A NATIONAL STUDY OF ROLE FUNCTIONS, JOB SATISFACTION AND CONTINUING EDUCATION NEEDS OF DIETETIC TECHNICIANS

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CHAPTER I

INTRODUCTION

Dietetics has been recognized as one of the allied health professions that contributes special skills in providing total patient health care (McTernan, 1979). Dietetic technicians have been recognized as part of dietetics teams since the early 1970's. Expansion of health care facilities due to the passage of federal legislation (Titles XVIII and XIX of the 1965 Social Security Amendments) created a need for more skilled dietetics support personnel (Peterson, 1967). This expansion added to dietitians' duties and made it necessary for dietitians to have trained professionals to whom they could delegate some tasks. The person advocated by Piper (1970) to fill this need was the dietetic technician.

The American Dietetic Association (A.D.A.) established guidelines for education of dietetic technicians in 1971 (A.D.A., 1971) and in 1974 dietetic technicians were admitted to membership in the A.D.A. (A.D.A., 1975).

Adding this skilled member to dietetics teams was expected to allow dietitians to focus on more complex tasks. In general, the technician was expected to provide dietitians with technical assistance; however the role of the technician was not always understood. Early research focused on identifying whether dietitians would be willing to use technicians, and then defining exactly which tasks dietitians were willing to delegate.

During the 1980's information on the role of the dietetic technician continued to be compiled. Most of the research indicated that many dietetic technicians were working in the area of clinical nutrition (Hilovsky, Zolber, Abbey, Connell & Burke, 1986; Ptak, Egenmaier, Godfrey, & Dillon, 1985) and that dietetic technicians were not being used effectively.

The American Dietetic Association undertook a massive role delineation study in the late 1980's (Kane, Estes, Colton, & Eltoft, 1990b) that clarified the roles of dietitians and dietetic technicians. This study identified role functions specific to the dietetic technician and outlined responsibilities of dietetic technicians in both clinical nutrition and foodservice management.

The American Dietetic Association, recognizing that dietetic technicians are valuable assets to nutrition care teams, began to urge more employers and dietitians to use the skills of the dietetic technicians (Parks, 1994). According to Parks, dietetic technicians could assist dietitians or assume full responsibility for a wide range of duties, including:

- Developing and implementing nutrition care plans
- Assessing clients' nutritional status
- Documenting client care
- Obtaining food preferences and diet histories
- Designing specialized meals
- Counseling clients on specific diets
- Teaching nutrition classes
- Monitoring food quality
- Supervising food production
- Ordering and inventory control
- Implementing cost control procedures (Parks, 1994, p. 7).

Limited published research is available on the role functions of dietetic technicians. It has not been established that dietetic technicians are actually functioning in the roles outlined in the Role Delineation Study. There has been no published research on whether performance of the specified roles leads to job satisfaction of dietetic technicians. Few studies have targeted continuing education needs of the dietetic technician to perform the identified role functions. The importance of maximizing health care resources coupled with the lack of information about dietetic technicians indicates a need for further research.

Purpose and Objectives

The purpose of this study was to examine how selected independent variables, both personal and institutional, affected the role functions, job satisfaction and continuing education needs of dietetic technicians.

The specific objectives were:

1. To determine if selected personal variables of age, gender, years of experience, membership in The American Dietetic Association and salary range were related to the role functions, job satisfaction, and continuing education needs of dietetic technicians.

2. To determine if selected institutional variables of type and size of employment facility, area of greatest percentage of work, and number of technicians in the facility were related to the role functions, job satisfaction, and continuing education needs of dietetic technicians.

Hypotheses

The hypotheses postulated in this study were:

H_1 - There will be no significant relationship between dietetic technician role functions and the personal variables of: a. age, b. gender, c. years of experience, d. membership in the American Dietetic Association, e. salary range.

H_2 - There will be no significant relationship between dietetic technician role functions and the institutional variables of: a. type of employment facility, b. size of facility, c. number of technicians in the facility, d. area of work.

H_3 - There will be no significant relationship between dietetic technician job satisfaction and the personal variables of: a. age, b. gender, c. years of experience, d. membership in the American Dietetic Association, e. salary range.

H_4 - There will be no significant relationship between dietetic technician job satisfaction and the institutional variables of: a. type of employment facility, b. size of facility, c. number of technicians in the facility, d. area of work.

H_5 - There will be no significant relationship between dietetic technician continuing education needs and the personal variables of: a. age, b. gender, c. years of experience, d. membership in the American Dietetic Association, e. salary range.

H_6 - There will be no significant relationship between dietetic technician continuing education needs and the institutional variables of: a. type of employment facility, b. size of facility, c. number of technicians in the facility, d. area of work.

Limitations

1. This study was limited to dietetic technicians who met education and training requirements of The American Dietetic Association (A.D.A.) and results can therefore only be generalized to this group.

2. Only one mailing was sent to the sample.

Assumptions

1. Respondents willingly participated in the study and completed the questionnaire objectively and without bias.

2. The survey instrument was valid and reliable for testing the hypotheses.

Definitions

A.D.A. - American Dietetic Association: A professional organization responsible for establishing educational and supervised experience requirements and standards of practice in the profession of dietetics.

R.D. - Registered Dietitian: A specialist educated for the profession of dietetics responsible for nutrition care of individuals and groups; one who has met education requirements of A.D.A. and has successfully passed the examination for registration as a dietitian (Arkwright, Collins, Sharp & Yahel, 1974)..

D.T.R.- Dietetic Technician, Registered: A technically skilled person who has met training and education requirements of the A.D.A. and has successfully passed the examination for registration as a dietetic technician (Arkwright, et al., 1974).

Continuing Education-(education) which follows the basic preparation for the profession of dietetics to enhance the knowledge of the individual member, thereby improving her competency (A.D.A., 1974).

Role Delineation-The identification of those major and specific responsibilities that a practitioner must assume, and be held accountable for, to provide quality care (Tower & Neville, 1988).

CHAPTER II

REVIEW OF LITERATURE

Historical Perspective

Since its foundation in 1917, The American Dietetic Association (A.D.A.) has focused on promoting nutrition to the public. The association fulfills this role in multiple ways including training professionals in dietetic education and establishing requirements and standards of practice. The professional first designated to provide nutrition information was the dietitian.

During World War II, the armed forces called for increased numbers of dietitians to provide nutrition care for the soldiers. That demand led to severe shortages of dietitians in institutions such as hospitals. Efforts to meet the public's need required dietitians to have some type of support personnel to aid them in their duties. In 1942, an A.D.A. committee was established to study training "nutrition aides" (Van Horne, 1960). Two wartime projects of A.D.A. were directed at meeting the needs of supplying nonprofessionals to aid the dietitian (Hughes, 1951). These projects concluded with the end of World War II, but the concept of using support personnel to aid dietitians was firmly in place.

During the late 1940's, the profession continued to search for ways to make more effective use of the dietitian's time. One option was to identify a nonprofessional role that would be responsible for routine dietary tasks. A 1948-49 survey conducted by the Food Administration Section of A.D.A found that 98 per cent of the dietitians who replied "acknowledged the need for training a type of nonprofessional assistant to perform many of the duties now or formerly handled by dietitians" (Hughes, 1951, p. 635).

In the 1950's, the dietitian's role expanded to include more management functions making it even more necessary to delegate day-to-day routine work to a nonprofessional. The "food service supervisor" was the first nonprofessional position created to assist the dietitian (Van Horne, 1960, p. 242). Passage in the 1960's of specific federal legislation (Titles XVIII & XIX of the 1965 Social Security Amendments) created new roles for dietitians in extended care and other health facilities (Peterson, 1967). Those new roles made it even more necessary for dietitians to have better qualified dietetics support personnel.

Early Manpower Studies

Due to increased demands a nationwide shortage of dietitians occurred in 1962. Schell and Bloetjes (1962) surveyed Veterans Administration dietitians to determine the duties that these dietitians would be willing to delegate to support personnel with specific educational backgrounds. One educational background identified was "at least two years of college with specified courses in home economics" (p. 557). The investigators found that a majority of dietitians were willing to delegate duties to personnel with this type of background and concluded that implementing this particular support position would lead

to better use of available dietitians by enabling them to concentrate on more complex tasks.

Kline and Dowling (1972) reported results of a Public Health Service-American Hospital Association survey conducted in 1966 that estimated the need for the services of 3,500 additional dietitians. Hubbard and Donaldson's 1968 manpower needs study determined numbers of dietitians needed by 1972 and 1977. They concluded that the estimated demand for dietitians in 1972 and 1977 could not be supplied by the increased enrollment in dietetics programs at the time of the survey. One recommendation of their study was "to explore and develop career ladders to utilize supportive personnel when possible and to allow dietitians to spend the maximum portion of their time in activities for which they are educated" (Hubbard & Donaldson, 1968, p. 215).

Powers (1975) reported that the growth in size and number of health facilities in the late 1960's led to increasing demands for "more talented persons to serve as supervisors, . . . and also for the paraprofessional to relieve the dietitian of as many duties as possible so the dietitian may assume greater responsibility in the health care delivery system" (p. 239). He said this demand would be served by the dietetic technician.

In 1970, Piper reported that two forces - the increased expansion of health care facilities and recognition of hunger and malnutrition problems in America - would cause more than 17,000 new dietitian positions to be available in 1975. Further, Piper noted "this manpower need would not be solved in the foreseeable future" (p. 226) and advocated delegating routine functions and tasks to a person with less training, who worked under the direction of the dietitian. Terming this person a "dietary technician"

and calling the technician a "skills oriented" member of the dietetic team with a two-year associate degree, she stated, "The utilization of technicians within the staffing pattern of a dietary department of a medical facility should help to provide the wide range of services required" (p. 227). Piper advocated establishing the technician position to help alleviate the manpower shortage in the dietetics field and called the dietary technician the newest team member of the dietetics team.

The Allied Health Professions Personnel Training Act of 1966 was the first federal legislation designed to increase the number of allied health professionals (Piper, 1970). The Basic Educational Improvement Grants of that Act allotted financial resources for nutrition-dietetics manpower and allowed junior colleges to begin funding programs for dietary technicians. In 1968-69 the fourteen junior colleges receiving these grants were conferring associate degrees for dietary technicians. Hatch (1973) reported the first Special Improvement Grants from the Division of Allied Health Manpower of the National Institutes of Health had awarded nearly $7 million for dietetics training and some of that money had been awarded to associate degree programs for dietetic technicians. He reported that there were nine dietetic technician programs in 1971 and an additional 12 more were expected to be operational by 1975.

Role Definitions

In response to the growing need for identifying a dietetics career ladder, the A.D.A. in 1971 identified three levels in the ladder and career guidelines for dietetic assistants, dietetic technicians and dietitians (Williams, 1977). "The dietetic technician was designated as that person being educated in the two-year college, with completion of

an Associate of Arts degree" (Williams, p. 622). A.D.A. had a long involvement in establishing standards or essentials for dietetics programs for dietitians (Hart, 1974; Haschke & Maize, 1984), so in the same year it also established guidelines for dietetic technician education programs. These guidelines, which are contained in Essentials of an Acceptable Program of Dietetic Technician Education (A.D.A., 1971), also established job competency standards for graduates of approved programs (Woodward, 1977). Technician programs could be designated either as nutritional care or foodservice management. Guidelines included specific coursework patterns leading to an associate degree and included a 450-hour field experience. Pennsylvania State University, Community College of Allegheny County, Pittsburgh, and Mercy College of Detroit were some of the early training programs for dietetic technicians (Clemen, 1974; Doherty, 1973; Powers, 1974; Schiller, 1977).

In 1974 the A.D.A. clarified the definition of the dietetic technician as:

> A technically skilled person who has successfully completed an associate degree program which meets the educational standards established by The American Dietetic Association. The dietetic technician, working under the guidance of an R.D. . . has responsibilities in assigned areas in food service management; in teaching foods and nutrition principles; and in dietary counseling (Arkwright, et al., 1974, p. 664).

The A.D.A. also outlined 23 responsibilities for dietetic technicians including: planning menus, standardizing recipes, procuring supplies, supervising food production, maintaining sanitation, calculating nutrient intakes, and guiding individuals in food selection.

Professional Recognition

In 1971, Israel Light, of the Chicago Medical School, recommended that A.D.A. offer associate membership status in the association to "such community college graduates from curriculums of which (the A.D.A.) approved" (p. 17). He continued, "Community college graduates are truly junior associates, not second-class citizens. Professional elitism and snobbishness can seriously interfere with any legitimate attempts to develop workable interdisciplinary health team plans" (p. 17). He said the A.D.A. should establish such restrictions on associate membership as it deemed necessary, but that including these members would lead to greater credibility for the association.

In 1974, the A.D.A. membership voted to allow technicians who met educational guidelines to become associate members. "A recognized category of membership within The American Dietetic Association has given credence to the technician's emerging roles" (A.D.A., 1975, p. 247). For the 1975-76 membership year there were a total of 24 dietetic technicians in the association. The A.D.A. bylaws were amended in 1977 to include dietetic technicians as non-voting members. In 1977 there were 22 approved dietetic technician programs in the United States and approximately 100 dietetic technicians were A.D.A. members (Woodward, 1977).

In 1983, the A.D.A. bylaws were again amended to allow dietetic technicians to vote and hold appointed office. Credentialing by the Commission on Dietetic Registration was initiated in 1986. In 1995 new A.D.A. bylaw revisions made the dietetic technician an Active member in the association.

Role Functions

The early 1970's saw an increase in all types of allied health professions with a resulting proliferation of personnel. After dietetic technicians were recognized as assets to the profession, many professionals made a strong push to incorporate them into dietetic health care teams. However, this effort did not always result in wise use of human resources. Mase (1976) wrote that many dietitians failed to delegate challenging tasks to technicians. He contended that unless tasks were effectively delegated, the dietetic technician could become an "expensive luxury" (p. 612) and continued, "Delegation of duties and responsibilities by the professionals in the respective health categories is essential" (p. 615).

Early Duties of Technicians

Even though the A.D.A. had outlined responsibilities for technicians in 1974, many technicians did not assume responsibilities at the defined level. The wide variation in technician use depended on the type of employment facility and on whether the technician functioned in food service management or clinical nutrition. Studies conducted in the 1970's showed more wide spread use of technicians in clinical nutrition than in foodservice management.

Several studies at this time reported on types of tasks delegated to technicians. Caliendo (1976) reported that dietetic technicians employed at Loretto Geriatric Center in Syracuse, New York, were involved in assessing diets, interviewing residents, developing

nutritional care plans, monitoring therapeutic diets, and serving as nutrition representatives on the health care team.

Lumsden, Zolber, Strutz, Moore, Sanchez, and Abbey (1976) surveyed dietitians in 197 United States hospitals to determine which specific tasks they would be willing to delegate to dietetic technicians. "A substantial number of dietitians were willing to delegate to the dietetic technicians, (but) there was also reservation as to the type of task functions (they would delegate)" (p. 147). Dietitians appeared more willing to delegate clinical nutrition tasks than food management tasks. Tasks the dietitians were most willing to delegate included: determining patient food preferences; assisting patients with menu selection; planning and supervising nourishments; transmitting diet orders and changes; verifying diet accuracy; taking accurate and informative dietary histories; and planning food production and work schedules.

A 1977 survey of dietetic technicians in Minnesota by Appel, Sipple and Von Kuster (N=80) reported limited demand of dietetic technicians due to lack of understanding regarding their abilities. Most of the surveyed technicians worked in hospitals (66 per cent) while 17 per cent worked in nursing homes. The technicians reported most of their duties were in the clinical nutrition area, especially assisting patients with diet selection. They also felt that they were undertrained in the area of food service production and supervision.

Rose, Zolber, Vhymeister, Abbey, and Burke (1980) surveyed all A.D.A. dietetic technician members as of August 1, 1977 (N=130) to determine the degree to which they were performing certain tasks. Task functions used in this study were the ones developed by Lumsden, et al. (1976). Rose et al. found that tasks most often performed by

technicians were: modifying diets, determining patients' food preferences, providing assistance with menu selection, instructing patients on diets, and planning nourishments. One finding of this study was that "dietitians are unwilling to delegate tasks other than clerical tasks, and that technicians are not allowed to function at the level of responsibility for which they had been trained" (p. 568). One recommendation resulting from this study was for a more detailed delineation of the role of the technician versus the role of the dietitian.

In a later study, Himburg (1981) formulated desirable competencies for clinical dietetic technicians regarding interviewing and diet counseling. Although primarily targeted for educational institutions, this study reinforced other work regarding entry-level responsibilities for technicians in clinical nutrition and concluded that entry-level technicians were competent in the areas of patient interviewing and education, but needed more in-depth training in counseling skills.

However, underutilization of dietetic technicians as dietetic team members, even in the area of clinical nutrition, continued to be a major problem. Argo and Miller (1981) surveyed 146 health care facilities in Georgia to examine employers' perceptions of dietetic technicians and their roles. Findings included the fact that technicians were underutilized in both acute care hospitals and long term care facilities because roles of technicians were not clearly understood. One recommendation of the survey was to differentiate the role of the dietetic technician from that of the dietitian to diminish role conflict between the two.

Role differentiation of dietitians and technicians was also advocated in a study done by Hoadley, Vaden and Spears (1981). Hospital dietitians in Colorado, Kansas,

Missouri, Nebraska, and Oklahoma were surveyed to determine which aspects of their role they would be willing to delegate to technicians. Interestingly, this survey found that these dietitians were more willing to delegate in food service management rather than in clinical dietetics. The types of duties with potential for delegation to technicians tended to be routine, operational activities such as: monitoring of receiving and storage of goods, sanitation, and planning daily food production. In addition, the authors stated that "defining the scope of practice for technicians and . . . differentiating the roles of dietitians and dietetic technicians" (p. 153) was necessary to use technicians fully. This study strongly advocated changing the emphasis of technician programs from that of specialty (nutrition care or food service management) to that of generalist with equal emphasis on both areas.

Role Competency Studies

All education programs training dietetic technicians used role competencies developed by the A.D.A. in 1971 and published in the book Essentials of an Acceptable Program of Dietetic Technician Education to teach entry-level skills to graduates. Competencies were defined as "the minimum knowledge, skills, affective behavior, and/or judgment deemed essential for a professional person" (Howard & Schiller, 1977, p. 429).

Howard and Schiller (1977) felt that a competent technician could be defined only in relation to the roles of a dietitian. They developed competencies for dietitians and differentiated those from competencies for the technician. Their study resulted in 45 competencies for technicians. Although relatively general, their competencies included both clinical nutrition care and foodservice management and were developed for entry-

level technicians. One of their recommendations was that competencies should be continuously evaluated and changed to reflect new trends.

Because use of technicians had been primarily in clinical nutrition and not in foodservice management, Holland (1978) used a Delphi technique to develop competencies for entry-level technicians in foodservice management. She contacted all 24 directors of A.D.A. certified programs in 1977. The input from these directors resulted in identification of 64 entry-level competencies in foodservice management. Although these competencies were intended primarily to aid educators of dietetic technician programs in curriculum design, they also enabled these same educators to teach entry-level skills to technicians which were needed on the job and thus helped form the basis for future role delineations.

A.D.A Role Delineation Studies in the 1980's

The A.D.A. has always been involved in identifying competence and expertise of its members. In the early 1970's, the A.D.A. appointed a Task Force for the Seventies to "define dietetic specialization roles" (Baird & Armstrong, 1981a, p. 371) and worked consistently to define competence in the field of dietetics. Federally supported role delineation studies, which grew out of the Health Training Improvement Act of 1970, resulted in A.D.A. being awarded a contract in 1979 from the Bureau of Health Manpower to study role delineation for the field of clinical dietetics.

To begin the role delineation studies, the A.D.A. appointed a 10-member Advisory Committee composed of dietetic and other health professionals, and an 8-member Working Committee composed of dietetic practitioners, educators, and

employers. These committees, working with project staff, helped develop skill and knowledge statements, and identified "appropriate" major and specific responsibilities (Baird & Armstrong, 1981b, p. 375). They identified "actual roles" (that which is currently accepted practice) and "appropriate roles" (that which should be done in current practice) for entry-level competence in all tiers of clinical dietetics (Baird & Armstrong, 1981b, p. 375).

Responsibilities in clinical dietetics were outlined in 10 areas:

Nutrition Care Process: Client/Patient Level
- Nutrition Assessment
- Nutrition Care Planning
- Nutrition Care Implementation
- Nutrition Care Evaluation
- Nutrition Education and Referral

Nutrition Care Process: Intra-professional Level
- Professional/Educational Activity and Development

Nutrition Care Process: Inter-professional Level
- Health Team Functions

Nutrition Care Process: Intra-organizational Level
- Food Procurement, Production and Service
- Strategic Direction and Personnel Management

Nutrition Care Process: Inter-organizational Level
- Identification and Management of Extraneous Influences upon Nutrition Care

(Baird & Armstrong, 1981b, p. 380).

After clinical dietetics areas were identified, the committees began to delineate practice levels to determine which responsibilities should be performed by dietitians and which could be performed by dietetic technicians. The final document, published in 1984, contained performance responsibilities and requisite knowledge for competent

performance in entry-level positions for both registered dietitians and dietetic technicians in clinical dietetics (Baird, Burelli, & Flack, 1984).

As a result of the role delineation study, the A.D.A. published a 1982 Position Paper on Clinical Dietetics which outlined responsibilities of entry-level dietetic technicians. These were categorized into four conceptual levels: client, intra-professional, inter-professional, and intra-organizational.

> At the *client* level the clinical dietetic technician assists the registered dietitian in clinical practice to provide direct nutrition services to patients or clients. The technician is responsible for:
> -Using predetermined criteria in screening patients to identify those at nutritional risk and collecting specified data for use in assessment of dietary status.
> -Following guidelines established by the clinical dietitian to develop nutrition care plans for individual patients.
> -Providing technical services in the implementation of nutrition care plans.
> -Monitoring the effect of nutrition intervention and assessing patient food acceptance.
> -Utilizing opportunities for nutrition education and providing diet counseling for individuals not at nutritional risk.
>
> Within the second level, *intra-professional* relationships, the dietetic technician cooperates with the clinical dietitian in promoting standards of quality practice and using current knowledge to solve nutrition problems of individual patients.
>
> At the third or *inter-professional* level the technician coordinates assigned nutrition care activities and is responsible for:
> -Coordinating nutrition care of assigned patients/clients with other health services.
> -Coordinating designated nutrition care services with institutional food service activities.
>
> At the *intra-organizational* level the dietetic technician utilizes established standards and procedures to implement the system of patient nutrition care. This responsibility includes:
> -Utilizing established procedures for making available designated special food products and dietary supplements.
> -Supervising diet clerks and other patient food service personnel.

> -Developing and implementing a program of orientation, training, and inservice education for patient food service personnel (A.D.A., 1982, p. 259).

There were two other role delineation studies conducted in the 1980's, one for entry-level positions in community dietetics and one for entry-level positions in food-service systems management. Neither of these two studies had any implication for dietetic technicians.

Duties of Technicians in the 1980's

Concurrent with the role delineation studies of the early 1980's, A.D.A. also conducted a Dietetic Manpower Demand Study to estimate the need for dietetics professionals in 1985 and 1990. Numbers of dietetic technicians in nutrition care were estimated to grow faster than the number in food service through 1990, but total demand for technicians was estimated to be great (Fitz & Baldyga, 1983). However, little research was published on technicians in the 1980's even though their numbers continued to increase.

Most studies published in the 1980's focused on duties of technicians in clinical nutrition (Crosson, 1984; Hilovsky, Zolber, Abbey, Connell, & Burke, 1986; Ptak, Egenmaier, Godfrey, & Dillon, 1985). Crosson (1984) reported use of clinical dietetic technicians in a psychiatric facility and identified typical duties as those of the *client* level of the Role Delineation Study. Ptak, et al. (1985) studied duties of dietetic technicians in a burn-trauma unit of an acute care hospital. Time-consuming and routine tasks, such as calculating and recording daily nutrient intakes, checking cardexes, and assisting patients with menu selection, were most often delegated to technicians. Dietitian effectiveness

and quality of patient care were augmented through increased use of technicians for these routine duties. Dietitians were more able to devote their time to assessment, planning, and monitoring of critically ill patients, and to documenting patient care.

Technician members of A.D.A. had increased to more than 900 by 1985. Hilovsky, et al. (1986) sampled 341 of these members to determine if "clinical dietetic technicians were performing tasks identified for their role by ADA" (p. 1028). Responses indicated that 35.6 per cent were employed in roles with a clinical emphasis, 19.1 per cent were employed in roles with a management emphasis, and 35.1 per cent were employed in roles with a combined emphasis. Clinical technicians were performing duties in agreement with those outlined in the role delineation study.

One interesting finding was that technicians were frequently employed in positions not related to their education specialization in clinical nutrition or food service management. An increasing number were functioning in a generalist role and had a wide variation in assigned responsibilities. Technicians also expressed concern that the technician's role was not clearly understood by the profession. Hilovsky, et al.(1986) stated, "The key to effective utilization of dietetic technicians is implementing their role as defined, assigning them to the appropriate responsibility for task performance" (p. 1028).

Although not focused directly on dietetic technicians, a 1989 study by Meyer and Olsen found that clinical dietitians spent a large portion of their time on routine tasks such as obtaining patient food preferences and modifying diets. Meyer and Olsen stated that this was "not efficient use of . . . trained health care professionals; appropriately trained dietary technicians could perform those tasks" (p. 492) and further stated that technicians would be more cost-effective in a time of increasing health care costs.

Simonis, Spears, and Vaden (1983) used the role competencies of Howard and Schiller (1977) and Holland (1978) to identify core competencies for dietetic technicians in order to assist with curriculum planning for dietetic education. Technician members of A.D.A. and their supervisors were surveyed on 74 core competencies to determine which duties were being performed. Two scales, Importance (ratings ranged from essential to not a responsibility) and Time Considerations (ratings ranged from constantly to not a responsibility), were used to identify in which area technicians had the most responsibilities. Of the 74 competencies, over half (39) were identified as having greater importance for general positions. Technicians indicated a program with an equal emphasis on clinical nutrition and food service management would be the best preparatory background for jobs. Simonis, et al. concluded that A.D.A. should revise curriculum requirements to provide programs with equal emphasis on clinical nutrition and food service management. Other studies (Appel, et al., 1977, Hilovsky, et al., 1986; Rose, et al., 1980) had also made these same recommendations.

In response, A.D.A. commissioned a Task Force on Education to study entry-level competencies. Recommendations of this Task Force included preparing entry-level persons with "a common body of knowledge" (Haschke & Maize, 1984, p. 209). Standards of Education were implemented by the A.D.A. for all programs beginning in 1988 (Smitherman & Anderson, 1987). The standards included knowledge and performance requirements which "represent a common body of knowledge and performance capabilities for the entry-level practitioner" (Smitherman & Anderson,

p. 1221). These standards changed dietetic technician programs from two separate emphases to programs with equal emphasis on clinical nutrition and food service management.

Other educational entities also studied duties of dietetic technicians in the 1980's. The Illinois Adult Vocational and Technical Education Division (Below, 1988) published a task list for dietetic technicians which included employability skills and proposed duties of technicians. Duties were divided into seven groups: managing a food service operation; gathering data; planning menus for optimal nutrition; evaluating and implementing nutritional care plans; instructing, gathering and supervising; documenting patient's progress; and setting standards. These groups were designed to aid teachers in structuring curriculum for technician programs.

Role Delineation for the 1990's

Concerns that changes in the profession of dietetics be reflected in the professionals' roles led A.D.A. to commission a more complete role delineation study in 1987. Role delineation was defined by Neville and Tower (1988) as, "The identification of those major and specific responsibilities that a practitioner must assume, and be held accountable for, to provide quality care" (p. 356). Earlier role delineation studies had focused only on entry-level positions. The new study focused on both entry-level dietitians and dietetic technicians, and on dietitians with experience. According to the A.D.A. Role Delineation Steering Committee, "This study measured what dietetic technicians and dietitians at entry level and dietitians beyond entry level are actually doing in a variety of settings" (Tower, Cassell, Dowling, Groeschen, & Scialabba, 1990, p.

1122). This role delineation was intended to define appropriate responsibilities for these professionals, and was also to be used by the Council on Education to update knowledge and performance requirements, by the Council on Practice to revise practice standards, and by the Commission on Dietetic Registration to set test specifications. "The goal of the study was to unify, clarify, update, and expand the understanding of dietetic practice that had emerged from three previous role delineation studies completed in the 1980's" (Kane, Estes, Colton, & Eltoft, 1990b, p. 1).

The study was conducted by American College Testing (ACT) and administered to representative samples of entry level dietitians and dietetic technicians, and beyond-entry-level dietitians. Results of the study were published by the A.D.A. in 1990 (Kane, et al. 1990b).

To measure what dietetic practitioners were actually doing, those sampled "were asked to describe their work in dietetics using a survey instrument designed for the study, the Dietetic Practice Inventory" (Kane, Estes, Colton & Eltoft, 1990a, p. 1124). Developed to study job functions and responsibilities, the Inventory consisted of four sections: a main section which included a list of 129 job activities; a demographic section; questions regarding a respondent's work setting; and amount of time spent on job activities. Job activities were divided into nine categories:

A. Managing Food and Other Material Resources
B. Providing Nutrition Care to Individuals
C. Providing Nutrition Programs to Population Groups
D. Managing Financial Resources
E. Marketing of Services and Products
F. Teaching Dietitians and Other Professionals/Students
G. Conducting Research
H. Managing Human Resources
I. Managing Facilities (Kane, et al, 1990b, p. 130).

Dietetic technicians surveyed were those who had graduated from A.D.A.-approved programs between January 1986 and August 1988. "Of the 1,226 entry-level dietetic technicians sampled, 840 (68.5%) completed the Inventory" (Kane, et al., 1990a, p. 1127). However, only 551 respondents were actually working as technicians.

Results showed the most common work setting for technicians was "inpatient care, acute-care facility," followed by "foodservice, long term care," and "foodservice, acute care" (Kane, et al., 1990b, p 59). Entry level technicians reported highest levels of involvement in Category A and Category B tasks. Category A tasks showing highest involvement were the following: maintain safety and sanitation of food, assess client satisfaction with menus, check trays for accuracy, monitor food quality, and monitor quality of service. Tasks in Category B for which highest involvement was shown were the following: take preliminary diet histories, adapt oral diets to individual needs, review medical records for nutrition data, assist clients with menu selection, identify nutrition related needs, and document client care. The remaining categories did not reflect much involvement by technicians; however some reported high involvement in other areas such as supervising dietary aides and cooks, clerical work, and picking up menus (Kane, et al., 1990b, p. 187). "Major differences among the three groups (were) not so much in the types of activities performed, but rather in the level of responsibility/authority exercised by entry-level dietetic technicians and entry-level dietitians" (Kane, et al., 1990b, p. 292).

As a result of this study, A.D.A. formed a 1992 task force to make recommendations for changes in how dietetic technicians were recognized. The Dietetic Technician Implementation Task Force spearheaded the effort to promote dietetic

technicians, both internally and externally, including publication in June 1994 of a brochure advising members of benefits of working with dietetic technicians.

Job Satisfaction

Because of the large amount of time individuals spend at work, factors affecting or influencing various aspects of work have been studied for decades. "The ways people respond to their jobs have consequences for their personal happiness, the effectiveness of their work organizations, and even the stability of society" (Loscocco & Roschelle, 1991, p. 183). Therefore, an individual's quality of life is influenced by his or her job.

Some of the earliest studies of work life focused on job satisfaction and work productivity (Locke, 1969). However, job satisfaction is only one aspect of an individual's work life; other components include the whole realm of work life quality and factors affecting it. According to Basset (1994), over the last 20-plus years, the focus of job satisfaction research changed to the study of Quality of Work Life.

Quality of Work Life

The term "quality of work life" (QWL) was first used in the late 1960's (Sashkin & Burke, 1987) but no single definition has ever been accepted by scholars. Tuttle (1982) called QWL a "broad 'umbrella' under which many diverse interests can gather" (p. 6). Early studies defined QWL as a way to express an individual's response to work. QWL was next viewed as organizational improvement to encourage union-management cooperation (Fields & Thacker, 1992). Organizations then defined QWL by the ways they used it to bring about organizational change. In the late 1970's, it was considered to

be a social movement (Sashkin & Burke, 1987). QWL may have a variety of meanings to the same person, depending on the role perspective the person has at the time.

Many management scholars characterized QWL as having two attributes: concern for the well-being of the worker and organizational effectiveness (Efraty & Sirgy, 1990; Zautra, Eblen, & Reynolds, 1986). QWL has been defined as "the continuing, dynamic process of increasing the freedom of employees in the workplace by improving organizational effectiveness and the well-being of individual workers through planned interventions, with the expectations that productivity as well as satisfaction will tend to increase in successful applications" (Golembiewski & Sun, 1990, p. 36). Tuttle contended that QWL was "a planned, structured, ongoing interpersonal process in which management and rank and file workers take part and from which both benefit" (p. 6). He felt that QWL and productivity were related concepts, while Fields and Thacker (1992) observed that successful QWL efforts affected a worker's job satisfaction. Efraty and Sirgy maintained that workers enjoyed a sense of QWL to the extent that the organization satisfied their individual needs, and that their QWL then affected such things as job satisfaction, job involvement, job effort and performance.

A broad range of job-related issues is associated with quality of work life and should be considered when implementing a QWL intervention. Walton (1973) was one of the first to define QWL by outlining issues comprising it. He characterized QWL as encompassing such areas as: adequate and fair compensation; safe and healthy working conditions; opportunity to use and develop personal capabilities; opportunity for continued growth and security; social integration in the work organization;

constitutionalism in the work place; work and total life space; and social relevance of work to life.

Rosow (1981) identified six critical QWL areas for workers as: pay, employee benefits, job security, alternative work schedules, occupational stress, and democracy in the work place. He noted that job security was fundamental to QWL for employees and ranked as more important than pay for many workers. Scobel (1980), however, listed the following as critical to improving QWL for workers, saying they wanted: input into decisions, revision of policies to reflect trust, lessened restrictions on work life, opportunities rather than adversarial relations with unions, and the freedom to be openly and honestly informed about policies.

Bowditch and Buono (1982) offered the following dimensions of QWL: overall organization (feelings and commitment); compensation issues (pay and benefits); job security; management (policies); relationship with immediate supervisor; advancement issues; co-workers and interpersonal relations; and the job itself (characteristics, demand, satisfaction) (p. 70).

Because the definition of QWL is so broad and encompasses such a variety of issues, studies targeting QWL have a wide array of application to all areas of business and industry.

Quality of Work Life in Dietetics

Although no studies have been identified specifically focusing on quality of work life of dietetic technicians, several studies have been done on QWL of various groups of dietitians (Taylor, 1984; Liu, 1992; Palan, 1985). Both Palan (1985) and Liu (1992)

studied dietitians in Oklahoma. Taylor (1984) studied dietitians in business and industry in the United States.

Palan (1985) surveyed 476 active members of the Oklahoma Dietetic Association on the following QWL dimensions: actual work on present job; promotion; supervision on present job; people on present job; general job satisfaction; job in general; and performance constraint measures. Out of the 476 questionnaires mailed, he received 196 responses (42%) and found that Oklahoma dietitians scored high on all aspects of QWL dimensions, especially general job satisfaction.

Liu (1992) surveyed 581 active members of the Oklahoma Dietetic Association using an instrument that assessed perceptions of QWL on current job as characterized by importance and current status. She received a response of 149 (26%) and reported dietitians perceived the following as important to their QWL: perception of self (life planning, formal education, career choices); salary commensurate with titles and responsibilities; work group environment; and friends and mentors.

Taylor (1984) surveyed members of the dietetic practice group, Dietitians in Business and Industry. A random sample of 600 was questioned on these QWL dimensions: company, actual work on present job, pay and benefits, opportunities for promotion, supervision on present job, people on present job, general job satisfaction, job in general and a performance constraint measure. Total response was 253 (42%). She found that these dietitians were, in general, very satisfied with their jobs as shown by response to the QWL dimensions, with the exception of opportunities for promotion.

Job Satisfaction in General

Job satisfaction is now considered to be a secondary or surrogate measurement of the quality of work life (Goodman, 1980). Systematic research on the character and explanation of job satisfaction did not begin until the 1930's, but it had been recognized long before that time that a worker's attitudes influenced his actions on the job (Locke, 1976). During the 1920's and 1930's, research conducted at Western Electric's Hawthorne Plant (widely referred to as the "Hawthorne studies") hypothesized that a satisfied worker was a productive worker (Bassett, 1994; Locke, 1976; Jones, 1992). The concept that job satisfaction influenced productivity was widely studied for many years but recent research shows this relationship is not as significant as first thought (Bassett, 1994; Ostroff, 1992; Moorman, 1993).

However, "job satisfaction remains one of the most studied concepts in organizational research" (Agho, Mueller, & Price, 1993, p. 1008). Locke (1976) calculated a minimum of 3,350 articles or dissertations had been written on job satisfaction by 1976 and Spector (1985) extrapolated this number to 4,793 by 1985. Job satisfaction has been viewed both as an independent and a dependent variable (Hopkins, 1983). According to Hopkins:

> As an independent variable, job satisfaction is seen as the cause of other phenomena such as productivity and motivation. As the dependent variable, job satisfaction is seen as being caused by other conditions such as the nature of the job and individual characteristics (p. 19).

Most recent studies have regarded job satisfaction as a dependent variable and calculated its presence through assessment of workers themselves (Ferratt, Dunham, & Pierce, 1981).

What exactly is meant by the term "job satisfaction"? In its most simplistic definition, satisfaction is simply fulfillment of a need or want, or the state of being content (Merriam-Webster, 1993). Therefore, job satisfaction is the state of being content with one's job. Locke (1976) defined job satisfaction as: "a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences" (p. 1300). He continued, "Job satisfaction results from the appraisal of one's job as attaining or allowing the attainment of one's important job values, providing these values are congruent with or help to fulfill one's basic needs" (p. 1319).

Job satisfaction has been defined in many different ways by various researchers. According to Efraty and Sirgy (1990), "Job satisfaction refers to one's affective appraisal of various job dimensions such as the work itself, supervision, pay, promotion policies, and co-workers" (p. 34). Agho, Price and Mueller (1992) termed job satisfaction "the extent to which employees like their work" (p. 185). And Loscocco and Roschelle (1991) labeled job satisfaction "the overall affective orientation to the job" (p. 183).

Most recent research on job satisfaction has centered around three different points of view: 1. job satisfaction related to characteristics of the job tasks performed by the workers; 2. job satisfaction related to characteristics of the organization where the tasks are performed; and 3. job satisfaction related to characteristics of the workers themselves (Agho, et al., 1993; Glisson & Durick, 1988; Loscocco & Roschelle, 1991).

Characteristics of Job Tasks. Characteristics of the job studied to determine relationship to job satisfaction include: the work itself, responsibility, pay, promotions, recognition, benefits, and working conditions (Locke, 1976). Work characteristics found to be related to satisfaction include autonomy, variety, complexity, and responsibility.

Autonomy, explained as the amount of freedom to act independently on the job, has been found to consistently lead to job satisfaction (Loscocco & Roschelle, 1991, p. 192). Role ambiguity, skill variety (or complexity) and role conflict also are strong predictors of job satisfaction (Glisson & Durick, 1988, p. 66). Role ambiguity is defined as "the degree to which role expectations are unclear" (Agho, et al., 1993, p. 1012). Role conflict is the degree to which a worker's behaviors are incompatible or inconsistent with what they expect of themselves (Agriesti-Johnson, & Miles, 1982). Workers who are clear about their roles and who are allowed to use more of their skills are more likely to be satisfied with their jobs.

Task significance or identity can also contribute to job satisfaction. Task significance is "the degree to which an individual's job contributes to the overall organizational work process" (Agho, et al., 1993, p. 1012). A challenging task having variety or complexity is most satisfying to workers (Hackman & Oldham, 1975). Routinization (or repetitiveness) has been found to negatively correlate with job satisfaction (Agho, et al., 1992).

Pay, promotion opportunities, recognition, benefits and job security also received attention as job characteristics relating to job satisfaction. Some studies found positive correlations between these characteristics and job satisfaction (Agho, et al., 1993; Calbeck, Vaden, & Vaden, 1979, Sims & Khan, 1986).

Characteristics of the Organization. Organizational characteristics investigated to determine effect on job satisfaction include: leadership, organizational structure, and supervision. Supervision, the degree to which a supervisor was helpful on job related matters, was found to be positively correlated with job satisfaction (Agho, et al., 1993). Loscocco and Roschelle (1991) stated that the other organizational characteristics by themselves are not good predictors of job satisfaction.

Characteristics of the Workers. Characteristics of workers analyzed to identify relationship to job satisfaction include: personality characteristics and individual disposition, age, education, gender, and family roles. Each of these is explored in the following paragraphs.

Personality characteristics include positive affectivity and negative affectivity. "Positive affectivity is an individual's disposition to be happy across time and situations; negative affectivity is an individual's disposition to experience discomfort across time and situations" (Agho, et al., 1992, p. 186). Positive affectivity is also related to "life satisfaction" (Rain, Lane, & Steiner, 1991). Several studies (Agho, et al., 1992; Agho, et al., 1993; Judge, 1993; Judge & Locke, 1993; Judge & Watanabe, 1993) have shown that individuals who are predisposed to be happy over time are more likely to be satisfied with their jobs. Judge and Watanabe (1993) suggested that "individuals satisfied with their lives are more likely to be satisfied with their jobs because their general state of satisfaction influences their . . . evaluation of job conditions" (p. 947). This satisfaction will, in turn, influence the commitment to the job and decrease the rate of absenteeism and turnover (Judge, 1993).

"Age may be the most commonly studied individual influence on work attitudes" (Loscocco & Roschelle, 1991, p. 189). Older workers are reported by many studies to have greater job satisfaction and be more committed to their work (Glisson & Durick, 1988). A related variable to age is length of work tenure or career stage. Loscocco and Roschelle (1991) conveyed inconsistent results from studies on these variables. They reported a positive correlation between career stage and work when career stage is defined by age, but a curvilinear relation when age is defined in terms of tenure. Agho, et al. (1993) suggested employees who have worked longer in an organization have higher levels of job satisfaction because they are more likely to have greater control over their jobs.

The effect of a worker's education on job satisfaction is another characteristic that has received some consideration. Education is thought to raise a worker's expectations and thus contribute to a lack of job satisfaction (Glisson & Durick, 1988; Loscocco & Roschelle, 1991). However, Coates (1982) cited results on a survey titled "Work in America" which showed those professional workers who enjoyed the highest levels of education found the most satisfaction with work; nonprofessional white-collar workers were less satisfied than professionals, and blue-collar workers were least satisfied with their work.

Gender has also been examined as a predictor of job satisfaction. Glisson and Durick (1988) reported results of one study indicating females are more intrinsically satisfied with their jobs, but noted little other empirical support for this position. The influence of family roles on job satisfaction is an area that has not been well researched to

date. Studies have been done primarily on working women showing family roles reflect needs that have a large influence on job satisfaction (Loscocco & Roschelle, 1991).

Measurement of Job Satisfaction

Instruments have been developed to measure job satisfaction, but not all instruments measure the same phenomena. According to Price and Mueller (1986), "Satisfaction can be measured globally or dimensionally and directly or indirectly" (p. 216). A global measure refers to general satisfaction with the organization, while a dimensional measure refers to specific features of the organization (Price & Mueller, p. 216). Global measures are often termed "facet-free" and dimensional measures are termed "facet-specific." A direct measure asks questions with the term "satisfaction" included, while an indirect measure never openly uses the term "satisfaction" but infers its presence from the questions. The following sections overview five job satisfaction instruments.

Index of Job Satisfaction. One of the early instruments developed to measure job satisfaction was Brayfield and Rothe's Index of Job Satisfaction (1951) termed by Price and Mueller (1986) a global and direct measure of satisfaction (p. 216). The development of this index was in response to the need to have a criterion measure for personnel studies. The authors designed an 18-question attitude scale and tested it on two different groups of employees using clearly worded statements such as: I am often bored with my work; or I enjoy my work more than my leisure time. Items were scored using a five-point Likert scale. The reliability coefficient for this index was 0.77,

corrected by the Spearman-Brown formula to 0.87. Validity of the index was correlated with scores on an earlier survey by Hoppock and the product-moment correlation was 0.92.

Job Descriptive Index. Smith, Kendall, and Hulin (1969) developed the Job Descriptive Index (JDI) to measure job and retirement satisfaction. It is termed by Price and Mueller (1986) a dimensional and indirect measure of satisfaction (p. 216). Smith, et al. (1969) defined job satisfaction as "the feelings a worker has about his job and are affective responses to facets of the situation" (p. 6). The facets measured were: work itself, supervision, pay, promotions, and co-workers. Each facet included items providing descriptive and evaluative measures. The format was simple. "For each area there is a list of adjectives or short phrases, and the respondent is instructed to indicate whether each word or phrase applies with respect to the particular facet of his job in question" (Smith, et al., p. 60). Responses could be yes, no, or question marks (?) indicating an inability to decide. The format permitted administration of the same questionnaire to a variety of educational levels. Scoring for the JDI was reassessed by Hanisch (1992). She indicated that the overall scoring procedure was still justified and appropriate, even with the question mark (?) response.

Norms for the five JDI scales were based on samples of 2,000 males and nearly 600 females from 16 different companies. Consistent convergent and discriminant validity was assessed by Smith, et al. using a multitrait-multimethod matrix. Reliability was determined by split-half correlation coefficients and ranged from 0.80 to 0.88 when corrected by the Spearman-Brown formula.

Job Diagnostic Survey. The Job Diagnostic Survey (JDS) was developed by Hackman and Oldham (1975) to aid in diagnosing existing jobs in order to plan job redesign, to determine if the job redesign increased employee motivation and productivity, and to evaluate the effect of the job redesign on the employees. It has been used many times in organizational surveys and has been used to assess job satisfaction in employees.

The JDS measured five job characteristics: skill variety, task identity, task significance, autonomy, and feedback. It also provided measures of three critical psychological states: experienced meaningfulness of the work; experienced responsibility for work outcomes; and knowledge of results. In addition, the JDS provided measures of several affective reactions an employee would have to the job: general satisfaction; internal work motivation; and specific satisfactions with job security, pay and other compensation, peers and co-workers, supervision, and personal growth and development on the job.

The instrument was tested with blue-collar, white-collar, and professional personnel in 62 different jobs. The authors determined that the instrument had satisfactory internal consistency and adequate discriminant validity. They cautioned, however, that the instrument was not recommended for persons with less than an eighth grade education or those who could not read English well. The instrument was not recommended for diagnosing jobs of single individuals (p. 169).

Job Characteristics Inventory. Sims, Szilagyi, and Keller (1976) developed the Job Characteristics Inventory (JCI) in an effort to refine the 1971 work of Hackman and

Lawler. This instrument was intended to measure a worker's perception of task characteristics and determine how these may relate to job satisfaction. "Many of the questions in the JCI were taken from the Hackman-Lawler research" (Sims, et al., 1976, p. 199). Task characteristics studied were: variety, autonomy, feedback, dealing with others, task identity, and friendship.

The instrument was tested on 1,161 employees of a medical center and 192 managerial and supervisory personnel of a manufacturing firm. "The original questionnaire administered to the medical center sample consisted of 23 items" (Sims, et al., p. 199). A five-point Likert scale was used for responses. The revised and final version contained 30 questions. A split-half reliability test showed all scores above 0.70 (corrected by the Spearman-Brown formula) with the exception of friendship. Construct, convergent, and discriminant validities were also tested.

Job Satisfaction Survey. Because most job satisfaction instruments were developed for manufacturing and industrial settings, and did not address workers in human service organizations, Spector (1985) developed the Job Satisfaction Survey (JSS). Designed specifically for human service, public, and nonprofit sector organizations, the JSS was normed and validated on human service personnel. The scale measured nine aspects of job satisfaction and also gave an overall attitude score as a combination of individual areas. The nine aspects were: pay, promotion, supervision, benefits, contingent rewards, operating procedures, co-workers, nature of work, and communication.

The instrument was tested on 3,148 respondents from 19 different human service areas including community mental health centers, state social service departments, and nursing homes. All levels of employees were represented from administrators and department supervisors to line and support personnel. The instrument consisted of 36 questions which were scored on a 6-point Likert scale.

Total internal reliability of the scale was found to be 0.91 Convergent and discriminant validities were provided by a multitrait-multimethod analysis of the JSS and JDI.

Job Satisfaction of Dietetic Professionals

Job satisfaction of dietetics professionals has received increased attention due to the fact that rapid growth in health care costs often leads to downsizing with possible loss of professional staff. Although data on job satisfaction of dietetic technicians is limited, there is information on other members of the dietetics profession, particularly dietitians, nutritionists, and foodservice managers and staff.

Job Satisfaction of Dietitians. One of the first studies of job satisfaction of dietitians was done by Broski and Cook (1978) using the JDI (Smith, et al., 1969). Their study compared the job satisfaction of dietitians to that of physical therapists, occupational therapists, and medical technologists. The subjects were recent graduates of the Ohio State University School of Allied Medical Professions at the time of the study. The sample size of dietitians was small; 103 dietitians were sent surveys, and 88 responded. Results showed that dietitians had the lowest overall job satisfaction and the

least satisfaction with all job facets investigated. The researchers also found that dietitians' scores were in the bottom third of scores of those with similar levels of education.

Full-time hospital dietitians in four specialties (foodservice management, clinical, generalist, and management) were surveyed by Calbeck, Vaden, and Vaden (1979) to compare selected demographic variables, job satisfaction, and work values. The sample was drawn from A.D.A. members in nine Midwestern states. Total sample size was 430 and a response rate of 75 percent was obtained from the surveys (N=323). The instrument used was divided into three sections: a biographical data section; the JDI (Smith, et al., 1969); and a work values section.

This research compared mean JDI scores of the dietitians with the foodservice workers of the Martin and Vaden (1978) research. Dietitians were found to be more satisfied with all aspects of their jobs except promotion. Indications were that these dietitians found the work itself and supervision to be the most important aspects of their job satisfaction. The dietitians' overall job satisfaction was greater than that of the foodservice workers in the Martin and Vaden study.

Agriesti-Johnson and Broski (1982) examined the level of job satisfaction of a national sample (N=529) of dietitians using the JDI (Smith, et al., 1969). Categories of dietitians were: consultant, clinical, private practice/other, generalist, administrative, community/public health, heads of departments, research, and teachers. "Job satisfaction scores were studied in relation to marital status, age, years of employment, place of employment, salary, job responsibilities, and dietitian category" (p. 556). There were no significant differences in the JDI scores among dietitian categories. However, JDI scores

were low overall. Nevertheless, dietitians were most satisfied with supervision, and least satisfied with opportunities for promotion.

In a related study, Agriesti-Johnson and Miles (1982), using data from the Agriesti-Johnson and Broski (1982) survey, compared the relationships between role ambiguity and conflict and job satisfaction of dietitians in the United States. Role ambiguity scores for all dietitians were low and role conflict scores were higher for all dietitian groups. This study found no correlation between role ambiguity, role conflict, and job satisfaction.

A national study of public health nutrition personnel by Sims and Khan (1986) examined job satisfaction and factors related to feelings of job satisfaction (N=584). Respondents indicated moderate levels of overall job satisfaction, but were most satisfied with type of work and co-workers, moderately satisfied with supervision, and least satisfied with pay. Sims and Khan found overall job satisfaction to be significantly correlated with age, tenure, and number of years in the profession.

Job satisfaction of South Carolina dietitians was examined in a study by Rehn, Stallings, Wolman, and Cullen (1989) and compared to the findings of the Agriesti-Johnson and Broski (1982) study. The instrument used for the study was the JDI (Smith, et al., 1969) with inclusion of a job in general (JIG) category contained in the revised JDI (Rehn, et al, 1989, p. 979). South Carolina dietitians were most satisfied with their jobs in general (JIG) and least satisfied with opportunities for promotion. However, mean scores for these dietitians were higher in all JDI categories, except pay, when compared to the Agriesti-Johnson and Broski (1982) study. The authors suggested that these higher scores could point to a trend toward higher job satisfaction for dietitians.

Dietitians in metropolitan New York City were evaluated by Dalton, Gilbride, Russo, and Vergis (1993) to assess their level of job satisfaction and compare the results to the Agriesti-Johnson and Broski (1982) and Rehn, et al.(1989) studies. Clinical, community, and long-term-care dietitians (N=409), both A.D.A. members and nonmembers, were surveyed to determine if registration status, work status, or professional position affected job satisfaction. This study again used the JDI (Smith, et al., 1969) as the survey instrument. Results were compared to the normative sample provided by Smith, et al. (1969). Mean JDI scores indicated that dietitians in New York City were less satisfied than the dietitians in the Agriesti-Johnson and Broski (1982) and Rehn, et al. (1989) studies. The New York City dietitians were very dissatisfied with pay and promotion, but were more satisfied with co-workers and supervision.

In a related study, Dalton, Gilbride, and Weisberg (1993) used the data from the New York City dietitians to assess job satisfaction as it related to professional tenure, job change rate, and hours worked. Dietitians who had worked in dietetics from six months to three years were least satisfied with their jobs, while dietitians who had worked more than 12 years were most satisfied. Dietitians who changed jobs most often had greatest satisfaction with work and pay. Hours worked did not relate significantly to satisfaction except for pay.

Job Satisfaction of Foodservice Employees or Managers. Martin and Vaden (1978) studied hospital foodservice workers to determine if there was a difference between work values of employees in large or small hospitals, if job satisfaction related to specified demographic variables, and if there was a relation between work values and job

satisfaction. Female foodservice employees in six hospitals with more than 240 beds in two Midwestern states were surveyed (N=149). The portion of their survey instrument which measured job satisfaction was the JDI (Smith, et al., 1969).

From the components measured by the JDI, significant differences were found for the work itself, supervision, pay and promotion in relation to length of employment. Women who had been employed less than six months or longer than three years were most satisfied with their jobs. However, satisfaction scores for these four components were below the norms for women workers found by Smith, et al. (1969).

A 1989 study by Duke and Sneed examined job satisfaction of university foodservice employees. In order to determine the relationship between job satisfaction and job characteristics, the survey used the JCI (Sims, et al., 1976), included six questions concerning job satisfaction, and obtained demographic information. The sample consisted of 179 managerial and non-managerial employees in a university foodservice department. The study found that job satisfaction was positively related to characteristics of the job. Dealing with others and feedback received higher scores than the other characteristics. Dealing with others was the only characteristic that was significantly higher for managerial than non-managerial employees. This study found no relation between demographic variables and job satisfaction with the exception of age. Employees in the 40 to 49 and 50 to 59 age groups expressed higher job satisfaction than did younger employees.

Sneed and Herman (1990) surveyed hospital foodservice employees in 11 hospitals to determine relationships between job characteristics and job satisfaction using the JCI (Sims, et al., 1976). The 45 supervisory and 172 nonsupervisory employees

indicated a positive relation between job characteristics and job satisfactic and feedback being the significant individual characteristics" (p. 1075). Su employees had higher scores for variety, autonomy, feedback, dealing with friendship opportunities than did nonsupervisory employees. There was no relation between demographic variables and job satisfaction. Sneed and Herman stated that their findings could have implications for foodservice managers considering job redesign for employees.

Foodservice managers were the subjects of a 1990 study by Kuntz, Borja, and Loftus in an effort to determine if educational background was related to job satisfaction. Participants included 128 men and 62 women who were college and university foodservice managers of a contract foodservice company in the northeast United States. Overall job satisfaction for respondents as a whole was rated moderate. Supervision, kind of work, and co-workers were perceived by these respondents as more satisfying, while pay and benefits and amount of work were perceived as least satisfying. There was a positive correlation between field of study and job satisfaction. Those whose background was foodservice were less satisfied with their jobs than those with other backgrounds. This study also found that job satisfaction decreased with increasing educational level. However, as the authors pointed out, their study dealt only with educational level and extrinsic components of job satisfaction (p. 1400).

Vyskocil-Czajkowski and Gilmore (1992) assessed the job satisfaction of 86 foodservice supervisors using the JSS (Spector, 1985). The researchers selected the JSS because of its simple vocabulary and applicability to the foodservice industry (p. 31). Demographic questions and job task statements were also asked. A majority or

respondents were female (95%), and between 30 and 59 years old. Fifteen percent had technical school or some college education; however no mention was made if these participants were dietetic technicians. Length of employment in foodservice ranged from two to 40 years. The majority were either employed at hospitals or long term care facilities. These supervisors were most satisfied with the subscales "nature of work" and "supervision" and least satisfied with "promotion" and "operating procedures." No differences were found between subscales and total JSS and frequency of performing the 11 job tasks studied. Total job satisfaction scores indicated a moderate satisfaction with the jobs.

Job Satisfaction of Dietetic Technicians. Little is known about job satisfaction of dietetic technicians. Appel, et al. (1977) did report high satisfaction of dietetic technicians with the overall job, work itself, supervisors, and co-workers, but the sample size was relatively small (N=80), and no mention was made of the instrument by which the job satisfaction was determined. A study that evaluated graduates of William Rainey Harper College also found high levels of job satisfaction among technicians (Lucas & Allendorph, 1993). However, this sample size was extremely small (N=8), and the graduates were simply asked: How satisfied are you with your job?

Barry (1989) likewise surveyed dietetic technicians to determine levels of job satisfaction. Again, the survey size was small (N=31); nevertheless, Barry used the JDI (Smith, et al., 1969) as her instrument. A task involvement checklist was also included in the study to determine if type of task performed had any relation to job satisfaction. Barry found that these dietetic technicians were not satisfied with their positions and had

high levels of burnout from those same positions. Furthermore, these dietetic technicians were most satisfied with supervision and co-workers and least satisfied with promotion and pay. Scores on the work itself indicated a low to moderate satisfaction level. Most of the dietetic technicians indicated a preference for clinical nutrition tasks, but also indicated their work involved more than just these tasks. These dietetic technicians had lower scores in work on present job, opportunities for promotion, and present pay when compared to the dietitians in the Agriesti-Johnson and Broski (1982) study. However, they scored higher than the dietitians on supervision on present job and relationship with colleagues.

Continuing Education

The explosion of knowledge in the latter half of the twentieth century made continuing education for medical and allied health workers extremely important. Although not mandated by many health professions until the 1960's (Scanlan, 1985), it has been a priority of the A.D.A. since the 1950's (Kirk, 1959). Continuing education is a common term used by many professional groups; when applied to medical and allied health workers, it means education beyond the basic entry level curriculum (Boatman, 1981). Houle (1980) stated, "The term continuing education, whether it designates the improvement of professional competence or any other goal, implies some form of learning that advances from a previously established level of accomplishment to extend and amplify knowledge, sensitiveness or skill" (p. 77).

Many professions recognize that basic, academic education is inadequate for lifelong professional practice. Professionals, especially those involved in medicine and

allied health, must engage in what is termed "lifelong learning." Boatman (1981) states, "For the health professional, it (continuing education) usually implies an effort to improve or to maintain a professional competence to practice an existing profession . . . " (p. 30). If the health professional does not establish a pattern of lifelong learning, he or she runs the risk of becoming professionally obsolete, incompetent, and ineffective (Boatman & Herzog, 1972). Many health professionals have continuing education requirements imposed by their credentialing agencies.

Continuing education may take many forms. It may be formal, postgraduate courses taken for credit via regular classroom, correspondence courses, or talkback television. It may be short-term workshops for no academic credit, or it may be individual self instruction. Additional sources of continuing education are professional meetings or conferences, and professional journals and audiotapes.

Continuing Education and the Profession of Dietetics

Recognizing continuing education as a priority for dietitians, in the 1950's the A.D.A. established a continuing education program which had three major areas of concern: graduate study, adult education, and communication (Kirk, 1959). At the 1962 annual A.D.A. Meeting, Hunscher (1963) stated, "Continuing education is not simply 'keeping up with new findings,' but involves acceptance of the principle of lifetime learning" (p. 118). She continued, "A philosophy of lifetime learning urgently needs to be instilled and vigorously maintained if the individual and the profession are to maintain excellence, as we must" (p. 119).

The A.D.A. established goals for lifetime education for dietitians in the late 1960's which stated, among other things, that continuing education was essential for the dietitian (Hunscher, Bosch, Gillig, Lewis, Miller, Murai, & Payne, 1969). Continuing education was made mandatory for registered dietitians in 1969 (DelVescovo, 1982) and for registered dietetic technicians in 1988 (Flynn, Bryk, & Neal, 1991). In 1974 the A.D.A. published a Position Paper on Continuing Education which said the objectives of continuing education were twofold: "to enhance the knowledge of the individual member, thereby improving her competency, and to enable the individual member to contribute to the advancement of the profession of dietetics" (A.D.A., 1974, p. 289). In fact, the A.D.A. Code of Ethics requires the dietetic practitioner to assume responsibility and accountability for personal competence in practice (A.D.A., 1988). Continuing education is essential for the dietetic practitioner to remain competent.

The A.D.A. now requires registered dietitians (R.D.) to accrue 75 hours of continuing education and dietetic technicians, registered (D.T.R.) to accrue 50 hours of continuing education every five years in order to maintain registration status. These requirements enable the dietetic practitioner to meet the standard of practice which states that the practitioner will engage in lifelong self-development to improve knowledge and skills (Flynn, et al., 1991).

Continuing Education Needs of Dietitians. One of Hart's (1974) recommendations to accomplish the goals of the A.D.A. 1974 Position Paper was for each dietetics practitioner to establish an individual effective continuing education plan in order to keep up with advancing changes in technology. Several surveys reported

continuing education needs and concerns of dietitians (Anderson, Arnold, Donnelly, Funnell, & Johnson, 1992; Burkholder & Eisele, 1984; Flynn, Bryk, & Neal, 1991; Holli, 1982; Klevans & Parrett, 1990; Partlow & Spears, 1989; Vanderveen & Hubbard, 1979).

Vanderveen and Hubbard (1979) surveyed 232 Ohio dietitians to identify their perceived continuing education needs. Knowledge areas surveyed for perceived needs were managerial sciences, nutritional care sciences, and behavioral, communicative, and socio-cultural sciences. These dietitians expressed strong desires for continuing education in the areas of managerial sciences and nutritional care sciences, which they perceived as directly related to practice. They also expressed needs for skills in technical and human ability rather than conceptual ability. A greater percentage expressed the need for continuing education in nutritional care topics than in managerial skills, probably due to the fact that the majority of respondents were employed in clinical and general practice.

Burkholder and Eisele (1984) adapted the questionnaire used by Vanderveen and Hubbard (1979) in order to survey dietitians in the upper Midwest regarding continuing education needs (N=359). Each need area was divided into topics and assessed for high, moderate, low or no need. Most respondents expressed moderate to high needs for all topics in managerial skills, especially managerial effectiveness and performance appraisals. In the nutritional care area, moderate to high needs were expressed for drug-nutrient interaction and progress in heart disease research. Dietitians preferred state and district dietetic meetings and workshops over national or allied health professional meetings and workshops as their choice of activity. They expressed low preference for individual activity, journal clubs, and computer-assisted instruction.

Registered dietitians (N=230) employed full-time in the Chicago area were surveyed by Holli (1982) to assess types of continuing education activities used, and how many hours were devoted to these activities. Types of continuing learning activities included: those eligible for continuing education credit, inservice education provided by employers and not eligible for continuing education credit, and individual learning not eligible for continuing education credit. She found that dietitians spent more time (77 per cent) in activities that were not eligible for continuing education credit (individual learning and inservice education) and concluded that dietitians had accepted responsibility for continuing professional learning and did not seek this learning solely for credentialing purposes. Nevertheless, these dietitians reported that their choice of continuing education eligible for credit was national, state and district dietetic association meetings.

However, a 1989 study by Partlow and Spears obtained conflicting results. This study surveyed registered dietitians (N=550) in Kansas to determine noneconomic and economic benefits of continuing education. The continuing education methods that were rated as providing highest satisfaction were academic coursework, presentations, dietetic demonstrations, and exhibits. Those rated as low or non-acceptable were self-study programs, videotapes, study groups, and journal clubs. Partlow and Spears concluded that "those findings may indicate dietitians are less satisfied with continuing education activities that require independent study or self-planning" (p. 1323).

Pennsylvania dietitians were surveyed by Klevans and Parrett (1990) to assess continuing education needs and interests. Four aspects of practice that these dietitians felt needed to be included in continuing education were clinical, procedural, professional development, and managerial skills. Specific topics such as computer applications,

patient education, staff development and time management were the ones most often chosen within the aspects of practice. Participatory workshops were their format of choice; self instruction, audiotapes and videotapes, and televised courses did not receive many favorable comments.

A.D.A. conducted a 1990 national study to determine perceived continuing education needs of both dietitians (N=4,000) and technicians (N=1,000) (Flynn, et al., 1991). Dietitians preferred topics such as: cardiovascular disease, diabetes, nutrition assessment, obesity/weight control, grantsmanship, and computer applications. Formats of choice included state, district, and national workshops and lectures. Least preferred were computer-assisted instruction and audiotapes.

Dietitian members of the American Association of Diabetes Educators (N=316) chose meetings, symposia, and workshops as formats of choice for continuing education (Anderson, et al., 1992). Least preferred format was audiotape. These dietitians indicated major barriers to receiving continuing education included lack of time to attend and monetary costs.

Continuing Education Needs of Dietetic Technicians. Although several studies reported continuing education needs and concerns of dietitians, only three studies were identified that focused on continuing education needs of dietetic technicians. Two of these were national studies (Bobeng, 1986; Flynn, et al., 1991) and one was a local survey (Wisner & Lucas, 1989).

A.D.A. conducted a needs assessment of its dietetic technician members in 1985 (N=676) which examined, among other things, preferred formats and topics for

continuing education (Bobeng, 1986). Although conducted prior to implementation of the credentialing requirement for technicians, this survey found technicians were highly in favor of credentialing and its attendant continuing education requirements. Topics most often named as important were: clinical nutrition updates (85%), community nutrition updates (64%), foodservice management techniques (58%), and foodservice systems (44%). Preferred formats were meetings and workshops (84%), journal articles (59%), and self-study with audiocassettes (51%).

As previously mentioned, Flynn, et al. (1991) conducted a national survey of A.D.A. technician members. However, these technicians were registered at the time of the survey. Technicians were oversampled due to a traditional low response rate and 43.2% (N=432) replied. These technicians also preferred workshops (43%), lectures (53%), and self-study (40%). Almost half indicated that they would not use study groups, journal clubs and computer assisted instruction. Basic level continuing education topics most often preferred were grantsmanship (74%), conducting research (71%), computer applications (66%), and media skills (63%). Advanced level continuing education topics most often preferred were obesity/weight control (40%), foodservice equipment (38%), food production (33%), nutrition assessment (32%), and diabetes (32%). Flynn, et al. stated, "Although fewer DTRs than RDs indicated the need for advanced presentations, it is interesting to note that DTRs identified four management topics for advanced level presentation . . . (which) most likely reflects the employment settings of a larger proportion of DTR respondents than of RD respondents" (p. 938).

A 1989 survey of Chicago area dietetic technicians (N=844) determined their continuing education needs (Wisner & Lucas, 1989). The response rate was extremely

low (7.8%) which was mentioned as a concern in Flynn, et al. (1991). These technicians preferred topics such as laboratory tests and nutritional implications (32%), geriatric nutrition (31%), weight reduction and diets (30%), and nutritional assessment/screening (30%). Information on preferred format for continuing education was not requested.

Summary

Since recognition in 1971 by the A.D.A. as members of the dietetics team, dietetic technician numbers have increased tremendously. Technician membership in A.D.A. grew from 130 in 1977 to 2,732 in 1993 (Bryk & Soto, 1994). There were also 1,527 D.T.R.s who were not members of A.D.A. in 1993. The 1990 membership survey of entry-level and beyond entry level technicians reported a majority (54.5 per cent) employed in "inpatient care/acute care" (hospitals) and a majority (57.6 per cent) practiced in the area of clinical dietetics (Bryk & Kornblum, 1991). The 1993 membership database reported the percentage of technicians employed in hospitals down slightly (50.9 per cent); however, the percentage employed in clinical nutrition was up slightly (59.1 per cent). In addition, 29.8 per cent worked in extended care facilities and 4.6 per cent worked in public/community health.

In 1993 a majority of technicians were between 31 and 45 years of age (56 per cent); most (97%) were female and white (87%). Median income was $22,350 in clinical nutrition and $25,255 in food and nutrition management. A large majority (81 per cent) worked 31 hours per week or more. Most (63 per cent) reported highest degree as associate, but 33 per cent were working toward or had received a baccalaureate degree.

Even though dietetic technicians have been recognized as dietetics team members for more than twenty years, two reports by Myers, Gregoire, and Spears (1991, 1994) indicated that dietitians were still unsure of the role technicians play in the dietetics team. Myers, et al., (1991) indicated that many clinical tasks were still not being delegated by dietitians, although Myers, et al. (1991) stated that additional delegation was possible without affecting quality of task outcomes. Many clinical tasks not delegated were those which the role delineation study (Kane, et al., 1990b) indicated that technicians could perform acceptably. However foodservice management tasks received greater potential as a whole for delegation by dietitians (Myers, et al., 1994). Myers, et al. (1994) stated that this pointed to a need for further clarification of roles of dietetics personnel.

Nevertheless, technicians and their capabilities remain an enigma to many in the dietetics profession. No updates in role functions of dietetic technicians have been done since 1990. Also, although job satisfaction has been measured for many jobs, there has been no national focus on job satisfaction of dietetic technicians, and no recent continuing education assessments of dietetic technicians have been conducted.

CHAPTER III

METHODOLOGY

Because dietetic technicians have become an increasingly important element in the dietetics team, and because little information is available regarding current role functions, job satisfaction, or continuing education needs, the purpose of this research was to focus on the dietetic technician and how selected independent variables, both personal and institutional, were related to the role functions, job satisfaction and continuing education needs of the dietetic technician. This chapter includes the research design; sample selection; data collection, which includes planning and development; instrumentation and survey procedure; and data analysis used in this study.

Research Design

The descriptive status survey was the research design used to meet the objectives of this study. "Descriptive research involves collecting data in order to test hypotheses or to answer questions concerning the current status of the subject of the study" (Gay, 1992, p. 217). Descriptive research is concerned with describing, recording, analyzing and interpreting conditions that exist. Survey research is one of the classifications of descriptive research. Survey research can study populations by selecting samples of the populations to determine the occurrence of the selected variables (Kerlinger, 1986).

Survey research usually employs questionnaires or interviews. The research in this study was carried out through use of a mailed questionnaire.

In this study, the dependent variables were scores from the instrument used to assess job satisfaction, role function levels, and range of continuing education needs. The independent variables were selected personal and institutional variables.

Population and Sample

The study sample was drawn from a population comprised of the 1994 list of dietetic technicians from A.D.A. consisting of both A.D.A members and nonmembers. The list identified 2,732 technician members of A.D.A. and 1,527 nonmembers at the time of the study. Data were collected from each group in order to test the hypotheses.

Because dietetic technicians have traditionally had a lower response rate to surveys (Flynn, et al., 1991), the population was deliberately oversampled in order to have an adequate number of responses with which to draw conclusions. Approximately, fifteen per cent of each group (400 A.D.A. technician members and 200 nonmembers) was chosen in a representative random sample conducted by the statistics office of A.D.A. A list of those chosen was provided to the researcher. Each member of the sample was mailed the questionnaire.

Data Collection

Planning and Development

Planning and development of the research began in the fall of 1994 and continued through the summer of 1995. Data collection procedures and data analysis techniques appropriate to test the research hypotheses were selected at that time.

Instrumentation

The research instrument (Appendix B) consisted of four parts: Part I contained demographic information; Part II contained role function questions; Part III contained continuing education questions; and Part IV contained the Job Satisfaction Survey (Spector, 1985).

Demographic information for Part I was similar to that used by Liu (1992) but was adapted for dietetic technicians. Demographic information included: gender; age; ethnic background; current job title; highest level of education; degree emphasis; employment status; years employed in dietetics and as a technician; area of work; type of employment facility, size, and location; information about registration status and A.D.A. membership; number of dietitians and technicians in facility; number of employees supervised; and salary range.

Role function questions for Part II were selected from the Dietetic Practice Inventory used in the 1990 Role Delineation Study (Kane, et al., 1990b). Out of the 129 role function statements used in the Dietetic Practice Inventory, 38 performed most often by technicians at that time were selected. There were 12 Category A statements

(Managing Food and Other Material Resources), 15 Category B statements (Providing nutrition Care to Individuals), 6 Category H statements (Managing Human Resources), and 1 statement each from Category C (Providing Nutrition Programs for Groups), Category D (Managing Financial Resources), Category F (Teaching Dietitians and Other Professional Students), and Category ((Managing Facilities). Two statements not in the Dietetic Practice Inventory, but listed by respondents as performed a majority of the time, were also included. Because role functions involvement in Category E (Marketing of Services and Products) and Category G (Conducting Research) was low for the technicians, no role function statements were included for these categories.

Respondents were asked to indicate level of involvement and frequency of performance for each role function statement. Level of involvement included 1 (I always do this by myself) 2 (I usually do this by myself), 3 (I work with the dietitian 50/50), 4 (I may do this 25 percent of the time, and 5 (I never do this). Frequency of performance ranged from 1 (Daily) to 5 (Never).

Continuing education information for Part III was drawn from topics included in the study by Flynn, et al. (1991). Respondents were asked to check level of importance of each topic similar to the form used by Fisher (1984). They were also asked to check their preferred method of continuing education.

The Job Satisfaction Survey (JSS) (Spector, 1985) was selected for Part IV because it had been normed and validated on human service personnel, used uncomplicated wording, and was thus applicable to dietetic technicians. The JSS consisted of 36 short evaluative statements on feelings about the job that were categorized into nine subscales with four statements in each subscale. The JSS had a

reliability coefficient of 0.91. The nine subscales were: pay, promotion, supervision, benefits, contingent rewards, operating procedures, co-workers, nature of work and communication. Respondents indicated their level of job satisfaction for each statement of the JSS on a 6-point scale with 1 = disagree very much to 6 = agree very much. About half the items were written in a positively worded direction and half in a negatively worded direction. Overall job satisfaction was obtained by combining the satisfaction scores of the nine subscales. The scores could range from four to 24 for the subscales and 36 to 216 for overall job satisfaction. Permission was obtained from the author to use the instrument.

The research instrument was reviewed for content validity, clarity, and format by a panel consisting of graduate faculty from the Nutritional Sciences and Statistics Departments at Oklahoma State University. A report by Nettles and Gregoire (1993) indicated that response to surveys was increased if content was interesting to those surveyed, so the questionnaire was pilot tested on 25 dietetic technicians in Oklahoma. Suggestions regarding changes were adopted prior to the study.

Survey Procedures

A cover letter was developed to accompany the instrument explaining the research, providing instructions for completion, and ensuring confidentiality The cover letter was printed on Oklahoma State University-Okmulgee letterhead stationery (Appendix A). The questionnaire was printed on light blue bond paper (Appendix B). The questionnaires and letter were folded into thirds and mailed first class in individual envelopes. Mailing information and codes were printed on the back of the last sheet of

the questionnaire so it could be mailed back without an envelope. Business reply mail was used on the return mailing; only returned questionnaires required payment. The questionnaires were mailed in October 1995, and respondents asked to reply on or before November 1, 1995. Only one mailing was sent due to time constraints.

Data Analysis

The returned questionnaires were coded and data collected were transcribed and processed into the computer using the software program PC-File III. SAS statistical software (Version 5, 1985) was used in the data analysis. Percentages and frequencies were determined for the demographic information, role functions and levels, and continuing education methods and topics. Standard statistical procedures which included t-test, analysis of variance (ANOVA), Duncan's Multiple Range Test, and Chi-square were used to analyze the data. The analysis of variance (ANOVA), t-test, and Duncan's Multiple Range Test were used to test if differences existed between scores on job satisfaction and the independent variables. Chi-square values were used to test whether a relationship existed between selected independent variables and role functions or continuing education needs. (Kerlinger, 1986).

CHAPTER IV

RESULTS AND DISCUSSION

This study assessed role function level of involvement and frequency of performance, job satisfaction, preferred method of continuing education and choice of continuing education topics of a selected national sample of dietetic technicians. Data were obtained using the research instrument described in Chapter III. The questionnaires were mailed to 600 randomly selected dietetic technicians from both A.D.A. membership (N=2,732) and nonmembership (N=1,527) lists. Of the 600 questionnaires mailed, 3.5 percent (N=21) were undeliverable by the postal service due to incorrect addresses. The response rate was 36 percent (N=211). Some of the questionnaires contained incomplete information so only 33.5 percent (N=194) of the questionnaires were used for analyses of data. Since the population was deliberately oversampled, the response rate for this group with one mailing was considered acceptable.

Characteristics of the Survey Participants

Table I lists the frequencies and percentages of the respondents' gender, age, ethnic background, highest level of education, degree emphasis, employment status, years employed as a technician and area of work. Type of employment facility, size, and location, information about registration status and A.D.A. membership, number of

TABLE I

FREQUENCIES AND PERCENTAGES OF THE RESPONDENTS CHARACTERISTICS

Characteristics	Frequency N = 194	Percentages
Gender		
Male	4	2.1
Female	190	97.9
Age		
Under 25	0	00.0
25 - 34	55	28.4
35 - 44	94	48.5
45 - 54	25	12.9
55 - 64	19	9.8
65 and older	1	0.5
Ethnic Background		
White	158	82.3
Asian	7	3.6
Black	24	12.5
Hispanic	2	1.0
Native American	1	0.5
No Response	2	1.0
Highest Level of Education Obtained		
Associate Degree	136	70.1
Bachelor's before becoming a DT	35	18.0
Bachelor's after becoming a DT	21	10.8
Master's	2	1.0

TABLE I (Continued)

Characteristics	Frequency N = 194	Percentages
Degree emphasis		
Clinical nutrition	72	37.1
Foodservice	10	5.2
General (equal emphasis)	112	57.7
Employment status		
Full time	138	71.1
Part time	38	19.6
Not employed, retired, not employed as a technician	18	9.3
Years employed as a dietetic technician		
Up to 5	30	15.5
6 - 10	77	39.7
11 - 15	50	25.8
Over 16	37	19.0
Area of greatest percentage of work		
Clinical nutrition	134	69.4
Foodservice management	37	19.2
Do both about equally	22	11.4
No Response	1	0.5
Type of employment facility		
Long term care	41	21.1
Acute care	121	62.4
Community/public health	16	8.2
School or restaurant foodservice	7	3.6

TABLE I (Continued)

Characteristics	Frequency N = 194	Percentages
Wellness	1	0.5
Self-employed	1	0.5
Other (research, other area)	7	3.6
Size of facility (beds, participants, etc.)		
Less than 100	22	11.4
101 - 199	49	25.4
200 - 299	34	17.6
300 -399	30	15.5
400 - 499	13	6.7
Over 500	45	23.3
No Response	1	0.5
Community size		
Town under 5000	9	4.6
Small city, 5000 - 25,000	45	23.2
City, 25,000 - 100,000	64	33.0
Large metropolitan area	76	39.2
Registration status		
Registered	193	99.5
Not registered	1	0.5
Membership in A.D.A.		
Member	35	18.0
Nonmember	159	82.0

TABLE I (Continued)

Characteristics	Frequency N = 194	Percentages
Number of dietitians in facility		
None	17	8.8
One	57	29.4
Two	16	8.2
Three	13	6.7
Four	21	10.8
Five	16	8.2
More than 5	54	27.9
Number of technicians in facility		
One	66	34.0
Two	40	20.6
Three	31	16.0
Four	16	8.2
Five or more	41	21.2
Number of employees supervised		
None	116	59.8
1 - 10	37	18.8
11 - 20	26	13.4
Over 20	15	8.0

TABLE I (Continued)

Characteristics	Frequency N = 194	Percentages
Salary range *		
Under $15,000	22	11.5
$15,000 - $20,000	36	18.8
$20,001 - $25,000	71	37.2
$25,001 - $30,000	44	23.0
$30,001 - $35,000	12	6.3
$35,001 - $40,000	4	2.1
$40,001 - $45,000	2	1.0
Over $45,000	0	0.0
No Response	3	1.5

dietitians and technicians in the facility, numbers of supervised, and salary range wre also included.

Of the 194 respondents, 98 percent (N=190) were female and only two percent were male. Therefore, gender was disregarded as a valid variable in the statistical analysis.

Respondents were also overwhelmingly white (N=158, 82 percent), however 12.5 percent (N=24) listed their ethnic background as black and 3.6 percent (N=7) listed their ethnic background as Asian. The majority of respondents were less than 44 years of age (N=149, 77 percent), but none were less than 25. These results are very similar to those

those reported by Bryk and Soto (1994). Their survey reported that only 5.6 percent of technicians were black, while the present study had a higher percentage.

Although 136 (70 percent) indicated that an associate degree was their highest degree, 18 reported additional college, and five of those had a second associate degree. There were two respondents who had obtained master's degrees. A majority (N=112, 58 percent) said their degree had an equal emphasis on clinical nutrition and foodservice. These results are similar to those reported by Bryk and Soto (1994).

Years employed as a technician ranged from zero to 24 with a mean of 11. Eleven respondents had been technicians more than 20 years. A majority (N=138, 71 percent) were employed full time and also listed clinical nutrition as their primary employment area (N=134, 69 percent). Most (N=121, 62 percent) reported that they worked in an acute care facility. Respondents who checked other employment worked in nutrition research, substance abuse centers, commercial weight loss programs, physicians' offices, or mental/correctional institutions. Bryk and Soto (1994) reported only 51 percent of technicians worked in acute care facilities, while the present study had a higher percentage. Bryk and Soto reported, however, that 81 percent of technicians worked full time, while the percentage from the present study was lower.

Over half (N=105, 54 percent) worked in facilities less than 300 beds, participants, or clients, but 45 (23 percent) worked in facilities larger than 500 beds, participants or clients. Most (N=140, 72 percent) reported that they lived in a community with a population of more than 25,000. Only nine (5 percent) reported living in a community less than 5000 population.

Number of dietitians in the technicians' facilities ranged from zero to 20 with an average of four. Numbers of technicians in each facility ranged from one to 17 with an average of three, however 66 (34 percent) reported that they were the only technician in the facility. Most did not supervise employees directly. In fact, 116 (60 percent) reported they supervised no one.

Salaries ranged from less than $15,000 per year to $45,000 per year, but a majority (79 percent) reported ranges from $15,000 to $30,000 per year. Although 99 percent (N=193) were registered technicians, only 35 (18 percent) said they were A.D.A. members. However, several reported membership in the Dietary Manager's Association.

Role Functions

Forty role function statements selected most often by entry-level technicians in the 1990 Role Delineation Study (Kane, et al., 1990b) were used for the present study. Respondents were asked to circle the number corresponding to their level of involvement and frequency of performance. Table II shows cumulative frequencies for each function statement (level of involvement and frequency of performance) for all respondents. Level of involvement was collapsed to determine which functions were performed most often by technicians "always or usually by themselves" (more than 50% of the time) and which were usually performed with a dietitian. The ten functions most often performed by technicians always or usually by themselves were ranked. Number and percentage of technicians performing these ten functions always or usually by themselves are shown in Table III. Frequency responses were also collapsed to determine which functions were

TABLE II

NUMBER OF RESPONSES TO ROLE FUNCTION LEVEL OF INVOLVEMENT AND FREQUENCY

Function	Level					Frequency				
	1	2	3	4	5	1	2	3	4	5
1. Assess client satisfaction with menus.	93	35	8	22	36	103	28	15	13	34
2. Take preliminary diet histories	105	27	8	13	41	100	33	22	10	40
3. Calculate nutrient intakes	95	15	15	27	42	63	38	23	28	42
4. Document client care	100	19	22	18	35	117	19	11	12	35
5. Adapt oral diets to individual needs	99	42	21	10	22	126	25	8	13	22
6. Review medical records for nutrition data	106	27	12	16	33	117	22	9	13	33
7. Identify nutrition related needs	93	41	26	14	20	128	27	7	10	22
8. Check trays for accuracy	77	19	0	28	70	71	20	16	17	70
9. Monitor food quality	78	21	10	37	48	84	24	17	21	48
10. Monitor quality of service	82	17	20	31	44	84	31	16	22	41
11. Maintain safety-sanitation of food	51	22	8	27	86	68	17	9	16	84
12. Assist clients with menu selection	99	14	3	34	44	98	27	19	17	42
13. Take comprehensive diet histories	88	19	18	28	41	77	42	11	23	41
14. Plan diets with multiple modifications	70	32	32	19	41	93	10	19	24	40
15. Teach/counsel clients/families	90	21	21	23	39	90	35	14	21	34

TABLE II (Continued)

Function	Level					Frequency				
	1	2	3	4	5	1	2	3	4	5
16. Evaluate intake of specific nutrients	60	20	26	33	55	59	26	28	26	55
17. Verify shipments against purchase orders	25	8	3	18	140	23	18	7	9	137
18. Develop menus for clients--normal needs	62	11	22	23	76	45	23	19	33	74
19. Develop menus for clients--special needs	54	14	28	30	68	44	23	15	43	69
20. Select products to be purchased	33	13	9	20	119	23	13	12	27	119
21. Assemble meals	20	6	1	33	134	24	7	6	24	133
22. Prepare food	8	5	1	34	146	8	9	6	26	145
23. Serve/distribute meals/food	13	6	1	37	137	16	11	9	26	132
24. Prescribe supplements for oral diets	69	21	34	15	55	75	29	24	13	53
25. Calculate nutrition requirements (e.g.: BEE)	59	25	23	20	67	63	32	12	20	67
26. Compare biochemical data--expected values	62	22	19	11	79	65	21	13	13	81
27. Confer with physicians about client care	52	13	33	38	58	44	34	25	35	56
28. Participate in a health care team	75	19	29	22	49	69	32	23	22	48
29. Prepare education materials for groups	45	18	21	32	78	18	16	37	46	77
30. Authorize purchase of food/supplies	33	9	4	9	139	24	13	4	13	140
31. Develop instructional materials	35	15	18	25	101	12	14	26	45	97
32. Assign/schedule staff	46	8	3	14	123	24	17	10	19	124
33. Counsel staff	45	9	9	27	104	22	13	22	30	107
34. Conduct staff training/development	36	15	13	34	96	11	12	23	52	96
35. Document personnel decisions	43	7	5	19	120	19	14	13	24	124

TABLE II (Continued)

Function	Level					Frequency				
	1	2	3	4	5	1	2	3	4	5
36. Evaluate performance of staff	45	6	4	23	116	21	4	14	40	115
37. Develop job descriptions	28	9	14	32	111	6	4	10	63	111
38. Maintain sanitation/safety	54	18	8	27	87	64	9	8	27	86
39. Supervise dietary aides/clerks	54	9	14	26	91	69	9	10	15	91
40. Monitor quality assurance programs	57	12	24	24	77	43	19	27	29	76

Level of Involvement:
1 = I always do this by myself
2 = I usually do this by myself.
3 = I work with the dietitian 50/50.
4 = I may do this 25 percent of the time.
5 = I never do this.

Frequency:
1 = Daily
2 = Once a week
3 = Once a month
4 = Less than once a month
5 = Never

TABLE III

ROLE FUNCTIONS MOST OFTEN PERFORMED BY DIETETIC TECHNICIANS ALWAYS OR USUALLY BY THEMSELVES

Function	Frequency N = 194	Percentage
Adapt oral diets to individual needs	141	72.7
Identify nutrition related needs	134	69.1
Review medical records for nutrition data	133	68.6
Take preliminary diet histories	132	68.0
Assess client satisfaction with menus	128	66.0
Document client care	119	61.3
Assist clients with menu selection	113	58.2
Teach/counsel clients/families	111	57.2
Calculate nutrient intakes	110	56.7
Take comprehensive diet histories	107	55.2

performed by technicians at least weekly. Numbers of technicians performing these ten functions at least weekly are shown in Table IV.

Level of Involvement

Of the ten functions most often performed by dietetic technicians always or usually by themselves as shown in Table III, only one was from Category A (Managing Food and Other Material Resources) in the Role Delineation Study (Kane, et al., 1990b). That function was "Assess client satisfaction with menus." The other tasks most often performed always or usually by themselves were from Category B (Providing Nutrition Care to Individuals). Since a large majority of respondents indicated that their greatest percentage of work was in clinical nutrition, these results are not surprising. Entry-level technicians surveyed in the Role Delineation Study had the highest involvement in Category A functions, but that finding was not supported by this research. Barry (1989) reported that clinical dietetic technicians spent a large amount of time on functions dealing with menu selection and satisfaction of patients, and these same technicians spent time in tasks such as food preparation which are all Category A functions. Technicians in the present study did not report the same involvement with Category A functions as those in the Barry (1989) study. The role of the clinical dietetic technician, especially in acute care facilities, appears to have changed since the study by Barry (1989) and the Role Delineation Study (Kane, et al., 1990b). Many of the functions performed by technicians in the present study have been traditionally performed by dietitians.

TABLE IV

NUMBER OF TECHNICIANS PERFORMING THE TEN MOST COMMON ROLE FUNCTIONS AT LEAST WEEKLY

Function	Frequency N = 194	Percentage
Adapt oral diets to individual needs	151	77.8
Identify nutrition related needs	155	79.9
Review medical records for nutrition data	139	71.6
Take preliminary diet histories	133	68.6
Assess client satisfaction with menus	131	67.5
Document client care	136	70.1
Assist clients with menu selection	125	64.4
Teach/counsel clients/families	125	64.4
Calculate nutrient intakes	101	52.1
Take comprehensive diet histories	119	61.3

Frequency of Performance

Frequency of performance of the ten role functions technicians always or usually performed by themselves (shown in Table IV) indicated that for nine of the functions, more than 60 percent of the technicians in the present study performed the function at least weekly. The other function, calculate nutrient intakes, was performed by more than 50 percent of the technicians at least weekly. These frequencies are similar to those reported by technicians in the Role Delineation Study (Kane, et al., 1990b). Technicians in that study reported performing eight of those functions at least weekly. Two functions, teach/counsel clients/families and take comprehensive diet histories, were performed by technicians in that study less than weekly.

The technicians in the present study were not entry-level as were those assessed in the Role Delineation Study, but the percentages of technicians who performed each function were very similar. Differences may be due to the smaller sample size of the present study. Table V compares percentages of technicians in the present study performing the ten role functions always or usually by themselves and technicians from the Role Delineation Study performing the ten role functions themselves (Kane, et al,, 1990b).

Role Functions Not Performed

Responses to the role function statements were examined to determine which of the role functions were never performed by technicians. The ten functions are shown in Table VI.

TABLE V

COMPARISON OF PERCENTAGES OF TECHNICIANS FROM THE PRESENT STUDY AND THE A.D.A. ROLE DELINEATION STUDY PERFORMING EACH ROLE FUNCTION

Function	Study Percentage N = 194	A.D.A. Study Percentage N = 551
Adapt oral diets to individual needs	72.7	69.0
Identify nutrition related needs	69.1	73.0
Review medical records for nutrition data	68.6	70.0
Take preliminary diet histories	68.0	70.0
Assess client satisfaction with menus	66.0	71.0
Document client care	61.3	70.0
Assist clients with menu selection	58.2	56.0
Teach/counsel clients/families	57.2	63.0
Calculate nutrient intakes	56.7	67.0
Take comprehensive diet histories	55.2	58.0

TABLE VI

ROLE FUNCTIONS MOST OFTEN REPORTED AS NEVER PERFORMED BY DIETETIC TECHNICIANS

Function	Frequency N = 194	Percentage
Prepare food	146	75.3
Verify shipments against purchase orders	140	72.2
Authorize purchase of food/supplies	139	71.6
Serve/distribute meals/food	137	70.6
Assemble meals	134	69.1
Assign/schedule staff	123	63.4
Document personnel decisions	120	61.9
Select products to be purchased	119	61.3
Evaluate performance of staff	116	59.8
Develop job descriptions	111	57.2

Of the ten functions listed by technicians in the present study as never performed, half were from Category A (Managing Food and Other Material Resources), one from Category D (Managing Financial Resources) and the remainder from Category H (Managing Human Resources). Since the majority of respondents were employed in clinical nutrition and did not supervise employees directly, these results are as expected. These technicians also were not entry-level so level of involvement is different from entry-level technicians, however the Role Delineation Study (Kane, et al., 1990b) reported that technicians in that study had low levels of involvement for Category D and H functions. Percentages of technicians of the present study never performing some of the functions are compared in Table VII to technicians from the Role Delineation Study. The differences may be due to the high percentage of technicians listing clinical nutrition as primary work area, or it may be due to the fact that the technicians in the present study were not entry-level technicians.

Statistical Analysis

Chi-square analyses were determined for the ten role functions most commonly performed by dietetic technicians always or usually by themselves. These analyses were examined for relationship with personal variables age, years of experience, membership in the A.D.A., salary range, and institutional variables type of employment facility, area of work, size of facility, and number of technicians in the facility. Gender was not examined due to the high number of female respondents.

TABLE VII

COMPARISON OF PERCENTAGES OF TECHNICIANS FROM THE PRESENT STUDY AND THE A.D.A. ROLE DELINEATION STUDY REPORTING NEVER PERFORMING EACH ROLE FUNCTION

Function	Study Percentage N = 194	A.D.A. Study Percentage N = 551
Prepare food	75.3	58
Verify shipments against purchase orders	72.2	62
Authorize purchase of food/supplies	71.6	76
Serve/distribute meals/food	70.6	84
Assemble meals	69.1	54
Assign/schedule staff	63.4	64
Document personnel decisions	61.9	73
Select products to be purchased	61.3	63
Evaluate performance of staff	59.8	68
Develop job descriptions	57.2	66

Testing of H_1

H_1 = There will be no significant relationship between dietetic technician role functions and the personal variables of: a. age, b. gender, c. years of experience, d. membership in the American Dietetic Association, e. salary range.

Chi-square analyses were completed on all personal variables except gender. The analyses indicated that performance of three role functions was significantly ($p \leq 0.05$, Table VIII) related to years of experience. The role functions were: take preliminary diet histories, review medical records for nutrition data, and identify nutrition related needs.

Technicians who had 11 or more years of experience were more likely ($p=0.043$) to take preliminary diet histories always or usually by themselves, while those with 10 years of experience or less were less likely to perform this function by themselves. Technicians who had 11 - 15 years of experience were more likely ($p=0.034$) to review medical records for nutrition data always or usually by themselves, while those with 10 years or less, or more than 16 years of experience were less likely to perform this function by themselves. Technicians who had 11 or more years of experience were more likely ($p=0.001$) to identify nutrition related needs always or usually by themselves, while those with 10 years of experience or less were less likely to perform this function by themselves. A majority indicated that they performed these activities at least once per week. (See Table IV for frequencies.)

TABLE VIII

CHI-SQUARE DETERMINATIONS INDICATING RELATIONSHIP BETWEEN ROLE FUNCTIONS AND YEARS OF EXPERIENCE

Role Function	DF	χ^2	p
Take preliminary diet histories	6	12.977	0.043
Review medical records for nutrition data	6	13.645	0.034
Identify nutrition related needs	6	22.143	0.001

$p \leq 0.05$

These functions are usually considered by dietitians to be beyond the scope of most entry-level technicians, and some dietitians consider entry-level to be up to five years. Therefore, technicians who have less than 10 years of experience may not be performing these functions as frequently as those with more years of experience because they are not allowed to perform them by their supervising dietitian. This is especially true in larger, acute care facilities which have more dietitians on their staffs. Many large facilities have entry-level dietitians on staff who prefer to have more involvement in these tasks and technicians in these facilities are usually assigned simpler tasks such as collecting menus. Technicians who have more than 16 years of experience may have graduated too long ago to have been trained in the skills necessary to perform these functions or may be involved more in foodservice and thus not required to perform these functions as a part of their jobs.

None of the other personal variables (age, membership in A.D.A., salary range) was related to performance of any of the ten role functions most frequently listed by

technicians as being performed always or usually by themselves. Based on the aforementioned analysis, the researcher rejected the null hypothesis H_1 for years of experience. Other personal variables, however, do not appear to affect role functions of dietetic technicians, so the researcher failed to reject null hypothesis H_1.

Testing of H_2

H_2= There will be no significant relationship between dietetic technician role functions and the institutional variables of: a. type of employment facility, b. size of facility, c. number of technicians in the facility, d. area of work.

Chi-square analyses were completed on the institutional variables. The analyses revealed that performance of the ten role functions technicians performed "always or usually by themselves" was significantly ($p \leq 0.05$) related to each of the institutional variables. (Table IX).

Area of Work. A technician's area of work was significantly related ($p \leq 0.05$) to each of the 10 role functions. Technicians who worked primarily in clinical nutrition were more likely to perform each function always or usually by themselves than they were to work with a dietitian in performing the function. Technicians who worked primarily in foodservice were more likely to work with a dietitian in performing four of the functions. Those functions were adapt oral diets to individual needs, identify nutrition related needs, assess client satisfaction with menus, and assist clients with menu selection. Foodservice technicians were less likely to perform the other six functions. Technicians

TABLE IX

CHI-SQUARE DETERMINATIONS INDICATING RELATIONSHIPS BETWEEN INSTITUTIONAL VARIABLES AND ROLE FUNCTIONS

Function	Institutional variable	DF	χ^2	p
Adapt oral diets to individual needs				
	Employment facility	6	17.228	0.008
	Area of work	4	25.404	0.000
Identify nutrition related needs				
	Area of work	4	39.820	0.000
Review medical records for nutrition data				
	Employment facility	6	21.153	0.002
	Facility size	10	21.325	0.019
	Area of work	4	38.656	0.000
	Number of technicians in facility	8	23.903	0.002
Take preliminary diet histories				
	Area of work	4	24.782	0.000
	Number of technicians in facility	8	18.323	0.019
Assess client satisfaction with menus				
	Employment facility	6	58.080	0.000
	Facility size	10	44.989	0.000
	Area of work	4	10.033	0.040

TABLE IX (Continued)

Function	Institutional variable	DF	χ^2	p
Document client care				
	Employment facility	6	17.156	0.009
	Area of work	4	30.946	0.000
	Number of technicians in facility	8	18.312	0.019
Assist clients with menu selection				
	Employment facility	6	53.971	0.000
	Facility size	10	29.442	0.001
	Area of work	4	12.144	0.016
	Number of technicians in facility	8	19.370	0.013
Teach/counsel clients/families				
	Employment facility	6	16.600	0.011
	Area of work	4	36.413	0.001
	Number of technicians in facility	8	23.386	0.003
Calculate nutrient intakes				
	Employment facility	6	16.841	0.010
	Area of work	4	38.146	0.000
Take comprehensive diet histories				
	Area of work	4	26.863	0.000
	Facility size	10	24.427	0.007

$p \leq 0.05$

with equal responsibilities in both areas were more likely to work with a dietitian to identify nutrition related needs and calculate nutrient intakes. They were more likely to perform the other eight functions always or usually by themselves than they were to work with a dietitian.

Employment Facility. Type of employment facility was significantly related ($p \leq 0.05$) to performance of seven of the ten functions. Technicians who worked in acute care or long term care facilities were more likely to perform three functions always or usually by themselves. Those were adapt oral diets to individual needs, review medical records for nutrition related data, and assess client satisfaction with menus. Technicians who worked in acute care or public health were more likely to document client care and calculate nutrient intakes always or usually by themselves. Technicians who worked in acute care were more likely to assist clients with menu selection always or usually by themselves. Technicians who worked primarily in public health were more likely to teach/council clients/families always or usually by themselves. However, technicians who worked in public health were less likely to perform four functions. Those functions were adapt oral diets to individual needs, review medical records for nutrition related data, assess client satisfaction with menus, and assist clients with menu selection. Technicians who worked in long term care facilities were more likely to work with a dietitian to document client care, teach/council clients/families, and calculate nutrient intakes.

Facility Size. Facility size was significantly related ($p \leq 0.05$) to performance of three of the functions. Technicians who worked in facilities larger than 100 beds were

more likely to review medical records for nutrition related data always or usually by themselves, while technicians who worked in facilities smaller than 100 beds were more likely to work with a dietitian. Technicians who worked in facilities less than 199 beds or in facilities 300-499 beds were more likely to assess client satisfaction with menus always or usually by themselves, while those who worked in facilities 101 - 499 beds were more likely to assist clients with menu selection always or usually by themselves. Technicians who worked in facilities larger than 500 beds were less likely to perform either function.

Number of Technicians in Facility. Number of technicians in the facility was significantly related ($p \leq 0.05$) to performance of five of the functions. Those functions were review medical records for nutritional data, take preliminary diet histories; document client care, assist clients with menu selection, and teach/council clients/families. When there were two or three technicians in the facility, they were more likely to perform these functions always or usually by themselves. When there was one technician in the facility, they were more likely to work with a dietitian in reviewing medical records for nutritional related data and assisting clients with menu selection, and were less likely to perform the other three functions.

Institutional variables appear to play a larger role in the dietetic technician role functions than the personal variables. The variable, area of work, was related to all of the role functions. Nine of the ten role functions were from Category B (Providing Nutrition Care to Individuals) (Kane, et al., 1990b). Because a majority of technicians in the present study worked in clinical nutrition, the type of function they would most likely perform would tend to come from Category B functions. Technicians who work primarily in foodservice would tend to have more involvement in Category A functions

(Managing Food and Other Material Resources), so they were not as familiar with Category B functions. Therefore, foodservice technicians who work in acute care or long term care facilities would need more guidance from the dietitian to perform nutrition related functions.

The variable, employment facilities, was related to seven of the role functions. This variable is also correlated with size of facility and number of technicians in the facility. Barry (1989) found that dietetic technicians were more likely to work in acute care facilities than offered a selective menu. Those facilities would tend to be larger facilities and have the resources to hire more than one technician. An acute care facility also offers technicians the opportunity to perform more roles in assessing and assisting clients in menu selection, calculating nutrient intakes, and reviewing medical records. The present research supports Barry's (1989) finding.

Significant relationships were found between dietetic technician role functions and institutional variables of type and size of employment facility, number of technicians in the facility, and area of work. Based on these associations, the researcher rejected null hypothesis H_2.

Job Satisfaction

Job satisfaction was assessed by asking respondents to answer the 36 statements in the Job Satisfaction Survey (JSS) (Spector, 1985). The 36 statements are divided into nine subscales: pay, promotion, supervision, benefits, contingent rewards (rewards), operating procedures (procedures), co-workers, nature of work, and communication. The JSS scores in this study were compared with mean scores of a normative national

sample (n=5605) for each subscale and for total job satisfaction. The normative sample consisted of workers from mental health, medical, social service, and corrections fields. Means 16 or above are considered in the satisfied range, those 12 or below in the dissatisfied range, and between 12 and 16 considered neutral (Spector, 1986) (Figure 1). Total scores 108 or below are considered in the dissatisfied range, above 144 in the satisfied range, and between 108 and 144 considered neutral. Subscale scores and total job satisfaction were compared to national norms using a t-test. Comparisons are shown in Table X and Figure 2.

Comparison of subscale scores to Spector's scale (See Figure 2) indicated that technicians were satisfied with supervision, benefits, co-workers, and nature of work and dissatisfied with promotion. The remaining subscales were in the neutral range. The promotion subscale included statements such as: "There is really too little chance for promotion on my job." The supervision subscale included statements such as: "I like my supervisor." The co-workers subscale included statements such as: "I like the people I work with." The nature of work subscale included statements such as: "My job is enjoyable." Technicians scored significantly lower, however, than the national sample on promotion (p=0.0019), supervision (p=0.0041), and co-workers (p=0.0001).

Technicians scored significantly higher than the national norms on pay (p=0.0001), benefits (p=0.0001), and communication (p=0.0001). The pay subscale included statements such as: "I feel I am being paid a fair amount for the work I do." The benefits subscale included statements such as: "The benefit package we have here is equitable." The communication subscale included statements such as: "Communications

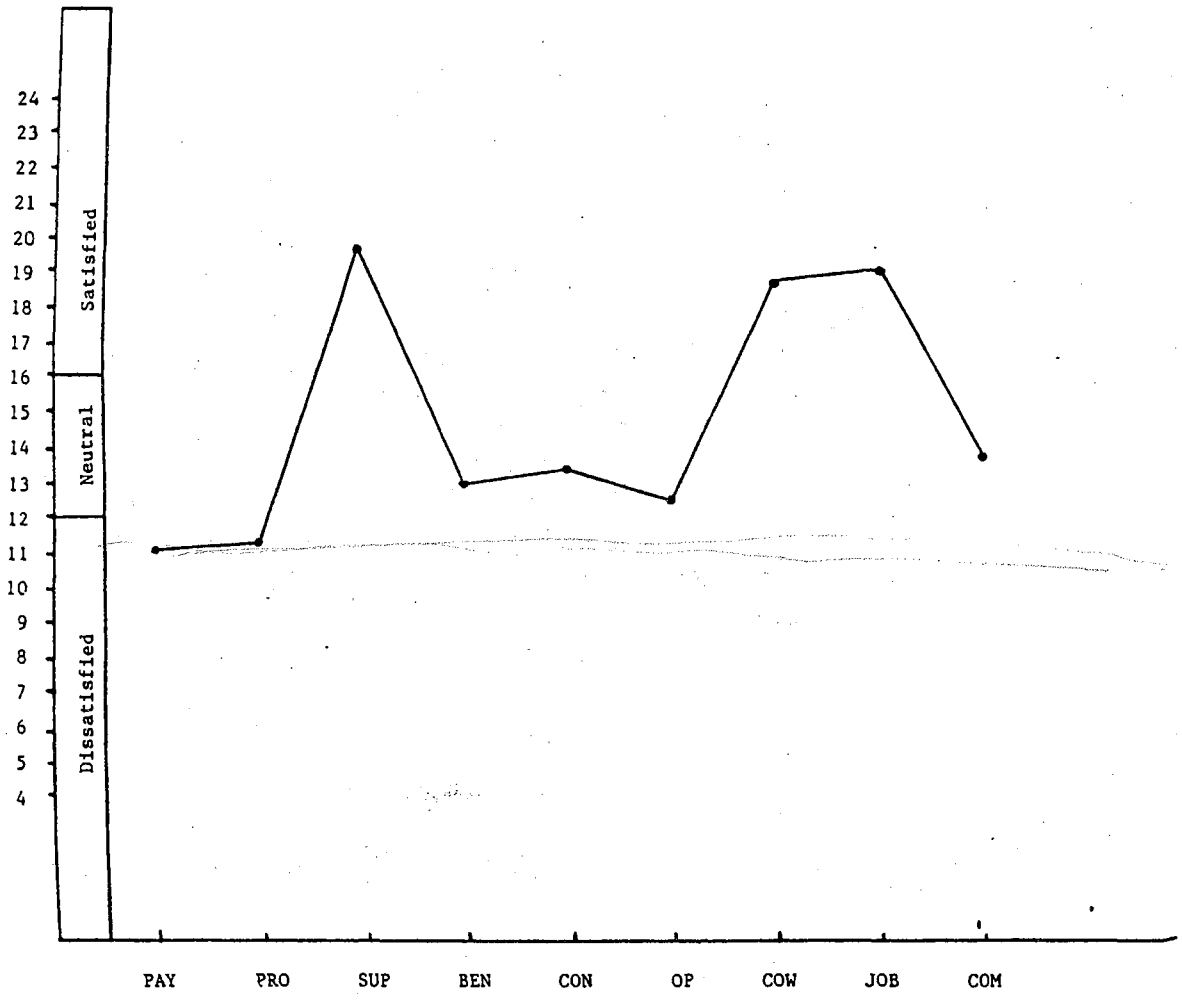

Figure 1: Normative Profile of Mean Responses for Organizations on the Nine Facets of the Job Satisfaction Survey (Spector, 1986).

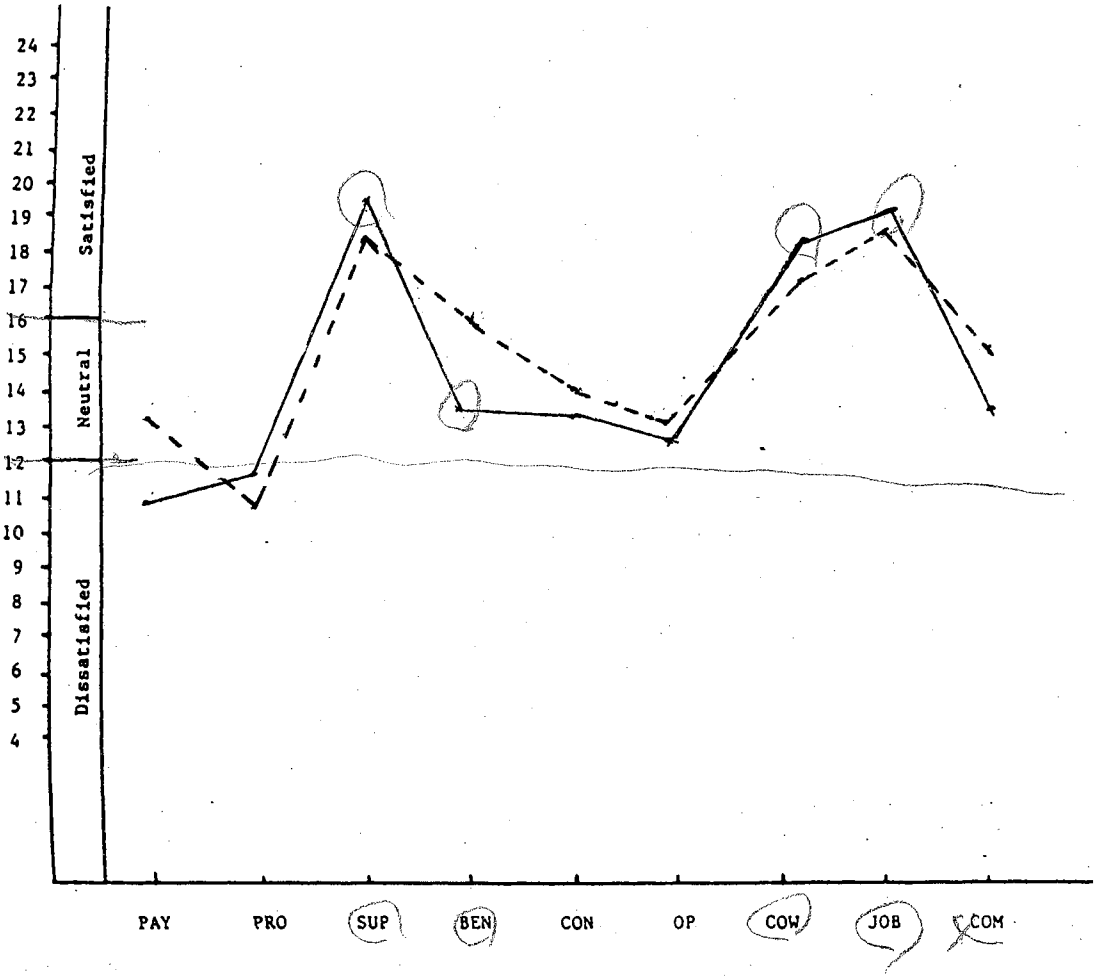

Figure 2. Comparison of 1994 Mean Responses with Dietetic Technician Mean Responses in the Nine Facets of the Job Satisfaction Survey.

KEY: _____ 1994 National Norms
-------- Dietetic Technicians

TABLE X

COMPARISON OF NATIONAL AND SAMPLE MEANS
FOR THE JOB SATISFACTION SURVEY (JSS)

Subscale	National Mean N = 5605	National SD	Sample Mean N = 194	Sample SD	t	p
Pay	10.9	2.0	13.05	4.96	6.02	0.0001
Promotion	11.6	1.9	10.62	4.35	-3.14	0.0019
Supervision	19.2	1.6	18.20	4.79	-2.91	0.0041
Benefits	13.5	1.4	16.02	4.94	7.10	0.0001
Rewards	13.2	1.9	13.69	4.99	1.36	0.1765
Procedures	12.7	1.9	12.89	3.88	0.69	0.4920
Co-workers	18.3	1.0	17.13	4.10	-3.98	0.0001
Nature/work	19.2	1.2	18.84	3.95	-1.27	0.2058
Communication	14.0	1.6	15.68	4.36	5.36	0.0001
Total	132.9	10.4	136.11	26.51	1.85	0.0664

Reference: P.E. Spector, May 16, 1995 (Personal Communication, Appendix D)

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group (9.909). The score for the middle group was not significantly different between younger and older workers.

TABLE XI

ANALYSIS OF VARIANCE FOR THE PROMOTION SUBSCALE AND AGE

Source	DF	Mean Square	F Value	Pr>F
Age	2	56.4402	3.05	0.0499
Error	191	18.5282		
Corrected Total	193			

TABLE XII

DUNCAN'S MULTIPLE RANGE TEST FOR THE PROMOTION SUBSCALE AND AGE

Age	N	Mean	Grouping
25 - 34	55	9.909	B
35 - 44	94	10.394	A B
45 and up	45	11.956	A

Means with the same letter are not significantly different at the $p \leq 0.05$ level.

Older workers may not see any opportunities for promotion, but have adapted and are not unhappy with their jobs, while younger workers view promotion as essential to their success in a job. Older workers may also have constraints such as family responsibilities which would prevent them from changing jobs. These constraints would also affect how they view opportunities for promotion.

None of the other personal variables (years of experience, membership in A.D.A., salary range) was related to job satisfaction. Based on the aforementioned discussion, the researcher rejected H_3 for age. Other personal variables, however, do not appear to affect the job satisfaction of dietetic technicians, so the researcher failed to reject H_3.

Testing of H_4

H_4 - There will be no significant relationship between dietetic technician job satisfaction and the institutional variables a. type of employment facility, b. size of facility, c. number of technicians in the facility, d. area of work.

Analysis of variance and Duncan's multiple range test were conducted on the institutional variables. Significant relationships were found for the institutional variables type of employment facility, number of technicians in the facility, and area of work and several of the subscales.

Area of Work. Analysis of variance and Duncan's multiple range test indicated a significant relationship between area of work (clinical, foodservice, or equal responsibility) and the subscale scores for pay ($p=0.0009$), promotion ($p=0.0011$), contingent rewards ($p=0.0122$) and operating procedures ($p=0.0012$). Results are shown in Tables XIII to XX. According to Spector's scale, scores for pay were in the neutral

range for technicians whose primary area of work is foodservice and those who work primarily in clinical nutrition. Technicians who had equal responsibilities in both areas were dissatisfied with pay. Those who worked in clinical nutrition or had equal responsibility were dissatisfied with opportunities for promotion, while those who worked primarily in foodservice were neutral. Scores for contingent rewards were in the neutral range for each area of work. Technicians who had equal responsibilities in both areas were dissatisfied with operating procedures, while those who worked in clinical nutrition or foodservice were neutral. Those with foodservice responsibilities scored higher on all four subscales, while those with equal responsibilities in both areas had the lowest scores on three of the subscales.

Dietetic technicians who work primarily in foodservice may have greater opportunity for promotion because they are in management positions and there may be a greater possibility for career laddering. The only promotion opportunity clinical technicians may have is through more education which may not be an option. The pay for foodservice positions tends to be higher than it does for clinical nutrition positions, which leads to higher scores on this subscale for those in foodservice. Technicians who work in foodservice may have higher scores on contingent rewards and operating procedures because of the nature of their job. They tend to receive the thanks of others, especially their supervisors, more often. Many times they are accorded more respect in the facility due to the nature of their position (management level) than are those in clinical nutrition.

TABLE XIII

ANALYSIS OF VARIANCE FOR THE PAY SUBSCALE AND AREA OF WORK

Source	DF	Mean Square	F Value	Pr>F
Area of work	2	169.4679	7.30	0.0009
Error	190	23.2297		
Corrected total	192			

TABLE XIV

DUNCAN'S MULTIPLE RANGE TEST FOR THE PAY SUBSCALE AND AREA OF WORK

Area of work	N	Mean	Grouping
Foodservice	37	15.541	A
Clinical	134	12.694	B
Equal responsibility	22	11.000	B

Means with the same letter are not significantly different at the $p \leq 0.05$ level.

TABLE XV

ANALYSIS OF VARIANCE FOR THE PROMOTION SUBSCALE AND AREA OF WORK

Source	DF	Mean Square	F Value	Pr>F
Area of work	2	127.1007	7.11	0.0011
Error	190	17.8812		
Corrected total	192			

TABLE XVI

DUNCAN'S MULTIPLE RANGE TEST FOR THE PROMOTION SUBSCALE AND AREA OF WORK

Area of work	N	Mean	Grouping
Foodservice	37	12.973	A
Equal responsibility	22	10.091	B
Clinical	134	10.052	B

Means with the same letter are not significantly different at the $p \leq 0.05$ level.

TABLE XVII

ANALYSIS OF VARIANCE FOR THE CONTINGENT REWARDS SUBSCALE AND AREA OF WORK

Source	DF	Mean Square	F Value	Pr>F
Area of work	2	108.0389	4.51	0.0122
Error	190	23.9650		
Corrected total	192			

TABLE XVIII

DUNCAN'S MULTIPLE RANGE TEST FOR THE CONTINGENT REWARDS SUBSCALE AND AREA OF WORK

Area of work	N	Mean	Grouping
Foodservice	37	15.757	A
Clinical	134	13.284	B
Equal responsibility	22	12.409	B

Means with the same letter are not significantly different at the $p \leq 0.05$ level.

TABLE XIX

ANALYSIS OF VARIANCE FOR THE OPERATING PROCEDURES SUBSCALE AND AREA OF WORK

Source	DF	Mean Square	F Value	Pr>F
Area of work	2	96.2129	6.95	0.0012
Error	190	13.8364		
Corrected total	192			

TABLE XX

DUNCAN'S MULTIPLE RANGE TEST FOR THE OPERATING PROCEDURES SUBSCALE AND AREA OF WORK

Area of work	N	Mean	Grouping
Foodservice	37	14.459	A
Clinical	134	12.739	B
Equal responsibility	22	10.773	C

Means with the same letter are not significantly different at the $p \leq 0.05$ level.

Employment Facility. Analysis of variance and Duncan's multiple range test indicated a relationship between type of employment facility and the subscale scores for promotion ($p=0.0071$). Results are shown in Tables XXI and XXII. Those who worked in acute care facilities or in public health were dissatisfied with opportunities for promotion when compared to Spector's scale. Those who worked in long term care or other areas were neutral; however, those who worked in other areas (school, foodservice, wellness, commercial weight loss programs) were more satisfied with opportunity for promotion than those who worked in acute care or public health.

Technicians who worked in other areas worked in places such as school foodservice, wellness, nonprofit associations, and physicians' offices. These technicians are exposed to a greater variety of opportunity through their jobs. Although it may not be realistic to assume they have greater opportunity for promotion, they may perceive that they do due to their job structure. Technicians who work in public health list primary employment in the area of WIC (Women, Infants and Children) Nutrition. This is a highly structured work setting with no opportunity for advancement due to the structure of most state health departments. The only opportunity for promotion in this environment would come either through increased education, which for many technicians may not be a realistic option, or a move to another employment setting.

TABLE XXI

ANALYSIS OF VARIANCE FOR THE PROMOTION SUBSCALE AND EMPLOYMENT FACILITY

Source	DF	Mean Square	F Value	Pr>F
Employment facility	3	74.7867	4.15	0.0071
Error	190	18.0390		
Corrected total	193			

TABLE XXII

DUNCAN'S MULTIPLE RANGE TEST FOR THE PROMOTION SUBSCALE AND EMPLOYMENT FACILITY

Employment Facility	N	Mean	Grouping
Other	16	12.813	A
Long term care	41	12.024	A B
Acute care	121	10.000	B C
Public health	16	9.500	C

Means with the same letter are not significantly different at the $p \leq 0.05$ level

Number of Technicians in Facility. Analysis of variance and Duncan's multiple range test indicated relationships between number of technicians in the facility and the subscale scores for promotion ($p=0.0096$) and operating procedures ($p=0.0243$). Results are shown in Tables XXIII through XXVI. Those who worked with two or more technicians were dissatisfied with opportunities for promotion according to Spector's scale. When there was one technician in the facility, the promotion subscale score was neutral. A single technician was more satisfied with opportunity for promotion than one who worked in a facility with five or more technicians.

Those who worked with two or three technicians were dissatisfied with operating procedures when compared to Spector's scale. When there was one technician or four or more technicians in the facility, the promotion subscale score was neutral; however, technicians who worked in facilities with four technicians were more satisfied than those who worked in facilities with two or three technicians

Technicians who work in facilities with other technicians may be dissatisfied with promotion opportunities because they may work with people who have been at the facility many years who have not been promoted. There is also increased competition between technicians at these facilities which may contribute to dissatisfaction with this variable. When there are four technicians in a facility, there may be more division of labor and the technicians experience more variety in their daily life. They may also be able to share some of the less desirable aspects of their jobs such as filling out forms and other types of paperwork.

TABLE XXIII

ANALYSIS OF VARIANCE FOR THE PROMOTION SUBSCALE AND NUMBER OF TECHNICIANS IN FACILITY

Source	DF	Mean Square	F Value	Pr>F
Number of technicians	4	62.0189	3.44	0.0096
Error	189	18.0089		
Corrected total	193			

TABLE XXIV

DUNCAN'S MULTIPLE RANGE TEST FOR THE PROMOTION SUBSCALE AND NUMBER OF TECHNICIANS IN THE FACILITY

Number of Technicians	N	Mean	Grouping	
1	66	12.091	A	
4	16	10.750	A	B
3	31	10.226	A	B
2	40	9.825	A	B
5 or more	41	9.268		B

Means with the same letter are not significantly different at the $p \leq 0.05$ level.

TABLE XXV

ANALYSIS OF VARIANCE FOR THE OPERATING PROCEDURES SUBSCALE AND NUMBER OF TECHNICIANS IN THE FACILITY

Source	DF	Mean Square	F Value	Pr>F
Number of technicians	4	41.5985	2.87	0.0243
Error	189	14.4885		
Corrected total	193			

TABLE XXVI

DUNCAN'S MULTIPLE RANGE TEST FOR THE OPERATING PROCEDURES SUBSCALE AND NUMBER OF TECHNICIANS IN THE FACILITY

Number of Technicians	N	Mean	Grouping	
4	16	14.500	A	
5	41	13.537	A	B
1	66	13.333	A	B
3	31	11.935		B
2	40	11.600		B

Means with the same letter are not significantly different at the $p \leq 0.05$ level

Total Job Satisfaction. Mean scores from each subscale were added to give a total score for job satisfaction. Analysis of variance and Duncan's multiple range tests were used to determine relationship between total satisfaction scores and personal and institutional variables. Significant differences were established at the $p \leq 0.05$ level or less. Analysis of variance and Duncan's multiple range test indicated a relationship between total job satisfaction and the institutional variable, area of work (foodservice, clinical, equal responsibility) ($p=0.0072$). Results are shown in Tables XXVII and XXVIII. Those employed primarily in foodservice had scores in the satisfied range, while the other groups were in the neutral range when compared to Spector's scale. Those employed in foodservice were more satisfied than those who had equal responsibilities in both clinical nutrition and foodservice.

Dietetic technicians who work primarily in foodservice have more autonomy and flexibility in their jobs than technicians who work primarily in clinical nutrition. Their job responsibilities tend to be non-routine while those in clinical nutrition work in a more structured environment. Technicians in foodservice have more decision-making responsibilities which require greater use of their skills, while those in clinical nutrition may have no decision making responsibilities. Technicians with equal responsibilities in both areas may be overwhelmed by the increased scope of work and thus experience increased frustration with their jobs. Sneed and Herman (1990) found that job characteristics such as variety are highly correlated with job satisfaction. Sims and Khan (1986) found that kind of work was the variable that was most correlated with job

TABLE XXVII

ANALYSIS OF VARIANCE FOR TOTAL JOB SATISFACTION AND AREA OF WORK

Source	DF	Mean Square	F Value	Pr>F
Area of work	2	3418.1799	5.06	0.0072
Error	190	675.6669		
Corrected total	192			

TABLE XXVIII

DUNCAN'S MULTIPLE RANGE TEST FOR TOTAL JOB SATISFACTION AND AREA OF WORK

Area of work	N	Mean	Grouping	
Foodservice	37	146.541	A	
Clinical nutrition	134	134.866	A	B
Equal responsibility	22	125.227		B

Means with the same letter are not significantly different at the $p \leq 0.05$ level.

satisfaction. Even though those studies were done on dietitians and not dietetic technicians, the present study would support those conclusions

Job satisfaction scores are related to the institutional variables of type of employment facility, area of work, and number of technicians in the facility. No relationship was found for the institutional variable, facility size, however because there was a relationship between job satisfaction and three of the variables, the researcher rejected H_4.

Comparison of Demographic Variables, Subscale, and Total Job Satisfaction Scores to National Norms

Subscale scores and total satisfaction scores on demographic variables of age, years a technician, type of facility, area of work, and number of technicians in the facility were compared to the national norms using a t-test to determine if there was any relationship. The results are presented in Table XXIX. When scores for the different demographic variables were compared to national norms, several were related at the $p \leq 0.05$ level, some at the $p \leq 0.01$ level, and some at the $p \leq 0.001$ level.

Age. For the demographic variable, age, subscale scores for pay, benefits, and communication were significantly higher than the national sample for all age groups. Workers, 25 - 34 years and 35 - 44 years, had significantly lower scores on the subscales of promotion and co-workers than the national sample. In addition, the 35 - 44 group scored lower on supervision than the national sample. Total job satisfaction was also significantly higher than the national sample for workers ages 45 and older although in

TABLE XXIX

COMPARISONS OF SUBSCALE AND TOTAL JOB SATISFACTION SCORES OF THE STUDY SAMPLE AND A NATIONAL SAMPLE BY DEMOGRAPHIC VARIABLES USING T-TEST

Variable	Pay	Promotion	Supervision	Benefits	Contingent Rewards	Operating Procedures	Co-workers	Nature of Work	Communication	Total
National Mean	10.9	11.6	19.2	13.5	13.2	12.7	18.3	19.2	14.0	132.9
Age										
25 - 34	12.93**	9.91**	19.09	16.73***	13.66	12.33	17.07*	18.69	15.71**	136.12
35 - 44	12.76**	10.34**	17.62**	15.37**	13.59	13.32	16.64***	18.67	15.38**	133.66
45 >	13.80**	11.96	18.47	16.51***	13.93	12.92	18.22	19.38	16.27**	141.23*
Years a technician										
Up to 5	12.67	10.24	18.67	14.43	13.81	12.81	16.71	17.71	15.67	132.72
6 - 10	13.39**	11.02	17.37	16.63***	14.00	12.96	17.33	18.80	15.98**	137.48
11 - 15	13.36***	10.47	18.61	16.11***	13.47	13.13	16.97	18.80	15.40**	136.32
16>	12.26	10.56	18.30	15.88**	13.61	12.42	17.35	19.51	15.81*	135.70

TABLE XXIX (Continued)

Variable	Pay	Promotion	Supervision	Benefits	Contingent Rewards	Operating Procedures	Co-workers	Nature of Work	Communication	Total
National Mean	10.9	11.6	19.2	13.5	13.2	12.7	18.3	19.2	14.0	132.9
Area of Work										
Clinical	12.69***	10.05***	18.07**	16.37***	13.28	12.74	16.96***	18.87	15.84***	134.87
Foodsv	15.54***	12.97	18.65	15.68*	15.76**	14.46**	18.35	19.22	15.92*	146.55*
Equal	11.00	10.09	18.09	14.55	12.41	10.77*	15.82*	18.14	14.36	125.23
Employment facility										
LTC	13.20**	12.02	19.27	15.00*	14.51	12.46	18.17	19.54	16.44**	140.61*
Acute Care	12.84***	10.00***	18.08*	16.65***	13.32	13.12	16.74***	18.41	15.45**	134.61
Public Health	12.25	9.50*	17.43	15.13	13.19	10.63**	16.81	19.69	15.00	129.63
Other	15.00*	12.81	17.13	14.81	14.81	14.56	17.75	19.50	16.19	142.56

TABLE XXIX (Continued)

Variable	Pay	Promotion	Supervision	Benefits	Contingent Rewards	Operating Procedures	Co-workers	Nature of Work	Communication	Total
National Mean	10.9	11.6	19.2	13.5	13.2	12.7	18.3	19.2	14.0	132.9
Number of technicians in facility										
1	13.73***	12.09	17.91*	15.44**	14.24	13.33	17.32	18.80	15.91**	136.77
2	11.98	9.83**	17.08*	15.38*	12.78	22.60	16.63*	17.98	14.78	128.04
3	12.45	10.23	19.00	16.19**	12.77	22.94	17.97	19.55	15.81*	135.91
4	15.50**	10.75	20.25	17.63**	15.56	13.54	16.81	19.25	16.75**	146.05*
5 or more	12.49*	9.27**	18.37	16.83***	13.63	14.50	16.81*	19.05	15.68*	136.63

* = $p \leq 0.05$
** = $p \leq 0.01$
*** = $p \leq 0.001$

the neutral range, however each age group indicated dissatisfaction with promotion. All groups indicated satisfaction with nature of work, co-workers, and supervision while workers ages 25 - 34 and 45 and older were satisfied with benefits.

Years a Technician. For the variable, years a technician, all groups indicated dissatisfaction with opportunities for promotion and satisfaction with supervision, co-workers, and nature of work. In addition, those who had been employed six years or more had higher mean scores on the subscales of pay, benefits, and communication compared to national norms. There were no significant differences on total job satisfaction scores and years as a technician, and each group scored in the neutral range for job satisfaction.

Area of Work. Technicians who listed foodservice as their primary employment area had significantly higher scores on total job satisfaction ($p=0.0072$), and had a total score indicating they were satisfied with their job. See Tables XXVII and XXVIII for statistics. The subscales of pay, benefits, rewards, operating procedures, and communication were also higher for this group when compared to the national norms. Moreover, these technicians indicated satisfaction with supervision, co-workers, and nature of work and were not dissatisfied with any aspects of their jobs.

Those who listed primary employment in clinical nutrition scored higher in pay, benefits, and communication, and lower in promotion, supervision and co-workers than national norms. They were satisfied with supervision, benefits, co-workers, and nature of work. In addition, they indicated dissatisfaction with promotion. Total job satisfaction was about equal with the national norms but still indicated a neutral level of satisfaction.

Those who listed equal responsibility in clinical and foodservice areas scored lower on the subscales of operating procedures and co-workers than the national norms and indicated dissatisfaction with pay and opportunities for promotion.

Employment Facility. Those technicians employed in long term care had significantly higher total satisfaction scores than national norms, and scored higher on the subscales of pay, benefits, and communication. Those employed in acute care had lower scores on the subscales of promotion, supervision, and co-workers and higher scores on pay, benefits, and communication, but total satisfaction was not significantly different. Those employed in community health had lower scores on promotion and operating procedures, while those listing other employment had higher scores on pay. All groups indicated satisfaction with supervision, co-workers, and nature of work. In addition, those employed in acute care and public health indicated dissatisfaction with promotion.

Number of Technicians in the Facility. Number of technicians in the facility showed significant differences for total satisfaction and the subscales of pay, promotion, supervision, benefits, co-workers and communication. Those who reported four technicians in the facility had higher scores on the subscales of pay, benefits, and communication and a total score indicating satisfaction. Lower satisfaction scores were found on promotion and co-workers if there were five or more technicians in the facility. There were also lower scores on the subscale of supervision for those reporting one or two technicians. Those reporting having two or more technicians indicated dissatisfaction with promotion.

None of the groups were satisfied with promotion opportunities. Only four groups (foodservice, technicians in long term care or other, and single technicians) had promotion subscale scores in the neutral range. Several previous studies of job satisfaction of dietitians (Calbeck, et al., 1979; Agriesti-Johnson & Broski, 1982; Rehn, et al., 1989; Dalton, et al., 1993) found that they were dissatisfied with promotion. Barry (1989) found that dietetic technicians were dissatisfied with opportunities for promotion. Results of the present study are congruent with previous research.

All groups were satisfied with supervision which indicates that there is a good relationship between the dietetic technician and the dietitian. Satisfaction with this subscale would indicate technicians work well in the dietetic team and have good professional relationships and respect for dietitians. They may see dietitians as mentors and look to them for guidance. All groups were satisfied with co-workers which also indicates that technicians work well in the dietetic team environment.

All groups were satisfied with nature of work. The dietetics field attracts people who like to work with others, who like to work with health promotion, and who like variety in their jobs. Satisfaction with this subscale indicates that the dietetic technician position attracts this same type of individual.

Sims and Khan (1986) found that job satisfaction of dietitians increased with age and number of years in the profession. Although concerned with technicians and not dietitians, the present study found that older workers were more satisfied, but did not find a significant relationship between number of years in the profession and job satisfaction.

Barry (1989) found a low to moderate satisfaction level for dietetic technicians. Although the technicians in the present study as a whole scored in the neutral range, their

total satisfaction score would indicate higher than average job satisfaction. Technicians who worked in foodservice or worked with four technicians were satisfied with their jobs. Those who work in foodservice have jobs which are more flexible and less regimented, provide greater challenge and require increased use of skills. Clinical technicians may have a more structured job setting with no variety. The technicians in Barry's (1989) study were primarily employed in clinical nutrition. Technicians in the present study who worked primarily in clinical nutrition had lower scores than those in foodservice indicating they were not as satisfied with their jobs. Technicians who work with other technicians may be able to share some of the work. If there is one technician in the facility they may have no one to help them or with whom to discuss problems. If there are too many technicians (five or more) it may lead to increased competition between technicians. When there are two or three technicians in the facility, there may be other factors which cause the total satisfaction score to be lower.

Comments by Respondents

Several surveys contained comments about job conditions and feelings about the profession of dietetics. (See Appendix D for comments). Comments generally reflected the feelings that dietitians still do not recognize the value of technicians or fully promote them. Many comments reflected dissatisfaction with pay and promotion opportunities. Some comments stated that jobs were not available after technicians had been trained and the perception was that technician jobs were being filled by entry-level dietitians.

Continuing Education

In order to determine effective methods and topics of continuing education for dietetic technicians, preferred method of continuing education and topics needed were assessed using information similar to that from the Flynn, et al. (1991) study. Respondents were asked to indicate their preferred method of continuing education by circling a number corresponding to: most preferred, would use sometimes or would not use. Respondents were asked to evaluate continuing education topics for ones they judged very important, important, slightly important and unimportant.

Continuing Education Method

There were nine methods of obtaining continuing education selected for the study. Cumulative frequencies and percentages for methods are shown in Table XXX. Methods are shown in rank order of most preferred.

These respondents chose workshops most often as the preferred method of continuing education. The second method chosen most often as preferred or would use sometimes was lecture. Study groups or journal clubs were least preferred and would not be used by a majority of respondents. Technicians from the Flynn, et al. (1991) study named lecture as most preferred method and workshop as second most preferred method. Least preferred in the Flynn, et al. study was computer assisted instruction which was the same found in the present study.

TABLE XXX

FREQUENCIES FOR CONTINUING EDUCATION METHODS

Method	Most Preferred	%	Would use sometimes	%	Would not use	%
Workshop, attendee participation	96	49.7	78	40.4	19	9.8
Lecture	93	48.2	79	40.9	21	10.9
National, state or district dietetic meetings	77	39.9	85	44.0	31	16.1
Self-study	65	33.7	95	49.2	33	17.1
Academic course work	52	26.9	89	46.1	52	26.9
Articles in publications	48	24.9	101	52.3	44	22.8
Audiocassettes	32	16.6	90	46.6	71	36.8
Study group/ journal club	29	15.0	62	32.1	102	52.8
Computer-assisted instruction	26	13.5	86	44.6	81	42.0

Chi-square analyses were conducted to determine if there were any relationships between preferred method of continuing education and personal variables of age, gender, years a technician, salary, and membership in A.D.A. None of the personal variables had any relationship to preferred method of continuing education with the exception of membership in A.D.A. That variable was related to the preferred continuing education method - national, state, or district dietetic meetings. (See Table XXXI.) Technicians who were members of A.D.A. were more likely ($p=0.042$) to use national, state, or district dietetic meetings as a means of obtaining continuing education than technicians who were not A.D.A. members. Non-A.D.A. members were more likely to never use this method of obtaining continuing education.

TABLE XXXI

CHI-SQUARE DETERMINATIONS INDICATING RELATIONSHIP BETWEEN MEMBERSHIP IN A.D.A. AND ATTENDING DIETETIC MEETINGS AS A MEANS OF OBTAINING CONTINUING EDUCATION

A.D.A. membership	DF	χ^2	p
National, state or district dietetic meetings	2	6.332	0.042

Chi-square analyses were also conducted to determine if there were any relations between preferred method of continuing education and institutional variables of area of work, employment facility, size of facility, and number of technicians in facility. No relationships were found between institutional variables and preferred method of continuing education.

Continuing Education Topics

There were 29 continuing education topics listed which technicians could choose. They were asked to evaluate each topic from very important to unimportant and check their preference for each topic. Cumulative frequencies and percentages for continuing education topics are shown in Table XXXII.

There were 12 continuing education topics listed as very important or important by at least 80 percent of respondents. Cumulative frequencies and percents for these 12 topics are shown in Table XXXIII.

The technicians in the Flynn, et al. (1991) study were asked to list choice of continuing education topics based on basic level need or advanced level need. Only three topics in the present study were the same as topics chosen most often by technicians in that study (diabetes, nutrition assessment and obesity/weight control).

TABLE XXXII

CUMULATIVE FREQUENCIES AND PERCENTAGES OF CONTINUING EDUCATION TOPICS

Continuing education topic	Very Important		Important		Slightly Important		Unimportant	
	#	%	#	%	#	%	#	%
1. Food allergies/intolerances	66	34.0	85	43.8	37	19.1	6	3.1
2. Behavior modification tech.	68	35.1	92	47.4	29	14.9	5	2.6
3. Cancer	98	50.5	71	36.6	18	9.3	7	3.6
4. Cardiovascular disease	104	53.6	74	38.1	10	5.2	6	3.1
5. Computer applications	62	32.0	66	34.0	52	26.9	14	7.2
6. Diabetes	114	58.8	68	35.1	9	4.6	3	1.5
7. Drug/nutrient interactions	99	51.0	75	38.7	17	8.8	3	1.5
8. Eating disorders	79	40.7	74	38.1	37	19.1	4	2.1
9. Education methods	45	23.2	104	53.6	34	17.5	11	5.7
10. Equipment (foodservice)	20	10.3	41	21.1	74	38.1	59	30.4
11. Food production	22	11.3	55	28.4	74	38.1	43	22.2
12. Food supply safety	38	19.6	61	31.4	60	30.9	35	18.0
13. Geriatric nutrition	94	48.5	75	38.7	18	9.3	7	3.6
14. Media skills	18	9.3	60	30.9	83	42.8	33	17.0
15. Nutrition assessment/screen	108	55.7	66	24.0	17	8.8	3	1.5
16. Nutrition support (enteral)	80	41.2	73	37.5	29	14.9	12	6.2
17. Presentation skills	44	22.7	82	42.3	50	25.8	18	9.3
18. Productivity/staffing	37	19.1	60	30.9	62	32.0	35	18.0
19. Motivation	72	37.1	69	35.6	41	21.1	12	6.2
20. Personnel training/dev.	57	29.4	58	29.9	64	33.0	15	7.7
21. Obesity/weight control	89	45.9	83	42.8	19	9.8	3	1.5
22. Wellness/health promotion	85	42.8	80	41.2	23	11.9	6	3.1
23. Immune system disorders	78	40.2	80	41.2	29	14.9	7	3.6
24. Writing skills	38	19.6	86	44.3	54	27.8	16	8.2
25. Lab tests/nutr implications	85	43.9	73	37.6	28	14.4	8	4.1
26. Legal/ethical issues	46	23.7	78	40.2	59	30.4	11	5.7
27. Renal nutrition	80	41.2	68	35.1	36	18.6	10	5.2
28. Dysphagia	86	44.3	72	37.1	26	13.4	10	5.2
29. Nutritional fads/ misinformation*	65	33.7	80	41.5	35	18.1	13	6.7

* = denotes missing number

TABLE XXXIII

CUMULATIVE FREQUENCIES AND PERCENTAGES FOR CONTINUING EDUCATION TOPICS MOST OFTEN CHOSEN BY TECHNICIANS

Topic	Number N = 194	Percentage
Diabetes	182	93.8
Cardiovascular disease	178	91.8
Drug/nutrient interactions	174	89.7
Nutrition assessment/screening	174	89.7
Obesity/weight control	172	88.7
Cancer	169	87.1
Geriatric nutrition	169	87.1
Wellness/health promotion programs	165	85.1
Behavior modification techniques	160	82.5
Immune system disorders	158	81.4
Lab tests/nutritional implications	158	81.4
Dysphagia	158	81.4

Statistical Analysis

Chi-square analyses were conducted for the 12 continuing education topics chosen by at least 80 percent of technicians. These analyses were examined for relationship to personal variables age, years of experience, membership in the A.D.A., and institutional variables type of employment facility, area of work, size of facility, and number of technicians in the facility.

Testing of H_5

H_5 - There will be no significant relationship between dietetic technician continuing education needs and the personal variables of: a. age, b. gender, c. years of experience, d. membership in the American Dietetic Association, d. salary range.

Chi-square analyses were completed on the personal variables. Gender was not examined due to the disproportionate number of female respondents. The analyses indicated that age was significantly ($p \leq 0.05$) related to one continuing education topic (cancer), years experience was significantly ($p \leq 0.05$) related to one continuing education topic (behavior modification techniques) and salary was significantly ($p \leq 0.05$) related to four topics. Summary is presented in Table XXXIV.

The continuing education topic, cardiovascular disease, was more likely ($p = 0.029$) to be judged very important by those making $15,000 to $20,000 per year. It was more likely to be judged important by those making $25,000 and up.

The continuing education topic, nutrition assessment/screening, was more likely ($p=0.000$) to be judged very important by those with a salary range of $15,000 to

TABLE XXXIV

CHI-SQUARE DETERMINATIONS INDICATING RELATIONSHIP BETWEEN PERSONAL VARIABLES AND CONTINUING EDUCATION TOPIC

Topic	Personal Variable	DF	χ^2	p
Cardiovascular disease				
	Salary	8	17.132	0.029
Nutrition assessment/screening				
	Salary	8	57.923	0.000
Cancer				
	Age	4	12.454	0.014
Behavior modification techniques				
	Years a technician	6	14.616	0.023
	Salary	8	16.625	0.034
Lab tests/nutritional implications				
	Salary	8	18.828	0.016

$30,000 per year. It was more likely to be judged slightly important or uni
those making $30,000 or more per year.

The continuing education topic, cancer, was more likely (p=0.014) to be judged very important by those ages 25 to 34. It was more likely to be judged important by those ages 35 to 44, and more likely to be judged slightly important or unimportant by those 45 years and older.

The continuing education topic, behavior modification techniques, was more likely (p=0.023) to be judged very important by those with 6 - 10 years experience as a technician. It was more likely to be judged important by those with 11 - 15 years of experience. Those with more than 16 years of experience were more likely to judge this topic slightly important or unimportant. This topic was more likely (p=0.034) to be judged very important by those technicians making less than $15,000 per year, or those making $20,000 to $25,000 per year. It was more likely to be judged slightly important or unimportant by those making $30,000 and up.

The continuing education topic, lab tests/nutritional implications, was more likely (p=0.016) to be judged very important by those with a salary range of $15,000 to $30,000 per year. It was more likely to be judged slightly important or unimportant by those making $30,000 or more per year.

The present study had a high percentage (69%) of technicians who listed clinical nutrition as their area of work. Even though it was considered an institutional variable in the present study, this variable has a strong effect on salary. The relationship of salary and these continuing education topics may be due to the fact that there was a high percentage of clinical technicians in this study. Clinical technicians generally do not make

as much as those in foodservice. Their salary range is generally between $15,000 and $25,000 per year.

Age may have been a factor in the selection of cancer as a continuing education topic due to the increased publicity regarding women's cancers in general and breast cancer in particular. Technicians in the 25 to 44 year ranges may be more aware of the risk factors affecting cancer, and thus more likely to want to learn about the topic.

Years of experience as a factor in choice of continuing education topics may also relate to the fact that those with the most experience are often in foodservice or management positions, while those with six to 10 years experience are in clinical nutrition positions. Those in clinical nutrition would be more likely to want to learn about behavior modification techniques.

Membership in the American Dietetic Association was not related to continuing education needs of technicians. However, since three of the personal variables were related to continuing education needs of technicians, the researcher rejected the null hypothesis H_5.

Testing of H_6

H_6 - There will be no significant relationship between dietetic technician continuing education needs and the institutional variables of: a. type of employment facility, b. size of facility, c. number of technicians in the facility, d. area of work.

Chi-square analyses were conducted for the institutional variables and continuing education topics. The analyses indicated that area of work was significantly related ($p \leq 0.05$) to nine topics, type of employment facility was significantly related ($p \leq 0.05$) to

three topics, size of facility was significantly related ($p \leq 0.05$) to one topic and number of technicians in the facility was significantly related ($p \leq 0.05$) to two topics. Summary is presented in Table XXXV.

The topic, diabetes, was more likely ($p=0.014$) to be judged very important by technicians who worked primarily in clinical nutrition and more likely to be judged important by those who worked in foodservice or had equal responsibilities in both areas. It was more likely ($p=0.000$) to be judged very important by technicians who worked in acute care facilities and more likely to be judged important by those who worked in long term care facilities. Technicians who worked in facilities up to 500 beds were more likely ($p=0.025$) to judge this topic very important and technicians who worked in facilities larger than 500 beds were more likely to judge this topic important, slightly important, or unimportant.

The topic, cardiovascular disease, was more likely ($p=0.001$) to be judged very important by those who worked primarily in clinical nutrition and more likely to be judged important by those who worked primarily in foodservice or had equal responsibilities in both areas. It was more likely ($p=0.000$) to be judged very important by those who worked in acute care facilities and more likely to be judged slightly important or unimportant by those who worked in public health.

The topic, drug/nutrient interactions, was more likely ($p=0.020$) to be judged very important by technicians who worked primarily in clinical nutrition or had equal

TABLE XXXV

CHI-SQUARE DETERMINATIONS INDICATING RELATIONSHIP BETWEEN INSTITUTIONAL VARIABLES AND CONTINUING EDUCATION TOPIC

Topic	Institutional Variable	DF	χ^2	p
Diabetes				
	Area of work	4	12.583	0.014
	Employment facility	6	25.699	0.000
	Size of facility	10	20.471	0.025
Cardiovascular disease				
	Area of work	4	19.103	0.001
	Employment facility	6	35.442	0.000
Drug/nutrient interactions				
	Area of work	4	11.619	0.020
Nutrition assessment/screening				
	Area of work	4	30.402	0.000
Cancer				
	Area of work	4	10.179	0.038
	Employment facility	6	15.645	0.016
Geriatric nutrition				
	Employment facility	6	40.022	0.000
Behavior modification techniques				
	Area of work	4	10.039	0.040
	Number of technicians	8	15.567	0.048
Immune system disorders				
	Area of work	4	11.746	0.019
Lab tests/nutritional implications				
	Area of work	4	22.756	0.000
	Number of technicians	8	16.285	0.038
Dysphagia				
	Area of work	4	23.001	0.000

responsibilities in both clinical nutrition and foodservice. It was more likely to be judged important by those who worked in foodservice.

The topic, nutrition assessment/screening, was more likely (p=0.000) to be judged very important by technicians who worked primarily in clinical nutrition or had equal responsibilities in both areas, and more likely to be judged important, slightly important or unimportant by those who worked primarily in foodservice.

The topic, cancer, was more likely (p=0.038) to be judged very important by technicians who worked primarily in clinical nutrition and more likely to be judged important, slightly important or unimportant by technicians who worked primarily in foodservice. It was more likely (p=0.016) to be judged very important by those who worked in acute care facilities and more likely to be judged slightly important or unimportant by technicians who worked in public health or other areas.

The topic, geriatric nutrition, was more likely (p=0.000) to be judged very important by those who worked in long term care and more likely to be judged slightly important or unimportant by those who worked in public health. Those who worked in acute care were more likely to judge this topic important.

The topic, behavior modification techniques, was more likely (p=0.040) to be judged very important by technicians who worked primarily in clinical nutrition, more likely to be judged important by those who worked primarily in foodservice, and more likely to be judged slightly important or unimportant by those who had equal responsibilities in clinical nutrition and foodservice. This topic was more likely (p=0.048) to be judged very important by technicians in facilities with three or five or more

technicians, and more likely to be judged important when there were one or two technicians in the facility.

The topic, immune system disorders, was more likely (p=0.019) to be judged very important by technicians who worked primarily in clinical nutrition or had equal responsibilities in clinical nutrition and foodservice. It was more likely to be judged important, slightly important or unimportant by those who worked primarily in foodservice.

The topic, lab tests/nutritional implications, was more likely (p=0.000) to be judged very important by technicians who worked primarily in clinical nutrition or had equal responsibilities in clinical nutrition and foodservice. It was more likely to be judged important, slightly important or unimportant by those who worked primarily in foodservice. This topic was more likely (p=0.038) to be judged very important by technicians who worked in facilities with two, three, or five or more technicians and more likely to be judged important by technicians who worked in facilities where there were only one or four technicians.

The topic, dysphagia, was more likely (p=0.000) to be judged very important by technicians who worked primarily in clinical nutrition or had equal responsibilities in clinical nutrition and foodservice. It was more likely to be judged important, slightly important or unimportant by those who worked primarily in foodservice.

The other two topics, obesity/weight control and wellness/health promotion, did not show any significant relationships to either personal or institutional variables.

Continuing education needs of dietetic technicians are highly related to institutional variables. A technician's area of work is an important factor in choosing continuing education topics. Ten of the 12 topics are highly related to clinical nutrition and would be more likely chosen by technicians who work primarily in that area. Flynn, et al. (1991) also determined that area of practice was very important in choice of continuing education topic. Clinical dietitians in their study were more likely to choose topics in clinical dietetics for continuing education credit. Although the present study was conducted on dietetic technicians and not dietitians, the results are similar and support the conclusions of Flynn, et al. (1991).

Employment facility is also related to choice of topic. Technicians who work in acute care facilities would be more likely to work with patients who have diabetes or cardiovascular problems. Technicians who work in long term care facilities would have more interest in geriatric nutrition and be more likely to choose that topic as very important. Technicians who work in facilities more than 500 beds are likely to work in noninstitutionalized foodservice. In that case, they would be less likely to see many clients with diabetes and would not consider it as an important topic. Technicians are more likely to seek continuing education on a topic if they work in an area of nutrition/dietetics which uses the topic. Klevans and Parrett (1990) studied the continuing education needs of dietitians and determined that dietitians' work settings highly influenced choice of continuing education topic. Even though the present study was done on dietetic technicians and not dietitians, patterns of continuing education topics are similar in the two groups.

Since 10 of the 12 topics chosen by more than 80 percent of technicians were significantly related to at least one of the institutional variables, the researcher rejected the null hypothesis H_6.

CHAPTER V

SUMMARY, RECOMMENDATIONS, AND IMPLICATIONS

Summary

Dietetic technicians are the newest members of the dietetics team, recognized in 1971 as a valuable asset to dietetics. They were admitted to membership in the American Dietetic Association (A.D.A.) in 1974 and became Active members in A.D.A. in 1995. Functioning under the direction of a registered dietitian (R.D.), they provide technical assistance to the dietitian in both clinical nutrition and foodservice management in acute care, long term care, public health and other facilities. This assistance enables the dietitian to expand his or her role to new areas and increase the scope of nutrition care to the public. Even though technicians have been recognized as valuable assets to dietitians, many dietitians are uncertain about the technician's ability to assume responsibility.

The purpose of this study was to assess current role functions, job satisfaction, and continuing education needs of dietetic technicians. The following objectives were established: to examine how personal variables of age, gender, years of experience, membership in the American Dietetic Association, and salary range affected the role functions, job satisfaction, and continuing education needs of dietetic technicians; and to examine how institutional variables of type of employment facility, area of work, size of

facility, and number of technicians in the facility affected the role functions, job satisfaction, and continuing education needs of dietetic technicians. As a result of these objectives, six hypotheses were postulated. Survey questionnaires were sent to 600 randomly selected dietetic technicians, both A.D.A. members and nonmembers. The population was deliberately oversampled and the final response rate was considered acceptable for this group with only one mailing.

The questionnaire had four sections: demographic information on the technician, role function questions, continuing education information assessing both preferred method and choice of topic, and the Job Satisfaction Survey (JSS) (Spector, 1985). Data obtained from 194 questionnaires (33.5 percent) were analyzed using frequencies, percentages, Chi-square, analysis of variance, t-tests, and Duncan's multiple range test.

Characteristics of Respondents

The majority of the respondents were female (98 percent), under the age of 44 (77 percent), and had been employed as dietetic technicians an average of 11 years. Most (79 percent) earned salaries of $15,000 to $30,000 per year. A majority (71 percent) were employed full time, listed clinical nutrition as their primary employment area (70 percent), and worked in acute care facilities (62 percent). Most (54 percent) worked in facilities of less than 300 beds. Average number of technicians in each facility was four, but a majority indicated that they were the only technician in their facilities. Most (60 percent) did not supervise employees. Nearly all (99.5 percent) were registered technicians (D.T.R.) with the Commission on Dietetic Registration, but only 18 percent were members of the American Dietetic Association.

Role Functions

The survey contained 40 role functions from the Role Delineation Study (Kane, et al., 1990b) which were performed by a majority of dietetic technicians at the time of that study. Respondents were asked to identify which functions they performed "always or usually by themselves" (more than 50 percent of the time), which they performed with a dietitian, and which they never did. Ten role functions performed by more than 55 percent of respondents always or usually by themselves were identified. Nine of the functions were related to providing nutrition care to individual patients or clients. One function was related to managing food. The role functions were performed by the technicians at least weekly. Demographic variables which had a significant association ($p \leq 0.05$) with role functions included years of experience, type of employment facility, size of facility, area of work, and number of technicians in the facility. The variables age, gender, salary, and membership in the American Dietetic Association had no significant association with any of the role functions. A dietetic technician's area of work was the primary influence on role functions. Because a majority of technicians worked in clinical nutrition (70 percent), they did not perform functions related to managing food, financial or human resources. Many of the role functions were also influenced by the type of facility where technicians were employed. The ten functions identified in this study have been traditionally performed by clinical dietitians. Performance of these functions by dietetic technicians indicates a shift in roles of both dietitians and dietetic technicians.

Job Satisfaction

Job satisfaction was assessed using the Job Satisfaction Survey (JSS) (Spector, 1985) because it had been normed and validated on human services personnel. Respondents were asked to indicate their level of job satisfaction for each of the 36 statements in the JSS. Means were calculated for each of the nine subscales in the JSS and a total job satisfaction score was calculated. These scores were compared to a 1994 normative sample (N=5605). Although dietetic technicians were more satisfied with their jobs than the national norms, their total job satisfaction score was neutral (between 108 and 144). They were, however, satisfied with supervision, benefits, co-workers, and the nature of their work and they were dissatisfied with opportunities for promotion. Technicians were neutral on pay, benefits, operating procedures and communication. Demographic variables which affected job satisfaction included age, years of experience, area of work, employment facility, and number of technicians in the facility. The variables gender, salary, membership in the American Dietetic Association, and size of facility did not affect job satisfaction.

Although total satisfaction scores were neutral, highest scores came from technicians who were 45 years of age and older or who worked in long term care facilities or other areas. Lowest scores came from technicians who worked in public health, had equal responsibilities in clinical nutrition and foodservice, or who worked in facilities with two technicians. Technicians who worked in foodservice or who worked in facilities where there were four technicians, however, were satisfied with their jobs as indicated by a total satisfaction score above 144 (Spector, 1986).

Continuing Education Needs

Dietetic technicians were asked to indicate their preferred method of continuing education from a list of nine choices. Dietetic technicians preferred workshops and lectures for obtaining continuing education, and they were reluctant to use computer-assisted instruction to obtain continuing education. Respondents were provided with a list of 29 continuing education topics and asked to indicate whether they considered each topic very important, important, slightly important or unimportant. The list contained topics in clinical nutrition, foodservice management, human resource management and public relations. Twelve continuing education topics were selected by more than 80 percent of respondents as very important or important. All 12 topics were in the area of clinical nutrition. Demographic variables which influenced choice of topics included age, years of experience, salary, employment facility, size of facility, area of work, and number of technicians in the facility. Choice of continuing education topics was highly influenced by the technicians' area of work and their employment facility. As expected, dietetic technicians who work in clinical nutrition choose topics related to that field for continuing education.

Hypotheses Testing

The relationships between personal and institutional variables and role functions are shown in Tables III through IX. The relationships between personal and institutional variables and job satisfaction are shown in Tables X through XXIX. The relationships between personal and institutional variables and continuing education needs

are shown in Tables XXX through XXXV. The level of significance was set at $p \leq 0.05$. The researcher fully rejected H_2, H_4, H_5, and H_6 and partially rejected H_1 and H_3 (Chapter IV).

Recommendations

The following recommendations are offered for future studies:

1. The personal variables that were relevant in this study were age, years of experience and salary range. Gender and membership in A.D.A. could be eliminated as variables in future studies.

2. Some of the demographic information was not relevant and could be deleted. Examples include: gender, highest level of education obtained, degree emphasis, number of years employed in the dietetic profession, and size of community.

3. Two additions could be made to demographic information. Many acute care facilities are operating skilled nursing units, long term care or rehabilitation centers. Better understanding of the technician's role could be determined if these choices were given. It is also important to determine if the technician works with an entry-level dietitian or one with experience. This addition would help give clarity to role functions.

4. The questionnaire was too lengthy. There were actually three studies in this research: role functions, job satisfaction, and continuing education needs. Even if recommended deletions are made in demographic information, a shorter questionnaire concentrating in only one area would make it possible to obtain more accurate information and increase the response rate.

5. The sample size could be expanded in order to determine differences between entry-level technicians and those with experience.

6. The questionnaires were mailed in October, just before the A.D.A. National Convention. Even though the majority of respondents did not report membership in A.D.A., they still work with dietitians who are A.D.A. members and may be involved with the Convention. Avoiding this time of the year may have increased the response rate. Also, a follow-up letter or second mailing is recommended to improve response rates.

7. A study of the dietitians who work with dietetic technicians and a study of dietetic technicians' activities actually being done under each role function would aid in understanding the technician's role.

Implications

Dietetic technicians are valuable members of the dietetics team. It is vital that dietitians understand the ways technicians' skills can be utilized to improve nutrition care of patients and to promote the dietetics profession. The role of dietetic technicians has expanded in the last twenty years. Many technicians now perform duties that were formerly done by dietitians. This shift can pose a threat to an entry-level dietitian or a clinical dietitian who is not willing to seek new areas of practice. Dietetic technicians will not replace dietitians, but dietitians need to be open to expanded areas of opportunity and shift their functions from roles technicians can perform to areas in which dietitians are uniquely qualified such as increased outpatient education and expanded community nutrition. By working as a team, dietitians and dietetic technicians can promote nutrition to the public in the most effective manner possible.

There is a great need for more promotion of the dietetic technician position which should be directed by the American Dietetic Association. Successful dietetic technicians could be featured in the Journal of the American Dietetic Association and the Association's newsletter, The Courier. Dietitians need to be encouraged to work with technicians and to publicize successful partnerships. Dietitians who work with dietetic technicians should be encouraged to support and join the A.D.A. practice group for technicians, TECHnical Practice in Dietetics. More technicians should be encouraged to become active in local, district, state, and national dietetic associations and run for elected office in order to increase visibility.

In order to effectively use dietetic technicians, factors affecting job satisfaction need to be addressed. Periodic surveys of job satisfaction of dietetic technicians, including a national study conducted by the A.D.A., would greatly enhance this endeavor. If future studies continue to show that technicians are dissatisfied with opportunities for promotion, a concerted effort should be made to determine new promotion opportunities. Many dietetic technicians have entered the field because they enjoy the type of work, but are unwilling to continue education in order to move up the career ladder. It may be that specialty roles need to be created for dietetic technicians, similar to ones now available for dietitians such as "Certified Diabetes Educator."

Dietetic technicians are willing and eager to obtain continuing education in order to gain current knowledge, however they do not have the background to understand many of the research-based articles published in the A.D.A. Journal. A.D.A. could address continuing education needs of dietetic technicians by adding Journal articles specifically targeting technicians. These articles could still have a research base, but

could be written in language more understandable to technicians. National and state meetings could also add more continuing education sessions specifically directed to the needs of technicians.

Only by working as a dietetics team will all members benefit. Understanding the role function shifts, job satisfaction, and continuing education needs of dietetic technicians by dietitians and health care administrators could enhance the successful/effective functioning of the dietetics team.

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APPENDIXES

APPENDIX A

COVER LETTER

Oklahoma State University
OKMULGEE

Hospitality Services Technology
1801 East 4th Street
Okmulgee, Oklahoma 74447-3901
918-756-6211, Ext. 220
TDD: 918-758-0665 FAX: 918-756-1315

October 10, 1995

Dear Dietetic Technician,

As you know, Dietetic Technicians have been recognized by the American Dietetic Association since 1975. However, 20 years later very limited information is known about how technicians function, or how satisfied they are with their chosen field.

We are conducting a national study of role functions, job satisfaction, and continuing education needs of dietetic technicians and urgently need your assistance. Your participation will help us identify how we can promote technicians more effectively to the dietetics profession. You have been chosen as one of 600 technicians in the United States invited to participate in this study.

The information you provide to us will be held in strict confidence. At no time will you or the facility where you are employed be identified in the research results. The code number on your questionnaire is merely to assist the researcher in tabulating data and to conduct any follow-up surveys which may be needed.

Please take time approximately 20 minutes from your busy schedule to complete this questionnaire. Your time and effort are greatly appreciated. When you are finished, please refold with the pre-paid reply visible, seal with tape, and return to us. Postage is furnished for your convenience.

Those surveys returned on or before Friday, November 10, will be entered in a random drawing for a $50.00 gift certificate.

Thank you for your time and professional assistance.

Sincerely,

Alexandria Miller, M.S., R.D./L.D.
Program Director, Dietetic Technology
Oklahoma State University-Okmulgee

Lea L. Ebro, Ph.D., R.D./L.D.
Professor, Nutritional Sciences
Oklahoma State University

APPENDIX B

RESEARCH INSTRUMENT

SURVEY OF DIETETIC TECHNICIANS (DT)

#_____

PART I: DEMOGRAPHIC INFORMATION
Please fill out every question by checking the appropriate answer.

1. Gender: (1) _____Male (2) _____Female

2. Age Group: (1) _____Under 25 (2) _____25 -34 (3) _____35 - 44
(4) _____45 - 54 (5) _____ 55-64 (6) _____ 65 and up

3. Your ethnic background: (1) _____White (2) _____Asian (3) _____Black (4) _____Hispanic
(5) _____Native American (6) _____Other; specify_____

4. Current job title: _____

5. Highest level of education obtained:
(1)_____Associate degree (2)_____B.S. before I was a DT (3)_____B.S. after I became a DT
(4)_____M.S. (5)_____Other; specify_____

6. Was your degree emphasis (1) ____Clinical Nutrition (2) _____Foodservice or (3) _____General (Both)

7. Status of employment:
(1)_____Full time (35 or more hours/week)
(2)_____Part time (34 or less hours/week)
(3)_____Not employed or retired; or not employed as a dietetic technician

8. Number of years you have been (or were) employed in the dietetic profession:_____

9. Number of years you have been (or were) employed as a dietetic technician:_____

10. In what area is the greatest percentage of your work?
(1)_____Clinical nutrition
(2)_____Foodservice Management
(3)_____Do both about equally

11. In what type of facility do you currently work?
(1)_____Long term care (including retirement)
(2)_____Hospital/medical center (acute care)
(3)_____Community/public health program (WIC, etc.)
(4)_____Food manufacturer; distributor; retailer
(5)_____Foodservice for noninstitutionalized population (school, college, restaurant, etc.)
(6)_____Wellness
(7)_____Self-employed; Specify type of duties:_____
(8)_____Outpatient care
(9)_____Other; Specify:_____

12. Facility or operation size: (beds, participants, clients, students
(1)_____Less than 100 (2)_____101 - 199 (3) _____200 - 299
(4)_____300-399 (5)_____ 400-499 (6) _____Over 500

13. In what size community is your facility located?
(1)____Town under 5000 (2) _____ Small city, 5000 - 25,000
(3)____City, 25,000-100,000 (4) _____Large metropolitan area over 100,000

14 Are you a DTR (Dietetic Technician, Registered)? _____(1) Yes _____(2) No

15 Are you a member of the American Dietetic Association? _____(1) Yes _____(2) No
If your answer is no, please list your reasons._____

16. Staffing: Number of RDs at your facility? _____
Number of DTRs (or DTR -eligible) at your facility? _____
How many employees do you supervise? _____

17. What is your approximate annual salary range? (If you receive hourly wages, compute to the closest range.)
(1)_____Under $15,000
(2)_____$15,001 - $20,000
(3)_____$20,001 - $25,000
(4)_____$25,001 - $30,000
(5)_____$30,001 - $35,000
(6)_____$35,001 - $40,000
(7)_____$40,001 - $45,000
(8)_____Over $45,000

****

PART II: ROLE FUNCTIONS

Please respond to the following role functions with both your level of involvement and frequency of involvement. Circle the number in each column that most closely describes the level and frequency. Use these rating scales:

Level of Involvement:	**1 = I always do this by myself**	**Frequency:**	**1 = Daily**
	2 = I usually do this by myself.		**2 = Once a week**
	3 = I work with the dietitian 50/50.		**3 = Once a month**
	4 = I may do this 25 percent of the time.		**4 = Less than once a month**
	5 = I never do this.		**5 = Never**

	Level	**Frequency**
1. Assess client satisfaction with menus.	1 2 3 4 5	1 2 3 4 5
2. Take preliminary diet histories	1 2 3 4 5	1 2 3 4 5
3. Calculate nutrient intakes	1 2 3 4 5	1 2 3 4 5
4. Document client care	1 2 3 4 5	1 2 3 4 5
5. Adapt oral diets to individual needs	1 2 3 4 5	1 2 3 4 5
6. Review medical records for nutrition data	1 2 3 4 5	1 2 3 4 5
7. Identify nutrition related needs	1 2 3 4 5	1 2 3 4 5
8. Check trays for accuracy	1 2 3 4 5	1 2 3 4 5
9. Monitor food quality	1 2 3 4 5	1 2 3 4 5
10. Monitor quality of service	1 2 3 4 5	1 2 3 4 5
11. Maintain safety-sanitation of food	1 2 3 4 5	1 2 3 4 5
12. Assist clients with menu selection	1 2 3 4 5	1 2 3 4 5
13. Take comprehensive diet histories	1 2 3 4 5	1 2 3 4 5
14. Plan oral diets with multiple modifications	1 2 3 4 5	1 2 3 4 5
15. Teach/counsel clients/families	1 2 3 4 5	1 2 3 4 5
16. Evaluate intake of specific nutrients	1 2 3 4 5	1 2 3 4 5
17. Verify shipments against purchase orders	1 2 3 4 5	1 2 3 4 5
18. Develop menus for clients--normal needs	1 2 3 4 5	1 2 3 4 5
19. Develop menus for clients--special needs	1 2 3 4 5	1 2 3 4 5

	Level	Frequency
20. Select products to be purchased	1 2 3 4 5	1 2 3 4 5
21. Assemble meals	1 2 3 4 5	1 2 3 4 5
22. Prepare food	1 2 3 4 5	1 2 3 4 5
23. Serve/distribute meals/food	1 2 3 4 5	1 2 3 4 5
24. Prescribe supplements for oral diets	1 2 3 4 5	1 2 3 4 5
25. Calculate nutrition requirements (e.g.: BEE)	1 2 3 4 5	1 2 3 4 5
26. Compare biochemical data--expected values	1 2 3 4 5	1 2 3 4 5
27. Confer with physicians about client care	1 2 3 4 5	1 2 3 4 5
28. Participate in a health care team	1 2 3 4 5	1 2 3 4 5
29. Prepare education materials for groups	1 2 3 4 5	1 2 3 4 5
30. Authorize purchase of food/supplies	1 2 3 4 5	1 2 3 4 5
31. Develop instructional materials	1 2 3 4 5	1 2 3 4 5
32. Assign/schedule staff	1 2 3 4 5	1 2 3 4 5
33. Counsel staff	1 2 3 4 5	1 2 3 4 5
34. Conduct staff training/development	1 2 3 4 5	1 2 3 4 5
35. Document personnel decisions	1 2 3 4 5	1 2 3 4 5
36. Evaluate performance of staff	1 2 3 4 5	1 2 3 4 5
37. Develop job descriptions	1 2 3 4 5	1 2 3 4 5
38. Maintain sanitation/safety	1 2 3 4 5	1 2 3 4 5
39. Supervise dietary aides/clerks	1 2 3 4 5	1 2 3 4 5
40. Monitor quality assurance programs	1 2 3 4 5	1 2 3 4 5

If there are other role functions you have that have not been covered, please list below and indicate level & frequency._____

PART III: CONTINUING EDUCATION NEEDS

What is your preferred method of continuing education? Circle one preference for each method.

	Most preferred	Would use sometimes	Would not use
1. Workshop with attendee participation	1	2	3
2. Lecture	1	2	3
3. Self-study	1	2	3
4. Audiocassettes	1	2	3
5. Articles in publications	1	2	3
6. Academic course work	1	2	3
7. Study group/journal club	1	2	3
8. Computer-assisted instruction	1	2	3
9. National, state or district dietetic meetings	1	2	3
10. Other; specify_____			

Below is a list of possible continuing education topics. Check the level that best describes your opinion of the importance of each topic as a continuing education need.

	Very Important	Important	Slightly Important	Unimportant
1. Food allergies/intolerances				
2. Behavior modification techniques				
3. Cancer				
4. Cardiovascular disease				
5. Computer applications				
6. Diabetes				
7. Drug/nutrient interactions				
8. Eating disorders				
9. Education methods				
10. Equipment (foodservice)				
11. Food production				
12. Food supply safety (including HACCP)				
13. Geriatric nutrition				
14. Media skills				
15. Nutrition assessment/screening				
16. Nutrition support (enteral/parenteral)				
17. Presentation skills				
18. Productivity/staffing				
19. Motivation				
20. Personnel training and development				
21. Obesity/weight control				
22. Wellness/health promotion programs				
23. Immune system disorders				
24. Writing skills				
25. Lab tests/nutritional implications				
26. Legal/ethical issues				
27. Renal nutrition				
28. Dysphagia				
29. Nutritional fads/misinformation				

30. Other; specify _____

Part IV: JOB SATISFACTION SURVEY

	PLEASE CIRCLE THE ONE NUMBER FOR EACH QUESTION THAT COMES CLOSEST TO REFLECTING YOUR OPINION ABOUT IT.	Disagree Very Much	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Very Much
1	I feel I am being paid a fair amount for the work I do.	1	2	3	4	5	6
2	There is really too little chance for promotion on my job.	1	2	3	4	5	6
3	My supervisor is quite competent in doing his/her job.	1	2	3	4	5	6
4	I am not satisfied with the benefits I receive.	1	2	3	4	5	6
5	When I do a good job, I receive the recognition for it that I should receive.	1	2	3	4	5	6
6	Many of our rules and procedures make doing a good job difficult.	1	2	3	4	5	6
7	I like the people I work with.	1	2	3	4	5	6
8	I sometimes feel my job is meaningless.	1	2	3	4	5	6
9	Communications seem good within this organization.	1	2	3	4	5	6
10	Raises are too few and far between.	1	2	3	4	5	6
11	Those who do well on the job stand a fair chance of being promoted.	1	2	3	4	5	6
12	My supervisor is unfair to me.	1	2	3	4	5	6
13	The benefits we receive are as good as most other organizations offer.	1	2	3	4	5	6
14	I do not feel that the work I do is appreciated.	1	2	3	4	5	6
15	My efforts to do a good job are seldom blocked by red tape.	1	2	3	4	5	6
16	I find I have to work harder at my job because of the incompetence of people I work with.	1	2	3	4	5	6
17	I like doing the things I do at work.	1	2	3	4	5	6
18	The goals of this organization are not clear to me.	1	2	3	4	5	6
19	I feel unappreciated by the organization when I think about what they pay me.	1	2	3	4	5	6
20	People get ahead as fast here as they do in other places.	1	2	3	4	5	6
21	My supervisor shows too little interest in the feelings of subordinates.	1	2	3	4	5	6
22	The benefit package we have is equitable.	1	2	3	4	5	6
23	There are few rewards for those who work here.	1	2	3	4	5	6
24	I have too much to do at work.	1	2	3	4	5	6

	PLEASE CIRCLE THE ONE NUMBER FOR EACH QUESTION THAT COMES CLOSEST TO REFLECTING YOUR OPINION ABOUT IT.	Disagree Very Much	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree Very Much
25	I enjoy my coworkers.	1	2	3	4	5	6
26	I often feel that I do not know what is going on with the organization.	1	2	3	4	5	6
27	I feel a sense of pride in doing my job.	1	2	3	4	5	6
28	I feel satisfied with my chances for salary increases.	1	2	3	4	5	6
29	There are benefits we do not have which we should have.	1	2	3	4	5	6
30	I like my supervisor.	1	2	3	4	5	6
31	I have too much paperwork.	1	2	3	4	5	6
32	I don't feel my efforts are rewarded the way they should be.	1	2	3	4	5	6
33	I am satisfied with my chances for promotion.	1	2	3	4	5	6
34	There is too much bickering and fighting at work.	1	2	3	4	5	6
35	My job is enjoyable.	1	2	3	4	5	6
36	Work assignments are not fully explained.	1	2	3	4	5	6

Thank you for taking the time to respond to this survey. Your answers will help others understand role functions and needs of dietetic technicians. Your answers will remain confidential.

Fold your survey into thirds so that the pre-paid reply is visible and seal with tape. Please mail back on or before November 10, 1995.

DIETETIC TECHNICIAN
MILLER / EBRO
NUTR SCIENCES

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

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FIRST CLASS PERMIT NO. 325 STILLWATER, OK

POSTAGE WILL BE PAID BY ADDRESSEE

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STILLWATER OK 74075-9988

APPENDIX C

CHI-SQUARE FREQUENCY ANALYSIS TABLES

FOR ROLE FUNCTION

KEY TO TABLES

In the following tables, the abbreviations refer to questions on the survey questionnaire.

AGE
- 2 = 25 - 34 years
- 3 = 35 - 44 years
- 4 = 45 years and over

CYR_TECH (Years of experience)
- 1 = Up to 5
- 2 = 6 - 10 year
- 3 = 11 - 15 years
- 4 = 16 years and over

FACILITY (Employment facility)
- 1 = Long term care
- 2 = Acute care
- 3 = Public health
- 4 = Other

SIZE (Beds, clients or participants)
- 1 = Less than 100
- 2 = 101 - 199
- 3 = 200 - 299
- 4 = 300 - 399
- 5 = 400 - 499
- 6 = Over 500

No_DTR (Number of technicians in facility)
- 1 = 1
- 2 = 2
- 3 = 3
- 4 = 4
- 5 = 5 and over

PC_WORK (Area of work)
- 1 = Clinical nutrition
- 2 = Foodservice
- 3 = Do both equally

ADA (Membership in American Dietetic Association)
- 1 = Yes
- 2 = No

Role functions follow function numbers in Part II Role Functions in survey.

Role function levels:
- 1 = Always perform by myself or usually by myself
- 2 = Usually perform with dietitian
- 3 = Never perform

TABLE OF PC_WORK BY RFL1

PC_WORK	RFL1			
Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	3	5	Total
1	92 88.87 0.1102 47.67 68.66 71.87	18 20.829 0.3842 9.33 13.43 60.00	24 24.301 0.0037 12.44 17.91 68.57	134 69.43
2	18 24.539 1.7424 9.33 48.65 14.06	11 5.7513 4.79 5.70 29.73 36.67	8 6.7098 0.2481 4.15 21.62 22.86	37 19.17
3	18 14.591 0.7966 9.33 81.82 14.06	1 3.4197 1.7121 0.52 4.55 3.33	3 3.9896 0.2455 1.55 13.64 8.57	22 11.40
Total	128 66.32	30 15.54	35 18.13	193 100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF PC_WORK BY RFL1

Statistic	DF	Value	Prob
Chi-Square	4	10.033	0.040
Likelihood Ratio Chi-Square	4	9.830	0.043
Mantel-Haenszel Chi-Square	1	0.017	0.897
Phi Coefficient		0.228	
Contingency Coefficient		0.222	
Cramer's V		0.161	

Effective Sample Size = 193
Frequency Missing = 1
WARNING: 22% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF FACILITY BY RFL1

FACILITY	RFL1			
Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	3	5	Total
1	32 27.052 0.9052 16.49 78.05 25.00	6 6.3402 0.0183 3.09 14.63 20.00	3 7.6082 2.7912 1.55 7.32 8.33	41 21.13
2	82 79.835 0.0587 42.27 67.77 64.06	23 18.711 0.983 11.86 19.01 76.67	16 22.454 1.8549 8.25 13.22 44.44	121 62.37
3	2 10.557 6.9356 1.03 12.50 1.56	0 2.4742 2.4742 0.00 0.00 0.00	14 2.9691 40.983 7.22 87.50 38.89	16 8.25
4	12 10.557 0.1973 6.19 75.00 9.38	1 2.4742 0.8784 0.52 6.25 3.33	3 2.9691 0.0003 1.55 18.75 8.33	16 8.25
Total	128 65.98	30 15.46	36 18.56	194 100.00

STATISTICS FOR TABLE OF FACILITY BY RFL1

Statistic	DF	Value	Prob
Chi-Square	6	58.080	0.000
Likelihood Ratio Chi-Square	6	45.637	0.000
Mantel-Haenszel Chi-Square	1	9.198	0.002
Phi Coefficient		0.547	
Contingency Coefficient		0.480	
Cramer's V		0.387	

Sample Size = 194
WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF PC_WORK BY RFL2

PC_WORK	RFL2			
Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	3	5	Total
1	102 91.648 1.1694 52.85 76.12 77.27	13 14.58 0.1713 6.74 9.70 61.90	19 27.772 2.7707 9.84 14.18 47.50	134 69.43
2	13 25.306 5.984 6.74 35.14 9.85	7 4.0259 2.1971 3.63 18.92 33.33	17 7.6684 11.356 8.81 45.95 42.50	37 19.17
3	17 15.047 0.2536 8.81 77.27 12.88	1 2.3938 0.8115 0.52 4.55 4.76	4 4.5596 0.0687 2.07 18.18 10.00	22 11.40
Total	132 68.39	21 10.88	40 20.73	193 100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF PC_WORK BY RFL2

Statistic	DF	Value	Prob
Chi-Square	4	24.782	0.000
Likelihood Ratio Chi-Square	4	23.276	0.000
Mantel-Haenszel Chi-Square	1	4.543	0.033
Phi Coefficient		0.358	
Contingency Coefficient		0.337	
Cramer's V		0.253	

Effective Sample Size = 193
Frequency Missing = 1
WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF CYR_TECH BY RFL2

CYR_TECH RFL2

Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	3	5	Total
1	11 14.289 0.7569 5.67 52.38 8.33	1 2.2732 0.7131 0.52 4.76 4.76	9 4.4381 4.689 4.64 42.86 21.95	21 10.82
2	33 36.742 0.3812 17.01 61.11 25.00	6 5.8454 0.0041 3.09 11.11 28.57	15 11.412 1.1278 7.73 27.78 36.59	54 27.84
3	58 51.711 0.7648 29.90 76.32 43.94	10 8.2268 0.3822 5.15 13.16 47.62	8 16.062 4.0465 4.12 10.53 19.51	76 39.18
4	30 29.258 0.0188 15.46 69.77 22.73	4 4.6546 0.0921 2.06 9.30 19.05	9 9.0876 0.0008 4.64 20.93 21.95	43 22.16
Total	132 68.04	21 10.82	41 21.13	194 100.00

STATISTICS FOR TABLE OF CYR_TECH BY RFL2

Statistic	DF	Value	Prob
Chi-Square	6	12.977	0.043
Likelihood Ratio Chi-Square	6	12.934	0.044
Mantel-Haenszel Chi-Square	1	5.064	0.024
Phi Coefficient		0.259	
Contingency Coefficient		0.250	
Cramer's V		0.183	

Sample Size = 194
WARNING: 25% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF SIZE BY RFL1

SIZE RFL1

Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	3	5	Total
1	16 14.591 0.1361 8.29 72.73 12.50	2 3.4197 0.5894 1.04 9.09 6.67	4 3.9896 269E-7 2.07 18.18 11.43	22 11.40
2	41 32.497 2.2246 21.24 83.67 32.03	6 7.6166 0.3431 3.11 12.24 20.00	2 8.886 5.3362 1.04 4.08 5.71	49 25.39
3	20 22.549 0.2882 10.36 58.82 15.63	7 5.285 0.5565 3.63 20.59 23.33	7 6.1658 0.1129 3.63 20.59 20.00	34 17.62
4	20 19.896 0.0005 10.36 66.67 15.63	9 4.6632 4.0332 4.66 30.00 30.00	1 5.4404 3.6242 0.52 3.33 2.86	30 15.54
5	11 8.6218 0.656 5.70 84.62 8.59	2 2.0207 0.0002 1.04 15.38 6.67	0 2.3575 2.3575 0.00 0.00 0.00	13 6.74
6	20 29.845 3.2473 10.36 44.44 15.63	4 6.9948 1.2822 2.07 8.89 13.33	21 8.1606 20.201 10.88 46.67 60.00	45 23.32
Total	128 66.32	30 15.54	35 18.13	193 100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF SIZE BY RFL1

Statistic	DF	Value	Prob
Chi-Square	10	44.989	0.000
Likelihood Ratio Chi-Square	10	45.158	0.000
Mantel-Haenszel Chi-Square	1	14.757	0.000
Phi Coefficient		0.483	
Contingency Coefficient		0.435	
Cramer's V		0.341	

Effective Sample Size = 193
Frequency Missing = 1
WARNING: 28% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF NO_DTR BY RFL2

NO_DTR RFL2

Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	3	5	Total
1	42 44.907 0.1882 21.65 63.64 31.82	8 7.1443 0.1025 4.12 12.12 38.10	16 13.948 0.3017 8.25 24.24 39.02	66 34.02
2	31 27.216 0.526 15.98 77.50 23.48	0 4.3299 4.3299 0.00 0.00 0.00	9 8.4536 0.0353 4.64 22.50 21.95	40 20.62
3	25 21.093 0.7238 12.89 80.65 18.94	5 3.3557 0.8057 2.58 16.13 23.81	1 6.5515 4.7042 0.52 3.23 2.44	31 15.98
4	8 10.887 0.7654 4.12 50.00 6.06	1 1.732 0.3093 0.52 6.25 4.76	7 3.3814 3.8723 3.61 43.75 17.07	16 8.25
5	26 27.897 0.129 13.40 63.41 19.70	7 4.4381 1.4788 3.61 17.07 33.33	8 8.6649 0.051 4.12 19.51 19.51	41 21.13
Total	132 68.04	21 10.82	41 21.13	194 100.00

STATISTICS FOR TABLE OF NO_DTR BY RFL2

Statistic	DF	Value	Prob
Chi-Square	8	18.323	0.019
Likelihood Ratio Chi-Square	8	24.101	0.002
Mantel-Haenszel Chi-Square	1	0.017	0.896
Phi Coefficient		0.307	
Contingency Coefficient		0.294	
Cramer's V		0.217	

Sample Size = 194
WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF FACILITY BY RFL3

FACILITY / RFL3	1	3	5	Total
1	17	15	9	41
	23.247	8.8763	8.8763	
	1.6789	4.2247	0.0017	
	8.76	7.73	4.64	21.13
	41.46	36.59	21.95	
	15.45	35.71	21.43	
2	73	26	22	121
	68.608	26.196	26.196	
	0.2811	0.0015	0.6721	
	37.63	13.40	11.34	62.37
	60.33	21.49	18.18	
	66.36	61.90	52.38	
3	12	0	4	16
	9.0722	3.4639	3.4639	
	0.9449	3.4639	0.083	
	6.19	0.00	2.06	8.25
	75.00	0.00	25.00	
	10.91	0.00	9.52	
4	8	1	7	16
	9.0722	3.4639	3.4639	
	0.1267	1.7526	3.6098	
	4.12	0.52	3.61	8.25
	50.00	6.25	43.75	
	7.27	2.38	16.67	
Total	110	42	42	194
	56.70	21.65	21.65	100.00

STATISTICS FOR TABLE OF FACILITY BY RFL3

Statistic	DF	Value	Prob
Chi-Square	6	16.841	0.010
Likelihood Ratio Chi-Square	6	19.552	0.003
Mantel-Haenszel Chi-Square	1	0.003	0.960
Phi Coefficient		0.295	
Contingency Coefficient		0.283	
Cramer's V		0.208	

Sample Size = 194
WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF PC_WORK BY RFL3

PC_WORK / RFL3	1	3	5	Total
1	93	23	18	134
	75.679	29.161	29.161	
	3.9645	1.3015	4.2715	
	48.19	11.92	9.33	69.43
	69.40	17.16	13.43	
	85.32	54.76	42.86	
2	8	10	19	37
	20.896	8.0518	8.0518	
	7.9591	0.4714	14.886	
	4.15	5.18	9.84	19.17
	21.62	27.03	51.35	
	7.34	23.81	45.24	
3	8	9	5	22
	12.425	4.7876	4.7876	
	1.5758	3.7064	0.0094	
	4.15	4.66	2.59	11.40
	36.36	40.91	22.73	
	7.34	21.43	11.90	
Total	109	42	42	193
	56.48	21.76	21.76	100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF PC_WORK BY RFL3

Statistic	DF	Value	Prob
Chi-Square	4	38.146	0.000
Likelihood Ratio Chi-Square	4	36.398	0.000
Mantel-Haenszel Chi-Square	1	18.116	0.000
Phi Coefficient		0.445	
Contingency Coefficient		0.406	
Cramer's V		0.314	

Effective Sample Size = 193
Frequency Missing = 1
WARNING: 22% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF FACILITY BY RFL4

FACILITY / RFL4	1	3	5	Total
1	29	7	5	41
	25.149	8.4536	7.3969	
	0.5895	0.2499	0.7767	
	14.95	3.61	2.58	21.13
	70.73	17.07	12.20	
	24.37	17.50	14.29	
2	70	30	21	121
	74.222	24.948	21.83	
	0.2401	1.0228	0.0315	
	36.08	15.46	10.82	62.37
	57.85	24.79	17.36	
	58.82	75.00	60.00	
3	13	2	1	16
	9.8144	3.299	2.8866	
	1.034	0.5115	1.233	
	6.70	1.03	0.52	8.25
	81.25	12.50	6.25	
	10.92	5.00	2.86	
4	7	1	8	16
	9.8144	3.299	2.8866	
	0.8071	1.6021	9.058	
	3.61	0.52	4.12	8.25
	43.75	6.25	50.00	
	5.88	2.50	22.86	
Total	119	40	35	194
	61.34	20.62	18.04	100.00

STATISTICS FOR TABLE OF FACILITY BY RFL4

Statistic	DF	Value	Prob
Chi-Square	6	17.156	0.009
Likelihood Ratio Chi-Square	6	15.319	0.018
Mantel-Haenszel Chi-Square	1	3.941	0.047
Phi Coefficient		0.297	
Contingency Coefficient		0.285	
Cramer's V		0.210	

Sample Size = 194
WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF NO_DTR BY RFL4

NO_DTR	RFL4			
Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	3	5	Total
1	39 40.485 0.0544 20.10 59.09 32.77	12 13.608 0.1901 6.19 18.18 30.00	15 11.907 0.8033 7.73 22.73 42.86	66 34.02
2	32 24.536 2.2705 16.49 80.00 26.89	4 8.2474 2.1874 2.06 10.00 10.00	4 7.2165 1.4336 2.06 10.00 11.43	40 20.62
3	22 19.015 0.4684 11.34 70.97 18.49	7 6.3918 0.0579 3.61 22.58 17.50	2 5.5928 2.308 1.03 6.45 5.71	31 15.98
4	6 9.8144 1.4825 3.09 37.50 5.04	4 3.299 0.149 2.06 25.00 10.00	6 2.8866 3.358 3.09 37.50 17.14	16 8.25
5	20 25.149 1.0544 10.31 48.78 16.81	13 8.4536 2.4451 6.70 31.71 32.50	8 7.3969 0.0492 4.12 19.51 22.86	41 21.13
Total	119 61.34	40 20.62	35 18.04	194 100.00

STATISTICS FOR TABLE OF NO_DTR BY RFL4

Statistic	DF	Value	Prob
Chi-Square	8	18.312	0.019
Likelihood Ratio Chi-Square	8	18.753	0.016
Mantel-Haenszel Chi-Square	1	1.434	0.231
Phi Coefficient		0.307	
Contingency Coefficient		0.294	
Cramer's V		0.217	

Sample Size = 194

TABLE OF PC_WORK BY RFL4

PC_WORK	RFL4			
Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	3	5	Total
1	95 82.622 1.8545 49.22 70.90 79.83	24 27.772 0.5123 12.44 17.91 60.00	15 23.606 3.1376 7.77 11.19 44.12	134 69.43
2	11 22.813 6.1174 5.70 29.73 9.24	9 7.6684 0.2312 4.66 24.32 22.50	17 6.5181 16.856 8.81 45.95 50.00	37 19.17
3	13 13.565 0.0235 6.74 59.09 10.92	7 4.5596 1.3062 3.63 31.82 17.50	2 3.8756 0.9077 1.04 9.09 5.88	22 11.40
Total	119 61.66	40 20.73	34 17.62	193 100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF PC_WORK BY RFL4

Statistic	DF	Value	Prob
Chi-Square	4	30.946	0.000
Likelihood Ratio Chi-Square	4	27.591	0.000
Mantel-Haenszel Chi-Square	1	7.066	0.008
Phi Coefficient		0.400	
Contingency Coefficient		0.372	
Cramer's V		0.283	

Effective Sample Size = 193
Frequency Missing = 1
WARNING: 22% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF PC_WORK BY RFL5

PC_WORK	RFL5			
Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	3	5	Total
1	109 97.896 1.2594 56.48 81.34 77.30	16 21.523 1.4174 8.29 11.94 51.61	9 14.58 2.1357 4.66 6.72 42.86	134 69.43
2	15 27.031 5.3548 7.77 40.54 10.64	12 5.943 6.1732 6.22 32.43 38.71	10 4.0259 8.865 5.18 27.03 47.62	37 19.17
3	17 16.073 0.0535 8.81 77.27 12.06	3 3.5337 0.0806 1.55 13.64 9.68	2 2.3938 0.0648 1.04 9.09 9.52	22 11.40
Total	141 73.06	31 16.06	21 10.88	193 100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF PC_WORK BY RFL5

Statistic	DF	Value	Prob
Chi-Square	4	25.404	0.000
Likelihood Ratio Chi-Square	4	22.847	0.000
Mantel-Haenszel Chi-Square	1	5.698	0.017
Phi Coefficient		0.363	
Contingency Coefficient		0.341	
Cramer's V		0.257	

Effective Sample Size = 193
Frequency Missing = 1
WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF FACILITY BY RFL5

FACILITY / RFL5	1	3	5	Total
1	33	5	3	41
	29.799	6.5515	4.6495	
	0.3439	0.3674	0.5852	
	17.01	2.58	1.55	21.13
	80.49	12.20	7.32	
	23.40	16.13	13.64	
2	90	22	9	121
	87.943	19.335	13.722	
	0.0481	0.3673	1.6247	
	46.39	11.34	4.64	62.37
	74.38	18.18	7.44	
	63.83	70.97	40.91	
3	10	2	4	16
	11.629	2.5567	1.8144	
	0.2282	0.1212	2.6326	
	5.15	1.03	2.06	8.25
	62.50	12.50	25.00	
	7.09	6.45	18.18	
4	8	2	6	16
	11.629	2.5567	1.8144	
	1.1324	0.1212	9.6553	
	4.12	1.03	3.09	8.25
	50.00	12.50	37.50	
	5.67	6.45	27.27	
Total	141	31	22	194
	72.68	15.98	11.34	100.00

STATISTICS FOR TABLE OF FACILITY BY RFL5

Statistic	DF	Value	Prob
Chi-Square	6	17.228	0.008
Likelihood Ratio Chi-Square	6	13.362	0.038
Mantel-Haenszel Chi-Square	1	10.481	0.001
Phi Coefficient		0.298	
Contingency Coefficient		0.286	
Cramer's V		0.211	

Sample Size = 194
WARNING: 42% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF CYR_TECH BY RFL6

CYR_TECH / RFL6	1	3	5	Total
1	12	3	6	21
	14.397	3.0309	3.5722	
	0.3991	0.0003	1.6501	
	6.19	1.55	3.09	10.82
	57.14	14.29	28.57	
	9.02	10.71	18.18	
2	32	7	15	54
	37.021	7.7938	9.1856	
	0.6809	0.0809	3.6805	
	16.49	3.61	7.73	27.84
	59.26	12.96	27.78	
	24.06	25.00	45.45	
3	61	9	6	76
	52.103	10.969	12.928	
	1.5192	0.3535	3.7125	
	31.44	4.64	3.09	39.18
	80.26	11.84	7.89	
	45.86	32.14	18.18	
4	28	9	6	43
	29.479	6.2062	7.3144	
	0.0742	1.2577	0.2362	
	14.43	4.64	3.09	22.16
	65.12	20.93	13.95	
	21.05	32.14	18.18	
Total	133	28	33	194
	68.56	14.43	17.01	100.00

STATISTICS FOR TABLE OF CYR_TECH BY RFL6

Statistic	DF	Value	Prob
Chi-Square	6	13.645	0.034
Likelihood Ratio Chi-Square	6	13.563	0.035
Mantel-Haenszel Chi-Square	1	4.181	0.041
Phi Coefficient		0.265	
Contingency Coefficient		0.256	
Cramer's V		0.188	

Sample Size = 194

TABLE OF PC_WORK BY RFL6

PC_WORK / RFL6	1	3	5	Total
1	106	14	14	134
	92.342	19.44	22.218	
	2.0201	1.5225	3.0394	
	54.92	7.25	7.25	69.43
	79.10	10.45	10.45	
	79.70	50.00	43.75	
2	12	8	17	37
	25.497	5.3679	6.1347	
	7.145	1.2907	19.244	
	6.22	4.15	8.81	19.17
	32.43	21.62	45.95	
	9.02	28.57	53.13	
3	15	6	1	22
	15.161	3.1917	3.6477	
	0.0017	2.4709	1.9218	
	7.77	3.11	0.52	11.40
	68.18	27.27	4.55	
	11.28	21.43	3.12	
Total	133	28	32	193
	68.91	14.51	16.58	100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF PC_WORK BY RFL6

Statistic	DF	Value	Prob
Chi-Square	4	38.656	0.000
Likelihood Ratio Chi-Square	4	34.737	0.000
Mantel-Haenszel Chi-Square	1	7.072	0.008
Phi Coefficient		0.448	
Contingency Coefficient		0.408	
Cramer's V		0.316	

Effective Sample Size = 193
Frequency Missing = 1
WARNING: 22% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF NO_DTR BY RFL6

NO_DTR RFL6

Frequency / Expected / Cell Chi-Square / Percent / Row Pct / Col Pct	1	3	5	Total
1	39	12	15	66
	45.247	9.5258	11.227	
	0.8626	0.6427	1.2681	
	20.10	6.19	7.73	34.02
	59.09	18.18	22.73	
	29.32	42.86	45.45	
2	33	4	3	40
	27.423	5.7732	6.8041	
	1.1343	0.5446	2.1269	
	17.01	2.06	1.55	20.62
	82.50	10.00	7.50	
	24.81	14.29	9.09	
3	26	4	1	31
	21.253	4.4742	5.2732	
	1.0605	0.0503	3.4628	
	13.40	2.06	0.52	15.98
	83.87	12.90	3.23	
	19.55	14.29	3.03	
4	7	1	8	16
	10.969	2.3093	2.7216	
	1.4362	0.7423	10.237	
	3.61	0.52	4.12	8.25
	43.75	6.25	50.00	
	5.26	3.57	24.24	
5	28	7	6	41
	28.108	5.9175	6.9742	
	0.0004	0.198	0.1361	
	14.43	3.61	3.09	21.13
	68.29	17.07	14.63	
	21.05	25.00	18.18	
Total	133	28	33	194
	68.56	14.43	17.01	100.00

STATISTICS FOR TABLE OF NO_DTR BY RFL6

Statistic	DF	Value	Prob
Chi-Square	8	23.903	0.002
Likelihood Ratio Chi-Square	8	22.897	0.003
Mantel-Haenszel Chi-Square	1	0.037	0.848
Phi Coefficient		0.351	
Contingency Coefficient		0.331	
Cramer's V		0.248	

Sample Size = 194

TABLE OF SIZE BY RFL6

SIZE RFL6

Frequency / Expected / Cell Chi-Square / Percent / Row Pct / Col Pct	1	3	5	Total
1	12	8	2	22
	15.161	3.1917	3.6477	
	0.6589	7.2437	0.7443	
	6.22	4.15	1.04	11.40
	54.55	36.36	9.09	
	9.02	28.57	6.25	
2	39	5	5	49
	33.767	7.1088	8.1244	
	0.811	0.6256	1.2015	
	20.21	2.59	2.59	25.39
	79.59	10.20	10.20	
	29.32	17.86	15.63	
3	25	3	6	34
	23.43	4.9326	5.6373	
	0.1052	0.7572	0.0233	
	12.95	1.55	3.11	17.62
	73.53	8.82	17.65	
	18.80	10.71	18.75	
4	22	4	4	30
	20.674	4.3523	4.9741	
	0.0851	0.0285	0.1908	
	11.40	2.07	2.07	15.54
	73.33	13.33	13.33	
	16.54	14.29	12.50	
5	11	1	1	13
	8.9585	1.886	2.1554	
	0.4652	0.4162	0.6194	
	5.70	0.52	0.52	6.74
	84.62	7.69	7.69	
	8.27	3.57	3.12	
6	24	7	14	45
	31.01	6.5285	7.4611	
	1.5848	0.0341	5.7306	
	12.44	3.63	7.25	23.32
	53.33	15.56	31.11	
	18.05	25.00	43.75	
Total	133	28	32	193
	68.91	14.51	16.58	100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF SIZE BY RFL6

Statistic	DF	Value	Prob
Chi-Square	10	21.325	0.019
Likelihood Ratio Chi-Square	10	18.886	0.042
Mantel-Haenszel Chi-Square	1	4.145	0.042
Phi Coefficient		0.332	
Contingency Coefficient		0.315	
Cramer's V		0.235	

Effective Sample Size = 193
Frequency Missing = 1
WARNING: 39% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF FACILITY BY RFL6

FACILITY RFL6

Frequency / Expected / Cell Chi-Square / Percent / Row Pct / Col Pct	1	3	5	Total
1	32	5	4	41
	28.108	5.9175	6.9742	
	0.5388	0.1423	1.2684	
	16.49	2.58	2.06	21.13
	78.05	12.20	9.76	
	24.06	17.86	12.12	
2	86	20	15	121
	82.954	17.464	20.582	
	0.1119	0.3683	1.5141	
	44.33	10.31	7.73	62.37
	71.07	16.53	12.40	
	64.66	71.43	45.45	
3	8	2	6	16
	10.969	2.3093	2.7216	
	0.8037	0.0414	3.9489	
	4.12	1.03	3.09	8.25
	50.00	12.50	37.50	
	6.02	7.14	18.18	
4	7	1	8	16
	10.969	2.3093	2.7216	
	1.4362	0.7423	10.237	
	3.61	0.52	4.12	8.25
	43.75	6.25	50.00	
	5.26	3.57	24.24	
Total	133	28	33	194
	68.56	14.43	17.01	100.00

STATISTICS FOR TABLE OF FACILITY BY RFL6

Statistic	DF	Value	Prob
Chi-Square	6	21.153	0.002
Likelihood Ratio Chi-Square	6	17.452	0.008
Mantel-Haenszel Chi-Square	1	13.952	0.000
Phi Coefficient		0.330	
Contingency Coefficient		0.314	
Cramer's V		0.233	

Sample Size = 194
WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF PC_WORK BY RFL7

PC_WORK RFL7

Frequency / Expected / Cell Chi-Square / Percent / Row Pct / Col Pct	1	3	5	Total
1	106	23	5	134
	93.036	27.772	13.192	
	1.8064	0.82	5.0868	
	54.92	11.92	2.59	69.43
	79.10	17.16	3.73	
	79.10	57.50	26.32	
2	14	10	13	37
	25.689	7.6684	3.6425	
	5.3188	0.7089	24.039	
	7.25	5.18	6.74	19.17
	37.84	27.03	35.14	
	10.45	25.00	68.42	
3	14	7	1	22
	15.275	4.5596	2.1658	
	0.1064	1.3062	0.6275	
	7.25	3.63	0.52	11.40
	63.64	31.82	4.55	
	10.45	17.50	5.26	
Total	134	40	19	193
	69.43	20.73	9.84	100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF PC_WORK BY RFL7

Statistic	DF	Value	Prob
Chi-Square	4	39.820	0.000
Likelihood Ratio Chi-Square	4	32.690	0.000
Mantel-Haenszel Chi-Square	1	11.293	0.001
Phi Coefficient		0.454	
Contingency Coefficient		0.414	
Cramer's V		0.321	

Effective Sample Size = 193
Frequency Missing = 1
WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF CYR_TECH BY RFL7

CYR_TECH RFL7

Frequency / Expected / Cell Chi-Square / Percent / Row Pct / Col Pct	1	3	5	Total
1	12	3	6	21
	14.505	4.3299	2.1649	
	0.4327	0.4085	6.7935	
	6.19	1.55	3.09	10.82
	57.14	14.29	28.57	
	8.96	7.50	30.00	
2	34	9	11	54
	37.299	11.134	5.567	
	0.2918	0.409	5.3022	
	17.53	4.64	5.67	27.84
	62.96	16.67	20.37	
	25.37	22.50	55.00	
3	58	17	1	76
	52.495	15.67	7.8351	
	0.5773	0.1129	5.9627	
	29.90	8.76	0.52	39.18
	76.32	22.37	1.32	
	43.28	42.50	5.00	
4	30	11	2	43
	29.701	8.866	4.433	
	0.003	0.5137	1.3353	
	15.46	5.67	1.03	22.16
	69.77	25.58	4.65	
	22.39	27.50	10.00	
Total	134	40	20	194
	69.07	20.62	10.31	100.00

STATISTICS FOR TABLE OF CYR_TECH BY RFL7

Statistic	DF	Value	Prob
Chi-Square	6	22.143	0.001
Likelihood Ratio Chi-Square	6	22.719	0.001
Mantel-Haenszel Chi-Square	1	7.765	0.005
Phi Coefficient		0.338	
Contingency Coefficient		0.320	
Cramer's V		0.239	

Sample Size = 194
WARNING: 25% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF AGE BY RFL12

AGE	RFL12			
Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	3	5	Total
2	36 32.036 0.4905 18.56 65.45 31.86	8 10.49 0.5909 4.12 14.55 21.62	11 12.474 0.1742 5.67 20.00 25.00	55 28.35
3	54 54.753 0.0103 27.84 57.45 47.79	17 17.928 0.048 8.76 18.09 45.95	23 21.32 0.1325 11.86 24.47 52.27	94 48.45
4	23 26.211 0.3934 11.86 51.11 20.35	12 8.5825 1.3609 6.19 26.67 32.43	10 10.206 0.0042 5.15 22.22 22.73	45 23.20
Total	113 58.25	37 19.07	44 22.68	194 100.00

STATISTICS FOR TABLE OF AGE BY RFL12

Statistic	DF	Value	Prob
Chi-Square	4	3.205	0.524
Likelihood Ratio Chi-Square	4	3.110	0.540
Mantel-Haenszel Chi-Square	1	1.044	0.307
Phi Coefficient		0.129	
Contingency Coefficient		0.127	
Cramer's V		0.091	

Sample Size = 194

TABLE OF PC_WORK BY RFL12

PC_WORK	RFL12			
Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	3	5	Total
1	87 78.456 0.9305 45.08 64.93 76.99	24 25.689 0.1111 12.44 17.91 64.86	23 29.855 1.5739 11.92 17.16 53.49	134 69.43
2	13 21.663 3.4645 6.74 35.14 11.50	9 7.0933 0.5125 4.66 24.32 24.32	15 8.2435 5.5377 7.77 40.54 34.88	37 19.17
3	13 12.881 0.0011 6.74 59.09 11.50	4 4.2176 0.0112 2.07 18.18 10.81	5 4.9016 0.002 2.59 22.73 11.63	22 11.40
Total	113 58.55	37 19.17	43 22.28	193 100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF PC_WORK BY RFL12

Statistic	DF	Value	Prob
Chi-Square	4	12.144	0.016
Likelihood Ratio Chi-Square	4	11.704	0.020
Mantel-Haenszel Chi-Square	1	3.820	0.051
Phi Coefficient		0.251	
Contingency Coefficient		0.243	
Cramer's V		0.177	

Effective Sample Size = 193
Frequency Missing = 1
WARNING: 22% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF FACILITY BY RFL12

FACILITY	RFL12			
Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	3	5	Total
1	19 23.881 0.9978 9.79 46.34 16.81	14 7.8196 4.8848 7.22 34.15 37.84	8 9.299 0.1815 4.12 19.51 18.18	41 21.13
2	83 70.479 2.2243 42.78 68.60 73.45	23 23.077 0.0003 11.86 19.01 62.16	15 27.443 5.642 7.73 12.40 34.09	121 62.37
3	3 9.3196 4.2853 1.55 18.75 2.65	0 3.0515 3.0515 0.00 0.00 0.00	13 3.6289 24.2 6.70 81.25 29.55	16 8.25
4	8 9.3196 0.1868 4.12 50.00 7.08	0 3.0515 3.0515 0.00 0.00 0.00	8 3.6289 5.2652 4.12 50.00 18.18	16 8.25
Total	113 58.25	37 19.07	44 22.68	194 100.00

STATISTICS FOR TABLE OF FACILITY BY RFL12

Statistic	DF	Value	Prob
Chi-Square	6	53.971	0.000
Likelihood Ratio Chi-Square	6	50.660	0.000
Mantel-Haenszel Chi-Square	1	6.658	0.010
Phi Coefficient		0.527	
Contingency Coefficient		0.467	
Cramer's V		0.373	

Sample Size = 194
WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF NO_DTR BY RFL12

NO_DTR	RFL12			
Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	3	5	Total
1	27 38.443 3.4063 13.92 40.91 23.89	18 12.588 2.3272 9.28 27.27 48.65	21 14.969 2.4298 10.82 31.82 47.73	66 34.02
2	28 23.299 0.9485 14.43 70.00 24.78	5 7.6289 0.9059 2.58 12.50 13.51	7 9.0722 0.4733 3.61 17.50 15.91	40 20.62
3	20 18.057 0.2091 10.31 64.52 17.70	8 5.9124 0.7371 4.12 25.81 21.62	3 7.0309 2.311 1.55 9.68 6.82	31 15.98
4	9 9.3196 0.011 4.64 56.25 7.96	1 3.0515 1.3792 0.52 6.25 2.70	6 3.6289 1.5493 3.09 37.50 13.64	16 8.25
5	29 23.881 1.0971 14.95 70.73 25.66	5 7.8196 1.0167 2.58 12.20 13.51	7 9.299 0.5684 3.61 17.07 15.91	41 21.13
Total	113 58.25	37 19.07	44 22.68	194 100.00

STATISTICS FOR TABLE OF NO_DTR BY RFL12

Statistic	DF	Value	Prob
Chi-Square	8	19.370	0.013
Likelihood Ratio Chi-Square	8	20.258	0.009
Mantel-Haenszel Chi-Square	1	5.197	0.023
Phi Coefficient		0.316	
Contingency Coefficient		0.301	
Cramer's V		0.223	

Sample Size = 194

TABLE OF SIZE BY RFL12

SIZE	RFL12			
Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	3	5	Total
1	11 12.881 0.2746 5.70 50.00 9.73	6 4.2176 0.7532 3.11 27.27 16.22	5 4.9016 0.002 2.59 22.73 11.63	22 11.40
2	34 28.689 0.9831 17.62 69.39 30.09	10 9.3938 0.0391 5.18 20.41 27.03	5 10.917 3.2071 2.59 10.20 11.63	49 25.39
3	21 19.907 0.06 10.88 61.76 18.58	8 6.5181 0.3369 4.15 23.53 21.62	5 7.5751 0.8754 2.59 14.71 11.63	34 17.62
4	17 17.565 0.0182 8.81 56.67 15.04	8 5.7513 0.8792 4.15 26.67 21.62	5 6.6839 0.4242 2.59 16.67 11.63	30 15.54
5	10 7.6114 0.7496 5.18 76.92 8.85	2 2.4922 0.0972 1.04 15.38 5.41	1 2.8964 1.2416 0.52 7.69 2.33	13 6.74
6	20 26.347 1.5291 10.36 44.44 17.70	3 8.6269 3.6702 1.55 6.67 8.11	22 10.026 14.301 11.40 48.89 51.16	45 23.32
Total	113 58.55	37 19.17	43 22.28	193 100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF SIZE BY RFL12

Statistic	DF	Value	Prob
Chi-Square	10	29.442	0.001
Likelihood Ratio Chi-Square	10	28.250	0.002
Mantel-Haenszel Chi-Square	1	7.068	0.008
Phi Coefficient		0.391	
Contingency Coefficient		0.364	
Cramer's V		0.276	

Effective Sample Size = 193
Frequency Missing = 1
WARNING: 22% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF PC_WORK BY RFL13

PC_WORK	RFL13			
Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	3	5	Total
1	82 74.29 0.8001 42.49 61.19 76.64	33 31.938 0.0353 17.10 24.63 71.74	19 27.772 2.7707 9.84 14.18 47.50	134 69.43
2	12 20.513 3.5329 6.22 32.43 11.21	6 8.8187 0.9009 3.11 16.22 13.04	19 7.6684 16.745 9.84 51.35 47.50	37 19.17
3	13 12.197 0.0529 6.74 59.09 12.15	7 5.2435 0.5884 3.63 31.82 15.22	2 4.5596 1.4369 1.04 9.09 5.00	22 11.40
Total	107 55.44	46 23.83	40 20.73	193 100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF PC_WORK BY RFL13

Statistic	DF	Value	Prob
Chi-Square	4	26.863	0.000
Likelihood Ratio Chi-Square	4	23.325	0.000
Mantel-Haenszel Chi-Square	1	2.935	0.087
Phi Coefficient		0.373	
Contingency Coefficient		0.350	
Cramer's V		0.264	

Effective Sample Size = 193
Frequency Missing = 1

TABLE OF SIZE BY RFL13

SIZE	RFL13			
Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	3	5	Total
1	15 12.197 0.6442 7.77 68.18 14.02	6 5.2435 0.1091 3.11 27.27 13.04	1 4.5596 2.7789 0.52 4.55 2.50	22 11.40
2	32 27.166 0.8603 16.58 65.31 29.91	12 11.679 0.0088 6.22 24.49 26.09	5 10.155 2.6172 2.59 10.20 12.50	49 25.39
3	19 18.85 0.0012 9.84 55.88 17.76	9 8.1036 0.0992 4.66 26.47 19.57	6 7.0466 0.1555 3.11 17.65 15.00	34 17.62
4	12 16.632 1.2901 6.22 40.00 11.21	7 7.1503 0.0032 3.63 23.33 15.22	11 6.2176 3.6784 5.70 36.67 27.50	30 15.54
5	8 7.2073 0.0872 4.15 61.54 7.48	5 3.0984 1.167 2.59 38.46 10.87	0 2.6943 2.6943 0.00 0.00 0.00	13 6.74
6	21 24.948 0.6248 10.88 46.67 19.63	7 10.725 1.294 3.63 15.56 15.22	17 9.3264 6.3136 8.81 37.78 42.50	45 23.32
Total	107 55.44	46 23.83	40 20.73	193 100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF SIZE BY RFL13

Statistic	DF	Value	Prob
Chi-Square	10	24.427	0.007
Likelihood Ratio Chi-Square	10	27.174	0.002
Mantel-Haenszel Chi-Square	1	9.734	0.002
Phi Coefficient		0.356	
Contingency Coefficient		0.335	
Cramer's V		0.252	

Effective Sample Size = 193
Frequency Missing = 1

TABLE OF FACILITY BY RFL15

FACILITY / RFL15 Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	3	5	Total
1	23 23.459 0.009 11.86 56.10 20.72	11 9.299 0.3112 5.67 26.83 25.00	7 8.2423 0.1872 3.61 17.07 17.95	41 21.13
2	65 69.232 0.2587 33.51 53.72 58.56	31 27.443 0.461 15.98 25.62 70.45	25 24.325 0.0187 12.89 20.66 64.10	121 62.37
3	15 9.1546 3.7323 7.73 93.75 13.51	1 3.6289 1.9044 0.52 6.25 2.27	0 3.2165 3.2165 0.00 0.00 0.00	16 8.25
4	8 9.1546 0.1456 4.12 50.00 7.21	1 3.6289 1.9044 0.52 6.25 2.27	7 3.2165 4.4505 3.61 43.75 17.95	16 8.25
Total	111 57.22	44 22.68	39 20.10	194 100.00

STATISTICS FOR TABLE OF FACILITY BY RFL15

Statistic	DF	Value	Prob
Chi-Square	6	16.600	0.011
Likelihood Ratio Chi-Square	6	19.613	0.003
Mantel-Haenszel Chi-Square	1	0.033	0.856
Phi Coefficient		0.293	
Contingency Coefficient		0.281	
Cramer's V		0.207	

Sample Size = 194
WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF NO_DTR BY RFL15

NO_DTR / RFL15 Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	3	5	Total
1	36 37.763 0.0823 18.56 54.55 32.43	12 14.969 0.5889 6.19 18.18 27.27	18 13.268 1.6876 9.28 27.27 46.15	66 34.02
2	31 22.887 2.8762 15.98 77.50 27.93	5 9.0722 1.8278 2.58 12.50 11.36	4 8.0412 2.031 2.06 10.00 10.26	40 20.62
3	19 17.737 0.0899 9.79 61.29 17.12	9 7.0309 0.5515 4.64 29.03 20.45	3 6.232 1.6761 1.55 9.68 7.69	31 15.98
4	7 9.1546 0.5071 3.61 43.75 6.31	2 3.6289 0.7311 1.03 12.50 4.55	7 3.2165 4.4505 3.61 43.75 17.95	16 8.25
5	18 23.459 1.2702 9.28 43.90 16.22	16 9.299 4.8289 8.25 39.02 36.36	7 8.2423 0.1872 3.61 17.07 17.95	41 21.13
Total	111 57.22	44 22.68	39 20.10	194 100.00

STATISTICS FOR TABLE OF NO_DTR BY RFL15

Statistic	DF	Value	Prob
Chi-Square	8	23.386	0.003
Likelihood Ratio Chi-Square	8	22.463	0.004
Mantel-Haenszel Chi-Square	1	0.629	0.428
Phi Coefficient		0.347	
Contingency Coefficient		0.328	
Cramer's V		0.246	

Sample Size = 194

TABLE OF PC_WORK BY RFL15

PC_WORK / RFL15 Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	3	5	Total
1	89 77.067 1.8476 46.11 66.42 80.18	30 30.549 0.0099 15.54 22.39 68.18	15 26.383 4.9115 7.77 11.19 39.47	134 69.43
2	10 21.28 5.9791 5.18 27.03 9.01	7 8.4352 0.2442 3.63 18.92 15.91	20 7.285 22.193 10.36 54.05 52.63	37 19.17
3	12 12.653 0.0337 6.22 54.55 10.81	7 5.0155 0.7852 3.63 31.82 15.91	3 4.3316 0.4094 1.55 13.64 7.89	22 11.40
Total	111 57.51	44 22.80	38 19.69	193 100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF PC_WORK BY RFL15

Statistic	DF	Value	Prob
Chi-Square	4	36.413	0.000
Likelihood Ratio Chi-Square	4	31.469	0.000
Mantel-Haenszel Chi-Square	1	8.906	0.003
Phi Coefficient		0.434	
Contingency Coefficient		0.398	
Cramer's V		0.307	

Effective Sample Size = 193
Frequency Missing = 1

APPENDIX D

CORRESPONDENCE, NATIONAL NORMS, T-TEST TABLES FOR JOB SATISFACTION, COMMENTS BY RESPONDENTS

Oklahoma State University
OKMULGEE

Hospitality Services Technology
1801 East 4th Street
Okmulgee, Oklahoma 74447-3901
918-756-6211, Ext. 220
TDD: 918-758-0665 FAX: 918-756-1315

May 5, 1995

Paul E. Spector
Department of Psychology
University of South Florida
Tampa, Florida 33620

Dear Sir:

While conducting a literature review for my research I found a study which used your Job Satisfaction Survey to assess job satisfaction of dietary managers. Part of my research will consist of assessing job satisfaction of dietetic technicians. I am very interested in using your survey for this aspect of my research. I am writing to ask your permission to use your survey. If you grant permission, I would also appreciate any additional information you may have regarding administration or scoring of the survey.

Thank you for your consideration.

Sincerely,

Alexandria Miller

Alexandria Miller, M.S., R.D./L.D.
Program Director
Dietetic Technology

JSS NORMS

08-22-1994

Includes the following organization types:

Mental Health Medical Social Service Corrections

SCALE	TOTAL N	N OF SAMPLES	WEIGHTED MEAN	MEAN OF SAMPLES	SD OF SAMPLES
PAY	5605	36	10.4	10.9	2
PROMOTION	5605	36	11.5	11.6	1.9
SUPERVISION	5605	36	19.4	19.2	1.6
BENEFITS	5605	36	13.3	13.5	1.4
REWARDS	5605	36	13.1	13.2	1.9
CONDITIONS	5605	36	12.8	12.7	1.9
COWORKERS	5605	36	18.5	18.3	1
WORK	5605	36	19.3	19.2	1.2
COMMUNICATION	5605	36	14.1	14	1.6
TOTAL	5605	36	132.2	132.9	10.4

JSS NORMS

08-22-1994

Includes the following organization types:

Mental Health Medical Social Service Municipal University, Nonfaculty Utility Retail Financial Corrections General Sample

SCALE	TOTAL N	N OF SAMPLES	WEIGHTED MEAN	MEAN OF SAMPLES	SD OF SAMPLES
PAY	11311	54	11.5	11.8	2.6
PROMOTION	11311	54	12.7	12	2
SUPERVISION	11311	54	19.3	19.2	1.4
BENEFITS	11311	54	14.2	14.2	2.2
REWARDS	11311	54	13.6	13.7	2
CONDITIONS	11311	54	14.2	13.5	2.2
COWORKERS	11311	54	18.3	18.2	1.2
WORK	11311	54	19.2	19.2	1.2
COMMUNICATION	11311	54	14.7	14.3	1.8
TOTAL	11311	54	137.4	136.4	12

Provided by P. E. Spector, May 1995.

KEY TO TABLES

In the following tables, the abbreviations refer to questions on the questionnaire.

AGE
- 2 = 25 - 34 years
- 3 = 35 - 44 years
- 4 = 45 years and over

CYR_TECH (Years of experience)
- 1 = Up to 5
- 2 = 6 - 10 year
- 3 = 11 - 15 years
- 4 = 16 years and over

FACILITY (Employment facility)
- 1 = Long term care
- 2 = Acute care
- 3 = Public health
- 4 = Other

SIZE (Beds, clients or participants)
- 1 = Less than 100
- 2 = 101 - 199
- 3 = 200 - 299
- 4 = 300 - 399
- 5 = 400 - 499
- 6 = Over 500

No_DTR (Number of technicians in facility)
- 1 = 1
- 2 = 2
- 3 = 3
- 4 = 4
- 5 = 5 and over

PC_WORK (Area of work)
- 1 = Clinical nutrition
- 2 = Foodservice
- 3 = Do both equally

ADA (Membership in American Dietetic Association)
- 1 = Yes
- 2 = No

Job Satisfaction:
- JS1 = Pay
- JS2 = Promotion
- JS3 = Supervision
- JS4 = Benefits
- JS5 = Contingent Rewards
- JS 6 = Operating Conditions
- JS7 = Co-workers
- JS8 = Nature of Work
- JS9 = Communication

NO_DTR=1

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
66	JS1	66	2.8272727	5.3133951	4.3228240	0.0001
	JS2	66	0.4909091	4.8729308	0.8184324	0.4161
	JS3	66	-1.2909091	4.8125710	-2.1791668	0.0329
	JS4	66	1.9393939	5.5167683	2.8559675	0.0058
	JS5	66	1.0424242	4.9863216	1.6983851	0.0942
	JS6	66	0.6333333	3.6724895	1.4010181	0.1660
	JS7	66	-0.9818182	4.3612246	-1.8289195	0.0720
	JS8	66	-0.3969697	3.6678214	-0.8792678	0.3825
	JS9	66	1.9090909	4.8823931	3.1766242	0.0023
	TOT	66	6.1727273	28.8677597	1.7371446	0.0871

NO_DTR=2

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
40	JS1	40	1.0750000	5.0762772	1.3393471	0.1882
	JS2	40	-1.7750000	3.6436633	-3.0809888	0.0038
	JS3	40	-2.1250000	5.7707818	-2.3289184	0.0251
	JS4	40	1.8750000	4.9649412	2.3884555	0.0219
	JS5	40	-0.4250000	5.1960907	-0.5172997	0.6079
	JS6	40	-1.1000000	4.1805410	-1.6641413	0.1041
	JS7	40	-1.6750000	4.1614069	-2.5456847	0.0150
	JS8	40	-1.2250000	4.4114507	-1.7562432	0.0869
	JS9	40	0.7750000	4.5431690	1.0788792	0.2873
	TOT	40	-4.6000000	29.9520985	-0.9713161	0.3374

NO_DTR=3

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
31	JS1	31	1.5516129	4.7738085	1.8096694	0.0804
	JS2	31	-1.3741935	3.7568575	-2.0365920	0.0506
	JS3	31	-0.2000000	3.7771241	-0.2948150	0.7702
	JS4	31	2.6935484	4.7287726	3.1714451	0.0035
	JS5	31	-0.4258065	4.6526672	-0.5095550	0.6141
	JS6	31	-0.7645161	3.6141895	-1.1777594	0.2482
	JS7	31	-0.3322581	4.0700849	-0.4545199	0.6527
	JS8	31	0.3483871	4.1620404	0.4660544	0.6445
	JS9	31	1.8064516	4.0118105	2.5070718	0.0178
	TOT	31	3.3032258	21.8301853	0.8424841	0.4062

NO_DTR=4

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
16	JS1	16	4.6000000	3.8470768	4.7828523	0.0002
	JS2	16	-0.8500000	4.8785244	-0.6969321	0.4965
	JS3	16	1.0500000	2.8635642	1.4667036	0.1631
	JS4	16	4.1250000	4.5147905	3.6546546	0.0023
	JS5	16	2.3625000	4.6038933	2.0526106	0.0580
	JS6	16	1.8000000	3.0550505	2.3567532	0.0324
	JS7	16	-1.4875000	3.9702015	-1.4986645	0.1547
	JS8	16	0.0500000	4.5240100	0.0442086	0.9653
	JS9	16	2.7500000	3.1091264	3.5379714	0.0030
	TOT	16	14.4000000	21.7623528	2.6467726	0.0183

NO_DTR=5

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
41	JS1	41	1.5878049	4.5006775	2.2589737	0.0294
	JS2	41	-2.3317073	3.7484956	-3.9829876	0.0003
	JS3	41	-0.8341463	4.8153717	-1.1091859	0.2740
	JS4	41	3.3292683	4.1647475	5.1186100	0.0001
	JS5	41	0.4341463	5.0633788	0.5490194	0.5860
	JS6	41	0.8365854	4.0255283	1.3306974	0.1908
	JS7	41	-1.4951220	3.7364389	-2.5621860	0.0143
	JS8	41	-0.1512195	3.5281101	-0.2744465	0.7852
	JS9	41	1.6829268	3.9902320	2.7005923	0.0101
	TOT	41	3.0585366	22.4104995	0.8738846	0.3874

N Obs	Variable	N	Minimum	Maximum	Mean	Std Dev
194	JOBSAT1	194	4.0000000	24.0000000	13.0463918	4.9623361
	JOBSAT2	194	4.0000000	24.0000000	10.6185567	4.3498396
	JOBSAT3	194	4.0000000	24.0000000	18.2010309	4.7894313
	JOBSAT4	194	4.0000000	24.0000000	16.0206186	4.9442056
	JOBSAT5	194	4.0000000	24.0000000	13.6855670	4.9858970
	JOBSAT6	194	4.0000000	24.0000000	12.8917526	3.8794842
	JOBSAT7	194	5.0000000	24.0000000	17.1288660	4.0996514
	JOBSAT8	194	6.0000000	24.0000000	18.8402062	3.9478770
	JOBSAT9	194	4.0000000	24.0000000	15.6804124	4.3631675
	TOTAL	194	65.0000000	212.0000000	136.1134021	26.5114605

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
194	JS1	194	2.1463918	4.9623361	6.0245370	0.0001
	JS2	194	-0.9814433	4.3498396	-3.1426270	0.0019
	JS3	194	-0.9989691	4.7894313	-2.9051527	0.0041
	JS4	194	2.5206186	4.9442056	7.1008686	0.0001
	JS5	194	0.4855670	4.9858970	1.3564592	0.1765
	JS6	194	0.1917526	3.8794842	0.6884432	0.4920
	JS7	194	-1.1711340	4.0996514	-3.9788772	0.0001
	JS8	194	-0.3597938	3.9478770	-1.2693779	0.2058
	JS9	194	1.6804124	4.3631675	5.3643221	0.0001
	TOT	194	3.5134021	26.5114605	1.8458443	0.0664

AGE=2

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
55	JS1	55	2.0272727	4.9548126	3.0343543	0.0037
	JS2	55	-1.6909091	3.8455011	-3.2609840	0.0019
	JS3	55	-0.7272727	4.8413900	-1.1140600	0.2702
	JS4	55	3.2272727	4.5438381	5.2673741	0.0001
	JS5	55	0.4545455	4.4272648	0.7614180	0.4497
	JS6	55	-0.3727273	3.4105205	-0.8104978	0.4212
	JS7	55	-1.2272727	3.7754300	-2.4107712	0.0194
	JS8	55	-0.5090909	3.7459743	-1.0078871	0.3180
	JS9	55	1.7090909	3.7794411	3.3536592	0.0015
	TOT	55	2.8909091	23.2441731	0.9223626	0.3604

AGE=3

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
94	JS1	94	1.8553191	5.0282774	3.5773656	0.0006
	JS2	94	-1.2063830	4.1431848	-2.8230256	0.0058
	JS3	94	-1.5829787	4.8173218	-3.1859089	0.0020
	JS4	94	1.8723404	5.2995923	3.4253605	0.0009
	JS5	94	0.3851064	5.1564962	0.7240856	0.4708
	JS6	94	0.6191489	3.9763082	1.5096595	0.1345
	JS7	94	-1.6617021	3.9590676	-4.0693419	0.0001
	JS8	94	-0.5297872	4.0464728	-1.2693716	0.2075
	JS9	94	1.3829787	4.6422704	2.8883445	0.0048
	TOT	94	1.1340426	26.9149099	0.4085078	0.6838

AGE=4

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
45	JS1	45	2.9000000	4.8645284	3.9991115	0.0002
	JS2	45	0.3555556	5.0988214	0.4677825	0.6422
	JS3	45	-0.1111111	4.6014930	-0.1619813	0.8721
	JS4	45	3.0111111	4.5558266	4.4336954	0.0001
	JS5	45	0.7333333	5.3572381	0.9182623	0.3635
	JS6	45	-0.0111111	4.1823342	-0.0178215	0.9859
	JS7	45	-0.0777778	4.6215350	-0.1128952	0.9106
	JS8	45	0.1777778	4.0186434	0.2967592	0.7680
	JS9	45	2.2666667	4.4589032	3.4100902	0.0014
	TOT	45	9.2444444	29.0273817	2.1363835	0.0382

CYR_TECH=1

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
21	JS1	21	1.7666667	4.8716869	1.6618235	0.1121
	JS2	21	-1.3619048	3.6180763	-1.7249585	0.1000
	JS3	21	-0.5333333	4.6079641	-0.5303948	0.6017
	JS4	21	0.9285714	5.3532367	0.7948927	0.4360
	JS5	21	0.6095238	5.7932637	0.4821443	0.6349
	JS6	21	0.1095238	4.7814124	0.1049692	0.9174
	JS7	21	-1.5857143	4.5071372	-1.6122553	0.1226
	JS8	21	-1.4857143	4.7132033	-1.4445373	0.1641
	JS9	21	1.6666667	5.0133156	1.5234681	0.1433
	TOT	21	0.1142857	29.7525509	0.0176026	0.9861

CYR_TECH=2

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
54	JS1	54	2.4888889	5.6815380	3.2191149	0.0022
	JS2	54	-0.5814815	5.1742860	-0.8258142	0.4126
	JS3	54	-1.8296296	5.4679039	-2.4588905	0.0172
	JS4	54	3.1296296	5.0368315	4.5659632	0.0001
	JS5	54	0.8000000	5.3623425	1.0963073	0.2779
	JS6	54	0.2629630	3.8606039	0.5005370	0.6188
	JS7	54	-0.9666667	4.0747728	-1.7432923	0.0871
	JS8	54	-0.4037037	4.4652944	-0.6643692	0.5093
	JS9	54	1.9814815	4.8777150	2.9851797	0.0043
	TOT	54	4.8814815	29.9815923	1.1964480	0.2368

CYR_TECH=3

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
76	JS1	76	2.4552632	4.4652852	4.7935321	0.0001
	JS2	76	-1.1263158	4.0545404	-2.4217278	0.0179
	JS3	76	-0.5947368	4.1411076	-1.2520311	0.2144
	JS4	76	2.6052632	4.7288588	4.8028835	0.0001
	JS5	76	0.2736842	4.5150819	0.5284342	0.5988
	JS6	76	0.4315789	4.0409309	0.9310770	0.3548
	JS7	76	-1.3263158	4.0725870	-2.8391175	0.0058
	JS8	76	-0.3973684	3.5440833	-0.9774538	0.3315
	JS9	76	1.3947368	3.4988720	3.4751297	0.0009
	TOT	76	3.7157895	23.7398178	1.3645219	0.1765

CYR_TECH=4

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
43	JS1	43	1.3558140	4.9477894	1.7968967	0.0795
	JS2	43	-1.0418605	4.1536119	-1.6448181	0.1075
	JS3	43	-0.8976744	5.0640417	-1.1624005	0.2516
	JS4	43	2.3837209	4.9962334	3.1285775	0.0032
	JS5	43	0.4046512	5.0338830	0.5271229	0.6009
	JS6	43	-0.2813953	3.1564941	-0.5845830	0.5620
	JS7	43	-0.9511628	4.0934542	-1.5236988	0.1351
	JS8	43	0.3116279	3.5144064	0.5814583	0.5640
	JS9	43	1.8139535	4.8317197	2.4618333	0.0180
	TOT	43	3.0976744	25.6733463	0.7912023	0.4333

PC_WORK=1

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
134	JS1	134	1.7940299	4.6795469	4.4379076	0.0001
	JS2	134	-1.5477612	3.8784486	-4.6195356	0.0001
	JS3	134	-1.1328358	4.8203793	-2.7204338	0.0074
	JS4	134	2.8656716	4.6591184	7.1199194	0.0001
	JS5	134	0.0835821	4.6946009	0.2060948	0.8370
	JS6	134	0.0388060	3.7112491	0.1210405	0.9038
	JS7	134	-1.3447761	3.9007724	-3.9907248	0.0001
	JS8	134	-0.3268657	3.7425046	-1.0110191	0.3138
	JS9	134	1.8358209	4.0377803	5.2630806	0.0001
	TOT	134	2.2656716	23.2792111	1.1266295	0.2619

PC_WORK=2

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
37	JS1	37	4.6405405	5.1022576	5.5323169	0.0001
	JS2	37	1.3729730	5.0743718	1.6458133	0.1085
	JS3	37	-0.5513514	4.7505334	-0.7059711	0.4847
	JS4	37	2.1756757	6.0921354	2.1723283	0.0365
	JS5	37	2.5567568	5.5797521	2.7872464	0.0084
	JS6	37	1.7594595	3.5792193	2.9901420	0.0050
	JS7	37	0.0513514	4.1647743	0.0750000	0.9406
	JS8	37	0.0162162	4.1708988	0.0236494	0.9813
	JS9	37	1.9189189	5.2460481	2.2249754	0.0324
	TOT	37	13.9405405	32.5444948	2.6055712	0.0133

PC_WORK=3

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
22	JS1	22	0.1000000	5.1823878	0.0905068	0.9287
	JS2	22	-1.5090909	4.7299360	-1.4964819	0.1494
	JS3	22	-1.1090909	4.8786131	-1.0663066	0.2984
	JS4	22	1.0454545	4.5010821	1.0894306	0.2883
	JS5	22	-0.7909091	4.8859282	-0.7592605	0.4561
	JS6	22	-1.9272727	3.9991882	-2.2603863	0.0345
	JS7	22	-2.4818182	4.6356421	-2.5111428	0.0203
	JS8	22	-1.0636364	4.8530349	-1.0279952	0.3156
	JS9	22	0.3636364	4.7363383	0.3601106	0.7224
	TOT	22	-7.3727273	29.4164383	-1.1755725	0.2529

FACILITY=1

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
41	JS1	41	2.2951220	4.4453319	3.3059289	0.0020
	JS2	41	0.4243902	4.8758989	0.5573174	0.5804
	JS3	41	0.0682927	3.7618107	0.1162436	0.9080
	JS4	41	1.5000000	4.2426407	2.2638463	0.0291
	JS5	41	1.3121951	4.7755730	1.7594011	0.0862
	JS6	41	-0.2365854	3.7222141	-0.4069850	0.6862
	JS7	41	-0.1292683	3.9236618	-0.2109562	0.8340
	JS8	41	0.3365854	3.9121449	0.5508993	0.5848
	JS9	41	2.4390244	3.9245941	3.9793608	0.0003
	TOT	41	8.0097561	24.9688587	2.0540572	0.0465

FACILITY=2

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
121	JS1	121	1.9429752	4.9345859	4.3312099	0.0001
	JS2	121	-1.6000000	4.0249224	-4.3727552	0.0001
	JS3	121	-1.1173554	4.8538417	-2.5322023	0.0126
	JS4	121	3.1446281	4.8129331	7.1870746	0.0001
	JS5	121	0.1223140	5.0599981	0.2659002	0.7908
	JS6	121	0.4157025	3.9268097	1.1644891	0.2465
	JS7	121	-1.5644628	4.0450970	-4.2543086	0.0001
	JS8	121	-0.7950413	4.0775371	-2.1447885	0.0340
	JS9	121	1.4462810	4.3835876	3.6292399	0.0004
	TOT	121	1.9950413	25.8149112	0.8501077	0.3970

FACILITY=3

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
16	JS1	16	1.3500000	5.4954527	0.9826306	0.3414
	JS2	16	-2.1000000	3.6331804	-2.3120239	0.0354
	JS3	16	-1.7625000	5.5493994	-1.2704078	0.2233
	JS4	16	1.6250000	5.1234754	1.2686701	0.2239
	JS5	16	-0.0125000	4.3698780	-0.0114420	0.9910
	JS6	16	-2.0750000	2.7537853	-3.0140331	0.0087
	JS7	16	-1.4875000	3.7097844	-1.6038668	0.1296
	JS8	16	0.4875000	3.6645827	0.5321206	0.6024
	JS9	16	1.0000000	3.4448028	1.1611695	0.2637
	TOT	16	-2.9750000	25.5574516	-0.4656176	0.6482

FACILITY=4

N Obs	Variable	N	Mean	Std Dev	T	Prob>|T|
16	JS1	16	4.1000000	5.8309519	2.8125768	0.0131
	JS2	16	1.2125000	4.7218464	1.0271406	0.3206
	JS3	16	-2.0750000	5.7489129	-1.4437512	0.1694
	JS4	16	1.3125000	6.8236720	0.7693805	0.4536
	JS5	16	1.6125000	5.5283361	1.1667163	0.2615
	JS6	16	1.8625000	4.0491769	1.8398801	0.0857
	JS7	16	-0.5500000	5.0793700	-0.4331246	0.6711
	JS8	16	0.3000000	3.0331502	0.3956283	0.6979
	JS9	16	2.1875000	5.9578380	1.4686536	0.1626
	TOT	16	9.9625000	35.1187865	1.1347203	0.2743

COMMENTS BY RESPONDENTS

The following comments were made on the surveys:

1. Our profession is ignored by the people who are to promote us. (DT, age 35-44, who worked in acute care facility)

2. DTR's are not sufficiently compensated monitarily for the amount of education and continuing education required. Other careers with the same or less education are paid much higher. (DT, age 35 - 44, who worked in acute care facility)

3. The title DTR is misunderstood by many. (DT, age 25-34, who worked in long term care facility)

4. I feel strongly that there must be a nation-wide understanding for health facilities to recognize a DTR. (DT, over 55 years of age, who worked in acute care facility)

5. Technicians are not clearly understood by other professionals in the field. (DT, age 35-44, who worked in other area)

6. There is limited job availability for a DTR. I have been bumped out of 2 jobs by entry level dietitians. (DT, age 35-44, who worked in long term care facility)

7. I left hospital dietetics due to the poor pary, poor chance of promotion, and lack of respect for my work. (DT, age 45-54, who had worked in acute care facility)

8. Foodservice supervisors have no formal education in dietetics. Something is wrong with our grade system when people who have no college education are at a higher grade and make a better salary than a dietetic technician with a degree. (DT, age 35-44, who worked in acute care facility)

9. Many DTRs are underutilized. I stay away from facilities that have techs passing menus. There is little hope for promotions in the career of a DTR. (DT, agee 35-44, who worked in acute care facility)

10. The pay and hours are awful. (DT, age 25-34, who worked in other area)

APPENDIX E

CHI-SQUARE FREQUENCY ANALYSIS TABLES

FOR CONTINUING EDUCATION

KEY TO TABLES

In the following tables, the abbreviations refer to questions on the questionnaire.

AGE
- 2 = 25 - 34 years
- 3 = 35 - 44 years
- 4 = 45 years and over

CYR_TECH (Years of experience)
- 1 = Up to 5
- 2 = 6 - 10 year
- 3 = 11 - 15 years
- 4 = 16 years and over

FACILITY (Employment facility)
- 1 = Long term care
- 2 = Acute care
- 3 = Public health
- 4 = Other

SIZE (Beds, clients or participants)
- 1 = Less than 100
- 2 = 101 - 199
- 3 = 200 - 299
- 4 = 300 - 399
- 5 = 400 - 499
- 6 = Over 500

No_DTR (Number of technicians in facility)
- 1 = 1
- 2 = 2
- 3 = 3
- 4 = 4
- 5 = 5 and over

PC_WORK (Area of work)
- 1 = Clinical nutrition
- 2 = Foodservice
- 3 = Do both equally

ADA (Membership in American Dietetic Association)
- 1 = Yes
- 2 = No

Continuing Education Needs:

CEN - preferred method of continuing education
- CEN1 - Workshop
- CEN2 - Lecture
- CEN3 - Self-study
- CEN4 - Audiocassettes
- CEN5 - Articles in publications
- CEN6 - Academic coursework
- CEN7 - Study group/journal club
- CEN8 - Computer assisted instruction
- CEN9 - National, state, district dietetic meetings

CETOP

Continuing education topics follow topic numbers in survey.
- 1 = Very Important
- 2 = Important
- 3 = Slightly important or Unimportant

TABLE OF ADA BY CEN9

ADA	CEN9			
Frequency / Expected / Cell Chi-Square / Percent / Row Pct / Col Pct	1	2	3	Total
1	20 13.565 3.0529 10.36 58.82 25.97	11 14.974 1.0547 5.70 32.35 12.94	3 5.4611 1.1091 1.55 8.82 9.68	34 17.62
2	57 63.435 0.6528 29.53 35.85 74.03	74 70.026 0.2255 38.34 46.54 87.06	28 25.539 0.2372 14.51 17.61 90.32	159 82.38
Total	77 39.90	85 44.04	31 16.06	193 100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF ADA BY CEN9

Statistic	DF	Value	Prob
Chi-Square	2	6.332	0.042
Likelihood Ratio Chi-Square	2	6.278	0.043
Mantel-Haenszel Chi-Square	1	5.591	0.018
Phi Coefficient		0.181	
Contingency Coefficient		0.178	
Cramer's V		0.181	

Effective Sample Size = 193
Frequency Missing = 1

TABLE OF CYR_TECH BY CETOP2

CYR_TECH / CETOP2	1	2	3	Total
1	7	11	3	21
	7.3608	9.9588	3.6804	
	0.0177	0.1089	0.1258	
	3.61	5.67	1.55	10.82
	33.33	52.38	14.29	
	10.29	11.96	8.82	
2	24	24	6	54
	18.928	25.608	9.4639	
	1.3592	0.101	1.2678	
	12.37	12.37	3.09	27.84
	44.44	44.44	11.11	
	35.29	26.09	17.65	
3	21	44	11	76
	26.639	36.041	13.32	
	1.1937	1.7575	0.404	
	10.82	22.68	5.67	39.18
	27.63	57.89	14.47	
	30.88	47.83	32.35	
4	16	13	14	43
	15.072	20.392	7.5361	
	0.0571	2.6794	5.5443	
	8.25	6.70	7.22	22.16
	37.21	30.23	32.56	
	23.53	14.13	41.18	
Total	68	92	34	194
	35.05	47.42	17.53	100.00

STATISTICS FOR TABLE OF CYR_TECH BY CETOP2

Statistic	DF	Value	Prob
Chi-Square	6	14.616	0.023
Likelihood Ratio Chi-Square	6	13.979	0.030
Mantel-Haenszel Chi-Square	1	2.612	0.106
Phi Coefficient		0.274	
Contingency Coefficient		0.265	
Cramer's V		0.194	

Sample Size = 194

TABLE OF PC_WORK BY CETOP2

PC_WORK / CETOP2	1	2	3	Total
1	56	56	22	134
	47.212	63.181	23.606	
	1.6356	0.8162	0.1093	
	29.02	29.02	11.40	69.43
	41.79	41.79	16.42	
	82.35	61.54	64.71	
2	7	24	6	37
	13.036	17.446	6.5181	
	2.795	2.4625	0.0412	
	3.63	12.44	3.11	19.17
	18.92	64.86	16.22	
	10.29	26.37	17.65	
3	5	11	6	22
	7.7513	10.373	3.8756	
	0.9766	0.0379	1.1644	
	2.59	5.70	3.11	11.40
	22.73	50.00	27.27	
	7.35	12.09	17.65	
Total	68	91	34	193
	35.23	47.15	17.62	100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF PC_WORK BY CETOP2

Statistic	DF	Value	Prob
Chi-Square	4	10.039	0.040
Likelihood Ratio Chi-Square	4	10.266	0.036
Mantel-Haenszel Chi-Square	1	5.123	0.024
Phi Coefficient		0.228	
Contingency Coefficient		0.222	
Cramer's V		0.161	

Effective Sample Size = 193
Frequency Missing = 1

TABLE OF NO_DTR BY CETOP2

NO_DTR / CETOP2	1	2	3	Total
1	20	37	9	66
	23.134	31.299	11.567	
	0.4246	1.0384	0.5697	
	10.31	19.07	4.64	34.02
	30.30	56.06	13.64	
	29.41	40.22	26.47	
2	12	23	5	40
	14.021	18.969	7.0103	
	0.2912	0.8566	0.5765	
	6.19	11.86	2.58	20.62
	30.00	57.50	12.50	
	17.65	25.00	14.71	
3	14	10	7	31
	10.866	14.701	5.433	
	0.9039	1.5033	0.452	
	7.22	5.15	3.61	15.98
	45.16	32.26	22.58	
	20.59	10.87	20.59	
4	4	5	7	16
	5.6082	7.5876	2.8041	
	0.4612	0.8825	6.2784	
	2.06	2.58	3.61	8.25
	25.00	31.25	43.75	
	5.88	5.43	20.59	
5	18	17	6	41
	14.371	19.443	7.1856	
	0.9163	0.307	0.1956	
	9.28	8.76	3.09	21.13
	43.90	41.46	14.63	
	26.47	18.48	17.65	
Total	68	92	34	194
	35.05	47.42	17.53	100.00

STATISTICS FOR TABLE OF NO_DTR BY CETOP2

Statistic	DF	Value	Prob
Chi-Square	8	15.657	0.048
Likelihood Ratio Chi-Square	8	14.038	0.081
Mantel-Haenszel Chi-Square	1	0.109	0.741
Phi Coefficient		0.284	
Contingency Coefficient		0.273	
Cramer's V		0.201	

Sample Size = 194

TABLE OF SALARY BY CETOP2

SALARY	CETOP2			
Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	2	3	Total
1	10 7.6021 0.7564 5.24 45.45 15.15	9 10.482 0.2094 4.71 40.91 9.89	3 3.9162 0.2144 1.57 13.64 8.82	22 11.52
2	12 12.44 0.0155 6.28 33.33 18.18	18 17.152 0.0419 9.42 50.00 19.78	6 6.4084 0.026 3.14 16.67 17.65	36 18.85
3	31 24.534 1.7041 16.23 43.66 46.97	32 33.827 0.0987 16.75 45.07 35.16	8 12.639 1.7025 4.19 11.27 23.53	71 37.17
4	11 15.204 1.1625 5.76 25.00 16.67	24 20.963 0.4399 12.57 54.55 26.37	9 7.8325 0.174 4.71 20.45 26.47	44 23.04
5	2 6.2199 2.863 1.05 11.11 3.03	8 8.5759 0.0387 4.19 44.44 8.79	8 3.2042 7.178 4.19 44.44 23.53	18 9.42
Total	66 34.55	91 47.64	34 17.80	191 100.00

Frequency Missing = 3

STATISTICS FOR TABLE OF SALARY BY CETOP2

Statistic	DF	Value	Prob
Chi-Square	8	16.625	0.034
Likelihood Ratio Chi-Square	8	15.719	0.047
Mantel-Haenszel Chi-Square	1	7.529	0.006
Phi Coefficient		0.295	
Contingency Coefficient		0.283	
Cramer's V		0.209	

Effective Sample Size = 191
Frequency Missing = 3

TABLE OF AGE BY CETOP3

AGE	CETOP3			
Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	2	3	Total
2	32 27.784 0.6399 16.49 58.18 32.65	17 20.129 0.4864 8.76 30.91 23.94	6 7.0876 0.1669 3.09 10.91 24.00	55 28.35
3	46 47.485 0.0464 23.71 48.94 46.94	41 34.402 1.2654 21.13 43.62 57.75	7 12.113 2.1585 3.61 7.45 28.00	94 48.45
4	20 22.732 0.3283 10.31 44.44 20.41	13 16.469 0.7307 6.70 28.89 18.31	12 5.799 6.631 6.19 26.67 48.00	45 23.20
Total	98 50.52	71 36.60	25 12.89	194 100.00

STATISTICS FOR TABLE OF AGE BY CETOP3

Statistic	DF	Value	Prob
Chi-Square	4	12.454	0.014
Likelihood Ratio Chi-Square	4	11.269	0.024
Mantel-Haenszel Chi-Square	1	4.116	0.042
Phi Coefficient		0.253	
Contingency Coefficient		0.246	
Cramer's V		0.179	

Sample Size = 194

TABLE OF PC_WORK BY CETOP3

PC_WORK	CETOP3			
Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	2	3	Total
1	76 68.041 0.9309 39.38 56.72 77.55	45 48.601 0.2668 23.32 33.58 64.29	13 17.358 1.0939 6.74 9.70 52.00	134 69.43
2	11 18.788 3.228 5.70 29.73 11.22	17 13.42 0.9552 8.81 45.95 24.29	9 4.7927 3.6933 4.66 24.32 36.00	37 19.17
3	11 11.171 0.0026 5.70 50.00 11.22	8 7.9793 538E-7 4.15 36.36 11.43	3 2.8497 0.0079 1.55 13.64 12.00	22 11.40
Total	98 50.78	70 36.27	25 12.95	193 100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF PC_WORK BY CETOP3

Statistic	DF	Value	Prob
Chi-Square	4	10.179	0.038
Likelihood Ratio Chi-Square	4	9.986	0.041
Mantel-Haenszel Chi-Square	1	3.532	0.060
Phi Coefficient		0.230	
Contingency Coefficient		0.224	
Cramer's V		0.162	

Effective Sample Size = 193
Frequency Missing = 1
WARNING: 22% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF FACILITY BY CETOP3

FACILITY	CETOP3			
Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	2	3	Total
1	21 20.711 0.004 10.82 51.22 21.43	15 15.005 177E-8 7.73 36.59 21.13	5 5.2835 0.0152 2.58 12.20 20.00	41 21.13
2	68 61.124 0.7736 35.05 56.20 69.39	43 44.284 0.0372 22.16 35.54 60.56	10 15.593 2.006 5.15 8.26 40.00	121 62.37
3	4 8.0825 2.0621 2.06 25.00 4.08	6 5.8557 0.0036 3.09 37.50 8.45	6 2.0619 7.5219 3.09 37.50 24.00	16 8.25
4	5 8.0825 1.1756 2.58 31.25 5.10	7 5.8557 0.2236 3.61 43.75 9.86	4 2.0619 1.8219 2.06 25.00 16.00	16 8.25
Total	98 50.52	71 36.60	25 12.89	194 100.00

STATISTICS FOR TABLE OF FACILITY BY CETOP3

Statistic	DF	Value	Prob
Chi-Square	6	15.645	0.016
Likelihood Ratio Chi-Square	6	13.585	0.035
Mantel-Haenszel Chi-Square	1	5.810	0.016
Phi Coefficient		0.284	
Contingency Coefficient		0.273	
Cramer's V		0.201	

Sample Size = 194

TABLE OF PC_WORK BY CETOP4

PC_WORK	CETOP4			
Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	2	3	Total
1	85 72.207 2.2665 44.04 63.43 81.73	41 50.684 1.8503 21.24 30.60 56.16	8 11.109 0.87 4.15 5.97 50.00	134 69.43
2	9 19.938 6.0005 4.66 24.32 8.65	23 13.995 5.7945 11.92 62.16 31.51	5 3.0674 1.2177 2.59 13.51 31.25	37 19.17
3	10 11.855 0.2902 5.18 45.45 9.62	9 8.3212 0.0554 4.66 40.91 12.33	3 1.8238 0.7585 1.55 13.64 18.75	22 11.40
Total	104 53.89	73 37.82	16 8.29	193 100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF PC_WORK BY CETOP4

Statistic	DF	Value	Prob
Chi-Square	4	19.103	0.001
Likelihood Ratio Chi-Square	4	19.506	0.001
Mantel-Haenszel Chi-Square	1	9.468	0.002
Phi Coefficient		0.315	
Contingency Coefficient		0.300	
Cramer's V		0.222	

Effective Sample Size = 193
Frequency Missing = 1
WARNING: 22% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF FACILITY BY CETOP4

FACILITY	CETOP4			
Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	2	3	Total
1	18 21.979 0.7205 9.28 43.90 17.31	21 15.639 1.8376 10.82 51.22 28.38	2 3.3814 0.5644 1.03 4.88 12.50	41 21.13
2	75 64.866 1.5832 38.66 61.98 72.12	40 46.155 0.8207 20.62 33.06 54.05	6 9.9794 1.5868 3.09 4.96 37.50	121 62.37
3	3 8.5773 3.6266 1.55 18.75 2.88	6 6.1031 0.0017 3.09 37.50 8.11	7 1.3196 24.452 3.61 43.75 43.75	16 8.25
4	8 8.5773 0.0389 4.12 50.00 7.69	7 6.1031 0.1318 3.61 43.75 9.46	1 1.3196 0.0774 0.52 6.25 6.25	16 8.25
Total	104 53.61	74 38.14	16 8.25	194 100.00

STATISTICS FOR TABLE OF FACILITY BY CETOP4

Statistic	DF	Value	Prob
Chi-Square	6	35.442	0.000
Likelihood Ratio Chi-Square	6	24.411	0.000
Mantel-Haenszel Chi-Square	1	1.680	0.195
Phi Coefficient		0.427	
Contingency Coefficient		0.393	
Cramer's V		0.302	

Sample Size = 194
WARNING: 25% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF SALARY BY CETOP4

SALARY CETOP4

Frequency / Expected / Cell Chi-Square / Percent / Row Pct / Col Pct	1	2	3	Total
1	14	8	0	22
	11.864	8.2932	1.8429	
	0.3846	0.0104	1.8429	
	7.33	4.19	0.00	11.52
	63.64	36.36	0.00	
	13.59	11.11	0.00	
2	21	10	5	36
	19.414	13.571	3.0157	
	0.1296	0.9395	1.3056	
	10.99	5.24	2.62	18.85
	58.33	27.78	13.89	
	20.39	13.89	31.25	
3	43	22	6	71
	38.288	26.764	5.9476	
	0.5799	0.8481	0.0005	
	22.51	11.52	3.14	37.17
	60.56	30.99	8.45	
	41.75	30.56	37.50	
4	22	19	3	44
	23.728	16.586	3.6859	
	0.1258	0.3512	0.1276	
	11.52	9.95	1.57	23.04
	50.00	43.18	6.82	
	21.36	26.39	18.75	
5	3	13	2	18
	9.7068	6.7853	1.5079	
	4.634	5.692	0.1606	
	1.57	6.81	1.05	9.42
	16.67	72.22	11.11	
	2.91	18.06	12.50	
Total	103	72	16	191
	53.93	37.70	8.38	100.00

Frequency Missing = 3

STATISTICS FOR TABLE OF SALARY BY CETOP4

Statistic	DF	Value	Prob
Chi-Square	8	17.132	0.029
Likelihood Ratio Chi-Square	8	19.360	0.013
Mantel-Haenszel Chi-Square	1	5.276	0.022
Phi Coefficient		0.299	
Contingency Coefficient		0.287	
Cramer's V		0.212	

Effective Sample Size = 191
Frequency Missing = 3
WARNING: 27% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF PC_WORK BY CETOP6

PC_WORK CETOP6

Frequency / Expected / Cell Chi-Square / Percent / Row Pct / Col Pct	1	2	3	Total
1	89	37	8	134
	79.15	46.518	8.3316	
	1.2257	1.9475	0.0132	
	46.11	19.17	4.15	69.43
	66.42	27.61	5.97	
	78.07	55.22	66.67	
2	13	21	3	37
	21.855	12.845	2.3005	
	3.5877	5.1782	0.2127	
	6.74	10.88	1.55	19.17
	35.14	56.76	8.11	
	11.40	31.34	25.00	
3	12	9	1	22
	12.995	7.6373	1.3679	
	0.0762	0.2431	0.0989	
	6.22	4.66	0.52	11.40
	54.55	40.91	4.55	
	10.53	13.43	8.33	
Total	114	67	12	193
	59.07	34.72	6.22	100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF PC_WORK BY CETOP6

Statistic	DF	Value	Prob
Chi-Square	4	12.583	0.014
Likelihood Ratio Chi-Square	4	12.438	0.014
Mantel-Haenszel Chi-Square	1	3.419	0.064
Phi Coefficient		0.255	
Contingency Coefficient		0.247	
Cramer's V		0.181	

Effective Sample Size = 193
Frequency Missing = 1
WARNING: 22% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF FACILITY BY CETOP6

FACILITY CETOP6

Frequency / Expected / Cell Chi-Square / Percent / Row Pct / Col Pct	1	2	3	Total
1	23	18	0	41
	24.093	14.371	2.5361	
	0.0496	0.9163	2.5361	
	11.86	9.28	0.00	21.13
	56.10	43.90	0.00	
	20.18	26.47	0.00	
2	77	38	6	121
	71.103	42.412	7.4845	
	0.4891	0.459	0.2945	
	39.69	19.59	3.09	62.37
	63.64	31.40	4.96	
	67.54	55.88	50.00	
3	8	3	5	16
	9.4021	5.6082	0.9897	
	0.2091	1.213	16.25	
	4.12	1.55	2.58	8.25
	50.00	18.75	31.25	
	7.02	4.41	41.67	
4	6	9	1	16
	9.4021	5.6082	0.9897	
	1.231	2.0513	0.0001	
	3.09	4.64	0.52	8.25
	37.50	56.25	6.25	
	5.26	13.24	8.33	
Total	114	68	12	194
	58.76	35.05	6.19	100.00

STATISTICS FOR TABLE OF FACILITY BY CETOP6

Statistic	DF	Value	Prob
Chi-Square	6	25.699	0.000
Likelihood Ratio Chi-Square	6	20.243	0.003
Mantel-Haenszel Chi-Square	1	4.133	0.042
Phi Coefficient		0.364	
Contingency Coefficient		0.342	
Cramer's V		0.257	

Sample Size = 194
WARNING: 25% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF SIZE BY CETOP6

SIZE CETOP6

Frequency / Expected / Cell Chi-Square / Percent / Row Pct / Col Pct	1	2	3	Total
1	14	7	1	22
	12.995	7.6373	1.3679	
	0.0778	0.0532	0.0989	
	7.25	3.63	0.52	11.40
	63.64	31.82	4.55	
	12.28	10.45	8.33	
2	30	18	1	49
	28.943	17.01	3.0466	
	0.0386	0.0576	1.3749	
	15.54	9.33	0.52	25.39
	61.22	36.73	2.04	
	26.32	26.87	8.33	
3	26	7	1	34
	20.083	11.803	2.114	
	1.7434	1.9546	0.587	
	13.47	3.63	0.52	17.62
	76.47	20.59	2.94	
	22.81	10.45	8.33	
4	18	11	1	30
	17.72	10.415	1.8653	
	0.0044	0.0329	0.4014	
	9.33	5.70	0.52	15.54
	60.00	36.67	3.33	
	15.79	16.42	8.33	
5	8	5	0	13
	7.6788	4.513	0.8083	
	0.0134	0.0526	0.8083	
	4.15	2.59	0.00	6.74
	61.54	38.46	0.00	
	7.02	7.46	0.00	
6	18	19	8	45
	26.58	15.622	2.7979	
	2.7698	0.7306	9.672	
	9.33	9.84	4.15	23.32
	40.00	42.22	17.78	
	15.79	28.36	66.67	
Total	114	67	12	193
	59.07	34.72	6.22	100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF SIZE BY CETOP6

Statistic	DF	Value	Prob
Chi-Square	10	20.471	0.025
Likelihood Ratio Chi-Square	10	19.233	0.037
Mantel-Haenszel Chi-Square	1	8.894	0.003
Phi Coefficient		0.326	
Contingency Coefficient		0.310	
Cramer's V		0.230	

Effective Sample Size = 193
Frequency Missing = 1
WARNING: 39% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF PC_WORK BY CETOP7

PC_WORK CETOP7

Frequency / Expected / Cell Chi-Square / Percent / Row Pct / Col Pct	1	2	3	Total
1	74	48	12	134
	68.736	52.073	13.192	
	0.4032	0.3185	0.1077	
	38.34	24.87	6.22	69.43
	55.22	35.82	8.96	
	74.75	64.00	63.16	
2	11	19	7	37
	18.979	14.378	3.6425	
	3.3546	1.4856	3.0948	
	5.70	9.84	3.63	19.17
	29.73	51.35	18.92	
	11.11	25.33	36.84	
3	14	8	0	22
	11.285	8.5492	2.1658	
	0.6532	0.0353	2.1658	
	7.25	4.15	0.00	11.40
	63.64	36.36	0.00	
	14.14	10.67	0.00	
Total	99	75	19	193
	51.30	38.86	9.84	100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF PC_WORK BY CETOP7

Statistic	DF	Value	Prob
Chi-Square	4	11.619	0.020
Likelihood Ratio Chi-Square	4	13.542	0.009
Mantel-Haenszel Chi-Square	1	0.062	0.804
Phi Coefficient		0.245	
Contingency Coefficient		0.238	
Cramer's V		0.173	

Effective Sample Size = 193
Frequency Missing = 1
WARNING: 22% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF FACILITY BY CETOP13

FACILITY CETOP13

Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	2	3	Total
1	32 19.866 7.4114 16.49 78.05 34.04	8 15.851 3.8882 4.12 19.51 10.67	1 5.2835 3.4728 0.52 2.44 4.00	41 21.13
2	55 58.629 0.2246 28.35 45.45 58.51	53 46.778 0.8275 27.32 43.80 70.67	13 15.593 0.4311 6.70 10.74 52.00	121 62.37
3	3 7.7526 2.9135 1.55 18.75 3.19	5 6.1856 0.2272 2.58 31.25 6.67	8 2.0619 17.102 4.12 50.00 32.00	16 8.25
4	4 7.7526 1.8164 2.06 25.00 4.26	9 6.1856 1.2806 4.64 56.25 12.00	3 2.0619 0.4269 1.55 18.75 12.00	16 8.25
Total	94 48.45	75 38.66	25 12.89	194 100.00

STATISTICS FOR TABLE OF FACILITY BY CETOP13

Statistic	DF	Value	Prob
Chi-Square	6	40.022	0.000
Likelihood Ratio Chi-Square	6	35.296	0.000
Mantel-Haenszel Chi-Square	1	22.531	0.000
Phi Coefficient		0.454	
Contingency Coefficient		0.414	
Cramer's V		0.321	

Sample Size = 194

TABLE OF PC_WORK BY CETOP15

PC_WORK CETOP15

Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	2	3	Total
1	91 74.984 3.4207 47.15 67.91 84.26	36 45.824 2.1061 18.65 26.87 54.55	7 13.192 2.9062 3.63 5.22 36.84	134 69.43
2	8 20.705 7.7958 4.15 21.62 7.41	20 12.653 4.2663 10.36 54.05 30.30	9 3.6425 7.88 4.66 24.32 47.37	37 19.17
3	9 12.311 0.8904 4.66 40.91 8.33	10 7.5233 0.8153 5.18 45.45 15.15	3 2.1658 0.3213 1.55 13.64 15.79	22 11.40
Total	108 55.96	66 34.20	19 9.84	193 100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF PC_WORK BY CETOP15

Statistic	DF	Value	Prob
Chi-Square	4	30.402	0.000
Likelihood Ratio Chi-Square	4	30.376	0.000
Mantel-Haenszel Chi-Square	1	17.044	0.000
Phi Coefficient		0.397	
Contingency Coefficient		0.369	
Cramer's V		0.281	

Effective Sample Size = 193
Frequency Missing = 1
WARNING: 22% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF SALARY BY CETOP15

SALARY CETOP15

Frequency Expected Cell Chi-Square Percent Row Pct Col Pct	1	2	3	Total
1	11 12.209 0.1198 5.76 50.00 10.38	9 7.4869 0.3058 4.71 40.91 13.85	2 2.3037 0.04 1.05 9.09 10.00	22 11.52
2	22 19.979 0.2044 11.52 61.11 20.75	11 12.251 0.1278 5.76 30.56 16.92	3 3.7696 0.1571 1.57 8.33 15.00	36 18.85
3	41 39.403 0.0647 21.47 57.75 38.68	26 24.162 0.1398 13.61 36.62 40.00	4 7.4346 1.5867 2.09 5.63 20.00	71 37.17
4	29 24.419 0.8595 15.18 65.91 27.36	15 14.974 458E-7 7.85 34.09 23.08	0 4.6073 4.6073 0.00 0.00 0.00	44 23.04
5	3 9.9895 4.8905 1.57 16.67 2.83	4 6.1257 0.7376 2.09 22.22 6.15	11 1.8848 44.082 5.76 61.11 55.00	18 9.42
Total	106 55.50	65 34.03	20 10.47	191 100.00

Frequency Missing = 3

STATISTICS FOR TABLE OF SALARY BY CETOP15

Statistic	DF	Value	Prob
Chi-Square	8	57.923	0.000
Likelihood Ratio Chi-Square	8	41.270	0.000
Mantel-Haenszel Chi-Square	1	5.225	0.022
Phi Coefficient		0.551	
Contingency Coefficient		0.482	
Cramer's V		0.389	

Effective Sample Size = 191
Frequency Missing = 3
WARNING: 27% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

TABLE OF PC_WORK BY CETOP23

PC_WORK	CETOP23			
Frequency / Expected / Cell Chi-Square / Percent / Row Pct / Col Pct	1	2	3	Total
1	60 53.461 0.7998 31.09 44.78 77.92	55 55.544 0.0053 28.50 41.04 68.75	19 24.995 1.4378 9.84 14.18 52.78	134 69.43
2	7 14.762 4.0811 3.63 18.92 9.09	19 15.337 0.875 9.84 51.35 23.75	11 6.9016 2.4338 5.70 29.73 30.56	37 19.17
3	10 8.7772 0.1704 5.18 45.45 12.99	6 9.1192 1.0669 3.11 27.27 7.50	6 4.1036 0.8764 3.11 27.27 16.67	22 11.40
Total	77 39.90	80 41.45	36 18.65	193 100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF PC_WORK BY CETOP23

Statistic	DF	Value	Prob
Chi-Square	4	11.746	0.019
Likelihood Ratio Chi-Square	4	12.436	0.014
Mantel-Haenszel Chi-Square	1	3.529	0.060
Phi Coefficient		0.247	
Contingency Coefficient		0.240	
Cramer's V		0.174	

Effective Sample Size = 193
Frequency Missing = 1

TABLE OF PC_WORK BY CETOP25

PC_WORK	CETOP25			
Frequency / Expected / Cell Chi-Square / Percent / Row Pct / Col Pct	1	2	3	Total
1	69 59.016 1.6892 35.75 51.49 81.18	48 49.99 0.0792 24.87 35.82 66.67	17 24.995 2.5572 8.81 12.69 47.22	134 69.43
2	5 16.295 7.8295 2.59 13.51 5.88	17 13.803 0.7404 8.81 45.95 23.61	15 6.9016 9.5029 7.77 40.54 41.67	37 19.17
3	11 9.6891 0.1774 5.70 50.00 12.94	7 8.2073 0.1776 3.63 31.82 9.72	4 4.1036 0.0026 2.07 18.18 11.11	22 11.40
Total	85 44.04	72 37.31	36 18.65	193 100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF PC_WORK BY CETOP25

Statistic	DF	Value	Prob
Chi-Square	4	22.756	0.000
Likelihood Ratio Chi-Square	4	23.483	0.000
Mantel-Haenszel Chi-Square	1	5.333	0.021
Phi Coefficient		0.343	
Contingency Coefficient		0.325	
Cramer's V		0.243	

Effective Sample Size = 193
Frequency Missing = 1

TABLE OF SALARY BY CETOP25

SALARY	CETOP25			
Frequency / Expected / Cell Chi-Square / Percent / Row Pct / Col Pct	1	2	3	Total
1	7 9.445 0.6329 3.66 31.82 8.54	12 8.4084 1.5342 6.28 54.55 16.44	3 4.1466 0.3171 1.57 13.64 8.33	22 11.52
2	20 15.455 1.3363 10.47 55.56 24.39	11 13.759 0.5533 5.76 30.56 15.07	5 6.7853 0.4698 2.62 13.89 13.89	36 18.85
3	31 30.482 0.0088 16.23 43.66 37.80	26 27.136 0.0476 13.61 36.62 35.62	14 13.382 0.0285 7.33 19.72 38.89	71 37.17
4	21 18.89 0.2357 10.99 47.73 25.61	18 16.817 0.0833 9.42 40.91 24.66	5 8.2932 1.3077 2.62 11.36 13.89	44 23.04
5	3 7.7277 2.8924 1.57 16.67 3.66	6 6.8796 0.1125 3.14 33.33 8.22	9 3.3927 9.2677 4.71 50.00 25.00	18 9.42
Total	82 42.93	73 38.22	36 18.85	191 100.00

Frequency Missing = 3

STATISTICS FOR TABLE OF SALARY BY CETOP25

Statistic	DF	Value	Prob
Chi-Square	8	18.828	0.016
Likelihood Ratio Chi-Square	8	16.896	0.031
Mantel-Haenszel Chi-Square	1	2.673	0.102
Phi Coefficient		0.314	
Contingency Coefficient		0.300	
Cramer's V		0.222	

Effective Sample Size = 191
Frequency Missing = 3

TABLE OF NO_DTR BY CETOP25

NO_DTR / CETOP25	1	2	3	Total
1	23	27	16	66
	28.918	24.835	12.247	
	1.2109	0.1887	1.1498	
	11.86	13.92	8.25	34.02
	34.85	40.91	24.24	
	27.06	36.99	44.44	
2	22	10	8	40
	17.526	15.052	7.4227	
	1.1422	1.6954	0.0449	
	11.34	5.15	4.12	20.62
	55.00	25.00	20.00	
	25.88	13.70	22.22	
3	17	8	6	31
	13.582	11.665	5.7526	
	0.8599	1.1515	0.0106	
	8.76	4.12	3.09	15.98
	54.84	25.81	19.35	
	20.00	10.96	16.67	
4	3	11	2	16
	7.0103	6.0206	2.9691	
	2.2941	4.1182	0.3163	
	1.55	5.67	1.03	8.25
	18.75	68.75	12.50	
	3.53	15.07	5.56	
5	20	17	4	41
	17.964	15.428	7.6082	
	0.2308	0.1602	1.7112	
	10.31	8.76	2.06	21.13
	48.78	41.46	9.76	
	23.53	23.29	11.11	
Total	85	73	36	194
	43.81	37.63	18.56	100.00

STATISTICS FOR TABLE OF NO_DTR BY CETOP25

Statistic	DF	Value	Prob
Chi-Square	8	16.285	0.038
Likelihood Ratio Chi-Square	8	16.698	0.033
Mantel-Haenszel Chi-Square	1	2.188	0.139
Phi Coefficient		0.290	
Contingency Coefficient		0.278	
Cramer's V		0.205	

Sample Size = 194

TABLE OF PC_WORK BY CETOP28

PC_WORK / CETOP28	1	2	3	Total
1	69	48	17	134
	59.71	49.295	24.995	
	1.4454	0.034	2.5572	
	35.75	24.87	8.81	69.43
	51.49	35.82	12.69	
	80.23	67.61	47.22	
2	5	19	13	37
	16.487	13.611	6.9016	
	8.0034	2.1333	5.3888	
	2.59	9.84	6.74	19.17
	13.51	51.35	35.14	
	5.81	26.76	36.11	
3	12	4	6	22
	9.8031	8.0933	4.1036	
	0.4923	2.0702	0.8764	
	6.22	2.07	3.11	11.40
	54.55	18.18	27.27	
	13.95	5.63	16.67	
Total	86	71	36	193
	44.56	36.79	18.65	100.00

Frequency Missing = 1

STATISTICS FOR TABLE OF PC_WORK BY CETOP28

Statistic	DF	Value	Prob
Chi-Square	4	23.001	0.000
Likelihood Ratio Chi-Square	4	25.274	0.000
Mantel-Haenszel Chi-Square	1	5.581	0.018
Phi Coefficient		0.345	
Contingency Coefficient		0.326	
Cramer's V		0.244	

Effective Sample Size = 193
Frequency Missing = 1

APPENDIX F

INSTITUTIONAL REVIEW BOARD FORM

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: 08-28-95 IRB#: HE-96-008

Proposal Title: A NATIONAL STUDY OF ROLE FUNCTIONS, JOB SATISFACTION, AND CONTINUING EDUCATION NEEDS OF DIETETIC TECHNICIANS

Principal Investigator(s): Lea Ebro, Alexandria Miller

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

ALL APPROVALS MAY BE SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT NEXT MEETING.
APPROVAL STATUS PERIOD VALID FOR ONE CALENDAR YEAR AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD APPROVAL.
ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR APPROVAL.

Comments, Modifications/Conditions for Approval or Reasons for Deferral or Disapproval are as follows:

Signature: John H. Wyckoff Date: August 31, 1995

Chair of Institutional Review Board

VITA

Alexandria Kay Miller

Candidate for the Degree of

Doctor of Philosophy

Thesis: A NATIONAL STUDY OF ROLE FUNCTIONS, JOB SATISFACTION, AND CONTINUING EDUCATION NEEDS OF DIETETIC TECHNICIANS

Major Field: Human Environmental Sciences

Area of Specialization: Foodservice Management

Biographical:

Personal Data: Born in Denver, Colorado, on April 11, 1946, the daughter of Esther and Virgil Rose. Married to John W. Miller, D.V.M. Mother of three children: Connie Upton, Mark and Amy.

Education: Graduated from Midwest City High School, Midwest City, Oklahoma in May, 1964; received Bachelor of Science degree in Food, Nutrition and Institution Administration in May 1968 and Master of Science degree in Nutrition from Oklahoma State University, Stillwater, Oklahoma, in December, 1973, completed the requirements for the Doctor of Philosophy degree at Oklahoma State University, Stillwater, Oklahoma in July, 1996.

Professional Experience: Administrative Dietitian at Muskogee Regional Medical Center, Muskogee, Oklahoma 1973 to 1975, Consultant dietitian to nursing homes and small hospitals in Eastern Oklahoma 1975 to 1996. Program Director and Instructor, Dietetic Technology Program, Oklahoma State University-Okmulgee, Okmulgee, Oklahoma, 1992 to present.

Professional Memberships: American Dietetic Association, Dietetic Educators of Practitioners, Technical Practice in Dietetics, Consultant Dietitians in Health Care Facilities, Oklahoma Dietetic Association, Oklahoma Consultant Dietitians in Health Care Facilities, and Phi Upsilon Omicron, Kappa Omicron Nu, Home Economics Honor Societies, Academy of Human Resource Development.