

DIETETIC TECHNICIANS: CHARACTERISTICS
AND CORRELATES OF SUCCESS

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CHAPTER I

INTRODUCTION

The Dietetic Technician (DT) program is a two year associate degree. Upon completion of course work and 450 hours of supervised field work, graduates are eligible to write the Dietetic Technician Registered (DTR) credentialing exam. The original concept for the DT position was conceived in an effort to relieve a shortage of Registered Dietitians (RD) in the 1960's. The technician was to function as an assistant to the RD, freeing the dietitian to complete more complex tasks and managerial duties. The dietetic technician option was approved by the American Dietetic Association (ADA) in 1971 and Dietetic Technicians became eligible for membership in the ADA in 1974 (ADA, 1975). Currently there are 74 accredited/approved dietetic technician programs in the U.S. and 5733 registered dietetic technicians (Personal communication, Donna Pertel, CDR 1999).

Currently, all available data on DTRs comes from practitioner surveys and practice audits conducted by ADA or the Commission on Dietetic Registration (CDR) (Baird & Armstrong, 1981; Baird, Burrelli, & Flack, 1984; Kane, Estes, Colton, & Eltoft, 1990). Practicing DTRs are most likely to be employed in acute or long-term care; most of

those working for less than five years earn \$25,000 or less annually. Most are white females between the ages of 31 and 45. Little information is available about their previous work or academic experience. There currently is no data available describing what affects an individual's decision to pursue an associate degree in dietetics.

As an associate degree, most DT programs are found on the campuses of community and technical colleges (Arkwright et al. 1974). The open-admission policies of many of these institutions dictates that students cannot be denied admission based on previous academic records or entrance exam scores (Bissett, 1995). Predicting a student's chance of success upon entering a program is difficult at best. Use of previous GPA may not accurately reflect an individual's current capabilities (Dittus & Wise, 1994). Use of standardized tests such as ACT or SAT have been criticized for bias against minority students (Goldman & Widawski, 1976). Prior work experience may enhance practitioner skills but be of little benefit academically. Reliance on high school GPA may be unnecessarily restrictive to older students who may have the maturity and motivation necessary to excel in the associate degree program.

Ultimately, the academic success of any DT candidate is measured by their ability to pass the credentialing exam. The competency levels for the DTR have been determined

largely through the use of practitioner and employer surveys. Previous life, work and education experiences necessarily impact an individual's current and future abilities. Reading level, writing ability, and interpersonal skills will impact a candidate's ability to function in an entry level position. In addition, some level of competency in basic math and algebra is essential. Lacking the ability to screen incoming students leaves program directors in a position of forced attrition in order to remove unsuccessful candidates from the program. This is an especially onerous task in an academic setting where students may be in their first higher education experience or have returned to school after long absences.

Socioeconomic factors may limit a candidate's ability to participate in traditional programs. Limited financial resources can reduce the amount of time that students have to devote to academics. Older students may have additional family responsibilities to consider. Such considerations dictate that students may be unable to participate in full-time enrollment, making the pursuit of a degree an extended time commitment. Additional course work in the form of voluntary remediation may be rejected as an unnecessary burden. The training required to meet the current DT competencies within the guidelines of an associate degree program allows little time for the teaching of "catch-up"

skills. Time spent in these remedial activities is time not spent in critical dietetics-related tasks. Classroom situations where students are not all at the same level necessitates either under-teaching the more advanced or leaving behind those with fewer incoming skills. Neither group is well-served.

Changes in the health care arena to control costs are increasing pressures for employees to produce at high levels of competency (Grandgenett, Gates, Henley, Hudiburg, Leonberg, Dahl, Nowlin, Smith, and Spitalnick, 1999). The dietetic technician can be a valuable asset by relieving a dietitian of lower level tasks at a reduced cost. In addition, DT graduates are equipped with on the job training due to the 450 hours of supervised practice which must be completed prior to graduation. While this training is of great benefit to potential employers, it does come at a cost. Supervised practice means that the time of a registered dietitian or DTR has been spent to train the student. In some areas, technician and dietitian students must compete for field training locations. In the face of such scarce resources, it is essential that the DT candidates are those students most likely to be successful at passing the credentialing exam.

It is clearly in the best interest of the prospective student, the DT programs and the Commission on Accreditation

and Approval for Dietetics Education (CAADE) to match incoming abilities with desired outcomes to maximize effectiveness of training and conserve limited resources.

Objectives

1. Identify those factors that influence students' decisions to pursue dietetic technician as a career.
2. Identify those factors of social, academic and employment histories which may place students' at risk for successful completion of the DTR credentialing exam.
3. Determine attitudes of DT program directors toward current levels of required competencies and selective admissions.
4. Determine the relationship between academic, social, and demographic factors and outcomes on the DTR credentialing exam among students in one DT program.

CHAPTER II

REVIEW OF LITERATURE

The Dietetic Technician (DT) program is a two year associate degree program which is accredited by the Commission on Accreditation and Approval for Dietetics Education (CAADE) of The American Dietetic Association (ADA). In addition to academic coursework, 450 hours of supervised field experience must be completed before a graduate may sit for the credentialing examination to become a Dietetic Technician Registered (DTR) (CAADE, 1999). Currently there are 74 accredited/approved DT programs in the US (ADA, 1999). There are currently 5,733 DTRs of which 1,774 are members of ADA (Personal communication, Donna Pertel, 1999).

Historical Perspective

The first dietetic technician programs were the result of The Allied Health Professions Personnel Training Act of 1966, federal legislation designed to increase the number of allied health professionals (Piper, 1970). Grants made available through this bill provided funding for junior colleges, and by 1968, fourteen junior colleges were awarding associate degrees for dietetic technicians.

In 1971, ADA established guidelines for dietetic technician education programs and set forth job competency standards for graduates of approved programs (ADA, 1971). The educational guidelines called for a curriculum specializing in either nutritional care or food-service management leading to the Associate of Arts degree plus 450 hours of supervised field experience (Williams, 1977). In 1974, ADA, "recognizing the need for identification and revision of titles and definitions used in the profession of dietetics", approved a selected listing of recommended titles and responsibilities for dietetic professionals. The stated purpose was to "impart clarity and consistency in the use and meaning of titles in the dietetic profession." Further, these definitions would also provide "useful information for developing and evaluating organizational structures; establishing departmental goals and objectives; defining and evaluating departmental positions; and as self-evaluation for members of the profession" (Arkwright, 1974, p. 661).

In 1974 The American Dietetic Association formally defined a 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 a Registered Dietitian (RD) or

an ADA dietitian, has responsibilities in assigned areas in food-service management; in teaching foods and nutrition principles; and in dietary counseling" (Arkwright, 1974, p. 664).

Among the 23 original stated job responsibilities outlined for the dietetic technician were menu planning, supervision of food production and service, maintenance and improvement of standards of sanitation, safety and security, and the calculation of nutrient intakes and dietary patterns (Arkwright, 1974).

Although ADA set the standards for the education and training of dietetic technicians, graduates of approved programs were not eligible for membership within the professional organization. Recognizing this disparity, Israel Light, Dean of the School of Related Health Sciences of The Chicago Medical School addressing ADA at the 53rd Annual Meeting, urged associate membership status for dietetic technicians. He said, in part, "in order to enlarge and strengthen your ranks and to provide ADA with greater leverage in coping with problems that are close to those of dietitians and nutritionists, I would recommend that associate membership status be given to such people as community college graduates from curriculums of which you will approve...Don't create any more competition than you already have. Professional elitism and snobbishness can

seriously interfere with any legitimate attempts to develop workable interdisciplinary health team plans." (Light 1971, p.17) A membership category for dietetic technicians was subsequently added in 1974 (Williams, 1977).

DT Curriculum Development

In 1968, ADA first established guidelines for dietetics careers in the health industry (Williams, 1977). Thus emerged a "career ladder" in dietetics with distinct levels of dietetic assistant, dietetic technician, and dietitian. With the role identification also came standards of training for the assistant and technician levels. Earlier food-service training programs were offered as non-credit courses in vocational and adult education training programs (Williams, 1977). With the development of the career ladder, training began to move toward credit courses on junior college campuses. In 1974, ADA published new guidelines for the dietetic assistant further differentiating the roles of the assistant, technician and dietitian (Arkwright, 1974).

A variety of approaches were implemented in the development of DT program curriculum. Pennsylvania State University-University Park was one of the first programs to implement a career ladder approach to dietetics training.

Their system was designed to "meet the needs of the modern work-while-studying student on one hand and satisfy the educational requirements of the newly defined roles of the dietetic technician on the other" (Clemen, 1974, p. 401). Terming their approach a "seminar-practicum", the program was divided into three distinct sections: a required work experience of 15 hours per week in a food service operation; self-instructional modules; and a weekly seminar for evaluation of both theory and practice of that theory through employment experience. The system was specifically designed to allow the employed, part-time student to incorporate employment and academic experiences into the requirements of the newly identified dietetic paraprofessional roles (Clemen, 1974).

Mercy College of Detroit was one of the first programs to implement the concept of competency-based education to facilitate the development of the curriculum for a career mobility program in dietetics. The goal of their program was to educate dietetic technicians who might then progress to coordinated undergraduate programs to become registered dietitians (Schiller, 1977). The program was based on a three step process: first, listing the competencies; second, determining terminal performance objectives; and finally, establishing evaluative criteria for assessing student achievement of the objectives (Howard & Schiller,

1977). Since technicians are intended to assist dietitians, it was felt that their role must be defined only in relation to each of the dietitian's roles. Therefore, the competencies for the technician program were designed to complement those of the entry-level dietitian according to ADA's Plan IV. The established validity of the Plan IV competencies helped to establish the validity of the derived competency statements for dietetic technicians (Howard & Schiller, 1977).

The Dietetic Technician program at Community College of Allegheny County, Pittsburgh, was designed using a philosophical approach: "it is axiomatic that each program must first have a philosophy which expresses its purpose or reason for being and defines the goals it expects to achieve through its curriculum. Once this philosophy is established, the planner then knows his direction and will reach his ultimate goal through the development of an optimal curriculum. Such a curriculum will in turn, serve as the measure of the philosophy and behavioral objectives on which it was built" (Doherty 1973, p.422). This program was designed with an emphasis in nutritional care. The objective of the program was stated as follows: "it views the dietetic technician as an assistant to the clinical dietitian or the public health nutritionist". The key to success, according to the program director, was to "select

field experiences that best demonstrate the application of theory learned in the classroom and provide the student with adequate preparation for future employment" (Doherty 1973, p.422).

A program can only be considered successful if it provides the student with training relevant to skills and knowledge required in the workplace. In order to measure the effectiveness of early technician programs, a 1975 study funded by the Department of Health, Education, and Welfare surveyed dietetic technician graduates. The purpose of the study was twofold: to collect information about curriculum relevance and labor markets, and to develop a method by which training programs could evaluate the adequacy of preparation of graduates for skills/tasks required on the job. While the authors of the study concluded that curricula in dietetic technician training programs were largely relevant and capable of producing graduates able to handle job requirements, the researchers recommended that training programs initiate their own formal, follow-up procedures for graduates. Significant variations existed between curricula and job requirements over geographic regions and non-traditional employers (Appel, Sippel, & Von Kuster, 1977).

Development of Educational Standards

Effective education of the DT is dependent upon providing training that is relevant to the current job market. Role delineation studies were first recommended by the ADA Task Force on Competencies to assure quality in dietetic education (Baird & Armstrong, 1981). A 1981 study by Hoadley, Vaden & Spears examined aspects of the dietitian's role that might be delegated to the DT. A set of 82 competency statements were submitted to RD's employed in hospital settings within a five state area. The RD's were asked to rank the statements with a scale which ranged from 1, RD should have total responsibility, to 5, DT should have total responsibility, with various levels of shared responsibilities as rankings 2, 3, and 4. A ranking system was developed based on the mean scores to determine those functions most likely to be delegated to the DT. The administrative responsibilities with the highest potential for delegation tended to be routine, operational activities. No clinical responsibilities received high enough ratings to be categorized as having the highest potential for delegation to DT. Seventy four percent of the RD's surveyed supported training of DT's as generalists with equal

emphasis in food service management and nutrition care (Hoadley, Vaden & Spears, 1981).

Role delineation studies were first commissioned by ADA in the 1980's (Baird & Armstrong 1981; ADA 1982). The studies were intended to provide data which would "serve as the vehicle for assuring agreement between practice and the registration examination, serve as the basis for the development of standards used in the accreditation or approval of educational programs, and provide a reliable framework for the description of dietetic practice" (Tower et al., 1991 p. 1122). These first studies were focused on a particular area of practice including clinical, community and food systems management. The need to continually update the studies in order to reflect the changing nature of the profession led to the commission of a new study in 1987 by the Board of Directors of ADA. While the original studies sought to verify entry-level positions based on expert opinion of what practice is and ought to be, the new study was designed as "an empirical investigation of practice with results that are descriptive, not prescriptive ..it measured what dietetic technicians and dietitians at entry level and dietitians beyond entry level are actually doing in a variety of settings. It did not measure quality, correctness, or efficacy of what the practitioners do" (Tower et al., 1991 p. 1122). The researchers used the

survey to provide objective information to answer, among others, the following questions:

- Are there job responsibilities that are unique to entry-level RDs and not shared by entry-level DTs or unique to entry-level DTs and not shared by entry-level RDs?
- What job responsibilities, if any, are shared by entry-level RDs and DTs?
- If any, what job responsibilities are unique to beyond-entry-level RDs and are not shared by entry-level RDs or DTs? (Tower et al., 1991).

Among the significant findings of the study was that there were very few, if any, activities performed that were unique to any one group of practitioners. In fact, all groups engaged in similar activities but at differing levels of responsibility. Therefore, the authors concluded that "job specifications and educational standards for entry-level dietetic technicians and dietitians may need to be approached from the perspective of differences in level of responsibility, not from the perspective of specific activities" (Tower et al., 1991 p.1123).

Analysis of the role delineation data led Wood (1993) to suggest potential applications for the use of role delineation data in designing dietetics education curricula. The author chose the following three concepts for examples:

quality assurance (QA), food production, and knowledge and skill in research. In the area of QA, she suggested that the DT program would emphasize task performance and supervision whereas the RD program would include more advanced level activities such as policy setting and advising roles for QA. As an example of a food production task, the standardization of recipes is a task performed by both RD and DT practitioners but is performed most often by the DT and therefore should occupy more of the DT training curriculum than that of the RD student. In the area of knowledge and skill in research, the role delineation study showed that DTs do not conduct research, therefore research should only be included in the RD curriculum (Wood, 1993).

The 1995 Commission on Dietetic Registration Dietetics Practice Audit was designed to "update the earlier study and to provide more extensive analysis of the differences in levels of responsibility in different areas of dietetics practice as well as some indication of what aspects of practice are likely to change over the next few years" (Kane, Cohen, Smith, Lewis and Reidy, 1996 p. 1292). The most commonly reported function for both groups was clinical services: 67% of RDs and 72% of DTRs. Employers' responses paralleled those of the practitioners, with the main difference being the tendency for employers to rate

involvement higher than did the practitioners. Among the conclusions drawn from the study were the following:

- involvement rates for different activities for both RDs and DTRs were strongly related to work settings and functions performed.
- level of responsibility for both groups was positively correlated with years of experience.
- percentages of RDs and DTRs in non-traditional and specialized activities were low but were anticipated to increase somewhat over the next two years. (Kane, Cohen, Smith, Lewis, & Reidy, 1996).

Gilmore, Maillet, & Mitchell (1997) conducted a study to determine educational preparation based on job competencies of entry-level RDs and DTRs. The survey population consisted of RD and DTR practitioners registered for three years or less. Respondents were asked to choose the verb that best described the level of competency performance from three perspectives: level taught in the education experience; performance level expected in first year of work; and rank importance of the competency during the first year of the first job. Both RDs and DTRs indicated that their education level was at the "assist" level more often than "perform". More than 50% of the educational competencies were "not done" by either DT or DTR respondents. The competencies with the greatest differences

between RDs and DTRs in performance level taught included a number of competencies dealing with parenteral and enteral formulas, research and application, and advanced assessment techniques. The use of the defined verbs to describe the various levels of performance helped to distinguish between the performance of DTs and RDs where previous studies had not. Significant differences occurred for 59 of the 102 draft competency statements.

Currently DT curricula are based on expected competencies for entry-level practice (Table V). These core competencies were developed by the Educational Competencies Steering Committee composed of members from dietetic education programs, the Council on Professional Issues, Commission on Accreditation/Approval for Dietetic Education (CAADE), the Commission on Dietetic Registration (CDR), and additional members and consultants as deemed necessary (Gilmore, Maillet, & Mitchell, 1997). The committee developed a set of 45 competencies for technician programs as well as foundation knowledge and skills to support the development of the competencies. The foundation knowledge and skills were categorized into seven content areas and three levels of learning. The content areas include: communications; research; biological, physical and social sciences; management; health care systems; food; and nutrition. Levels of learning include basic knowledge, in-

depth knowledge, and ability to demonstrate basic skills associated with the content area. The competency statements have been used as a basis for the content and format of the DTR registration examination as well as a guide for curriculum development, evaluation, and assessment.

Prediction of Academic Success

Background

The academic success of a DT student must be measured by the student's ability to complete the scholastic program and subsequently pass the DTR exam. High attrition rates represent a waste of available resources in the form of time and money. Attrition rates among associate degree nursing students have been estimated at 44% (Rowland, 1978). Among reasons cited for dropping out of nursing school were: failure in classwork, dislike for nursing, marriage, and ill health (Hill, Taylor & Stacy 1963). Limited program resources make the need to discriminate effectively between potentially successful and non-successful applicants essential.

Currently, DT students are required to complete 450 hours of supervised practice prior to graduation (<http://www.eatright.org/caade/>, 10/1/99). While this "on-

the-job" training allows the DT graduate to step directly into a work situation, it requires the time of an RD or DTR for supervision. In some cases, DT students compete directly with RD students for field training locations. Faced with scarce resources, it is imperative that DT program directors expend the available resources on those candidates most likely to succeed.

Much research has focused on the variables that correlate with academic success. Many colleges and universities rely upon SAT/ACT scores, high school rank and/or GPA in choosing applicants due to the established validity and reliability of these methods (Slack & Porter 1980). However, some research has indicated that these variables may be biased against minority students (Goldman & Widawski 1976). In addition, grading methods in high schools are far from standardized and the variance between schools and school districts may be significant.

Non-academic variables may also correlate with academic success. Demographic factors such as age, sex, and marital status have been found to correlate with academic success. Older nursing students were found to be more motivated and mature than younger nursing students (Malarkey, 1979) while marital status but not age were found to be significantly related to college achievement by Theiman & Marsh-Williams (1984). Variables such as personal interviews and letters

of recommendation have also been investigated and found to be subjective (Dittus & Wise 1994). The research tends to focus on specific groups and may not be generalizable across other professions, age groups, gender or ethnicity.

Correlates of success in baccalaureate programs

Dietetics Programs. Hanson & Fruin (1988) examined the validity of selection criteria for a coordinated undergraduate program in dietetics. The study examined 46 graduates of the University of Minnesota coordinated undergraduate program (CUP). Interviews were found to be an ineffective means of choosing students as were letters of recommendation; however, narrative writing skills, based on a short essay, were significantly ($p < 0.04$) correlated with core curriculum GPA although those scores did not correlate well with grades in English courses. Prerequisite college GPA was found to be significantly related to score on the registration exam and academic achievement within the program. No relationship was found between GPA and clinical performance. In addition, results of personal interviews conducted prior to admission were not related to performance in the program or registration examination scores.

Pope & Gines (1986) examined both academic and nonacademic variables as predictors of success among baccalaureate dietetic students. The variables included ACT

scores, preprofessional grades, work experience, extracurricular organization activities, and college and career decisions. Academic success, defined as cumulative GPA, was most highly correlated with preprofessional science grades followed by grades in nutrition, food science, math, business, and communication. Participation in the student dietetic association was found to be negatively correlated with the number of times students repeated the credentialing exam.

Dittus & Wise (1994) surveyed coordinated dietetic program directors to determine which were the most important criteria used to select students. Among the selection criteria were GPA, interview, writing skills, letters of recommendation and work experience. The directors rated each criteria in terms of importance, accuracy and objectivity and then ranked them according to the emphasis they receive in the selection process. GPA was cited as both the most important and most objective selection criteria. Writing skill was ranked second in importance and objectivity but was considered the most accurate selection factor. Personal interviews were rated as moderately accurate and highly subjective. Letters of recommendation were considered the least accurate and most subjective selection factor. The authors pointed out that while other research has shown academic indicators were positively

correlated with success on the RD exam, they did not correlate with clinical skills or professional success as an RD among graduates from their program. They conclude that "factors such as communication skills and leadership ability may better predict professional success, but it is difficult to identify objective ways to measure these traits" (Dittus & Wise, 1994 p. 150).

Nursing programs. Yocum & Scherubel (1985) conducted a study of 147 students who completed the baccalaureate program of the University of Illinois College of Nursing between August 1979 and June 1980. Data were analyzed on 139 students for whom State Board Examination (SBE) results were available and identifiable. They found that nursing theory GPA was more highly correlated with SBE than was practicum GPA. Also significantly related to SBE scores were pre-admission liberal arts and cumulative GPA, number of prior credit hours, school attended, and race. There was a significant relationship between pass rate on the SBE and the number of hours of previous college credit; no student with an associate or higher degree failed the SBE. The authors noted a possible interaction between minority students' ethnic background and previous urban junior college attendance, indicating a possible "double jeopardy" for minority students in urban junior colleges. Minority students from

urban junior colleges performed lower on SBE scores than other students. However, they noted "caution must be emphasized when considering the import of these findings since minority students accounted for only 10% (n=14) of the study population" (Yocum & Scherubel, 1985 p. 249).

McKinney et al. (1988) found no significant relationship between age, sex and personality type and National Council Licensing Examination (NCLEX) performance; however, cumulative GPA, SAT, Mosby Assess Test scores and core courses repeated were positively correlated with success on NCLEX among 136 baccalaureate nursing graduates from a private liberal arts college.

A study by Stronk (1979) was designed to determine the degree of correlation between admission criteria and the students' academic coursework, National League of Nursing test results, and the State Board Test Pool Examination results among 501 baccalaureate nursing students. The GPA for prerequisite courses was found to be a better indicator of performance in upper-division coursework than was cumulative GPA for all courses. Findings were in agreement with those of Hanson & Fruin (1988).

Poorman & Martin (1991) examined the role of nonacademic variables in passing the NCLEX among 102 senior bachelor's degree nursing students. Test anxiety was negatively correlated with performance on NCLEX. Successful

subjects were more likely to believe that they were good test takers. Self-predicted scores and self perceived grades were best predictors of NCLEX. Many of the graduate nurses who have demonstrated a competent knowledge base in nursing have not been successful on the exam. The authors felt that it was apparent that the "majority of nurses who failed NCLEX experienced some form of disabling anxiety related to taking the examination" (p. 26). Compared to college GPA and SAT scores, non-academic variables were shown to be the best predictors.

Allied Health. Admission criteria to allied health programs including physician assistant (PA) and occupational therapy (OT) were examined by Schmalz, Rahr, & Allen (1990). The researchers found written essays to be effective predictors of graduation for OT students although they cautioned that further research is necessary to establish the validity and reliability of this method. In addition, they found the personal interview to be of limited value for the selection of PA students. In a finding similar to Yocum & Schruebel (1985), the study found that among OT applicants, the type of institution where the prerequisite course work was completed was a significant factor. Students who previously attended four year institutions were more likely to successfully graduate than those who did not.

Weitzman (1982) attempted to rectify a dispute between the research of Slack & Porter (1980) and Jackson (1980) concerning the relative validities of the high school record (HSR) and the verbal portion of the Scholastic Aptitude Test (SAT) when used as predictors of first-year college achievement. A predictive validity of .64 for the SAT and .60 for the HSR with a combined validity of .76 led Weitzman (1982, p. 190) to the conclusion that "prediction is the purpose of the SAT and the developers of the SAT may have satisfactorily achieved this purpose. The predictive validity of .76 likewise indicates that the HSR-SAT combination may be a powerful predictor of first-year academic achievement in college."

Correlates of Success in Associate Degree Programs

Less is known about the predictors of success for associate degree students. It is not clear that the same criteria can be used effectively to evaluate candidates for baccalaureate and associate degree programs. Woodham & Taube (1986) examined the relationship of certain admission criteria and performance in major didactic nursing courses of an associate of science in nursing degree program as predictors for performance on the licensing examination for registered nurses (NCLEX). Records of 107 graduates from a

major midwestern state university in an urban setting were examined. They found that grades from all nursing courses and SAT verbal scores were significant predictors of NCLEX performance. Among the variables that were not found to be significant predictors were age at graduation from the program, high school class rank percentile, and SAT math scores. The student population on which the study was conducted was described as tending toward an adult learner population with the largest single age category occurring between 20-24 years of age. The authors also noted that a significant number of the students were married and were parents of dependent children. A majority required some financial aid, and many were employed part-time.

Tompkins & Harkins (1990) studied the prediction of academic success in a self-paced non-traditional respiratory therapy program administered by Southwest Texas State University. The authors defined non-traditional student as one who "attends noncampus-based courses while continuing full-time employment" (p. 16). Further these students are described as likely to have been away from formal education for a number of years. The study consisted of 6 males and 34 females of which there were 32 Caucasians, 2 Blacks, and 6 Hispanic students. Success was defined by program GPA, clinical performance rating and credentialing examination scores from the entry-level examination for respiratory care

practitioners, administered by the National Board for Respiratory Care. Historical data including admission requirement records, high school information, program GPA, and performance on the national credentialing exam were obtained from the student records. Among the variables that were found to correlate with success in the program were high school quartile, number of years since last formal education, and Psychological Services Bureau (PSB) exam scores. Program GPA was found to be a useful indicator of success on the respiratory credentialing exam. The authors point out that this information may be of significant use to predict success among nontraditional students because this population often is not required to meet standard entrance requirements because of advanced age.

Oliver (1985) found a significant relationship between HSR, biology and English grades with first semester GPA and completion of program among associate degree nursing students. The findings characterized the successful student as older, attending school part time, and having previously attended college. However, a disproportionate number of black subjects failed to complete the program as compared to white subjects. Also significant were faculty predictions of program completion based on a review of the applicant's achievement record and a personal interview prior to admission. The author suggests that "these variables should

continue to be considered in selection decisions and that additional research should be undertaken to further validate faculty prediction efficiencies" (p. 205).

A study by Jensen (1989) examined the relationship between selected preadmission characteristics to program GPAs, graduation status and national board scores. Using students from three allied health fields (i.e., dental hygiene, radiologic technology, and respiratory therapy), the following data were collected: High school GPA, high school class rank, prior college experience, age, gender, and ACT composite, mathematics, English, and natural science scores. Although results varied by discipline, the best predictors of graduation for all three programs considered together were the natural science ACT score and high school class rank. In addition to these two variables, high school GPA and age were the best predictors of final college GPA. National board scores of the aggregate population were best predicted by high school GPA, and ACT math and composite scores.

Currently there is no published research on prediction variables of success for DT students. It may be reasonable to assume that students choosing a career as dietetic technician may share similar attributes as those in other allied health fields and therefore those findings may be generalized to the DT population.

Profile of the Dietetic Technician

Based on the recommendation of the Board of Directors, ADA's House of Delegates approved an annual membership database plan in 1989. Prior to this time, ADA had conducted a periodic membership census but the information was often not current nor consistently accessible (Bryk, 1991).

Only current members in the Active, Associate, Technician and Retired member classes of ADA were surveyed in 1989. Among the topics covered in the survey were demographics, professional characteristics, employment status and characteristics, and annual gross income. Gender and ethnicity varied across member classes. Males accounted for 3.6% of Technicians and 2.2% of Active members and 10.9% of Active members and 16.6% of Technicians were from minority groups. Asians/Pacific Islanders predominated the minority group for active members whereas blacks were the predominate Technician minority. More than 75% of the responding DTR's (n=1,566) reported employment in hospitals or extended-care facilities with most practicing areas in either clinical or management areas. In general, the diversity of both practice areas and employment settings was found to be

greater among RD's (n= 30,445) when compared to DTR's (Bryk, 1991).

After collecting data in 1991 reflecting stable member characteristics, it was determined that a biannual update of the membership database would be sufficient to meet the original database goals (Bryk, 1994). Among the significant findings in the 1993 survey was that the majority of both RDs and DTRs were between the ages of 31-45 (age distribution for RD's and DTR's in the 1991 survey were reported as an aggregate). Annual gross incomes for both groups were higher in 1993 than comparable incomes in 1990 or 1991 (Bryk, 1994).

The findings of the 1997 update were consistent with previous surveys. Men made up 4.2% of Technician members but only 2.4% of Active members. Blacks made up the largest minority group within the Technician members representing 5.5% of that group. Asian/Pacific Islander was the largest minority group among Active members, representing 4.8%. The largest age groups for both Active and Technician members were 36-45. Thirty three percent of DTR's reported that they were pursuing or currently held degrees higher than the required Associate degree. Hospitals and long-term care facilities remained the largest employers of DTR's with 42.2% and 34.6% respectively. Of those surveyed, 2.1% reported

unemployment and actively seeking employment within the field of dietetics. Median income for DTR's practicing in clinical nutrition did not change, however, median income for those employed in food management increased by 3.7% over those reported in the 1995 survey (Bryk, 1999).

Non-Traditional Students

Non-traditional students have been described as "an adult, age 25 or older, who has returned to school either full-time or part-time" (Ely, 1997). Non-traditional students have become as prevalent in colleges and universities as traditional students. Among other considerations, the older student must balance school with employment and family responsibilities. It is characteristic of the older student to have better grades than younger students but to require more time to complete their studies (Ely, 1997).

Richardson & King (1998) explored various issues concerning adult learners in undergraduate psychology programs. While the majority of adult students in the US are female, they found that these students were not underachievers from either ethnic minorities or lower social-status groups. In their study, many of the adult students had chosen to defer their entry into a university

despite having the necessary qualifications. They failed to find support for the notion that adult students were lacking in study skills or intellectual ability when compared to younger students.

Few data are available to determine what differences exist, if any, between the adult student pursuing an associate degree and those who return to school seeking a baccalaureate degree. Both groups would share the external pressures of financial and family responsibilities. In addition, the fear of academic failure and the inability to "fit in" with younger students would be common to both. More research is needed in order to better serve the learning needs of this group.

Conclusions

Since their recognition by ADA in 1971, the number of dietetic technicians has grown tremendously. Currently there are 5733 registered dietetic technicians and 74 accredited/approved DT programs. However, little is known about DT students. Research has been limited to DT practitioners and members of ADA. Current research in dietetics education has centered on RD students and programs. Correlations between academic success and other factors have most often examined baccalaureate students.

Less attention has been focused on students seeking Associate degree status. It is not clear that results from students in four year programs can be generalized to those in two year programs. The lack of information about DT students forces generalizations from other allied health professions which may not be applicable.

In order to establish functional guidelines for the education and practice of dietetic technicians, it is necessary to first identify the population most likely to participate in DT programs. That information can then help to provide a general framework structured around the needs and capabilities of this population.

CHAPTER III

METHODOLOGY

Four separate studies were conducted. An initial survey of program directors using a Delphi technique was conducted to determine issues of concern. Based on those findings, three studies were conducted. Program directors participated in a telephone survey; DT students completed a written survey; and a survey of student records was completed for a case study.

Delphi Methods

In order to determine those issues of greatest concern to program directors, a survey of directors using the Delphi technique (Dalkey, 1967) was implemented. All program directors with e-mail addresses published in the 1998-99 American Dietetic Association Directory of Dietetics Programs were contacted by e-mail during the spring semester of 1998 and asked to volunteer to participate.

The survey was described as a three part process, each section requiring up to thirty minutes to complete. Participants were insured of confidentiality of all responses. Permission for the study was granted through OSU Institutional Review Board #HE-98-081. Those willing to

participate indicated their consent by return e-mail. Twenty five directors were contacted and seven agreed to participate.

The initial survey (appendix D) was sent by e-mail. Participants responded to the questions within the given format and returned it to sender. Round one consisted of eight open-ended questions. Questions included necessary incoming educational competencies for DT students, competencies lacking in enrolling students, effect of educational background, problems with current competency requirements, sources of most students, post-graduation employment opportunities, and suggested changes in current system of training DTRs.

All responses to the questions were compiled and resubmitted to the original respondents in round two. Participants were instructed to agree or disagree with each of the compiled responses. The round two responses were then compiled and the results returned to the respondents. Two of the original participants did not respond to the second round questionnaire leaving a total of five respondents for the two round survey.

Although initially a third round of questions had been planned, the agreement among respondents in round two eliminated the need for further clarification. The

compilation of the first two round responses were returned to the participants as round three.

DT Director Survey Methods

A telephone survey of DT program directors was conducted in the spring semester of 1999. The survey was designed to determine the attitudes of current DT program directors concerning the current levels of educational competencies as set forth by the CAADE and their attitudes toward the use of selected admissions for DT programs (Appendix A). Other topics included: current number of students enrolled in program, criteria predictive of student success, recruitment strategies, field experience problems, student academic deficiencies, and graduate employment outlook. The questions in the survey were derived from the results of the Delphi exercise.

Survey participants were contacted by mail or in person at the 1998 ADA Annual Meeting & Exhibition (Appendix E). Those DT directors willing to participate were asked to sign a provided self-addressed stamped postcard indicating their willingness to participate in the phone survey (appendix C). The card contained a space for a contact phone number and preferred time for calls. A follow-up phone call was then made to set up an appointment for the actual interview.

Program directors who agreed to participate in the study but were unable to be contacted by phone within a 60 day designated time period were considered non-responders. Interviews were audiotape recorded to facilitate content analysis. All interviews were conducted by the same investigator; interview time ranged from 15-45 minutes.

The format of telephone survey was chosen in order to reduce the likelihood of non-response and allow the respondents the opportunity to express their true feelings rather than being confined to provided responses. The diversity of issues confronting DT programs in the various regions of the country made the validity of a written survey questionable.

Results were analyzed for descriptive statistics using SPSS 9.0 (1998).

Technician Survey Methods

A written survey designed to ascertain factors including demographics, socioeconomic status, previous work and education, and interest in dietetics was distributed to current DT students during the spring semester of 1999. Participation in the survey was determined by the individual program directors. The directors were contacted either by mail or in person at the 1998 ADA Annual Meeting &

Exhibition (appendix E). Those directors willing to participate were asked to sign and return a postage paid pre-addressed card indicating their willingness to participate and requesting a specific number of written surveys (Appendix C). Program directors were requested to administer the surveys to an upper level core curriculum course such as clinical nutrition or food service management. The surveys were then returned in a provided self addressed stamped envelope.

The survey was divided into three sections. Section one contained questions pertaining to the student's interest in dietetics. Questions were adapted from a study of RD students by Kobel (1997). Questions on interest in dietetics included: prior experience in dietetics, food service or health care, knowledge of program, area of interest, and age of initial interest.

Section two dealt with academic history and future academic plans. Questions included highest academic level achieved to date, plans for future academic achievement, selective admissions policies of their current program, and expected time to complete the program.

Section three covered demographic information including age, gender, ethnicity, marital status, current employment status, financial assistance and projected earnings at completion of the program. Bryk et al, have published

similar data for current DTR members of ADA (Bryk et al. 1991, 1993, 1994, 1997, 1999).

Descriptive statistics were analyzed using SPSS 9.0 (1998).

Case Study Methods

An in-depth case study of the DT program at OSU-Okmulgee was designed to compare variables of demographics and academics to results on the DTR exam. The records of all first-time test takers from pathway 1 since the inception of the program in 1991 were examined. Students in pathway 1 are defined as those who completed an approved coordinated program (ADA, 1990).

Student records were examined for the following variables: age, gender, incoming GPA, high school diploma vs. GED, core coursework GPA, overall GPA, and ACT scores. Excluded from the study were graduates that did not seek registration, non-graduates, repeat test takers, and students that did not release their scores to the program. Data were analyzed for frequencies, T-Tests and correlations using SPSS 9.0 (1998).

CHAPTER IV

DIETETIC TECHNICIANS: DEMOGRAPHIC CHARACTERISTICS AND INFLUENCES ON CAREER DECISIONS

Dietetic Technician programs are two year associate degrees offered through Commission on Accreditation/Approval for Dietetic Education (CAADE) approved programs located in community and vocational colleges. Currently, all available information about dietetic technicians comes either from practitioner surveys designed to determine job responsibilities (ADA, 1990) or from the membership data base survey conducted periodically by The American Dietetic Association (Bryk, 1999). No data is currently available characterizing dietetic technician students. In the absence of such information it is difficult to target potential students for program recruitment.

The purpose of this research was to determine those factors that influenced current DT students' decisions to pursue a career in dietetics, and to identify characteristics of academic history and socio-economic background that these students may have in common.

Methods

Seventy five DT program directors were contacted either by mail or in person at the 1998 ADA Annual Meeting and Exhibition. Participants were requested to administer surveys to an upper division core curriculum course such as clinical nutrition or food service management. Those willing to participate returned a self-addressed stamped postcard indicating the number of surveys needed. Surveys were then mailed to the program directors along with a provided stamped return envelope. Data were analyzed with descriptive statistics using SPSS 9.0 (1998).

Results and Discussion

A total of 34 programs agreed to participate and requested a total of 580 surveys to distribute; 29 programs returned a total of 336 completed surveys. The majority of the 336 respondents (88%) indicated that their interest in dietetics resulted from an interest in nutrition; fifty five percent expressed an interest in health care. These results are similar to Kobel (1997) who found 96.3% of RD students also cited an interest in nutrition as an important factor in their decision to pursue a career in dietetics. Only 18% of DT students indicated an initial interest in food service; however, 61% had prior food service experience

(Table I). The desire to "help people" was cited by 32% as a factor that attracted them to the field of dietetics. The age at which students became interested in dietetics ranged from 8 to 60 years of age; average age of interest was 24₉.

Most students learned about their DT program from the college admissions office or campus publications such as the catalog, web site or mail flyers (Table II). Forty five percent of respondents cited these sources. Kobel (1997) found that 48.3% of RD students cited the college catalog as either useful or very useful in helping them make their career decision. Other sources of information about DT programs included high school counselors, worksite information, and "from a friend". The majority of students (74%) chose the program in which they were currently enrolled because of its location and 36% chose the program because of the amount of time required to complete the program. Few geographic areas offer multiple DT programs so competing programs were most likely to be other allied health or four year programs.

When asked "What factors, if any, may delay or prevent your completion of this program" the most frequent response was problems with scheduling (22%). Other factors cited included family problems (17%), difficulty of coursework (13%), and lack of transportation (3%). It should be noted that the majority of students (57.7%) indicated that they

expected to be delayed or prevented from completing the program. This apparent high rate of anticipated delay should be of concern to DT program directors since the surveyed students were from upper division courses from which lower attrition rates would be expected.

The vast majority of respondents reported a high school diploma as the highest level of previously completed education (72%) (Table III). Fourteen percent indicated a previous associate degree; 9% held baccalaureate degrees. GED was cited by only 4% of students. A study by Schmalz et al. (1990) found previous attendance of four year institutions positively correlated with successful completion of a bachelor nursing program. Sixty nine percent of survey respondents expressed an interest in continuing their education beyond the DT degree; of those, 87% indicated they would continue in the field of nutrition. The remainder were generally divided between nursing or another allied health field. Bryk (1999) found that among practicing DTRs, 13% actually had an additional degree in progress.

Very few students indicated that they were currently receiving any financial aid in the form of welfare, food stamps, WIC or SSI (Table IV). A total of only 52 students (15%) indicated that they were receiving aid from one or more of those sources (Table XIII). A similar number

(17.7%) cited financial support from their family. However, 57% of all respondents were receiving some financial aid for tuition and/or textbook expenses. The majority of that aid came from the federal (30%) and state (19%) governments (Table V).

Most students were employed while attending school; 71% reported working an average of 28+12 hours per week. Hourly wages averaged \$8.88+3.54 per hour. When asked to estimate their starting salary as a DTR, the average salary was estimated to be \$11.22+2.84 per hour. Results from the ADA membership survey for DTRs with less than 5 years on the job indicated that the most common salary range was between \$9.61 per hour and \$12.02 per hour.

Demographic characteristics varied somewhat from those of the ADA membership survey (Bryk, 1999). Women made up 85% of our student population whereas 96% of practicing DTRs were female (Table VI). The age group younger than 24 years old was the single largest category of the students; 36% of students fell into this age bracket (Table VII). In the last ADA membership survey, only 6% of practicing DTRs were less than 25 years of age. Eighty percent of the respondents were white; 11% were black; and Hispanic, Asian and Native Americans combined for a total of 6% of the surveyed population (Table VIII). Practicing DTRs were 89% White, 6% Black with the remainder comprising a combination

of ethnic minorities similar to our survey. Oliver (1985) found that a disproportionate number of black students failed to complete an associate degree nursing program as compared to white students. The lack of ethnic and gender diversity among the DT students should be a consideration in recruitment efforts.

Thirty four percent of the students were married; 17% had children below the age of 6 (Table IX & X). Thirty five percent considered themselves as "head of the household". Findings by Oliver (1985) characterized the successful associate degree nursing student as older, attending school part time and having previously attended college. Similarly, Woodham & Taube (1986) described the student population of an associate of science nursing program as tending toward an adult learner population with the largest age category occurring between 20-24 years with a significant number of students married with dependent children. A majority required some financial aid and many were employed part-time. Among this group, grades within the program were the best predictors of completing the program and passing the credentialing exam.

Limitations

A total of 29 DT programs participated in our survey (39% participation rate). Since program directors volunteered by mail to participate, no reminder cards were sent to non-responders. Five programs failed to return surveys after agreeing to participate. The number of surveys varied among programs with a range of 2-34. Results were not weighted and therefore results from the larger programs may have reduced the significance of those from smaller programs. Sending equal numbers of surveys to all programs might limit this effect but could introduce bias by having directors select the students who participate.

Conclusions

The typical DT student that emerged from the results of our survey was an employed, older white female with a high school education. Many had food service work experience but were more likely to cite an interest in nutrition. Most discovered the DT program through information provided by the college. Program directors can use these results to target recruitment efforts toward those students most likely to be interested in dietetics and to tailor programs to better meet the needs of these non-traditional working

students. Special attention should be paid to the promotion of the programs through the college catalog since this is the most often cited source of initial interest in the programs.

The lack of ethnic and gender diversity among the DT student population should be of concern to dietetic professionals. Our student population was 17% minority compared to 11% among practicing DTs. Are minorities less likely than whites to maintain membership in ADA or are they less likely to complete the program and pass the credentialing exam? Or are minorities leaving the field of dietetics after graduation? Slightly more than half of those surveyed indicated that they may be delayed or prevented from program completion by outside factors. Is a traditional degree program preventing desirable candidates from obtaining DTR? Further research of this population is needed.

References

American Dietetic Association (ADA). Role delineation for Registered Dietitians and entry-level dietetic technicians. Chicago, IL: American Dietetic Association;1990.

Bryk JA. Report on the 1997 membership database of the ADA. J Am Diet Assoc 1999;99(1):102-107.

Oliver D. The relationship of selected admission criteria to the academic success of associate degree nursing students. J Nurs Educ 1985;24(5):197-206.

Schmalz GM, Rahr RR, Allen RM. The use of pre-admission data to predict levels of success in allied health students. Occup Therapy J Res. 1990;10(6):367-376.

Woodham RT, Taube K. Relationship of nursing program predictors and success on the NCLEX-RN examination for licensure in a selected associate degree program. J Nurs Educ 1986;25(3):112-117.

TABLE I
 PRIOR EMPLOYMENT EXPERIENCE AMONG SURVEYED DT STUDENTS
 (N=336)

Experience	N	Percent
Health care	107	31.8
Food service	205	61.0
Dietetics	57	17.0

TABLE II
 INITIAL SOURCE OF INFORMATION ABOUT DT PROGRAM FOR SURVEYED
 STUDENTS (N=333)

Source	N	Percent
High School	31	9.3
Job	28	8.4
Friend	54	16.2
College catalog	152	45.6
Other	67	20.1

TABLE III

HIGHEST EDUCATION LEVEL ATTAINED BY DT STUDENTS PRIOR TO
CURRENT ENROLLMENT
N=336

Level	N	Percent
GED	13	3.9
High School Diploma	240	72.1
Associate Degree	46	13.8
Bachelor Degree	31	9.3
Graduate Degree	3	0.9

TABLE IV

SOURCES OF FINANACIAL ASSISTANCE AMONG SURVEYED STUDENTS
N=336

Source	N	Percent
Food Stamps	17	5.4
WIC	14	4.4
AFDC	7	2.2
Welfare	5	1.6
SSI	9	2.8
Family	56	17.7

TABLE V
 SOURCES OF FINANCIAL AID FOR TUITION AND/OR BOOKS AMONG
 SURVEYED STUDENTS
 N=177

Source	N	Percent
Federal Government	101	32.4
State Government	62	19.9
Local Government	4	1.3
School	25	8.0
Family	24	7.1
Other	30	9.6

TABLE VI
 GENDER DISTRIBUTION OF SURVEYED DT STUDENTS (N=312)

Gender	N	Percent
Male	28	9.0
Female	284	91.0

TABLE VII

AGE GROUP DISTRIBUTION AMONG SURVEYED STUDENTS
N=313

Age Group	N	Percent
24 or less	120	38.3
25-30	59	18.8
31-35	34	10.9
36-40	31	9.9
41-45	35	11.2
45-50	23	7.3
50 or more	11	3.5

TABLE VIII
 ETHNIC GROUP DISTRIBUTION AMONG SURVEYED STUDENTS
 N=312

Ethnic origin	N	Percent
White	250	80.1
Black	35	11.2
Asian	10	3.2
Hispanic	6	1.9
American Indian	4	1.3
Other	7	2.2

TABLE IX
 MARITAL STATUS OF SURVEYED STUDENTS
 N=309

Status	N	Percent
Married	113	36.6
Single/Divorced/ Separated	196	63.4

TABLE X
NUMBER OF DEPENDENT CHILDREN RESIDING
WITH SURVEYED STUDENTS
N=308

Number	N	Percent
None	175	56.8
One	68	22.1
Two	45	14.6
Three	15	4.9
Four	2	0.6
Five	3	1.0

CHAPTER V

DIETETIC TECHNICIANS: ATTITUDES OF PROGRAM DIRECTORS ON SELECTED ADMISSIONS AND COMPETENCY LEVELS

Dietetic Technician programs are two year associate degrees offered nationwide through institutions that have obtained approval through the Commission on Accreditation/Approval for Dietetic Education of The American Dietetic Association (CAADE) (CAADE, 1999). Current competency levels for Dietetic Technicians Registered (DTRs) have been developed largely through the use of practitioner and employer surveys (Gilmore, Maillet, & Mitchell, 1997). These surveys have been useful in determining what tasks DTRs routinely perform and at what level they may be expected to perform them (Gilmore, Maillet, & Mitchell, 1997). Changes in health care have increased pressures for practitioners to expand their roles and assume more responsibility than once expected (Grandgenett, Gates, Henley, Hudiburg, Leonberg, Dahl, Nowlin, Smith, & Spitalnick, 1999). The result has been an expansion of the competencies and the level of performance currently expected of a DTR.

Little is known about the individuals who pursue a career as a DTR. Previous life, work and education experiences may impact an individual's current and future abilities. Financial pressures may dictate the need for

students to maintain employment while attending classes. Family obligations may limit an individual's freedom to attend classes or participate in field experiences (Richardson & King, 1998). Older students in particular may face a combination of pressures that may negatively impact their ability to complete a DT program.

Success as an entry-level DTR practitioner requires well-developed reading and writing skills (Gilmore et al. 1997). In addition, some level of competency in basic mathematics and algebra is essential. Open-admission policies of most community and technical colleges mean that students lacking in these basic skills may not be prevented from enrolling in many DT programs (Bissett, 1995). Forced attrition becomes the only method of removing candidates unable to function at the desired levels.

DT program directors are in a unique position to observe potential DT candidates. The purpose of this research was to determine the attitudes of DT program directors toward the use of selective admissions, and perceptions of the appropriateness of current levels of educational competencies, and to describe other problems and concerns facing DT programs.

Methods

A telephone survey of DT program directors was conducted in the spring semester of 1999 (Appendix A). Topics included: Selective admission policies, current competency levels, current number of students enrolled in program, criteria predictive of student success, recruitment strategies, field experience problems, student academic deficiencies, and graduate employment outlook.

The questions in the survey were derived from the results of a Delphi exercise conducted in the spring of 1998. The Delphi technique (Dalkey, 1967) consisted of a group of seven program directors recruited through e-mail addresses available in the ADA program directory of educational programs (ADA, 1998). Those willing to participate agreed to respond to three rounds of questioning. Each rounds' responses were aggregated and returned to the respondents with a new round of questions. Consensus was reached after round two which eliminated the need for a third round. The issues raised by the participants in the Delphi survey provided the groundwork for the phone survey of all DT program directors.

DT program directors were contacted by mail or in person at the 1998 ADA Annual Meeting & Exhibition. Those DT directors willing to participate were asked to sign a

provided self-addressed stamped postcard indicating their willingness to participate in the phone survey. The card contained a space for a contact phone number and preferred time for calls. A follow-up phone call was then made to set up an appointment for the actual interview.

Interviews were audiotape recorded to facilitate content analysis. All interviews were conducted by the same investigator; interview time ranged from 15-45 minutes.

The format of telephone survey was chosen in order to reduce the likelihood of non-response and allow the respondents the opportunity to express their true feelings rather than being confined to provided responses. The diversity of issues confronting DT programs in the various regions of the country made the validity of a written survey questionable.

Results were analyzed by content analysis as described by Achterberg & Shepherd (1992). Descriptive statistics were run using SPSS 9.0 (1998).

Results and Discussion

A total of 32 of 74 program directors volunteered to participate in the study. Twenty six directors were subsequently interviewed; the remainder were not able to be contacted by phone within a 60 day designated time period.

The 26 programs varied widely in size. The average number of students of all interviewed programs was 40 with a range of 5-120. Fifteen (58%) of the programs surveyed reported some type of selective admission policy beyond the basic requirement of a high school diploma or equivalent (Table XI). Among the selective admission criteria mentioned most frequently were: successful completion of all remedial or deficiency work 60.9% (n=14), high school GPA 39.1% (n=9), entrance exam (other than ACT/SAT) 21.7% (n=5), ACT/SAT 17.4% (n=4). When asked if selective admission policies were beneficial to reduce attrition in a DT program, 76.9% (n=20) said yes.

Incoming students were most likely reported to be deficient in math skills (n=24), writing skills (n=20), science (n=16), computer skills (n=12), reading skills (n=11), and verbal skills (n=9). Cited less often were maturity, study skills, listening skills and time management (Table XII).

The majority of respondents (n=24) indicated that they experienced some problems in maintaining adequate numbers of students; directors frequently noted that selective admission policies would be beneficial (n=20) but "would kill the program". Other program directors noted that selective admissions would "restrict qualified candidates"

or the philosophy of their program is "to be accessible to anyone...lots of housewives turn out to be good students".

When asked to suggest factors most predictive of a student's success, the following were cited most often: general academic abilities (n=12), motivation (n=10), older age (n=8), program GPA (n=7), and knowledge of profession (n=6) (Table XIII). Other predictors cited included English as a Second Language (ESL), work experience, high school GPA, clinical skills, reading skills, and ACT scores. Although ACT scores were considered predictive by only one program director, it is one of the most often cited predictors in the literature (Weitzman, 1982; Slack & Porter, 1980; McKinney et al. 1988; Jensen, 1989).

When asked to cite factors that would reduce student failure, remedial strategies predominated the answers (Table XIV). Among the suggestions were to improve skills in reading (n=5), English (n=3), math (n=7), and test-taking (n=6). Steps suggested by individual programs included raising admission standards, providing mentors, and scheduling more flexible course offerings.

Rural areas tended to have more problems providing adequate field experiences. Urban areas reported more problems with ESL. The most often cited need of individual programs was for additional teaching staff. The biggest

frustration was the failure of the dietetics profession to fully recognize and utilize DTRs' maximum potential.

The majority of programs (n=25) incorporated field experience with classroom teaching over several semesters. Only one program reported a single semester field experience after all classroom work was completed. Most programs used volunteer RDs, DTRs and Certified Dietary Managers (CDM) as preceptors (Table XV). Three programs reported that they paid RD preceptors to supervise their students. Directors were divided on the difficulty of placing students in appropriate field sites; 14 directors reported some difficulty in student placement. Among the problems cited were: reorganization of health care (n=2), competition with RD students (n=4), limited staff (n=8), preceptor turnover (n=2), and limits of one student per facility (n=7) (Table XVI). Overall, program directors tended to report similar problems.

Educational competencies

Responses about the current competencies included foundation knowledge and skills for program graduates as well as core competencies for graduates of supervised practice. The current competency levels were viewed as "about right" by 19 of the 25 respondents. Five felt the levels were "too high"; one did not have an opinion.

Even though the majority of program directors felt that the competency levels were appropriate, many mentioned individual competencies with which they had concerns (Table XVII). Eleven directors were concerned about the change from "knowledge" to "application" in the terminology of the new competency statements. Of the specific competencies, the one mentioned most often (n=12) dealt with multi-skilling and the problems associated with providing the educational experience (DT. 39). Calculation of enteral and parenteral feedings (F. 3.5) and recommendations for enteral feedings (DT. 35) were also frequently cited as either beyond the range of students' capabilities or beyond the range of job expectancies within that geographical region. A small number of respondents had general problems meeting community competencies (DT. 40, 41, 44, and 45) due to a lack of appropriate facilities for field experience. Food service competencies mentioned most often included those requiring the students to "demonstrate" and equipment selection and layout (DT. 20 & 21).

Program directors were more equally divided on the question of whether the competencies could be adequately covered in a two-year program. More than half (n=14) agreed that two years was adequate time; 42% (n=11) felt this was not enough time. Most directors indicated that few of their students completed the program within two years. Mean

estimated time to complete the program was 2.8 ± 0.6 years. Directors estimated that 88% of students worked at least part-time while in school.

Recruitment efforts

Eighty nine percent (n=23) of directors surveyed reported active recruitment of new students. Equally often cited sources of new students were high schools and referrals from the college admissions office (n=16) (Table XVIII). Other successful recruitment sources mentioned were long-term care facilities, hospitals, recruitment fairs, open houses, and introductory nutrition courses. The average age of students was perceived to be related to the source of the recruitment effort; those programs with an older population tended to draw from hospitals or long-term care and those with younger students found high schools to be a better source of new students.

Attracting and retaining high quality students was a concern for many programs (n=8). A notable exception occurred in one state where DTRs are licensed. In this situation, the director reported routinely having twice as many applicants as the program could accommodate. This was clearly the exception.

Most directors predicted adequate employment opportunities for graduates. Projections from the Bureau of Labor Statistics estimated a 26% increase in demand for dietitian/nutritionist positions between 1994-2005 (Kornblum, 1998). Demand for DTRs is assumed to follow the same trend. In general, the DT graduates that had trouble finding employment tended to be location-bound. Estimated salaries varied geographically; mean salary was \$10.95 \pm 1.45 per hour with a range of \$7.69-\$13.50. Practitioner surveys have indicated that the most frequent salary range for entry-level DTR with less than 5 years experience ranged from \$9.61-12.01 per hour (Bryk, 1999).

Limitations

Most directors had not implemented the new competency statements at the time of the interview and therefore had difficulty in citing specific competency statements with which they had concerns. Many of the cited problems with their programs were related to their individual situation and therefore not generalizable to the entire group. In addition, responses were limited to perceptions of program directors and did not include the opinions of other staff, students or administrators.

Conclusions

Program directors tended to believe that selective admissions would benefit DT programs by reducing the numbers of non-successful students; however, the majority also felt that selective admissions would make it difficult to maintain adequate numbers of students in their programs. Most directors were comfortable with the current competencies although they cited problems with implementation. Geographical location tended to separate program directors perceptions of problems. Programs located in rural areas were more likely to experience difficulty in recruiting and retaining good students and were more likely to experience difficulty with field experience placement. Urban area directors were more likely to cite problems with ESL. There was a strong sense of frustration among many directors that DTs were not being fully utilized. Education of RDs as well as other health professionals of the functions of the DTR is necessary to increase demand. Current competencies are designed to train DTRs to be highly competent professionals. Future research should focus on ways to increase utilization of DTRs to their full potential

thereby increasing the demand for their services within the profession.

References

Achterberg CL, Shepherd SK. The components and use of qualitative research. In Monsen ER (ED.), Research: Successful approaches (pp. 82-100) 1992, Chicago IL: The American Dietetic Association.

American Dietetic Association. Directory of Dietetics Programs 1998-1999. Chicago, IL: American Dietetic Association, 1998.

American Dietetic Association (ADA). The professional development 2001 portfolio. J Am Diet Assoc, 1999;99(5):612-614.

Bissett HG. Selective admissions in community college nursing programs: Ethical considerations. Commun Coll Rev 1995;22:35-47.

Bryk JA. Report on the 1997 membership database of the ADA. J Am Diet Assoc 1999;99(1):102-107.

Dalkey NC; Delphi. Rand Corporation, 1967

Gilmore CJ, Maillet JO, Mitchell BE. Determining educational preparation based on job competencies of entry-level dietetics practitioners. J Am Diet Assoc 1997;97(3):306-316.

Grandgenett RS, Gates GE, Henley EC, Hudiburg JR, Leonberg B, Dahl L, Nowlin BJ, Smith ER. The professional development 2001 portfolio. J Am Diet Assoc 1999;99(5):612-614.

Jensen S. Predictors of success for allied health students. J Studies in Technical Careers 1989;11(4):297-304.

Kornblum TH. Professional demand for dietitians and nutritionists in the year 2005. J Am Diet Assoc 1998;98:589-590

McKinney J, Small S, O'Dell N, Coonrod BA. Identification of predictors of success for the NCLEX and students at risk for NCLEX failure in a baccalaureate nursing program. J of Prof Nurs 1988;4(1):55-59.

Richardson JTE, King E. Adult students in higher education: Burden or boon? J Higher Educ 1998;69(1):65-89.

Slack WV, Porter D. The Scholastic Aptitude test: A critical appraisal. Harvard Educ Rev 1980;50(2):154-175.

Weitzman R. The prediction of college achievement by the Scholastic Aptitude Test and the high school record. J of Educ Measure 1982;19(3):179-199.

TABLE XI

PERCENTAGES OF DT PROGRAMS WITH SELECTIVE ADMISSIONS
CRITERIA
(N=26)

Criteria	N	Percent
ACT/SAT	4	17.4
High School GPA	9	39.1
Entrance Exam	5	21.7
Completion of Remedial work	14	60.9

TABLE XII

SKILLS MOST LIKELY TO BE DEFICIENT AMONG INCOMING DT
STUDENTS

Skills	N	Percent
Math	24	92.3
Writing	20	76.9
Science	16	61.5
Computer	12	46.2
Reading	11	42.3
Verbal	9	34.6
Listening	6	23.1
English	3	11.5
Time management	3	11.5

TABLE XIII

VARIABLES CONSIDERED TO BE PREDICTIVE OF STUDENT SUCCESS

VARIABLE	N	Percent
General Academic Abilities	12	46.2
Motivation	10	38.5
Age	8	30.8
Grades in Program	7	26.9
Knowledge of Profession	6	23.1
High School GPA	4	15.4
ACT	1	3.8

TABLE XIV

METHODS SUGGESTED BY DT PROGRAM DIRECTORS TO REDUCE STUDENT FAILURE

Method	N	Percent
Improve math skills	7	26.9
Provide mentors	7	26.9
Improve test taking skills	6	23.1
Raise program GPA	6	23.1
Improve reading skills	5	19.2
Raise admission standards	4	15.4

TABLE XV

TYPES OF PRECEPTORS USED BY DT PROGRAM DIRECTORS
FOR STUDENT FIELD EXPERIENCES

Source	N	Percent
Volunteer RD	19	73.1
DTR	16	61.5
CDM	14	53.8
Full-time faculty	4	15.4
Adjunct faculty	4	15.4
Paid RD	3	11.5

TABLE XVI

REASONS FOR DIFFICULTY IN PLACING DT STUDENTS IN FIELD
EXPERIENCES AS CITED BY DT PROGRAM DIRECTORS

Reason	N	Percent
Limited staff	8	32.0
Limited slots	7	28.0
Competition with RD students	4	16.0
Reorganization in health care	2	8.0

TABLE XVII
 COMPETENCY STATEMENTS MOST FREQUENTLY CITED
 AS CAUSE FOR CONCERN AMONG DT PROGRAM DIRECTORS

Competency Number	N	Percent
Conduct general health assessment	12	46.2
Participate in selection, monitoring, and evaluation of standard enteral nutrition regimens	6	23.1
Participate in development of departmental budget/operating plan	4	15.4
Collect and process financial data (perform)	4	15.4
Participate in legislative and public policy processes	3	12.0
Supervise organizational unit including financial, human, physical, and material resources and services	3	12.0
Participate in facility management including equipment selection and design/redesign of work units	2	7.7

TABLE XVIII

PROGRAM DIRECTORS STRATEGIES FOR STUDENT RECRUITMENT

Source	N	Percent
High School	16	66.7
Within the college	16	66.7
Recruitment fairs	10	41.7
Long term care facilities	9	37.5
Hospital staffs	9	37.5
Mailings	6	25.0
Dietary Manager Program	5	20.8
Introductory Nutrition course	5	20.8

CHAPTER VI

CORRELATES OF SUCCESS ON DTR CREDENTIALING EXAMINATION: A CASE STUDY

Ultimately, the success of DT students is measured by their ability to complete the academic program and pass the credentialing exam. High attrition rates represent a waste of valuable resources and time for both the program and the student. Limited spaces for field training mean that the unsuccessful student has excluded potentially successful students for whom the space was not available.

As an associate degree, most DT programs are found on the campuses of community and technical colleges (ADA 1999). The open-admission policies of many of these institutions dictate that students cannot be denied admission based on previous academic records or entrance exam scores (Bissett, 1995). Predicting a student's chance of success upon entering a program is difficult at best. Use of previous GPA may not accurately reflect an individual's current capabilities; use of standardized tests such as ACT or SAT have been criticized for bias against minority students (Goldman & Widawski, 1976). Prior work experience may enhance practitioner skills but be of little benefit academically. Reliance on high school GPA may be unnecessarily restrictive to older students who may now have

the maturity and motivation necessary to excel in the associate degree program (Dittus & Wise, 1994).

A case study was conducted at a DT program located on the campus of a two-year technical college in a rural area in the Midwest. The purpose of the study was to determine what student characteristics, if any, might relate to success or failure on the DTR exam.

Methods

Data were collected on only those students who successfully completed the academic program and subsequently sat for the credentialing exam. The records of all first-time test takers from pathway 1 since the inception of the program in 1991 were studied. Pathway 1 graduates are those who complete both the coursework and field experience from an approved coordinated program (ADA, 1990). Excluded from the study were graduates who did not seek registration, students who did not graduate, repeat test takers, and students who did not release their scores to the program.

Records were examined for the following student characteristics: age at completion, gender, ethnic origin, high school GPA, ACT scores, high school diploma or GED, core coursework GPA, and overall GPA. These data were compared to the outcomes of domain and cumulative scores on

the DTR examination. Descriptive statistics were run on variables of age, race, previous education, and pass rate on the DTR examination. Student's t-tests were used to determine differences in cumulative GPA, all ACT scores, and domain and cumulative scores on the DTR examination between ethnic background, previous education level, gender and pass/fail on the DTR examination. Spearman correlations were used to examine relationships among cumulative GPA, ACT scores and domain and cumulative scores on the DTR examination. All data were processed using SPSS 9.0.(1998)

Results and Discussion

Data were collected on a total of 34 students. Demographic characteristics indicated a largely white, older female student population. Females comprised 82.4% (n=28) of the survey population. Average age was 35.3 \pm 11.5 within a range of 20 to 61 years. The majority of the students were non-Hispanic Whites (76.5%, n=26), followed by 11.8% Blacks (n=4), 8.8% Native Americans (n=3), and one Asian. The majority of the students (88.2%, n=30) completed high school. These findings differ somewhat from the findings of the ADA membership database of practicing DTRs. Among that population, women comprised 95.8%; 88.5% were

non-Hispanic whites. Native Americans accounted for only 0.2% of the national average of DTRs (Bryk, 1999).

ACT scores were available for 68% (n=23) of the case study students. The average composite score was 16.8 ± 4.0 . All ACT domain and composite scores were positively correlated with composite scores on the DTR exam (Table XIX). Scores for ACT natural sciences and social studies were positively correlated with DTR test domains of nutrition services, foodservice systems and management and standards; ACT English scores correlated with nutrition services and foodservice systems; ACT math scores correlated with DTR composite scores only. No ACT scores correlated significantly with scores in the Education and Communication domain (Table XX). These results are similar to Jensen (1989) who found that national board scores in three allied health fields were best predicted by high school GPA, ACT math and ACT composite scores. Woodham & Taube (1986) found nursing course grades and SAT verbal scores to be the best predictors of registration examination success among associate degree nursing students.

Cumulative GPA was significantly different between students who passed or failed the DTR exam. Student's T-test showed that students who passed the registration examination (scored 25 or higher) had significantly ($p < 0.02$) higher cumulative GPA (3.38 ± 0.49) than those who failed

(scored below 25) (2.94 ± 0.54). Tompkins & Harkins (1990) found a similar relationship between program GPA and performance on the credentialing exam for respiratory therapy students. Cumulative GPA in the case study students was found to be positively correlated with age ($p < 0.008$). This finding is in agreement with Jensen (1989) who found age and high school GPA to be the best predictors of cumulative college GPA. However, Woodham & Taube (1986) found age and high school class rank to be non-significant predictors of registration examination pass rate among associate degree nursing students.

Significant differences in composite scores on the DTR credentialing exam were noted for whites and non-whites for 27 students who took the exam between 1990 and 1994 (Table XXI). Minority students had significantly lower ($p < 0.02$) mean scores (19.25 ± 6.23) when compared to white students (26.08 ± 7.08). Individual domain scores were also significantly lower in the non-white students; scores in nutritional services (14.67 ± 13.29) and education/communication (18.33 ± 25.46) were significantly lower than those of the white students (37.48 ± 25.7) and (50.48 ± 22.97) (respectively). Yocum & Scherubel (1985) also reported a significant association between race and scores on the State Board Test Pool Examination (SBE) for registered nurses. It should be noted that while minority

students accounted for 24% of the study population, the actual number of subjects was small (n=8).

Conclusions and Limitations

Results of this case study are similar to findings of other research in allied health fields (Tompkins & Harkins, 1990; Jensen, 1989; Yocum & Scherubel, 1985; McKinney et al. 1988). DT students at this program were most likely to be non-Hispanic White, older females. Students with higher scores on ACT exams and/or those with higher cumulative GPA were more likely to pass the DTR credentialing exam. Older students tended to have higher cumulative GPA than younger students, however there was no significant relationship between age and DTR exam scores. Minority students scored lower on the composite score of the DTR exam. Program directors can use this information to target students with potential difficulty and implement strategies to overcome academic weaknesses.

While some results of this study are similar to findings of other research, the unique characteristics of this DT program may limit any generalizability of these results to other DT programs. This program is located in a Midwestern state in a rural area with a high illiteracy rate. A large Native American population provides an ethnic

diversity found in few other areas of the US. In addition, the field experience occurs entirely within the final semester and generally requires the student to travel between 20-40 miles each way each day, thereby restricting the ability of students with limited financial means or transportation to complete the program. These factors may contribute to a skewed population sample, not representative of other DT programs or DT students in other locations.

The study population was limited to those students who successfully completed the academic program and field experience and subsequently sat for the registration exam. The result was a restriction of range which may have dramatically altered the results from a larger population. Future research should attempt to determine what factors prevent eligible candidates from sitting for the DTR examination. In addition, broader based research designed to examine the correlates of success on the DTR examination would be of benefit to program directors both for recruitment and to identify students at-risk for failure.

References

American Dietetic Association (ADA). Role delineation for Registered Dietitians and entry-level dietetic technicians. Chicago, IL: American Dietetic Association;1990.

Bissett HG. Selective admissions in community college nursing programs: Ethical considerations. Commun Coll Rev 1995;22:35-47.

Bryk JA. Report on the 1997 membership database of the ADA. J Am Diet Assoc 1999;99(1):102-107.

Dittus KL, Wise KJ. Criteria that predict dietetics success. J Am Diet Assoc 1994;94(2):150.

Goldman RD, Widawski MH. An analysis of types of errors in the selection of minority college students. J Educ Measure 1976;13:185-200.

Jensen S. Predictors of success for allied health students. J Stud Tech Careers 1989;11(4):297-304.

McKinney J, Small S, O'Dell N, Coonrod BA. Identification of predictors of success for the NCLEX and students at risk for NCLEX failure in a baccalaureate nursing program. J Prof Nurs 1988;4(1):55-59.

Tompkins LS, Harkins CJ. Predicting academic success in a nontraditional program. J Allied Health 1990;19(1):15-24.

Woodham RT, Taube K. Relationship of nursing program predictors and success on the NCLEX-RN examination for licensure in a selected associate degree program. J Nurs Educ 1986;25(3):112-117.

Yocum CJ, Scherubel JC. Selected pre-admission and academic correlates of success on State Board Examinations. J Nurs Educ 1985;24(6):244-249.

TABLE XIX

ACT SCORES OF DT STUDENTS PASSING DTR EXAM (N=16)
VS FAILING (N=7)

Domain	Pass	Fail	p
Natural Science	18.31 \pm 3.50	13.43 \pm 4.50	0.01**
Social Studies	18.44 \pm 8.97	14.71 \pm 5.22	0.32
Math	15.81 \pm 2.10	14.50 \pm 5.36	0.41
English	17.69 \pm 4.01	13.29 \pm 4.50	0.03*
Composite	17.63 \pm 4.44	15.14 \pm 2.12	0.17

Scores reported as means \pm standard deviations

* p<.05

** p<.01

TABLE XX

ACT AND DTR DOMAIN SCORES OF WHITE (N=18)
VS NON-WHITE (N=5) DT STUDENTS

Domain score	White	Non-white	p value
ACT English	16.89 ± 4.98	14.40 ± 1.67	.291
ACT Math	15.22 ± 3.00	16.50 ± 4.43	.486
ACT Social Studies	19.11 ± 7.76	10.80 ± 6.02	.039
ACT Natural Sciences	17.78 ± 4.12	13.40 ± 3.78	.045*
ACT Composite	17.67 ± 4.13	14.00 ± 1.58	.069
DTR Nutrition Services	37.48 ± 25.70	14.67 ± 13.29	.048*
DTR Foodservice Systems	43.67 ± 33.14	17.67 ± 15.11	.058
DTR Management	42.00 ± 28.35	18.33 ± 14.67	.062
DTR Education/ Communication	50.48 ± 22.97	18.83 ± 25.46	.027*
DTR Composite	26.08 ± 7.08	19.25 ± 6.23	.021*

Scores reported as means ± standard deviations

*p<.05

TABLE XXI
CORRELATION COEFFICIENTS BETWEEN ACT DOMAIN SCORES
AND DTR DOMAIN SCORES

DTR Domain	English	Math	Social Sciences	Natural Sciences	Composite Score
Nutrition Services	.005**	.104	.004**	.004**	.009**
Food Service Systems	.007**	.099	.002**	.000**	.000**
Management and Standards	.051	.413	.004**	.001**	.025*
Education and Communication	.243	.899	.058	.057	.222
Composite	.004**	.036*	.002**	.000**	.001**

* $p < .05$
** $p < .01$

CHAPTER VII

CONCLUSIONS AND IMPLICATIONS

An interest in nutrition was the overwhelming factor cited by students which influenced the decision to pursue dietetics as a career. This information should be of use in recruiting students to DT programs and may provide opportunities in non-traditional settings to reach potential candidates. This finding was supported by several program directors who found that the basic nutrition course was an excellent recruiting forum for their programs.

Characteristics of dietetic technician students in this study varied from the profile developed by the ADA membership survey. The student population consisted of a higher percentage of both minorities and men. Perhaps the student population characteristics were more similar to that of DTRs in general than to those who chose to maintain membership in ADA. Conversely it may be that the attrition rates were higher among men and minorities resulting in their under-representation in the practitioner population. The data from the case study indicated that the minority students tended to score lower on the DTR exam than did white students but it is not possible to generalize those results to the entire DTR population.

What cannot be accounted for among these results were the overall attrition rates nationwide and the waste of resources associated with it. Results from the student survey indicated that the main reason for delay or inability to complete the program was time conflicts. The scheduling conflicts that occur with field experience requirements and outside employment and/or family responsibilities may force students to choose between finishing the program or maintaining employment. Practitioner salaries of \$25,000 annually may make the prospect of giving up current employment for future rewards untenable. Anticipated starting salaries as a DT tended to be only slightly higher than the current salaries of the employed students. Results from the program directors survey indicated that few programs tailored their class offerings or field experiences to accommodate working student schedules.

The numbers of students participating in the student survey was far greater than the number which actually sit for the credentialing examination each year. Factors which affect a students decision to take the examination remain unknown. Are those students who forgo the credentialing examination practicing within the field of dietetics? If so, why do they choose not to become credentialed? Is the cost of the exam prohibitive? These questions remain to be explored by future research.

Program directors tended to believe that selective admissions would be beneficial although most acknowledged that implementation of selective admissions would adversely affect their ability to attract adequate numbers of students. There was little commonality to the restrictions imposed by programs nationwide. Some programs allowed open access to students with only a GED or high school diploma. Most directors felt that the curriculum was sufficiently difficult to weed out those less likely to succeed. Future research should examine ways to increase the demand for DTRs nationwide. Increases in demand would increase enrollment and thereby reduce the pressures to maintain adequate enrollment.

Most program directors were comfortable with the current competency statements. Many expressed the opinion that the vague wording allowed for multiple interpretations as to the meaning and level of achievement required. Most acknowledged a lack of familiarity with the new competencies which prevented them from making objective assessments of their ability to successfully integrate and implement them within the curriculum. Future research should reinvestigate the current level of competencies after they have been fully implemented.

The results of the case study paralleled those found in the literature. In general, those students with higher GPA

and higher ACT scores were more likely to pass the DTR examination. In addition, minority students were more likely to fail the registration examination than were white students. The small number of students in the survey make these results difficult to generalize. Although the restricted range of the sample may also limit the generalizability of the results, it should be noted that all students who sat for the credentialing exam were included and if passing the examination is the ultimate measure of success, such restriction of range is mandatory.

Much research remains to be done to fully understand the needs of this student population. Efforts by CAADE to raise standards of practice and levels of function must not ignore the impact that those changes may make on DT programs and their students.

REFERENCES

Achterberg CL, Shepherd SK. The components and use of qualitative research. In Monsen ER (ED.), Research: Successful Approaches, Chicago IL: The American Dietetic Association pp. 82-100, 1992.

American Dietetic Association (ADA). Essentials of an acceptable program of dietetic technician education. Revised. Chicago IL: American Dietetic Association 1971.

American Dietetic Association (ADA). Position paper on the dietetic technician and the dietetic assistant. J Am Diet Assoc, 1975;67:246-247.

American Dietetic Association (ADA). Position paper on clinical dietetics. J Am Diet Assoc, 1982;80,3:256-260.

American Dietetic Association (ADA). Role delineation for Registered Dietitians and entry-level dietetic technicians. Chicago, IL: American Dietetic Association;1990.

American Dietetic Association. Directory of Dietetic Programs 1999-2000. Chicago, IL: American Dietetic Association, 1999.

Appel GL, Sippel CL, Von Kuster TW. (1977). Evaluating dietetic technician training programs: Labor market conditions and curriculum relevance. J Am Diet Assoc 1970;70:287-289.

Arkwright MS, Collins ME, Sharp JL, Yakel RM. Titles, definitions, and responsibilities for the profession of dietetics. J Am Diet Assoc 1974;64:661-665.

Baird SC, Armstrong RV. The ADA role delineation for the field of clinical dietetics. J Am Diet Assoc 1981;78:370-382.

Bissett HG. Selective admissions in community college nursing programs: Ethical considerations. Comm Coll Rev 1995;22:35-47.

Bryk JA. Report on the 1990 membership database of the ADA. J Am Diet Assoc 1991;91(9):1136-1141.

Bryk JA. Report on the 1993 Membership database of the ADA. J Am Diet Assoc 1994;94(12):1433-1438.

Bryk JA. Report on the 1995 membership database of the ADA. J Am Diet Assoc 1997;97(2):197-203.

Bryk JA. Report on the 1997 membership database of the ADA. J Am Diet Assoc 1999;99(1):102-107.

Clemen S. (1974). A model for educating supportive personnel: the dietetic technician, J Am Diet Assoc 1974; 64:401-405.

Dalkey NC; Delphi. Rand Corporation, 1967

Dittus KL, Wise KJ. Criteria that predict dietetics success. J Am Diet Assoc 1994;94(2):150.

Doherty E. (1973). Educating the dietetic technician. J Am Diet Assoc 1973;62:421-424.

Ely EE. The Non-Traditional student. Paper presented at the American Association of Community Colleges Annual Conference; Anaheim, CA., April 15, 1997;

Goldman RD, Widawski MH. An analysis of types of errors in the selection of minority college students. J Educ Measure 1976;13:185-200.

Gilmore CJ, Maillet JO, Mitchell BE. Determining educational preparation based on job competencies of entry-level dietetics practitioners. J Am Diet Assoc 1997;97(3):306-316.

Grandgenett RS, Gates GE, Henley EC, Hudiburg JR, Leonberg B, Dahl L, Nowlin BJ, Smith ER. The professional development 2001 portfolio. J Am Diet Assoc 1999;99(5):612-614.

Hanson MN, Fruin MF. Validity of selection criteria for a coordinated undergraduate program. J Am Diet Assoc 1988;84(8):915-919.

Hill LL, Taylor C, Stacy JE. Is there a correlation between attrition in nursing schools and job turnover in professional nursing? Nurs Outlook 1963;11(9):666-669.

Hoadley PK, Vaden AG, Spears MC. Role differentiation of dietitians and dietetic technicians. J Am Diet Assoc 1981;79:145-153.

Howard VA, Schiller R. (1977). Competency-based education in a career mobility program in dietetics. J Am Diet Assoc 1977;71:428-431.

Jensen S. Predictors of success for allied health students. J of Stud Tech Careers 1989;11(4):297-304.

Kane, MT, Cohen AS, Smith ER, Lewis C, Reidy C. 1995 Commission on Dietetic Registration Dietetics Practice audit. J Am Diet Assoc 1996;96(12):1292-1301.

Kobel K (1997). Influences on the selection of dietetics as a career. J Am Diet Assoc 1997;97(3):254-257.

Kornblum TH. Professional demand for dietitians and nutritionists in the year 2005. J Am Diet Assoc 1998;98:589-590

Light I. Challenging perceptions of the health team members. J Am Diet Assoc 1971;59:13-17.

Malarkey L. The older student-stress or success on campus. J of Nurs Educ 1979;18(2):15-19.

McKinney J, Small S, O'Dell N, Coonrod BA. Identification of predictors of success for the NCLEX and students at risk for NCLEX failure in a baccalaureate nursing program. J Prof Nurs 1988;4(1):55-59.

Oliver D. The relationship of selected admission criteria to the academic success of associate degree nursing students. J Nurs Educ 1985;24(5):197-206.

Piper G. Dietetic manpower trends in education and training. J Am Diet Assoc 1970;57:225-228.

Poorman S, Martin EJ. (1991). The role of nonacademic variables in passing the National Council Licensure Examination. J of Pro Nurs 1991;7(1):25-32.

Pope J, Gines DJ. Correlates of success of graduates of a coordinated undergraduate program. J Am Diet Assoc 1986;86(8):1022-1027.

Richardson JTE, King E. Adult students in higher education: Burden or boon? Journal of Higher Education 1998; 69(1):65-89.

Rowland HA. The Nurses' Almanac. New York: Aspen Systems 1978.

Schiller R. (1977) A career mobility program in dietetics. J Am Diet Assoc 1977;71:269-273.

Schmalz GM, Rahr RR, Allen RM. The use of pre-admission data to predict levels of success in allied health students. Occup Therapy J Res. 1990;10(6):367-376.

Slack WV, Porter D. The Scholastic Aptitude test: A critical appraisal. Harvard Educ Rev 1980;50(2):154-175.

Stronck D. Predicting student performance from college admission criteria. Nurs Outlook 1979;27:604-607.

Thieman T, Marsh-Williams P. Prediction of academic performance of adult women in a weekend college program. J College Person 1984;25:260-264.

Tompkins LS, Harkins CJ. Predicting academic success in a nontraditional program. J Allied Health 1990;19(1):15-24.

Tower JB, Cassell JA, Dowling RA, Groeschen SM, Scialabba MA. Commentary on the role delineation study. J Am Diet Assoc 1991;91:1122-1123.

Weitzman R. The prediction of college achievement by the Scholastic Aptitude Test and the high school record. J Educ Measure 1982;19(3):179-191.

Williams C. Dietetic assistant/technician education. J Am Diet Assoc 1977;70:621-623.

Wood O. Using role delineation data to design dietetics education curriculums. J Am Diet Assoc 1993;93(8):907-908.

Woodham RT, Taube K. Relationship of nursing program predictors and success on the NCLEX-RN examination for licensure in a selected associate degree program. J Nurs Educ 1986;25(3):112-117.

Yocum CJ, Scherubel JC. Selected pre-admission and academic correlates of success on State Board Examinations. J Nurs Educ 1985;24(6):244-249.

APPENDIX A

Survey of DT program directors: Attitudes concerning selective admissions and current competencies

Does your program currently employ a selective admission policy? yes no
Defined as any entrance requirement beyond a HS diploma or GED.

If yes, which of the following apply: HS diploma
 ACT SAT GPA entrance exam referral
 other (please specify)

Do you feel that selective admissions are beneficial to a DT program? yes no

Why or why not?

Do you experience difficulty in maintaining adequate numbers of students? yes no

How do selective admissions affect your quotas? increase
 decrease

How many students are currently enrolled in your program?
Would you implement selective admissions if allowed by your institution? yes no

What type of criteria do you consider the most predictive of student success?

Why?

What percentage of your students do you estimate will either not complete the program or be unable to pass the credentialing exam?

What measures do you think would be necessary to reduce your rate of non-success?

Does your program actively recruit students? yes no
From what sources?

What is your most successful recruitment strategy?

Do you feel that the new competency levels for DT programs are: Too high, about right, too low, don't know

Are there specific competencies with which you have concerns? ___yes ___no If so, which ones

Do you feel that the current level of competencies can be reasonably covered within a two year program? ___yes ___no

Do you feel that the current competencies are adequately defined? ___yes ___no

What type of field experience does your program currently offer?

Internship, CUPS, other

Who do you use for preceptors?

Do you experience difficulty in placing students in field experience? If yes, Why?

Do your students receive adequate training to meet competencies in the field experience? ___yes ___no

Our incoming students are most likely to be deficient in:
___math ___science ___verbal ___written ___listening
___reading ___computer ___other please specify Check
all that apply.

What do you estimate is the average amount of time required for a student to complete your program?

What percentage of your students do you estimate receive financial assistance?

What percentage work?

What is the average starting salary in your area?

Are there any steps that CAADE or ADA could take which would help to improve your attrition rate? ___yes ___no If so, what?

If I could change one thing about my program it would be _____.

APPENDIX B

Dietetic Technician Student Survey

Instructions: please mark the appropriate response(s) in either pencil or ink.

Section one: Interest in dietetics:

Do you have any prior experience in : _____ 1 health care
(Check all that apply) _____ 2 food service
_____ 3 dietetics

How did you learn about the DT program? _____ 1 High School
_____ 2 Job
_____ 3 Friend
_____ 4 Other (please specify) _____

What about the field of dietetics first attracted your interest?
_____ 1 Interest in nutrition
_____ 2 Interest in food service
_____ 3 Part time opportunity
_____ 4 Health care
_____ 5 Helping people
_____ 6 Other (please specify) _____

At what age did you initially become interested in dietetics? _____

Why did you choose the DT program in which you are currently enrolled?
_____ 1 Location
_____ 2 Financial Aid
_____ 3 Time required to complete the program
_____ 4 Other (please specify) _____

What factors, if any, may delay or prevent your completion of this program?
_____ 1 Financial
_____ 2 Family problems
_____ 3 Lack of transportation
_____ 4 Difficulty of courses
_____ 5 Other (please specify) _____

Section two: Academics

Previous education: Mark the highest level completed: _____ 1 GED
_____ 2 High school diploma _____ 3 Associate degree _____ 4 Bachelor's degree _____ 5 Graduate degree
Do you plan to continue in school beyond the degree you are currently seeking? _____ 1 Yes _____ 2 No
If yes, in what field? _____

Does the program in which you are currently enrolled have any restrictions for admission ? (For example, did you have to achieve a certain score on the ACT or SAT to be admitted to the program?)
_____ 1 Yes, please explain _____
_____ 2 No

When did you first enroll in this program? _____ (month/year)

When do you expect to graduate? _____ (month/year)

Section three: Demographics

Are you currently working? _____ 1 Yes How many hours per week? _____
_____ 2 No

What is your current salary? \$ _____ (per hour)

What do you think your starting salary as a DTR will be? \$ _____ (per hour)

Do you currently receive assistance from any of the following sources? Check all that apply.

- _____ 1 Food stamps
- _____ 2 WIC
- _____ 3 AFDC
- _____ 4 Welfare
- _____ 5 SSI
- _____ 6 Family
- _____ 7 Other (please specify) _____

Do you currently receive any financial assistance for tuition and/or books? _____ 1 Yes
_____ 2 No

If you answered yes to the last question, is that assistance from:

- _____ 1 Federal government
- _____ 2 State government
- _____ 3 Local government
- _____ 4 School
- _____ 5 Family
- _____ 6 Other (please specify) _____

Gender: _____ 1 Male
_____ 2 Female

Age: _____ <25
_____ 25-30
_____ 31-35
_____ 36-40
_____ 41-45
_____ 45-50
_____ >50

Ethnic origin: _____ 1 White
_____ 2 Hispanic
_____ 3 Black
_____ 4 Asian
_____ 5 American Indian
_____ 6 Other

Marital status: _____ 1 married
_____ 2 single / separated / divorced

Are you considered the head of the household? _____ 1 Yes
_____ 2 No

How many adults (over 18) currently live in your household? _____

How many dependent children (under age 18) live with you? _____ How many dependent children below the age of six live with you? _____

APPENDIX C

SURVEY CONSENT FORM

I am willing to participate in the Dietetic Technician
Program Directors' Survey. I prefer to be contacted at

_____ (phone number) during the hours of _____.

I will need _____ surveys to distribute to my students.

_____ (Signature)

Please print your name and contact address below:

I wish to receive a composite of the survey results.

Yes / No (circle one)

APPENDIX D

Dear Program Director

I am an instructor with the Dietetic Technology program at Oklahoma State University-Okmulgee and I am currently working on my Doctorate degree in Nutritional Sciences. I am asking for your participation in a Delphi technique. The Delphi acts essentially as a focus group without bringing the participants together. The information gathered in this survey will be used to build a larger survey planned for all DT program directors this fall. Your responses will remain anonymous. Your program was one of a small number of programs chosen for the Delphi technique based on your geographic location, size of program, and entrance requirements. At the completion of the survey, you will be provided with the overall results. If you have questions or comments, please feel free to contact us by phone or e-mail.

Thank you for your participation.

Sincerely yours,

Sharon Bode MS, RD
skbode@worldnet.att.net
(918)-749-1792

Gail Gates PhD, RD
ggates@okway.okstate.edu
(405)-372-5506

Purpose

The new competency levels for DTR have been determined largely through the use of practitioner and employer surveys. Little data is available concerning the individuals who pursue a career as a DTR. Previous life, work and education experiences necessarily impact an individual's current and future abilities. As a program director, you are in a unique position to observe these individuals for incoming strengths and weaknesses and how they may contribute to the student's ultimate success or failure. The goal of this study is to attempt to match those incoming competencies and educational backgrounds of DT students to the required competencies as set forth by the CDR.

As a program director and dietetics professional, you are invited to participate in this study as an expert panel member in developing competencies consistent with the abilities of your incoming students while maintaining the standards of the dietetics profession. The Delphi Technique will be utilized to reach agreement among DT program directors about necessary incoming competencies for Dietetic Technicians.

Method

The Delphi Technique provides for a systematic collection and refinement of expert opinions on a particular subject without bringing the experts together face to face. The process consists of obtaining each person's opinion on three questionnaires in three rounds. The technique utilizes subsequent rounds to disseminate group opinion and attempt to reach consensus.

Round 1 will consist of open-ended questions asking your opinion about various incoming skills and education levels necessary to successfully complete your program and obtain employment as a DTR.

Round 2 will be created based on the responses gathered in Round 1. A similar procedure will be followed in developing the third questionnaire (Round 3). Following Round 3, a group consensus of responses will be provided to you and used as the basis of a more in-depth survey planned for the entire DT Program Director population.

Each questionnaire will be shorter than the previous and none should require more than one-half hour to complete. It is essential that each person respond to ALL THREE questionnaires. Your cooperation and opinion are vital to the development of competency requirements which can be met by the average incoming student. This information will be of benefit for purposes of recruitment, career counseling and job placement. With your prompt return of the questionnaires all three can be completed with a short period of time. Upon completion, the results will be shared with you. All responses will remain confidential and summarized as group data. No individual responses will be released. At no time will your name appear on the Round 2 or Round 3 questionnaires. You will be assigned a subject number that will be known only to the researchers.

Kindly inform us of your interest to participate in this study by returning the responses to the Round 1 questions via e-mail. Participation in this project is voluntary. If you desire additional information, please contact me at (918) 749-1792

I volunteer to participate in this Delphi study _____.
I prefer to respond via: e-mail _____
Postal mail _____
fax _____

Round 1

1. What competencies do you think are necessary for incoming DT students to have prior to beginning your program?
2. Which necessary competencies, if any, do you find lacking in the students who enroll in your program?
3. How does incoming educational background affect a students ability to successfully complete your program and find employment as a DT?
4. How well are students in your program meeting the current (Fall '97) CAADE DT competencies?
5. If students have difficulty meeting the competencies, which ones are most difficult and why.
6. From what sources do you obtain the majority of your students?
7. What % of your graduates are able to find employment as a DT?
8. What changes, if any, would you recommend for the current system of training DTR's?

APPENDIX E

October 14, 1998

Dear Dietetic Technician Program Director:

Oklahoma State University is conducting research into the educational competency levels of incoming Dietetic Technology students in order to match those levels with desired outcome competencies, including successful completion of the DTR exam. The research will be twofold with data collection from program directors as well as current DT students.

As a participant, you are requested to do the following:

1. Complete a telephone interview designed to assess your attitudes concerning the current outcome competency requirements and their effect on your program. The interview will take 20-30 minutes to complete and will be scheduled at your convenience.
2. Administer surveys to technician students in your program. You are asked to choose an upper-level required course (such as clinical nutrition) and distribute the surveys to all students in the class. This survey is designed to illicit background information into previous life experiences, socio-economic and academic histories.

ALL responses will be strictly confidential. Names of programs directors will be converted into numbers known only to the researchers. Once your response is received, the number will be separated from your questionnaire. At the completion of the research, all records will be destroyed. The students participating in the survey will be known only to you. Individual information will not be used, all results will be reported in aggregate form.

Please indicate your willingness to participate by signing the attached postcard. Indicate the number of student surveys that you will need to distribute. Please provide the telephone number and time when you can be contacted to set up an appointment for the phone interview.

Any questions concerning this research should be directed to:

Sharon Bode MS RD 918-749-1792

Gail Gates Ph.D. RD 405-744-5032

Gay Clarkson, Institutional Review Board, OSU 405-744-5700

Thank you for participating! If you wish to receive a composite of the results, please indicate in the space provided on the postcard.

Sharon Bode MS RD

Gail Gates Ph.D. RD

APPENDIX F

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: 03-27-98

IRB #: HE-98-031

Proposal Title: DTR Competencies: Effect of incoming skills on outcomes

Principal Investigator(s): Gail Gates, Sharon K. Bode

Reviewed and Processed as: Modification

Approval Status Recommended by Reviewer(s): Approved

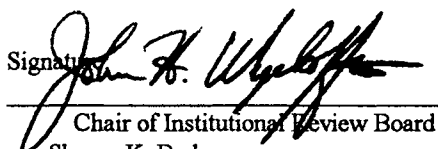
ALL APPROVALS MAY BE SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT NEXT MEETING, AS WELL AS ARE SUBJECT TO MONITORING AT ANY TIME DURING THE APPROVAL PERIOD.

APPROVAL STATUS PERIOD VALID FOR DATA COLLECTION FOR A ONE CALENDAR YEAR PERIOD 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 Disapproval are as follows:

Signature



Chair of Institutional Review Board

cc: Sharon K. Bode

Date: June 3, 1998

APPENDIX G

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD

DATE: 10-14-98

IRB #: HE-99-024

Proposal Title: DTR COMPETENCIES: EFFECT OF INCOMING SKILLS ON
OUTCOMES

Principal Investigator(s): Gail Gates, Sharon Bode

Reviewed and Processed as: Expedited

Approval Status Recommended by Reviewer(s): Approved

Signature:



Date: October 15, 1998

Carol Olson, Director of University Research Compliance
cc: Sharon Bode

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modification to the research project approved by the IRB must be submitted for approval. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

VITA

Sharon K. Bode

Candidate for the Degree of
Doctor of Philosophy

THESIS: DIETETIC TECHNICIANS: CHARACTERISTICS AND CORRELATES
OF SUCCESS

MAJOR FIELD: Human Environmental Sciences

BIOGRAPHICAL:

Personal data: Born in Baton Rouge, Louisiana on January 5, 1957, the daughter of Aubrey and Docia Kent. Married to David J. Bode May 23, 1981.

Education: Graduated University High School, Baton Rouge, Louisiana in May 1974; received Bachelor of Science Degree in Social Studies from Louisiana State University in December, 1978. Completed Master of Science degree in Nutritional Sciences from Oklahoma State University in December, 1993. Completed the requirements for the Doctor of Philosophy degree at Oklahoma State University in December, 1999.

Professional Experience: Instructor at Dietetic Technology program Oklahoma State University-Okmulgee from 1992-1994 and 1996-1999. Consultant Dietitian for long term care facilities in Eastern Oklahoma and Okmulgee Memorial Hospital 1992-1993. Consultant Dietitian for long term care in Sapulpa, Oklahoma 1996-1999. Consultant Dietitian for long term care in Houston, Texas 1999 to present.

Professional Memberships: American Dietetic Association, Oklahoma Dietetic Association, Texas Dietetic Association, Houston Area Dietetic Association, Dietetic Educators of Practitioners Practice Group, Consultant Dietitian Practice Group.