3.35		
	88	3.33	0.19	.8495
Perform nutrient analysis using:				
	89	3.42		
1. food composition tables	88	3.26	1.29	.1982
	89	3.08		
2. food product labels	88	3.32	-1.82	.0699
Determine the influence of physical activity on nutrient requirements.	88	2.80		
	87	3.42	-5.41	.0001
Define nutritional needs based on the interpretation of the following data:				
	89	3.21		
1. laboratory tests	87	3.71	-4.64	.0001
	89	3.52		
2. nutritional history	87	3.71	-2.17	.0310
	88	3.19		
3. other historical data	87	3.47	-2.56	.0114
	89	2.70		
4. physical examination	87	3.37	-5.21	.0001
Determine patient's ability and willingness to assume responsibility for his own nutritional care.	89	3.29		
	87	3.67	-3.46	.0007
Evaluate patient's learning ability, considering education, level of motivation, acceptance of the medical condition, and possible changes in lifestyle.	87	3.36		
	86	3.67	-2.87	.0046
Utilize the U.S. Recommended Dietary Allowances to estimate nutrient requirements.	88	3.26		
	87	3.24	0.17	.8679

TABLE XXIV (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Calculate nutrient requirements for individuals in various states of health and disease.	89 88	3.27 3.65	-3.85	.0002
Determine dietary modifications that will promote maintenance of health and prevention of disease.	89 87	3.46 3.75	-2.86	.0047
Determine nutrient requirements necessary to treat specific disorders.	89 88	3.18 3.65	-4.22	.0001
Determine appropriate method(s) (i.e., parenteral, enteral, or oral) to provide adequate intake based on assessment.	89 88	3.19 3.57	-3.15	.0019
Prescribe appropriate nutritional feedings:				
1. total parenteral nutrition solutions	89 87	2.16 3.23	-7.30	.0001
2. nutritionally complete enteral feedings products	89 88	2.99 3.57	-4.68	.0001
3. supplemental enteral feedings products	89 88	3.09 3.61	-4.39	.0001
4. diet products	86 85	2.87 3.60	-6.13	.0001
Design diets for the prevention and treatment of disease states based on patient's needs and food preferences.	88 87	3.52 3.69	-1.64	.1032
Plan nutritionally adequate meal patterns considering food preferences, beliefs, customs, and health status of the patient.	89 88	3.51 3.68	-1.86	.0643
Coordinate the nutritional requirements of the patients with the food service system.	89 88	3.24 3.30	-0.45	.6521

TABLE XXIV (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Plan nutrition-related learning experiences based on knowledge of the teaching-learning process and educational strategies.	89 88	3.61 3.52	0.98	.3278
Design nutrition education materials to meet specified needs of patients.	89 87	3.34 3.46	-1.08	.2833
Implement nutrition-related learning experiences to meet identified needs of individuals or groups.	89 88	3.46 3.59	-1.38	.1706
Counsel patient, family, or significant others on normal and/or therapeutic nutrition.	89 88	3.71 3.80	-1.08	.2806
Elicit feedback from the patient regarding his response to the established plan of nutritional care.	89 88	3.62 3.72	-0.99	.3208
Evaluate the effectiveness of nutrition-related learning experiences.	89 88	3.43 3.65	-2.15	.0332
Determine the need for dietary intervention based on:	88	3.19		
1. course of illness	88	3.63	-3.98	.0001
2. patient's physical response to previous diet modifications	89 88	3.09 3.57	-4.15	.0001
3. patient's attitude to previous diet modifications	89 88	3.31 3.56	-2.37	.0189
Integrate counsultation with health care and community personnel to coordinate nutritional management of the patient.	88 86	2.80 3.44	-5.08	.0001
Participate in multidisciplinary health team activities, i.e., case conferences, medical rounds, and educational programs in the provision of optimal nutritional care.	88 87	3.34 3.55	-1.84	.0674

TABLE XXIV (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Integrate established nutrition care plans and schedules of other health services.	88 86	3.20 3.30	-0.78	.4382
Monitor response to nutrition interventions.	87 86	3.24 3.62	-3.32	.0011
Verify the authenticity of patient's response to nutrition care plan using laboratory and clinical assessment data.	88 86	3.07 3.51	-3.71	.0003
Recognize any deviations from the expected outcomes of nutrition care.	87 87	2.93 3.51	-4.48	.0001
Modify plan of nutritional care based on patient's progress.	87 86	3.22 3.58	-3.16	.0019
Determine the human resources (health professionals, auxiliary personnel, family, and/or significant others) that can facilitate nutritional care.	88 87	3.35 3.54	-1.81	.0722
Establish a plan for the follow-up care utilizing appropriate human resources.	88 87	2.94 3.39	-3.59	.0004
Interact with community health services and other health professionals to provide follow-up nutritional care of the patient.	88 87	2.59 3.20	-4.46	.0001
Document in the S.O.A.P format clear, concise, and relevant nutrition progress notes, including diagnostic, therapeutic, and patient education plans.	88 87	3.68 3.61	0.66	.5115
Critique nutrition-related literature that is published and marketed for professional and public consumers.	88 86	2.72 3.36	-4.93	.0001
Critique media programming (radio, television, films) on nutrition-related topics.	88 87	2.43 3.11	-4.94	.0001

TABLE XXIV (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Determine availability and scope of community health services that provide nutrition information.	87 85	2.60 3.24	-5.19	.0001
Determine material resources available to the providers and recipients of nutrition care.	87 85	2.69 3.38	-5.98	.0001
Interpret health care legislation and regulatory guidelines as they influence nutrition welfare of patients.	86 85	2.54 3.00	-3.42	.0008
Maintain current knowledge of health care legislation and regulatory guidelines affecting nutrition welfare of patients, i.e., PSRO, Medicare, and Maternal Child Health.	87 85	2.58 2.95	-2.72	.0072
Evaluate the quality of nutrition research.	87 86	2.40 3.28	-6.61	.0001
Interpret research findings as they relate to nutrition care.	87 86	2.53 3.43	-7.37	.0001
Utilize current research data to promote progressive practices in the provision of nutrition care.	86 85	2.79 3.48	-6.02	.0001
Provide nutrition education and consultation service to personnel within the health care system.	87 86	3.18 3.38	-1.71	.0897
Organize nutritional information for accurate, clear, and concise presentation (oral and written).	87 86	2.30 3.64	-3.09	.0024
Deliver presentations on nutrition information.	87 86	3.31 3.69	-3.50	.0006

*First mean=real; second mean=ideal

TABLE XXV

NUTRITION KNOWLEDGE COMPETENCY SURVEY
RESULTS--MEDICAL STUDENTS

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Identify the major functions of specific nutrients.	87 79	2.56 3.03	-4.78	.0001
Differentiate food sources of specific nutrients.	87 79	2.13 2.89	-7.11	10001
Describe the process of digestion, absorption transport, metabolism, and excretion of nutrients in the well individual.	87 79	3.16 3.24	-0.75	.4535
Relate growth and development to nutrient requirements and utilization.	87 79	2.34 2.97	-5.75	.0001
Relate the nutrient requirements and utilization throughout the life cycle.	87 79	1.99 2.70	-6.53	.0001
Examine the physiologic and sensory changes of aging that influence nutrient intake and utilization.	87 79	1.69 2.56	-7.29	.0001
Relate the pathophysiology of disease to metabolic changes affecting nutrient requirements, intake, and utilization.	87 79	2.37 3.18	-8.60	.0001
Determine the religious, ethnic, economic, philosophical, psychological, and community factors that may influence:				
1. food habits and behavior	87 79	1.87 2.43	-4.52	.0001
2. vulnerability to food faddism	84 79	1.75 2.35	-5.20	.0001
3. food availability	87 79	1.95 2.44	-4.04	.0001

TABLE XXV (Continued)

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Determine the influence of the following therapies on nutrient requirements, intake, and utilization:				
1. drug therapy	87 79	2.14 3.06	-4.69	.0001
2. radiation therapy	87 79	1.79 2.87	-9.13	.0001
3. surgical therapy	87 79	2.36 3.14	-6.90	.0001
Define clinical signs and symptoms characteristic of specific nutrition disease processes.	87 79	2.49 3.29	-7.63	.0001
Identify nutritionally significant laboratory tests.	87 79	2.30 3.06	-6.84	.0001
Explain the rationale of therapeutic diets.	86 78	2.28 3.04	-7.28	.0001
Recognize drug-nutrient interrelations.	87 78	2.01 2.92	-8.22	.0001
Differentiate alternate nutrient sources:				
1. total parenteral nutrition	87 79	2.55 3.27	-6.54	.0001
2. nutritionally complete enteral products, i.e., Vivonex, Sustacal	87 79	2.25 3.18	-8.22	.0001
3. supplemental enteral products, i.e., Controlyte, MCT	86 79	1.90 3.00	-9.43	.0001
4. diet products, i.e., low protein bread, sodium free foods, gluten free foods	86 79	2.02 2.95	-8.19	.0001
Refer patient to the appropriate nutrition resources for information and materials.	87 79	2.20 3.05	-7.14	.0001

*First mean=real; second mean=ideal

TABLE XXVI

NUTRITION SKILLS COMPETENCY SURVEY
RESULTS--MEDICAL STUDENTS

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Interview patient following established criteria for effective communication for nutrition history.	87 79	2.02 2.44	-3.58	.0005
Interview family members or significant others to obtain family, social, medical, and historical information and relate to nutritional status of the patients.	87 79	2.29 2.51	-1.74	.0832
Consult with other health professionals to obtain nutritionally significant data.	87 79	2.54 2.84	-2.53	.0124
Utilize the medical record or other available health record to obtain nutritionally significant data.	87 79	2.34 2.56	-1.76	.0810
Identify the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	87 79	2.37 3.03	-5.98	.0001
Order the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	87 78	2.38 3.01	-5.61	.0001
Perform the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	84 77	2.18 2.82	-5.28	.0001
Perform anthropometric measurements to obtain assessment data.	83 72	1.63 2.19	-4.53	.0001
Interpret the nutritional significance of the following data:				
1. laboratory data	87 79	2.57 3.04	-4.43	.0001
2. nutritional history	87 79	2.30 2.80	-4.62	.0001

TABLE XXVI (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
	87	2.37		
3. other historical data	79	2.78	-3.95	.0001
	87	2.82		
4. physical examination	79	3.18	-3.45	.0007
Compare food intake data to estimated nutrient requirements.	87	2.03		
	79	2.58	-5.11	.0001
Perform nutrient analysis using:				
	87	1.52		
1. food composition tables	79	2.04	-4.84	.0001
	87	1.59		
2. food product labels	79	2.04	-4.01	.0001
Determine the influence of physical activity on nutrient requirements.	87	2.16		
	78	2.65	-4.09	.0001
Define nutritional needs based on the interpretation of the following data:				
	87	2.30		
1. laboratory tests	79	2.91	-5.55	.0001
	86	2.10		
2. nutritional history	79	2.71	-5.52	.0001
	86	2.13		
3. other historical data	79	2.68	-5.41	.0001
	86	2.51		
4. physical examination	79	2.91	-3.71	.0003
Determine patient's ability and willingness to assume responsibility for his own nutritional care.	87	2.52		
	78	2.70	-1.45	.1479
Evaluate patient's learning ability, considering education, level of motivation, acceptance of the medical condition, and possible changes in lifestyle.	87	2.61		
	79	2.68	-0.60	.5484
Utilize the U.S. Recommended Dietary Allowances to estimate nutrient requirements.	87	1.97		
	79	2.48	-4.62	.0001

TABLE XXVI (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Calculate nutrient requirements for individuals in various states of health and disease.	87 79	2.10 3.05	-8.33	.0001
Determine dietary modifications that will promote maintenance of health and prevention of disease.	87 79	2.23 3.05	-7.70	.0001
Determine nutrient requirements necessary to treat specific disorders.	87 79	2.26 3.10	-7.64	.0001
Determine appropriate method(s) (i.e., parenteral, enteral, or oral) to provide adequate intake based on assessment.	87 79	2.55 3.21	-6.01	.0001
Prescribe appropriate nutritional feedings:				
1. total parenteral nutrition solutions	86 78	2.09 3.14	-8.34	.0001
2. nutritionally complete enteral feedings products	86 78	2.10 3.20	-8.50	.0001
3. supplemental enteral feedings products	86 78	1.99 3.05	-9.29	.0001
4. diet products	86 78	2.88 2.85	-8.70	.0001
Design diets for the prevention and treatment of disease states based on patient's needs and food preferences.	85 77	1.87 2.64	-6.30	.0001
Plan nutritionally adequate meal patterns considering food preferences, beliefs, customs, and health status of the patient.	86 77	1.10 2.17	-3.89	.0002
Coordinate the nutritional requirements of the patients with the food service system.	86 78	1.90 2.24	-2.65	.0088

TABLE XXVI (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Plan nutrition-related learning experiences based on knowledge of the teaching-learning process and educational strategies.	85 77	1.52 1.90	-3.39	.0009
Design nutrition education materials to meet specified needs of patients.	86 78	1.38 1.79	-3.62	.0004
Implement nutrition-related learning experiences to meet identified needs of individuals or groups.	86 78	1.37 1.85	-4.15	.0001
Counsel patient, family, or significant others on normal and/or therapeutic nutrition.	86 78	2.14 2.55	-3.58	.0005
Elicit feedback from the patient regarding his response to the established plan of nutritional care.	86 78	2.08 2.47	-3.14	.0020
Evaluate the effectiveness of nutrition-related learning experiences.	86 78	1.64 2.11	-3.96	.0001
Determine the need for dietary intervention based on:				
1. course of illness	86 78	2.24 2.88	-6.42	.0001
2. patient's physical response to previous diet modifications	86 78	2.22 2.77	-5.10	.0001
3. patient's attitude to previous diet modifications	86 78	2.20 2.59	-3.43	.0008
Integrate counsultation with health care and community personnel to coordinate nutritional management of the patient.	86 78	2.16 2.68	-3.96	.0001
Participate in multidisciplinary health team activities, i.e., case conferences, medical rounds, and educational programs in the provision of optimal nutritional care.	86 78	2.22 2.40	-1.37	.1716

TABLE XXVI (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Integrate established nutrition care plans and schedules of other health services.	86 78	1.88 2.24	2.73	.0071
Monitor response to nutrition interventions.	86 78	2.15 2.56	-3.43	.0008
Verify the authenticity of patient's response to nutrition care plan using laboratory and clinical assessment data.	86 78	2.20 2.64	-3.45	.0007
Recognize any deviations from the expected outcomes of nutrition care.	86 78	2.17 2.64	-3.83	.0002
Modify plan of nutritional care based on patient's progress.	86 78	2.10 2.61	-4.28	.0001
Determine the human resources (health professionals, auxiliary personnel, family, and/or significant others) that can facilitate nutritional care.	85 78	2.22 2.54	-2.27	.0246
Establish a plan for the follow-up care utilizing appropriate human resources.	86 78	2.03 2.47	-3.26	.0014
Interact with community health services and other health professionals to provide follow-up nutritional care of the patient.	86 78	2.05 2.50	-3.27	.0013
Document in the S.O.A.P format clear, concise, and relevant nutrition progress notes, including diagnostic, therapeutic, and patient education plans.	85 78	2.26 2.37	-0.83	.4101
Critique nutrition-related literature that is published and marketed for professional and public consumers.	86 78	1.85 2.36	-3.66	.0003
Critique media programming (radio, television, films) on nutrition-related topics.	86 78	1.92 1.33	-2.99	.0033

TABLE XXVI (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Determine availability and scope of community health services that provide nutrition information.	86 78	1.70 2.31	-5.27	.0001
Determine material resources available to the providers and recipients of nutrition care.	86 78	1.73 2.32	-5.05	.0001
Interpret health care legislation and regulatory guidelines as they influence nutrition welfare of patients.	86 78	1.60 2.20	-4.91	.0001
Maintain current knowledge of health care legislation and regulatory guidelines affecting nutrition welfare of patients, i.e., PSRO, Medicare, and Maternal Child Health.	86 78	1.63 2.29	-5.65	.0001
Evaluate the quality of nutrition research.	86 78	1.71 2.15	-3.36	.0010
Interpret research findings as they relate to nutrition care.	86 78	1.88 2.27	-2.96	.0035
Utilize current research data to promote progressive practices in the provision of nutrition care.	86 78	1.73 2.24	-4.22	.0001
Provide nutrition education and consultation service to personnel within the health care system.	86 78	1.62 2.05	-3.37	.0010
Organize nutritional information for accurate, clear, and concise presentation (oral and written).	86 78	1.76 1.96	-1.64	.1037
Deliver presentations on nutrition information.	87 78	1.62 1.87	-2.18	.0307

*First mean=real; second mean=ideal

TABLE XXVII

NUTRITION KNOWLEDGE COMPETENCY SURVEY
RESULTS--MEDICAL ALUMNI

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Identify the major functions of specific nutrients.	127 126	2.30 2.50	-2.06	.0400
Differentiate food sources of specific nutrients.	127 126	2.07 2.41	-3.35	.0009
Describe the process of digestion, absorption transport, metabolism, and excretion of nutrients in the well individual.	127 126	2.96 2.75	2.08	.0384
Relate growth and development to nutrient requirements and utilization.	126 126	2.25 2.40	-1.35	.1778
Relate the nutrient requirements and utilization throughout the life cycle.	126 126	1.90 2.24	-3.38	.0008
Examine the physiologic and sensory changes of aging that influence nutrient intake and utilization.	125 126	1.62 2.38	-7.00	.0001
Relate the pathophysiology of disease to metabolic changes affecting nutrient requirements, intake, and utilization.	125 123	2.22 2.98	-6.70	.0001
Determine the religious, ethnic, economic, philosophical, psychological, and community factors that may influence:				
1. food habits and behavior	126 126	1.74 2.23	-4.70	.0001
2. vulnerability to food faddism	126 126	1.74 2.17	-3.99	.0001
3. food availability	126 125	1.78 2.23	-4.28	.0001

TABLE XXVII (Continued)

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Determine the influence of the following therapies on nutrient requirements, intake, and utilization:				
1. drug therapy	126 126	2.05 2.87	-7.91	.0001
2. radiation therapy	126 126	1.79 2.56	-6.93	.0001
3. surgical therapy	126 125	2.25 2.93	-6.21	.0001
Define clinical signs and symptoms characteristic of specific nutrition disease processes.	126 124	2.45 2.98	-5.45	.0001
Identify nutritionally significant laboratory tests.	126 122	2.33 3.01	-6.49	.0001
Explain the rationale of therapeutic diets.	125 124	2.27 2.81	-4.94	.0001
Recognize drug-nutrient interrelations.	125 123	1.87 2.76	-8.71	.0001
Differentiate alternate nutrient sources:				
1. total parenteral nutrition	125 124	2.17 3.02	-6.55	.0001
2. nutritionally complete enteral products, i.e., Vivonex, Sustacal	126 125	2.04 3.00	-7.74	.0001
3. supplemental enteral products, i.e., Controlyte, MCT	125 123	1.81 2.81	-8.21	.0001
4. diet products, i.e., low protein bread, sodium free foods, gluten free foods	123 122	1.96 2.84	-7.49	.0001
Refer patient to the appropriate nutrition resources for information and materials.	125 125	2.25 2.81	-4.57	.0001

*First mean=real; second mean=ideal

TABLE XXVIII

NUTRITION SKILLS COMPETENCY SURVEY
RESULTS--MEDICAL ALUMNI

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Interview patient following established criteria for effective communication for nutrition history.	125 125	1.91 2.30	-3.69	.0003
Interview family members or significant others to obtain family, social, medical, and historical information and relate to nutritional status of the patients.	125 124	1.99 2.22	-2.07	.0393
Consult with other health professionals to obtain nutritionally significant data.	124 122	2.28 2.65	-3.48	.0006
Utilize the medical record or other available health record to obtain nutritionally significant data.	123 122	2.1- 2.43	-3.08	.0023
Identify the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	123 121	2.26 2.83	-5.09	.0001
Order the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	120 119	2.19 2.82	-5.39	.0001
Perform the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	121 117	2.09 2.71	-5.46	.0001
Perform anthropometric measurements to obtain assessment data.	123 121	1.64 2.00	-3.43	.0007
Interpret the nutritional significance of the following data:				
1. laboratory data	124 123	2.52 3.07	-5.04	.0001
2. nutritional history	124 126	2.15 2.68	-4.85	.0001

TABLE XXVIII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
	126	2.31		
3. other historical data	126	2.75	-3.59	.0001
	126	2.61		
4. physical examination	126	2.94	-2.61	.0097
Compare food intake data to estimated nutrient requirements.	119	1.82		
	117	2.25	-3.75	.0002
Perform nutrient analysis using:				
	119	1.47		
1. food composition tables	116	1.78	-3.27	.0012
	119	1.45		
2. food product labels	116	1.82	-3.81	.0002
Determine the influence of physical activity on nutrient requirements.	117	1.92		
	113	2.34	-3.78	.0002
Define nutritional needs based on the interpretation of the following data:				
	118	2.08		
1. laboratory tests	114	2.72	-5.74	.0001
	118	1.96		
2. nutritional history	114	2.54	-5.56	.0001
	118	1.97		
3. other historical data	114	2.98	-4.45	.0001
	117	2.21		
4. physical examination	114	2.71	-4.33	.0001
Determine patient's ability and willingness to assume responsibility for his own nutritional care.	119	2.18		
	118	2.56	-3.24	.0014
Evaluate patient's learning ability, considering education, level of motivation, acceptance of the medical condition, and possible changes in lifestyle.	117	2.18		
	116	2.50	-2.56	.0110
Utilize the U.S. Recommended Dietary Allowances to estimate nutrient requirements.	119	1.77		
	118	2.12	-3.29	.0011

TABLE XXVIII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Calculate nutrient requirements for individuals in various states of health and disease.	119 118	1.81 2.63	-7.01	.0001
Determine dietary modifications that will promote maintenance of health and prevention of disease.	119 118	1.97 2.66	-5.98	.0001
Determine nutrient requirements necessary to treat specific disorders.	119 118	2.02 2.68	-5.81	.0001
Determine appropriate method(s) (i.e., parenteral, enteral, or oral) to provide adequate intake based on assessment.	118 118	2.11 2.89	-6.16	.0001
Prescribe appropriate nutritional feedings:				
1. total parenteral nutrition solutions	119 120	1.87 2.82	-7.20	.0001
2. nutritionally complete enteral feedings products	119 120	1.86 2.82	-7.63	.0001
3. supplemental enteral feedings products	119 120	1.90 2.77	-6.96	.0001
4. diet products	118 119	1.69 2.55	-7.25	.0001
Design diets for the prevention and treatment of disease states based on patient's needs and food preferences.	119 118	1.62 2.19	-5.11	.0001
Plan nutritionally adequate meal patterns considering food preferences, beliefs, customs, and health status of the patient.	118 118	1.56 1.98	-4.0	.0001
Coordinate the nutritional requirements of the patients with the food service system.	120 119	1.48 1.92	-4.43	.0001

TABLE XXVIII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Plan nutrition-related learning experiences based on knowledge of the teaching-learning process and educational strategies.	120 120	1.38 1.66	-3.05	.0026
Design nutrition education materials to meet specified needs of patients.	120 120	1.39 1.69	-3.14	.0019
Implement nutrition-related learning experiences to meet identified needs of individuals or groups.	120 119	1.33 1.17	-4.15	.0001
Counsel patient, family, or significant others on normal and/or therapeutic nutrition.	120 120	1.81 2.29	-4.44	.0001
Elicit feedback from the patient regarding his response to the established plan of nutritional care.	120 120	1.78 2.25	-4.24	.0001
Evaluate the effectiveness of nutrition-related learning experiences.	119 119	1.50 1.87	-3.80	.0002
Determine the need for dietary intervention based on:				
	120	2.07		
1. course of illness	120	2.65	-5.24	.0001
2. patient's physical response to previous diet modifications	119 119	1.92 2.48	-4.84	.0001
3. patient's attitude to previous diet modifications	120 120	1.88 2.35	-4.25	.0001
Integrate counsultation with health care and community personnel to coordinate nutritional management of the patient.	118 118	1.84 2.29	-3.83	.0002
Participate in multidisciplinary health team activities, i.e., case conferences, medical rounds, and educational programs in the provision of optimal nutritional care.	117 118	1.82 2.28	-4.06	.0001

TABLE XXVIII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Integrate established nutrition care plans and schedules of other health services.	117 117	1.66 2.03	-3.51	.0006
Monitor response to nutrition interventions.	118 118	1.81 2.34	-4.82	.0001
Verify the authenticity of patient's response to nutrition care plan using laboratory and clinical assessment data.	119 119	1.87 2.41	-4.69	.0001
Recognize any deviations from the expected outcomes of nutrition care.	118 117	1.75 2.40	-5.91	.0001
Modify plan of nutritional care based on patient's progress.	118 118	1.83 2.48	-6.02	.0001
Determine the human resources (health professionals, auxiliary personnel, family, and/or significant others) that can facilitate nutritional care.	118 118	1.98 2.44	-3.91	.0001
Establish a plan for the follow-up care utilizing appropriate human resources.	118 118	1.78 2.31	-4.84	.0001
Interact with community health services and other health professionals to provide follow-up nutritional care of the patient.	118 118	1.77 2.22	-3.92	.0001
Document in the S.O.A.P format clear, concise, and relevant nutrition progress notes, including diagnostic, therapeutic, and patient education plans.	118 118	2.03 2.14	-.94	.3496
Critique nutrition-related literature that is published and marketed for professional and public consumers.	119 119	1.68 2.14	-3.99	.0001
Critique media programming (radio, television, films) on nutrition-related topics.	118 118	1.64 2.09	-4.01	.0001

TABLE XXVIII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Determine availability and scope of community health services that provide nutrition information.	118 117	1.54 2.08	-5.11	.0001
Determine material resources available to the providers and recipients of nutrition care.	117 116	1.51 2.03	-5.09	.0001
Interpret health care legislation and regulatory guidelines as they influence nutrition welfare of patients.	118 117	1.40 1.99	-4.95	.0001
Maintain current knowledge of health care legislation and regulatory guidelines affecting nutrition welfare of patients, i.e., PSRO, Medicare, and Maternal Child Health.	117 117	1.38 1.93	-5.49	.0001
Evaluate the quality of nutrition research.	118 116	1.51 1.88	-3.41	.0008
Interpret research findings as they relate to nutrition care.	118 117	1.61 2.01	-3.65	.0003
Utilize current research data to promote progressive practices in the provision of nutrition care.	118 117	1.54 2.03	-4.74	.0001
Provide nutrition education and consultation service to personnel within the health care system.	118 116	1.47 1.86	-3.80	.0002
Organize nutritional information for accurate, clear, and concise presentation (oral and written).	118 117	1.51 1.85	-3.19	.0016
Deliver presentations on nutrition information.	118 117	1.44 1.72	-2.73	.0068

*First mean=real; second mean=ideal

TABLE XXIX

NUTRITION KNOWLEDGE COMPETENCY SURVEY
RESULTS--DENTAL STUDENTS

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Identify the major functions of specific nutrients.	72 71	2.39 1.86	-4.47	.0001
Differentiate food sources of specific nutrients.	72 71	2.61 2.89	-2.71	.0075
Describe the process of digestion, absorption transport, metabolism, and excretion of nutrients in the well individual.	72 71	3.01 2.71	-2.27	.0246
Relate growth and development to nutrient requirements and utilization.	72 71	2.46 2.89	-3.62	.0004
Relate the nutrient requirements and utilization throughout the life cycle.	72 71	2.17 2.61	-3.49	.0006
Examine the physiologic and sensory changes of aging that influence nutrient intake and utilization.	72 70	1.88 2.49	-4.77	.0001
Relate the pathophysiology of disease to metabolic changes affecting nutrient requirements, intake, and utilization.	72 81	2.43 2.97	-4.48	.0001
Determine the religious, ethnic, economic, philosophical, psychological, and community factors that may influence:				
1. food habits and behavior	72 71	1.78 2.41	-4.63	.0001
2. vulnerability to food faddism	72 71	2.04 2.39	-2.46	.0151
3. food availability	72 71	1.85 2.32	-3.31	.0012

TABLE XXIX (Continued)

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Determine the influence of the following therapies on nutrient requirements, intake, and utilization:				
1. drug therapy	72 71	2.32 3.17	-6.31	.0001
2. radiation therapy	72 71	2.33 3.08	-5.46	.0001
3. surgical therapy	72 71	2.56 3.25	-5.32	.0001
Define clinical signs and symptoms characteristic of specific nutrition disease processes.	72 71	2.46 3.14	-5.27	.0001
Identify nutritionally significant laboratory tests.	72 71	1.82 2.58	-4.77	.0001
Explain the rationale of therapeutic diets.	72 71	2.17 2.61	-3.38	.0009
Recognize drug-nutrient interrelations.	71 70	2.14 2.84	-5.24	.0001
Differentiate alternate nutrient sources:				
1. total parenteral nutrition	72 71	1.90 2.51	-4.38	.0001
2. nutritionally complete enteral products, i.e., Vivonex, Sustacal	72 71	1.82 2.41	-4.10	.0001
3. supplemental enteral products, i.e., Controlyte, MCT	72 71	1.64 2.31	-4.87	.0001
4. diet products, i.e., low protein bread, sodium free foods, gluten free foods	72 71	1.78 2.39	-4.98	.0001
Refer patient to the appropriate nutrition resources for information and materials.	71 70	2.55 3.03	-3.23	.0015

*First mean=real; second mean=ideal

TABLE XXX

NUTRITION SKILLS COMPETENCY SURVEY
RESULTS--DENTAL STUDENTS

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Interview patient following established criteria for effective communication for nutrition history.	72 71	2.26 2.41	-1.10	.2727
Interview family members or significant others to obtain family, social, medical, and historical information and relate to nutritional status of the patients.	72 71	2.00 2.39	-2.79	.0061
Consult with other health professionals to obtain nutritionally significant data.	72 71	2.28 2.73	-3.16	.0019
Utilize the medical record or other available health record to obtain nutritionally significant data.	72 71	2.24 2.76	-3.46	.0007
Identify the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	72 71	1.99 2.49	-3.52	.0006
Order the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	72 71	1.82 2.37	-3.65	.0004
Perform the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	71 70	1.68 2.30	-3.98	.0001
Perform anthropometric measurements to obtain assessment data.	72 68	1.32 1.78	-3.78	.0002
Interpret the nutritional significance of the following data:				
1. laboratory data	72 71	2.07 2.65	-4.05	.0001
2. nutritional history	72 72	2.25 2.64	-2.73	.0072

TABLE XXX (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
	72	2.13		
3. other historical data	72	2.57	-2.88	.0046
	72	2.03		
4. physical examination	72	2.67	-3.86	.0002
Compare food intake data to estimated nutrient requirements.	68 67	2.35 2.54	-1.52	.1313
Perform nutrient analysis using:				
	68	1.79		
1. food composition tables	67	3.23	-2.50	.0137
	68	1.75		
2. food product labels	67	2.10	-2.74	.0069
Determine the influence of physical activity on nutrient requirements.	68 67	2.01 2.30	-2.29	.0237
Define nutritional needs based on the interpretation of the following data:				
	68	1.90		
1. laboratory tests	66	2.35	-2.90	.0044
	68	2.16		
2. nutritional history	66	2.41	-1.67	.0976
	68	1.88		
3. other historical data	66	2.30	-2.70	.0078
	68	1.84		
4. physical examination	66	2.41	-3.48	.0007
Determine patient's ability and willingness to assume responsibility for his own nutritional care.	67 66	2.48 2.77	-2.07	.0402
Evaluate patient's learning ability, considering education, level of motivation, acceptance of the medical condition, and possible changes in lifestyle.	68 67	2.41 2.75	-2.27	.0246
Utilize the U.S. Recommended Dietary Allowances to estimate nutrient requirements.	67 66	2.51 2.59	-.60	.5506

TABLE XXX (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Calculate nutrient requirements for individuals in various states of health and disease.	68 67	1.75 2.54	-5.85	.0001
Determine dietary modifications that will promote maintenance of health and prevention of disease.	67 66	2.09 2.67	-4.31	.0001
Determine nutrient requirements necessary to treat specific disorders.	67 66	1.79 2.38	-3.87	.0002
Determine appropriate method(s) (i.e., parenteral, enteral, or oral) to provide adequate intake based on assessment.	66 66	1.59 2.30	-4.87	.0001
Prescribe appropriate nutritional feedings:				
1. total parenteral nutrition solutions	68 67	1.35 2.03	-5.13	.0001
2. nutritionally complete enteral feedings products	68 67	1.40 2.07	-5.03	.0001
3. supplemental enteral feedings products	68 67	1.46 2.12	-4.96	.0001
4. diet products	68 67	1.53 2.27	-5.59	.0001
Design diets for the prevention and treatment of disease states based on patient's needs and food preferences.	68 67	1.60 2.36	-5.53	.0001
Plan nutritionally adequate meal patterns considering food preferences, beliefs, customs, and health status of the patient.	68 67	1.72 2.18	-3.28	.0013
Coordinate the nutritional requirements of the patients with the food service system.	68 67	1.46 1.82	-2.76	.0067

TABLE XXX (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Plan nutrition-related learning experiences based on knowledge of the teaching-learning process and educational strategies.	68 67	1.65 1.85	-1.44	.1527
Design nutrition education materials to meet specified needs of patients.	68 78	1.71 2.04	-2.33	.0213
Implement nutrition-related learning experiences to meet identified needs of individuals or groups.	68 67	1.68 1.99	-2.26	.0256
Counsel patient, family, or significant others on normal and/or therapeutic nutrition.	68 67	2.01 2.38	-2.55	.0119
Elicit feedback from the patient regarding his response to the established plan of nutritional care.	68 67	1.94 2.34	-2.77	.0065
Evaluate the effectiveness of nutrition-related learning experiences.	68 67	1.65 1.99	-2.78	.0063
Determine the need for dietary intervention based on:				
1. course of illness	68 67	1.93 2.49	-3.84	.0002
2. patient's physical response to previous diet modifications	68 67	1.84 2.45	-4.17	.0001
3. patient's attitude to previous diet modifications	68 66	1.88 2.42	-3.51	.0006
Integrate counsultation with health care and community personnel to coordinate nutritional management of the patient.	72 71	1.92 2.32	-2.74	.0069
Participate in multidisciplinary health team activities, i.e., case conferences, medical rounds, and educational programs in the provision of optimal nutritional care.	72 71	1.90 2.27	-2.30	.0226

TABLE XXX (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Integrate established nutrition care plans and schedules of other health services.	72 71	1.67 2.14	-3.36	.0010
Monitor response to nutrition interventions.	72 71	1.65 2.17	-3.81	.0002
Verify the authenticity of patient's response to nutrition care plan using laboratory and clinical assessment data.	72 71	1.56 2.11	-4.10	.0001
Recognize any deviations from the expected outcomes of nutrition care.	72 71	1.61 2.27	-4.83	.0001
Modify plan of nutritional care based on patient's progress.	72 71	1.57 2.24	-5.07	.0001
Determine the human resources (health professionals, auxiliary personnel, family, and/or significant others) that can facilitate nutritional care.	72 71	2.11 2.55	-2.96	.0036
Establish a plan for the follow-up care utilizing appropriate human resources.	72 69	1.83 2.26	-2.97	.0035
Interact with community health services and other health professionals to provide follow-up nutritional care of the patient.	72 71	1.86 2.46	-4.37	.0001
Document in the S.O.A.P format clear, concise, and relevant nutrition progress notes, including diagnostic, therapeutic, and patient education plans.	72 71	1.71 2.34	-4.14	.0001
Critique nutrition-related literature that is published and marketed for professional and public consumers.	71 70	1.90 2.27	-2.59	.0107
Critique media programming (radio, television, films) on nutrition-related topics.	71 70	2.00 2.37	-2.45	.0154

TABLE XXX (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Determine availability and scope of community health services that provide nutrition information.	71 69	1.83 2.26	-3.20	.0017
Determine material resources available to the providers and recipients of nutrition care.	71 70	1.85 2.24	-2.87	.0048
Interpret health care legislation and regulatory guidelines as they influence nutrition welfare of patients.	71 70	1.72 2.13	-2.90	.0044
Maintain current knowledge of health care legislation and regulatory guidelines affecting nutrition welfare of patients, i.e., PSRO, Medicare, and Maternal Child Health.	71 70	1.73 2.13	-2.84	.0053
Evaluate the quality of nutrition research.	71 70	1.78 2.07	-2.11	.0368
Interpret research findings as they relate to nutrition care.	70 68	1.91 2.13	-1.43	.1554
Utilize current research data to promote progressive practices in the provision of nutrition care.	71 69	1.77 2.13	-2.42	.0167
Provide nutrition education and consultation service to personnel within the health care system.	71 69	1.80 2.22	-2.84	.0052
Organize nutritional information for accurate, clear, and concise presentation (oral and written).	71 70	1.92 2.20	-1.98	.0492
Deliver presentations on nutrition information.	71 70	1.86 2.16	-2.05	.0426

*First mean=real; second mean=ideal

TABLE XXXI

NUTRITION KNOWLEDGE COMPETENCY SURVEY
RESULTS--DENTAL ALUMNI

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Identify the major functions of specific nutrients.	134 133	2.39 2.41	-0.29	.7701
Differentiate food sources of specific nutrients.	134 133	240 2.51	-1.30	.1932
Describe the process of digestion, absorption transport, metabolism, and excretion of nutrients in the well individual.	135 131	2.92 2.30	5.66	.0001
Relate growth and development to nutrient requirements and utilization.	134 132	2.36 2.52	-1.64	.1032
Relate the nutrient requirements and utilization throughout the life cycle.	134 132	2.01 2.26	-2.50	.0130
Examine the physiologic and sensory changes of aging that influence nutrient intake and utilization.	133 132	1.73 2.14	-4.19	.0001
Relate the pathophysiology of disease to metabolic changes affecting nutrient requirements, intake, and utilization.	134 131	2.30 2.59	-2.97	.0033
Determine the religious, ethnic, economic, philosophical, psychological, and community factors that may influence:				
1. food habits and behavior	134 133	1.64 2.11	-5.01	.0001
2. vulnerability to food faddism	134 133	1.83 2.04	-2.17	.0310
3. food availability	134 133	1.75 2.02	-2.74	.0066

TABLE XXXI (Continued)

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Determine the influence of the following therapies on nutrient requirements, intake, and utilization:				
1. drug therapy	135 131	2.18 2.85	-6.58	.0001
2. radiation therapy	135 131	2.04 2.56	-4.60	.0001
3. surgical therapy	134 132	2.31 3.00	-6.36	.0001
Define clinical signs and symptoms characteristic of specific nutrition disease processes.	135 132	2.57 2.98	-4.37	.0001
Identify nutritionally significant laboratory tests.	135 132	1.78 2.35	-5.55	.0001
Explain the rationale of therapeutic diets.	134 131	1.78 2.40	-6.10	.0001
Recognize drug-nutrient interrelations.	134 132	1.96 2.76	-8.51	.0001
Differentiate alternate nutrient sources:				
1. total parenteral nutrition	135 132	1.52 1.92	-4.36	.0001
2. nutritionally complete enteral products, i.e., Vivonex, Sustacal	135 132	1.38 1.89	-5.48	.0001
3. supplemental enteral products, i.e., Controlyte, MCT	135 132	1.30 1.84	-6.21	10001
4. diet products, i.e., low protein bread, sodium free foods, gluten free foods	135 132	1.50 2.14	-6.83	.0001
Refer patient to the appropriate nutrition resources for information and materials.	135 132	1.96 2.59	-5.89	.0001

*First mean=real; second mean=ideal

TABLE XXXII

NUTRITION SKILLS COMPETENCY SURVEY
RESULTS--DENTAL ALUMNI

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Interview patient following established criteria for effective communication for nutrition history.	134 130	1.99 2.17	-1.77	.0770
Interview family members or significant others to obtain family, social, medical, and historical information and relate to nutritional status of the patients.	134 130	1.84 2.05	-2.07	.0391
Consult with other health professionals to obtain nutritionally significant data.	135 131	2.04 2.32	-2.64	.0088
Utilize the medical record or other available health record to obtain nutritionally significant data.	135 131	1.94 2.32	-3.59	.0004
Identify the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	135 131	1.61 2.32	-7.36	.0001
Order the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	134 130	1.49 2.15	-6.60	.0001
Perform the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	134 130	1.37 1.99	-6.73	.0001
Perform anthropometric measurements to obtain assessment data.	133 125	1.16 1.50	-4.49	.0001
Interpret the nutritional significance of the following data:				
1. laboratory data	134 130	1.72 2.31	-5.84	.0001
2. nutritional history	134 131	2.04 2.37	-3.21	.0015

TABLE XXXII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
	134	1.88		
3. other historical data	131	2.33	-4.47	.0001
	134	2.87		
4. physical examination	131	2.40	-4.92	.0001
Compare food intake data to estimated	135	2.10		
nutrient requirements.	130	3.13	-0.33	.7420
Perform nutrient analysis using:				
	135	1.80		
1. food composition tables	129	1.93	-1.28	.2005
	135	1.88		
2. food product labels	129	1.98	-1.02	.3084
Determine the influence of physical	135	1.83		
activity on nutrient requirements.	129	2.14	-3.49	.0006
Define nutritional needs based on the interpretation of the following data:				
	134	1.60		
1. laboratory tests	128	2.14	-5.72	.0001
	134	1.87		
2. nutritional history	129	2.78	-4.23	.0001
	134	1.77		
3. other historical data	129	2.21	-4.52	.0001
	134	1.69		
4. physical examination	128	2.36	-6.47	.0001
Determine patient's ability and willingness to assume responsibility for	135	1.98		
his own nutritional care.	129	2.53	-5.73	.0001
Evaluate patient's learning ability, considering education, level of motivation, acceptance of the medical				
condition, and possible changes in	133	1.97		
lifestyle.	128	2.55	-5.98	.0001
Utilize the U.S. Recommended Dietary Allowances to estimate nutrient	135	2.27		
requirements.	131	2.29	-0.23	.8200

TABLE XXXII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Calculate nutrient requirements for individuals in various states of health and disease.	135 131	1.47 2.28	-8.58	.0001
Determine dietary modifications that will promote maintenance of health and prevention of disease.	135 131	1.81 2.56	-7.87	.0001
Determine nutrient requirements necessary to treat specific disorders.	135 131	1.66 2.39	-7.06	.0001
Determine appropriate method(s) (i.e., parenteral, enteral, or oral) to provide adequate intake based on assessment.	135 130	1.39 2.05	-6.97	.0001
Prescribe appropriate nutritional feedings:				
1. total parenteral nutrition solutions	123 130	2.10 1.69	-5.99	.0001
2. nutritionally complete enteral feedings products	133 130	1.23 1.72	-5.74	.0001
3. supplemental enteral feedings products	133 130	1.32 1.79	-5.22	.0001
4. diet products	132 130	1.41 1.89	-5.43	.0001
Design diets for the prevention and treatment of disease states based on patient's needs and food preferences.	131 128	1.50 2.05	-5.65	.0001
Plan nutritionally adequate meal patterns considering food preferences, beliefs, customs, and health status of the patient.	132 129	1.54 1.90	-3.61	.0004
Coordinate the nutritional requirements of the patients with the food service system.	132 129	1.35 1.68	-3.58	.0004

TABLE XXXII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Plan nutrition-related learning experiences based on knowledge of the teaching-learning process and educational strategies.	131 129	1.48 1.81	-3.67	.0003
Design nutrition education materials to meet specified needs of patients.	132 128	1.50 1.87	-3.83	.0002
Implement nutrition-related learning experiences to meet identified needs of individuals or groups.	132 128	1.43 1.80	-4.06	.0001
Counsel patient, family, or significant others on normal and/or therapeutic nutrition.	132 129	1.85 2.33	-4.63	.0001
Elicit feedback from the patient regarding his response to the established plan of nutritional care.	132 129	1.66 2.19	-5.72	.0001
Evaluate the effectiveness of nutrition-related learning experiences.	132 129	1.54 1.98	-4.70	.0001
Determine the need for dietary intervention based on:				
1. course of illness	131 128	1.61 2.27	-6.55	.0001
2. patient's physical response to previous diet modifications	131 127	1.48 2.10	-6.62	.0001
3. patient's attitude to previous diet modifications	131 128	1.54 2.02	-5.27	.0001
Integrate counsultation with health care and community personnel to coordinate nutritional management of the patient.	131 128	1.50 2.05	-5.72	.0001
Participate in multidisciplinary health team activities, i.e., case conferences, medical rounds, and educational programs in the provision of optimal nutritional care.	131 128	1.51 2.03	-4.96	.0001

TABLE XXXII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Integrate established nutrition care plans and schedules of other health services.	129 125	1.36 1.83	-5.22	.0001
Monitor response to nutrition interventions.	131 126	1.38 1.86	-5.53	.0001
Verify the authenticity of patient's response to nutrition care plan using laboratory and clinical assessment data.	131 126	1.25 1.89	-7.23	.0001
Recognize any deviations from the expected outcomes of nutrition care.	131 127	1.37 2.06	-7.38	.0001
Modify plan of nutritional care based on patient's progress.	130 126	1.40 2.01	-6.65	.0001
Determine the human resources (health professionals, auxiliary personnel, family, and/or significant others) that can facilitate nutritional care.	130 125	1.71 2.34	-6.00	.0001
Establish a plan for the follow-up care utilizing appropriate human resources.	130 126	1.46 2.06	-6.09	.0001
Interact with community health services and other health professionals to provide follow-up nutritional care of the patient.	130 126	1.48 2.09	-6.16	.0001
Document in the S.O.A.P format clear, concise, and relevant nutrition progress notes, including diagnostic, therapeutic, and patient education plans.	128 126	1.33 1.91	-6.10	.0001
Critique nutrition-related literature that is published and marketed for professional and public consumers.	130 128	1.85 2.25	-3.59	.0004
Critique media programming (radio, television, films) on nutrition-related topics.	130 128	1.93 2.31	-3.37	.0009

TABLE XXXII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Determine availability and scope of community health services that provide nutrition information.	127 127	1.67 2.13	-4.68	.0001
Determine material resources available to the providers and recipients of nutrition care.	126 126	1.61 2.06	-4.61	.0001
Interpret health care legislation and regulatory guidelines as they influence nutrition welfare of patients.	129 127	1.57 1.97	-3.94	.0001
Maintain current knowledge of health care legislation and regulatory guidelines affecting nutrition welfare of patients, i.e., PSRO, Medicare, and Maternal Child Health.	128 126	1.50 2.02	-5.61	.0001
Evaluate the quality of nutrition research.	129 126	1.70 2.04	-3.22	.0015
Interpret research findings as they relate to nutrition care.	129 126	1.78 2.02	-2.17	.0310
Utilize current research data to promote progressive practices in the provision of nutrition care.	129 127	1.62 2.03	-4.07	.0001
Provide nutrition education and consultation service to personnel within the health care system.	129 127	1.60 2.02	-4.30	.0001
Organize nutritional information for accurate, clear, and concise presentation (oral and written).	128 127	1.68 2.16	-4.49	.0001
Deliver presentations on nutrition information.	129 126	1.67 2.13	-4.07	.0001

*First mean=real; second mean=ideal

TABLE XXXIII

NUTRITION KNOWLEDGE COMPETENCY SURVEY
RESULTS--NURSE STUDENTS

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Identify the major functions of specific nutrients.	58 58	2.55 3.29	-5.89	.0001
Differentiate food sources of specific nutrients.	57 57	2.61 3.42	-6.13	.0001
Describe the process of digestion, absorption transport, metabolism, and excretion of nutrients in the well individual.	57 57	3.05 3.40	-2.51	.0138
Relate growth and development to nutrient requirements and utilization.	58 58	2.86 3.40	-3.60	.0005
Relate the nutrient requirements and utilization throughout the life cycle.	58 58	2.72 3.48	-5.54	.0001
Examine the physiologic and sensory changes of aging that influence nutrient intake and utilization.	58 58	2.91 3.21	-1.98	.0496
Relate the pathophysiology of disease to metabolic changes affecting nutrient requirements, intake, and utilization.	58 58	2.76 3.52	-5.77	.0001
Determine the religious, ethnic, economic, philosophical, psychological, and community factors that may influence:				
1. food habits and behavior	58 57	2.74 3.16	-2.55	.0121
2. vulnerability to food faddism	58 58	2.41 2.86	-2.70	.0079
3. food availability	58 58	2.41 3.26	-5.46	.0001

TABLE XXXIII (Continued)

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Determine the influence of the following therapies on nutrient requirements, intake, and utilization:				
1. drug therapy	58 58	2.29 3.50	-8.92	.0001
2. radiation therapy	58 58	2.19 3.41	-8.77	.0001
3. surgical therapy	58 58	2.69 3.55	-6.58	.0001
Define clinical signs and symptoms characteristic of specific nutrition disease processes.	58 58	2.26 3.34	-7.92	.0001
Identify nutritionally significant laboratory tests.	58 58	1.98 2.97	-6.36	.0001
Explain the rationale of therapeutic diets.	58 58	2.95 3.43	-3.55	.0006
Recognize drug-nutrient interrelations.	58 58	2.05 3.31	-8.96	.0001
Differentiate alternate nutrient sources:				
1. total parenteral nutrition	58 58	3.00 3.41	-2.84	.0053
2. nutritionally complete enteral products, i.e., Vivonex, Sustacal	58 58	3.28 3.40	-7.23	.0001
3. supplemental enteral products, i.e., Controlyte, MCT	58 58	2.05 3.28	-8.39	.0001
4. diet products, i.e., low protein bread, sodium free foods, gluten free foods	58 56	2.38 3.32	-6.88	.0001
Refer patient to the appropriate nutrition resources for information and materials.	58 58	2.69 3.34	-4.22	.0001

*First mean=real; second mean=ideal

TABLE XXXIV

NUTRITION SKILLS COMPETENCY SURVEY
RESULTS--NURSE STUDENTS

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Interview patient following established criteria for effective communication for nutrition history.	58 58	2.97 3.28	-2.24	.0274
Interview family members or significant others to obtain family, social, medical, and historical information and relate to nutritional status of the patients.	58 58	2.88 3.21	-2.32	.0221
Consult with other health professionals to obtain nutritionally significant data.	58 58	2.79 3.29	-3.45	.0009
Utilize the medical record or other available health record to obtain nutritionally significant data.	58 57	2.90 3.23	-2.50	.0140
Identify the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	57 57	1.93 2.82	-6.76	.0001
Order the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	57 57	1.67 2.47	-5.66	.0001
Perform the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	56 56	1.61 2.48	-5.83	.0001
Perform anthropometric measurements to obtain assessment data.	52 50	1.96 2.76	-4.65	.0001
Interpret the nutritional significance of the following data:				
1. laboratory data	57 57	2.30 3.13	-5.91	.0001
2. nutritional history	57 59	2.84 3.07	-1.37	.1725

TABLE XXXIV (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
	59	2.54		
3. other historical data	59	2.95	-2.16	.1329
	59	2.25		
4. physical examination	59	3.00	-4.21	.0001
Compare food intake data to estimated nutrient requirements.	57	2.74		
	56	3.16	-3.27	.0014
Perform nutrient analysis using:				
	57	2.30		
1. food composition tables	57	2.79	-3.04	.0030
	57	2.46		
2. food product labels	57	2.88	-2.76	.0068
Determine the influence of physical activity on nutrient requirements.	57	2.74		
	57	3.12	-2.99	.0034
Define nutritional needs based on the interpretation of the following data:				
	57	2.09		
1. laboratory tests	57	3.04	-6.56	.0001
	57	2.60		
2. nutritional history	57	3.05	-2.94	.0039
	55	2.44		
3. other historical data	55	2.95	-3.22	.0017
	57	2.12		
4. physical examination	57	2.98	-5.93	.0001
Determine patient's ability and willingness to assume responsibility for his own nutritional care.	57	3.12		
	56	3.41	-2.38	.0188
Evaluate patient's learning ability, considering education, level of motivation, acceptance of the medical condition, and possible changes in lifestyle.	57	3.42		
	57	3.51	-0.67	.5020
Utilize the U.S. Recommended Dietary Allowances to estimate nutrient requirements.	57	2.75		
	57	3.00	-1.78	.0773

TABLE XXXIV (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Calculate nutrient requirements for individuals in various states of health and disease.	57 57	2.28 2.95	-4.70	.0001
Determine dietary modifications that will promote maintenance of health and prevention of disease.	57 57	2.63 3.12	-3.60	.0005
Determine nutrient requirements necessary to treat specific disorders.	57 57	2.12 2.81	-4.59	.0001
Determine appropriate method(s) (i.e., parenteral, enteral, or oral) to provide adequate intake based on assessment.	57 57	2.40 2.91	-3.53	.0006
Prescribe appropriate nutritional feedings:				
1. total parenteral nutrition solutions	58 58	1.78 2.55	-4.60	.0001
2. nutritionally complete enteral feedings products	58 58	1.79 2.62	-5.10	.0001
3. supplemental enteral feedings products	58 58	1.78 2.60	-5.32	.0001
4. diet products	58 58	1.78 2.53	-4.86	.0001
Design diets for the prevention and treatment of disease states based on patient's needs and food preferences.	58 58	2.10 2.90	-5.95	.0001
Plan nutritionally adequate meal patterns considering food preferences, beliefs, customs, and health status of the patient.	58 58	2.45 2.98	-3.69	.0003
Coordinate the nutritional requirements of the patients with the food service system.	57 58	2.21 3.03	-5.13	.0001

TABLE XXXIV (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Plan nutrition-related learning experiences based on knowledge of the teaching-learning process and educational strategies.	56 56	2.59 3.00	-2.66	.0090
Design nutrition education materials to meet specified needs of patients.	58 58	2.24 2.86	-4.05	.0001
Implement nutrition-related learning experiences to meet identified needs of individuals or groups.	58 58	2.26 2.83	-3.72	.0003
Counsel patient, family, or significant others on normal and/or therapeutic nutrition.	58 58	2.59 3.14	-3.99	.0001
Elicit feedback from the patient regarding his response to the established plan of nutritional care.	58 58	2.93 3.33	-3.03	.0031
Evaluate the effectiveness of nutrition-related learning experiences.	58 58	2.64 3.02	-2.64	.0095
Determine the need for dietary intervention based on:				
1. course of illness	58 58	2.40 3.16	-6.20	.0001
2. patient's physical response to previous diet modifications	58 58	2.34 3.03	-5.25	.0001
3. patient's attitude to previous diet modifications	58 58	2.76 3.22	-3.84	.0002
Integrate counsultation with health care and community personnel to coordinate nutritional management of the patient.	58 58	2.48 2.98	-3.15	.0021
Participate in multidisciplinary health team activities, i.e., case conferences, medical rounds, and educational programs in the provision of optimal nutritional care.	58 58	2.66 3.21	-3.30	.0013

TABLE XXXIV (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Integrate established nutrition care plans and schedules of other health services.	58 58	2.60 3.10	-3.23	.0016
Monitor response to nutrition interventions.	58 58	2.67 3.17	-3.87	.0002
Verify the authenticity of patient's response to nutrition care plan using laboratory and clinical assessment data.	58 58	2.19 2.95	-5.30	.0001
Recognize any deviations from the expected outcomes of nutrition care.	58 58	2.38 3.03	-4.96	.0001
Modify plan of nutritional care based on patient's progress.	58 58	2.47 3.05	-4.71	.0001
Determine the human resources (health professionals, auxiliary personnel, family, and/or significant others) that can facilitate nutritional care.	58 58	3.07 3.35	-2.14	.0343
Establish a plan for the follow-up care utilizing appropriate human resources.	58 58	2.81 3.21	-2.98	.0036
Interact with community health services and other health professionals to provide follow-up nutritional care of the patient.	58 58	2.67 3.09	-2.64	.0095
Document in the S.O.A.P format clear, concise, and relevant nutrition progress notes, including diagnostic, therapeutic, and patient education plans.	58 58	2.76 3.28	-3.10	.0025
Critique nutrition-related literature that is published and marketed for professional and public consumers.	58 58	1.97 2.59	-3.94	.0001
Critique media programming (radio, television, films) on nutrition-related topics.	58 58	2.10 2.60	-2.98	.0036

TABLE XXXIV (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Determine availability and scope of community health services that provide nutrition information.	57 58	2.33 2.86	-3.56	.0005
Determine material resources available to the providers and recipients of nutrition care.	58 58	2.26 2.81	-3.59	.0005
Interpret health care legislation and regulatory guidelines as they influence nutrition welfare of patients.	58 57	1.81 2.47	-4.31	.0001
Maintain current knowledge of health care legislation and regulatory guidelines affecting nutrition welfare of patients, i.e., PSRO, Medicare, and Maternal Child Health.	58 58	1.62 2.57	-6.47	.0001
Evaluate the quality of nutrition research.	58 58	1.66 2.33	-4.44	.0001
Interpret research findings as they relate to nutrition care.	58 57	1.91 2.47	-3.55	.0006
Utilize current research data to promote progressive practices in the provision of nutrition care.	58 58	1.88 2.64	-4.89	.0001
Provide nutrition education and consultation service to personnel within the health care system.	58 58	1.88 2.62	-5.18	.0001
Organize nutritional information for accurate, clear, and concise presentation (oral and written).	58 58	2.21 2.71	-3.22	.0017
Deliver presentations on nutrition information.	58 58	2.05 2.67	-4.10	.0001

*First mean=real; second mean=ideal

TABLE XXXV

NUTRITION KNOWLEDGE COMPETENCY SURVEY
RESULTS--NURSE ALUMNI

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Identify the major functions of specific nutrients.	124 121	2.46 2.87	-4.20	.0001
Differentiate food sources of specific nutrients.	123 121	2.57 2.93	-3.63	.0003
Describe the process of digestion, absorption transport, metabolism, and excretion of nutrients in the well individual.	124 120	2.92 2.97	-0.44	.6569
Relate growth and development to nutrient requirements and utilization.	124 121	2.66 3.06	-3.66	.0003
Relate the nutrient requirements and utilization throughout the life cycle.	122 120	2.47 2.90	-4.08	.0001
Examine the physiologic and sensory changes of aging that influence nutrient intake and utilization.	123 120	2.48 2.79	-2.69	.0076
Relate the pathophysiology of disease to metabolic changes affecting nutrient requirements, intake, and utilization.	120 117	2.52 2.24	-6.55	.0001
Determine the religious, ethnic, economic, philosophical, psychological, and community factors that may influence:				
1. food habits and behavior	124 121	2.40 2.79	-3.57	.0004
2. vulnerability to food faddism	124 121	2.36 2.55	-1.70	.0896
3. food availability	124 120	2.30 2.65	-3.04	.0026

TABLE XXXV (Continued)

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Determine the influence of the following therapies on nutrient requirements, intake, and utilization:				
1. drug therapy	124 121	2.20 3.32	-10.69	.0001
2. radiation therapy	123 118	2.03 2.98	-7.87	.0001
3. surgical therapy	123 119	2.39 3.23	-7.35	.0001
Define clinical signs and symptoms characteristic of specific nutrition disease processes.	123 119	2.38 2.92	-5.61	.0001
Identify nutritionally significant laboratory tests.	122 118	1.83 2.92	-10.05	.0001
Explain the rationale of therapeutic diets.	123 120	2.56 3.26	-7.20	.0001
Recognize drug-nutrient interrelations.	123 120	1.89 3.15	-13.32	.0001
Differentiate alternate nutrient sources:				
1. total parenteral nutrition	123 120	2.28 3.19	-7.24	.0001
2. nutritionally complete enteral products, i.e., Vivonex, Sustacal	123 120	2.11 3.12	-8.61	.0001
3. supplemental enteral products, i.e., Controlyte, MCT	123 120	1.75 2.83	-9.04	.0001
4. diet products, i.e., low protein bread, sodium free foods, gluten free foods	123 119	2.21 3.07	-7.96	.0001
Refer patient to the appropriate nutrition resources for information and materials.	122 119	2.61 3.10	-4.05	.0001

*First mean=real; second mean=ideal

TABLE XXXVI

NUTRITION SKILLS COMPETENCY SURVEY
RESULTS--NURSE ALUMNI

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Interview patient following established criteria for effective communication for nutrition history.	122 117	2.83 2.79	0.29	.7691
Interview family members or significant others to obtain family, social, medical, and historical information and relate to nutritional status of the patients.	122 115	2.84 2.79	0.38	.7033
Consult with other health professionals to obtain nutritionally significant data.	122 118	2.80 2.93	-1.15	.2530
Utilize the medical record or other available health record to obtain nutritionally significant data.	122 118	2.80 2.88	-0.71	.4808
Identify the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	122 118	1.99 2.50	-4.57	.0001
Order the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	120 114	1.56 2.03	-4.17	.0001
Perform the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	120 116	1.53 1.97	-3.94	.0001
Perform anthropometric measurements to obtain assessment data.	116 113	1.87 1.91	-0.31	.7531
Interpret the nutritional significance of the following data:				
1. laboratory data	121 117	1.97 2.89	-8.20	.0001
2. nutritional history	122 119	2.58 2.79	-1.77	.0785

TABLE XXXI (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
	123	2.46		
3. other historical data	119	2.74	-2.33	.0205
	123	2.20		
4. physical examination	119	2.82	-5.12	.0001
Compare food intake data to estimated nutrient requirements.	121 117	2.44 2.56	-0.96	.3383
Perform nutrient analysis using:				
	121	1.93		
1. food composition tables	115	2.08	-1.23	.2195
	121	2.03		
2. food product labels	116	2.11	-0.67	.5034
Determine the influence of physical activity on nutrient requirements.	121 117	2.40 2.59	-1.75	.0818
Define nutritional needs based on the interpretation of the following data:				
	120	1.90		
1. laboratory tests	116	2.61	-6.34	.0001
	120	2.33		
2. nutritional history	116	2.61	-2.51	.0127
	120	2.25		
3. other historical data	116	2.57	-2.95	.0035
	120	2.08		
4. physical examination	116	2.61	-4.70	.0001
Determine patient's ability and willingness to assume responsibility for his own nutritional care.	121 117	2.87 3.03	-1.43	.1537
Evaluate patient's learning ability, considering education, level of motivation, acceptance of the medical condition, and possible changes in lifestyle.	121 117	3.03 3.07	-0.33	.7451
Utilize the U.S. Recommended Dietary Allowances to estimate nutrient requirements.	121 117	2.64 2.50	1.16	.2466

TABLE XXXVI (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Calculate nutrient requirements for individuals in various states of health and disease.	121 116	2.09 2.53	-3.73	.0002
Determine dietary modifications that will promote maintenance of health and prevention of disease.	121 117	2.42 2.87	-4.16	.0001
Determine nutrient requirements necessary to treat specific disorders.	121 117	2.02 2.50	-4.29	.0001
Determine appropriate method(s) (i.e., parenteral, enteral, or oral) to provide adequate intake based on assessment.	121 117	2.04 2.63	-4.81	.0001
Prescribe appropriate nutritional feedings:				
1. total parenteral nutrition solutions	120 117	1.52 2.08	-4.76	.0001
2. nutritionally complete enteral feedings products	120 117	1.52 2.04	-4.53	.0001
3. supplemental enteral feedings products	120 117	1.55 2.09	-4.64	.0001
4. diet products	120 117	1.70 2.21	-4.32	.0001
Design diets for the prevention and treatment of disease states based on patient's needs and food preferences.	122 117	1.89 2.21	-2.86	.0046
Plan nutritionally adequate meal patterns considering food preferences, beliefs, customs, and health status of the patient.	122 118	2.25 2.29	-0.32	.7476
Coordinate the nutritional requirements of the patients with the food service system.	122 118	2.20 2.52	-2.62	.0093

TABLE XXXVI (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Plan nutrition-related learning experiences based on knowledge of the teaching-learning process and educational strategies.	119 114	2.25 2.30	-0.39	.6999
Design nutrition education materials to meet specified needs of patients.	122 118	2.06 2.22	-1.39	.1655
Implement nutrition-related learning experiences to meet identified needs of individuals or groups.	120 116	2.13 2.22	-0.79	.4324
Counsel patient, family, or significant others on normal and/or therapeutic nutrition.	122 118	2.37 2.69	-2.86	.0046
Elicit feedback from the patient regarding his response to the established plan of nutritional care.	120 116	2.67 2.78	-0.96	.3384
Evaluate the effectiveness of nutrition-related learning experiences.	121 115	2.47 2.57	-0.88	.3796
Determine the need for dietary intervention based on:				
1. course of illness	120 116	2.24 2.78	-4.88	.0001
2. patient's physical response to previous diet modifications	121 117	2.20 2.72	-4.53	.0001
3. patient's attitude to previous diet modifications	121 117	2.40 2.72	-2.85	.0048
Integrate counsultation with health care and community personnel to coordinate nutritional management of the patient.	119 116	2.34 2.59	-2.03	.0436
Participate in multidisciplinary health team activities, i.e., case conferences, medical rounds, and educational programs in the provision of optimal nutritional care.	119 116	2.44 2.73	-2.31	.0216

TABLE XXXVI (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Integrate established nutrition care plans and schedules of other health services.	119 116	2.26 2.58	-2.46	.0146
Monitor response to nutrition interventions.	119 116	2.27 2.83	-4.82	.0001
Verify the authenticity of patient's response to nutrition care plan using laboratory and clinical assessment data.	119 115	1.87 2.56	-5.87	.0001
Recognize any deviations from the expected outcomes of nutrition care.	120 115	2.11 2.66	-5.00	.0001
Modify plan of nutritional care based on patient's progress.	119 115	2.19 2.67	-4.23	.0001
Determine the human resources (health professionals, auxiliary personnel, family, and/or significant others) that can facilitate nutritional care.	120 116	2.73 2.84	-0.89	.3756
Establish a plan for the follow-up care utilizing appropriate human resources.	120 115	2.38 2.46	-0.62	.5349
Interact with community health services and other health professionals to provide follow-up nutritional care of the patient.	120 115	2.39 2.41	-0.13	.8948
Document in the S.O.A.P format clear, concise, and relevant nutrition progress notes, including diagnostic, therapeutic, and patient education plans.	119 114	2.84 2.54	2.18	.0301
Critique nutrition-related literature that is published and marketed for professional and public consumers.	120 116	1.79 2.09	-2.47	.0142
Critique media programming (radio, television, films) on nutrition-related topics.	120 116	1.87 2.19	-2.71	.0072

TABLE XXXVI (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Determine availability and scope of community health services that provide nutrition information.	118 115	2.24 2.28	-0.34	.7374
Determine material resources available to the providers and recipients of nutrition care.	119 115	2.18 2.37	-1.60	.1102
Interpret health care legislation and regulatory guidelines as they influence nutrition welfare of patients.	119 114	1.68 2.00	-2.76	.0062
Maintain current knowledge of health care legislation and regulatory guidelines affecting nutrition welfare of patients, i.e., PSRO, Medicare, and Maternal Child Health.	119 115	1.71 2.14	-3.67	.0003
Evaluate the quality of nutrition research.	119 115	1.54 1.75	-2.03	.0435
Interpret research findings as they relate to nutrition care.	119 115	1.61 1.90	-2.66	.0084
Utilize current research data to promote progressive practices in the provision of nutrition care.	119 115	1.59 1.97	-3.70	.0003
Provide nutrition education and consultation service to personnel within the health care system.	119 115	1.78 2.04	-2.20	.0291
Organize nutritional information for accurate, clear, and concise presentation (oral and written).	119 114	2.02 2.16	-1.18	.2378
Deliver presentations on nutrition information.	119 1.14	1.92 2.03	-0.91	.3627

*First mean=real; second mean=ideal

TABLE XXXVII

NUTRITION KNOWLEDGE COMPETENCY SURVEY
RESULTS--DIETETIC STUDENTS

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Identify the major functions of specific nutrients.	34 34	3.03 3.79	-4.64	.0001
Differentiate food sources of specific nutrients.	34 34	2.62 3.82	-7.03	.0001
Describe the process of digestion, absorption transport, metabolism, and excretion of nutrients in the well individual.	34 34	3.26 3.97	-5.64	.0001
Relate growth and development to nutrient requirements and utilization.	34 34	3.18 3.91	-5.55	.0001
Relate the nutrient requirements and utilization throughout the life cycle.	34 34	2.82 3.88	-7.84	.0001
Examine the physiologic and sensory changes of aging that influence nutrient intake and utilization.	34 34	2.29 3.50	-6.42	.0001
Relate the pathophysiology of disease to metabolic changes affecting nutrient requirements, intake, and utilization.	34 34	3.18 3.94	-5.90	.0001
Determine the religious, ethnic, economic, philosophical, psychological, and community factors that may influence:				
1. food habits and behavior	34 34	3.03 3.65	-4.16	.0001
2. vulnerability to food faddism	34 34	2.56 3.38	-4.85	.0001
3. food availability	34 34	2.74 3.38	-3.91	.0002

TABLE XXXVII (Continued)

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Determine the influence of the following therapies on nutrient requirements, intake, and utilization:				
	34	2.71		
1. drug therapy	34	3.88	-7.13	.0001
	34	2.88		
2. radiation therapy	34	3.65	-4.31	.0001
	34	2.01		
3. surgical therapy	34	3.88	-7.22	.0001
Define clinical signs and symptoms characteristic of specific nutrition disease processes.	34	3.29		
	34	3.79	-3.38	.0013
Identify nutritionally significant laboratory tests.	34	3.26		
	34	4.00	-4.77	.0001
Explain the rationale of therapeutic diets.	34	3.32		
	34	4.00	-4.68	.0001
Recognize drug-nutrient interrelations.	34	2.76		
	34	3.91	-7.41	.0001
Differentiate alternate nutrient sources:				
	34	3.09		
1. total parenteral nutrition	34	3.88	-5.91	.0001
2. nutritionally complete enteral products, i.e., Vivonex, Sustacal	34	3.21		
	33	3.97	-5.93	.0001
3. supplemental enteral products, i.e., Controlyte, MCT	34	3.15		
	34	3.94	-5.93	.0001
4. diet products, i.e., low protein bread, sodium free foods, gluten free foods	34	2.85		
	34	3.82	-5.33	.0001
Refer patient to the appropriate nutrition resources for information and materials.	34	2.59		
	34	3.71	-6.49	.0001

*First mean=real; second mean=ideal

TABLE XXXVIII

NUTRITION SKILLS COMPETENCY SURVEY
RESULTS--DIETETIC STUDENTS

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Interview patient following established criteria for effective communication for nutrition history.	34 34	3.56 3.88	-2.05	.0442
Interview family members or significant others to obtain family, social, medical, and historical information and relate to nutritional status of the patients.	34 34	3.26 3.74	-2.66	.0099
Consult with other health professionals to obtain nutritionally significant data.	34 34	3.18 3.88	-4.15	.0001
Utilize the medical record or other available health record to obtain nutritionally significant data.	34 34	3.50 3.91	-2.75	.0078
Identify the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	33 34	2.88 3.74	-4.81	.0001
Order the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	34 34	2.18 3.38	-5.89	.0001
Perform the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	33 33	2.52 3.36	-3.90	.0002
Perform anthropometric measurements to obtain assessment data.	34 34	3.44 3.68	-1.55	.1257
Interpret the nutritional significance of the following data:				
1. laboratory data	34 34	3.21 3.88	-4.72	.0001
2. nutritional history	34 34	3.56 3.789	-1.61	.1120

TABLE XXXVIII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
	34	3.12		
3. other historical data	34	3.65	-2.83	.0062
	34	2.71		
4. physical examination	34	3.44	-3.58	.0007
Compare food intake data to estimated nutrient requirements.	34 34	3.56 3.59	-0.19	.8491
Perform nutrient analysis using:				
	34	3.38		
1. food composition tables	34	3.50	-0.67	.5048
	34	2.94		
2. food product labels	34	3.41	-2.18	.0326
Determine the influence of physical activity on nutrient requirements.	33 33	2.82 3.64	-4.81	.0001
Define nutritional needs based on the interpretation of the following data:				
	34	3.12		
1. laboratory tests	34	3.88	-5.12	.0001
	34	3.44		
2. nutritional history	34	3.79	-2.42	.0185
	33	3.27		
3. other historical data	34	3.59	-1.88	.0651
	34	2.82		
4. physical examination	34	3.62	-4.26	.0001
Determine patient's ability and willingness to assume responsibility for his own nutritional care.	34 33	3.15 3.70	-3.06	.0032
Evaluate patient's learning ability, considering education, level of motivation, acceptance of the medical condition, and possible changes in lifestyle.	33 33	3.24 3.73	-2.68	.0094
Utilize the U.S. Recommended Dietary Allowances to estimate nutrient requirements.	34 34	3.21 3.29	-0.44	.6596

TABLE XXXVIII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Calculate nutrient requirements for individuals in various states of health and disease.	34 34	3.35 3.85	-3.28	.0016
Determine dietary modifications that will promote maintenance of health and prevention of disease.	34 33	3.44 3.82	-2.38	.0202
Determine nutrient requirements necessary to treat specific disorders.	34 34	2.24 3.85	-3.88	.0002
Determine appropriate method(s) (i.e., parenteral, enteral, or oral) to provide adequate intake based on assessment.	34 34	3.26 3.88	-4.21	.0001
Prescribe appropriate nutritional feedings:				
1. total parenteral nutrition solutions	34 34	2.41 3.82	-9.42	.0001
2. nutritionally complete enteral feedings products	34 34	2.97 3.94	-7.12	.0001
3. supplemental enteral feedings products	34 34	3.18 3.85	-4.34	.0001
4. diet products	33 33	2.97 3.82	-5.64	.0001
Design diets for the prevention and treatment of disease states based on patient's needs and food preferences.	34 34	3.47 3.85	-2.69	.0091
Plan nutritionally adequate meal patterns considering food preferences, beliefs, customs, and health status of the patient.	34 34	3.56 3.76	-1.39	.1682
Coordinate the nutritional requirements of the patients with the food service system.	34 34	3.24 3.59	-1.91	.0606

TABLE XXXVIII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Plan nutrition-related learning experiences based on knowledge of the teaching-learning process and educational strategies.	34 34	3.62 3.62	.00	1.0000
Design nutrition education materials to meet specified needs of patients.	34 33	3.29 3.61	-1.74	.0864
Implement nutrition-related learning experiences to meet identified needs of individuals or groups.	34 34	3.42 3.68	-1.82	.0730
Counsel patient, family, or significant others on normal and/or therapeutic nutrition.	34 34	3.68 3.85	-1.33	.1876
Elicit feedback from the patient regarding his response to the established plan of nutritional care.	34 34	3.56 3.82	-1.76	.0827
Evaluate the effectiveness of nutrition-related learning experiences.	34 34	3.44 3.74	-1.83	.0719
Determine the need for dietary intervention based on:				
1. course of illness	33 34	3.27 3.82	-3.35	.0014
2. patient's physical response to previous diet modifications	34 34	3.29 3.73	-2.71	.0085
3. patient's attitude to previous diet modifications	34 34	3.41 3.68	-1.75	.0848
Integrate counsultation with health care and community personnel to coordinate nutritional management of the patient.	34 33	2.68 3.82	-6.89	.0001
Participate in multidisciplinary health team activities, i.e., case conferences, medical rounds, and educational programs in the provision of optimal nutritional care.	34 34	3.26 3.82	-3.44	.0010

TABLE XXXVIII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Integrate established nutrition care plans and schedules of other health services.	34 33	3.21 3.58	-1.99	.0508
Monitor response to nutrition interventions.	34 34	3.38 3.79	-2.54	.0136
Verify the authenticity of patient's response to nutrition care plan using laboratory and clinical assessment data.	34 34	3.26 3.76	-3.02	.0036
Recognize any deviations from the expected outcomes of nutrition care.	34 34	3.06 3.73	-3.65	.0006
Modify plan of nutritional care based on patient's progress.	34 34	3.26 3.74	-2.58	.0120
Determine the human resources (health professionals, auxiliary personnel, family, and/or significant others) that can facilitate nutritional care.	34 34	3.38 3.74	-2.29	.0252
Establish a plan for the follow-up care utilizing appropriate human resources.	34 34	2.94 3.62	-3.27	.0018
Interact with community health services and other health professionals to provide follow-up nutritional care of the patient.	34 34	2.44 3.59	-6.35	.0001
Document in the S.O.A.P format clear, concise, and relevant nutrition progress notes, including diagnostic, therapeutic, and patient education plans.	34 34	3.65 3.82	-1.24	.2192
Critique nutrition-related literature that is published and marketed for professional and public consumers.	34 34	2.82 3.50	-3.44	.0010
Critique media programming (radio, television, films) on nutrition-related topics.	34 34	2.35 3.29	-4.26	.0001

TABLE XXXVIII (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Determine availability and scope of community health services that provide nutrition information.	34 34	2.44 3.50	-6.18	.0001
Determine material resources available to the providers and recipients of nutrition care.	34 34	2.50 3.59	-6.80	.0001
Interpret health care legislation and regulatory guidelines as they influence nutrition welfare of patients.	34 33	2.76 3.39	-3.20	.0021
Maintain current knowledge of health care legislation and regulatory guidelines affecting nutrition welfare of patients, i.e., PSRO, Medicare, and Maternal Child Health.	34 33	2.76 3.30	-2.53	.0137
Evaluate the quality of nutrition research.	34 34	2.53 3.62	-5.73	.0001
Interpret research findings as they relate to nutrition care.	34 34	2.59 3.71	-5.97	.0001
Utilize current research data to promote progressive practices in the provision of nutrition care.	34 34	2.85 3.65	-5.02	.0001
Provide nutrition education and consultation service to personnel within the health care system.	34 34	3.12 3.59	-2.71	.0085
Organize nutritional information for accurate, clear, and concise presentation (oral and written).	34 34	3.41 3.74	-1.89	.0631
Deliver presentations on nutrition information.	34 34	3.47 3.76	-1.91	.0604

*First mean=real; second mean=ideal

TABLE XXXIX

NUTRITION KNOWLEDGE COMPETENCY SURVEY
RESULTS--DIETETIC ALUMNI

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Identify the major functions of specific nutrients.	52 52	3.27 3.33	-1.03	.3043
Differentiate food sources of specific nutrients.	52 52	3.08 3.54	-2.96	.0039
Describe the process of digestion, absorption transport, metabolism, and excretion of nutrients in the well individual.	52 52	3.54 3.37	1.20	.2321
Relate growth and development to nutrient requirements and utilization.	52 52	3.08 3.13	-0.35	.7301
Relate the nutrient requirements and utilization throughout the life cycle.	52 52	2.96 3.11	-1.00	.3214
Examine the physiologic and sensory changes of aging that influence nutrient intake and utilization.	52 52	2.38 2.83	-2.62	.0102
Relate the pathophysiology of disease to metabolic changes affecting nutrient requirements, intake, and utilization.	52 52	3.46 3.54	-0.54	.5906
Determine the religious, ethnic, economic, philosophical, psychological, and community factors that may influence:				
1. food habits and behavior	51 51	3.08 3.31	-1.55	.1240
2. vulnerability to food faddism	51 51	2.61 3.16	-3.20	.0018
3. food availability	51 51	2.78 3.00	-1.14	.2553

TABLE XXXIX (Continued)

Nutrition Knowledge Competencies	n	Mean*	t	Level of Significance
Determine the influence of the following therapies on nutrient requirements, intake, and utilization:				
1. drug therapy	52 52	2.38 3.17	-4.38	.0001
2. radiation therapy	51 51	2.55 2.80	-1.32	.1892
3. surgical therapy	52 51	2.94 3.12	-1.02	.3079
Define clinical signs and symptoms characteristic of specific nutrition disease processes.	51 50	3.19 3.40	-1.20	.2325
Identify nutritionally significant laboratory tests.	52 51	3.38 3.45	-0.39	.7004
Explain the rationale of therapeutic diets.	52 51	3.73 3.69	0.37	.7107
Recognize drug-nutrient interrelations.	52 51	2.46 3.16	-4.19	.0001
Differentiate alternate nutrient sources:				
1. total parenteral nutrition	52 51	2.48 3.06	-2.74	.0073
2. nutritionally complete enteral products, i.e., Vivonex, Sustacal	52 52	3.13 3.35	-1.21	.2281
3. supplemental enteral products, i.e., Controlyte, MCT	52 51	3.00 3.25	-1.34	.1838
4. diet products, i.e., low protein bread, sodium free foods, gluten free foods	52 51	2.85 3.25	-2.35	.0205
Refer patient to the appropriate nutrition resources for information and materials.	52 51	2.98 3.31	-2.03	.0450

*First mean=real; second mean=ideal

TABLE XL

NUTRITION SKILLS COMPETENCY SURVEY
RESULTS--DIETETIC ALUMNI

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Interview patient following established criteria for effective communication for nutrition history.	51 50	3.84 3.70	1.27	.2071
Interview family members or significant others to obtain family, social, medical, and historical information and relate to nutritional status of the patients.	52 51	3.60 3.61	-0.09	.9306
Consult with other health professionals to obtain nutritionally significant data.	52 51	3.42 3.57	-1.20	.2319
Utilize the medical record or other available health record to obtain nutritionally significant data.	52 51	3.75 3.78	-0.29	.7735
Identify the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	51 50	2.98 3.36	-2.33	.0220
Order the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	51 49	2.45 3.04	-3.07	.0028
Perform the appropriate diagnostic procedures in the treatment of nutritional disorders based on historical and physical findings.	50 49	2.52 2.96	-2.37	.0197
Perform anthropometric measurements to obtain assessment data.	52 50	2.92 3.16	-1.22	.2260
Interpret the nutritional significance of the following data:				
1. laboratory data	52 51	3.29 3.59	-1.90	.0609
2. nutritional history	52 51	3.71 3.65	0.53	.5979

TABLE XL (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
	52	3.35		
3. other historical data	51	3.35	-0.05	.9630
	52	2.69		
4. physical examination	51	3.16	-2.47	.0151
Compare food intake data to estimated nutrient requirements.	51	3.20		
	51	3.16	0.23	.8193
Perform nutrient analysis using:				
	52	3.40		
1. food composition tables	51	3.40	1.85	.0672
	52	3.12		
2. food product labels	51	3.24	-0.70	.4860
Determine the influence of physical activity on nutrient requirements.	52	2.75		
	51	3.25	-3.28	.0014
Define nutritional needs based on the interpretation of the following data:				
	52	3.27		
1. laboratory tests	50	3.60	-2.19	.0310
	52	3.58		
2. nutritional history	50	3.64	-0.54	.5873
	52	3.15		
3. other historical data	50	3.36	-1.41	.1609
	52	2.67		
4. physical examination	50	3.18	-2.92	.0043
Determine patient's ability and willingness to assume responsibility for his own nutritional care.	52	3.40		
	51	3.62	-1.57	.1185
Evaluate patient's learning ability, considering education, level of motivation, acceptance of the medical condition, and possible changes in lifestyle.	51	3.41		
	50	3.62	-1.41	.1602
Utilize the U.S. Recommended Dietary Allowances to estimate nutrient requirements.	51	3.27		
	50	3.20	0.47	.6376

TABLE XL (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Calculate nutrient requirements for individuals in various states of health and disease.	52 51	3.21 3.53	-2.31	.0231
Determine dietary modifications that will promote maintenance of health and prevention of disease.	52 51	3.46 3.69	-1.66	.1009
Determine nutrient requirements necessary to treat specific disorders.	52 51	3.13 3.51	-2.41	.0176
Determine appropriate method(s) (i.e., parenteral, enteral, or oral) to provide adequate intake based on assessment.	52 51	3.10 3.35	-1.48	.1430
Prescribe appropriate nutritional feedings:				
1. total parenteral nutrition solutions	52 51	1.92 2.82	-4.44	.0001
2. nutritionally complete enteral feedings products	52 51	2.96 3.31	-1.93	.0568
3. supplemental enteral feedings products	52 51	2.98 3.45	-2.76	.0069
4. diet products	50 49	2.78 3.45	-3.90	.0002
Design diets for the prevention and treatment of disease states based on patient's needs and food preferences.	51 50	3.57 3.58	-0.08	.9379
Plan nutritionally adequate meal patterns considering food preferences, beliefs, customs, and health status of the patient.	52 51	3.50 3.63	-0.99	.3235
Coordinate the nutritional requirements of the patients with the food service system.	52 51	3.25 3.08	0.94	.3517

TABLE XL (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Plan nutrition-related learning experiences based on knowledge of the teaching-learning process and educational strategies.	52 51	3.61 3.47	1.10	.2737
Design nutrition education materials to meet specified needs of patients.	52 51	3.38 3.35	0.21	.8352
Implement nutrition-related learning experiences to meet identified needs of individuals or groups.	52 51	3.48 3.51	-0.22	.8233
Counsel patient, family, or significant others on normal and/or therapeutic nutrition.	52 51	3.73 3.75	-0.13	.8900
Elicit feedback from the patient regarding his response to the established plan of nutritional care.	52 51	3.67 3.63	0.34	.7370
Evaluate the effectiveness of nutrition-related learning experiences.	52 51	3.42 3.57	-1.04	.3021
Determine the need for dietary intervention based on:				
1. course of illness	52 51	3.13 3.49	-2.41	.0180
2. patient's physical response to previous diet modifications	52 51	2.94 3.45	-3.16	.0021
3. patient's attitude to previous diet modifications	52 51	3.25 3.45	-1.55	.1235
Integrate counsultation with health care and community personnel to coordinate nutritional management of the patient.	51 50	2.86 3.16	-1.72	.0888
Participate in multidisciplinary health team activities, i.e., case conferences, medical rounds, and educational programs in the provision of optimal nutritional care.	51 50	3.39 3.38	0.08	.9388

TABLE XL (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Integrate established nutrition care plans and schedules of other health services.	51 50	3.20 3.14	0.33	.7384
Monitor response to nutrition interventions.	50 49	3.16 3.51	-2.27	.0252
Verify the authenticity of patient's response to nutrition care plan using laboratory and clinical assessment data.	51 49	2.94 3.35	-2.47	.0151
Recognize any deviations from the expected outcomes of nutrition care.	50 50	2.86 3.34	-2.67	.0089
Modify plan of nutritional care based on patient's progress.	50 49	3.16 3.47	-2.00	.0485
Determine the human resources (health professionals, auxiliary personnel, family, and/or significant others) that can facilitate nutritional care.	51 50	3.31 3.38	-0.46	.6429
Establish a plan for the follow-up care utilizing appropriate human resources.	51 50	2.92 3.20	-1.74	.0800
Interact with community health services and other health professionals to provide follow-up nutritional care of the patient.	51 50	2.69 2.94	-1.37	.1740
Document in the S.O.A.P format clear, concise, and relevant nutrition progress notes, including diagnostic, therapeutic, and patient education plans.	51 50	3.69 3.48	1.29	.2013
Critique nutrition-related literature that is published and marketed for professional and public consumers.	51 49	2.63 3.25	-3.58	.0005
Critique media programming (radio, television, films) on nutrition-related topics.	51 50	2.43 2.96	-2.95	.0040

TABLE XL (Continued)

Nutrition Skills Competencies	n	Mean*	t	Level of Significance
Determine availability and scope of community health services that provide nutrition information.	50 48	2.70 3.04	-2.06	.0417
Determine material resources available to the providers and recipients of nutrition care.	50 48	2.82 3.19	-2.37	.0200
Interpret health care legislation and regulatory guidelines as they influence nutrition welfare of patients.	49 49	2.43 2.75	-1.93	.0561
Maintain current knowledge of health care legislation and regulatory guidelines affecting nutrition welfare of patients, i.e., PSRO, Medicare, and Maternal Child Health.	50 49	2.52 2.73	-1.29	.1986
Evaluate the quality of nutrition research.	50 49	2.28 3.02	-4.08	.0001
Interpret research findings as they relate to nutrition care.	50 49	2.46 3.22	-4.65	.0001
Utilize current research data to promote progressive practices in the provision of nutrition care.	49 48	2.73 3.37	-3.88	.0002
Provide nutrition education and consultation service to personnel within the health care system.	50 49	3.18 3.22	-0.28	.7823
Organize nutritional information for accurate, clear, and concise presentation (oral and written).	50 49	3.20 3.55	-2.34	.0215
Deliver presentations on nutrition information.	50 49	3.16 3.61	-3.01	.0034

*First mean=real; second mean=ideal

VITA

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Candidate for the Degree

of Doctor of Education

Thesis: NUTRITION EDUCATION IN THE CURRICULA OF SELECTED HEALTH CARE PROFESSIONALS: NUTRITIONAL CARE COMPETENCIES FOR PHYSICIANS, DENTISTS, NURSES, AND CLINICAL DIETITIANS

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