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The Effects Of Two Teaching Methodologies On Knowledge Of Insulin Administration Practices In An Older Adult Group

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THE EFFECTS OF TWO TEACHING METHODOLOGIES
ON KNOWLEDGE OF INSULIN ADMINISTRATION
PRACTICES IN AN OLDER ADULT GROUP

by

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The Effects of Two Teaching Methodologies
on Knowledge of Insulin Administration
Practices in an Older Adult Group

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Abstract

Approximately 11 million people are affected with acute and chronic complications of diabetes. An estimated $20 billion is spent annually on the diagnosis and management of diabetes. Client adherence to self-care practice is essential to the control of diabetes. The self-care practice of injecting insulin is imperative for the management of both patients with type 1 and type 2 diabetes. Teaching modalities which effectively increase patient knowledge about insulin administration need to be developed and implemented. Therefore, the purpose of this study was to determine whether individualized instructions or audiovisual instructions increased the knowledge of insulin administration practices in older adults. Knowles' Theory of Adult Learning and King's Theory of Goal Attainment were used as frameworks to guide this study. Data were collected using a researcher-designed tool. Eleven participants were selected from two metropolitan hospitals located in either an inpatient or outpatient educational setting. The majority of the sample were female (72.7%), African American (63.6%), between the ages

of 61 and 70 years (63.6%), and all were diagnosed with
type 2 diabetes. This quasi-experimental design utilized a
pretest-posttest model. The researcher-designed tool was
used to collect data. The two teaching interventions used
in the study were individualized and audiovisual
instructions. Both interventions included learning
objectives with structured content, return demonstrations,
and immediate evaluations. Data were analyzed using a two-
tailed independent t test. There was no statistical
significance in posttest scores between participants
provided with individualized and audiovisual instructions
($p = .301$). There were excellent return demonstrations by
the participants with an average of 10 out of 11 on the
performance checklist. Regardless of the teaching
modalities implemented during the study, participants
achieved increased knowledge levels about insulin
administration evidenced by increase in knowledge
(posttest) scores ($p = .009$). Results indicate that
teaching intervention does improve knowledge level about
insulin administration and performance skills for older
adults. Identifying learning needs of older adults can
facilitate their responses in collaborating with the

physician and adhering to treatment plans. This study should be replicated with a larger sample size and multiple teaching modality options for older adults.

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Chapter I

The Research Problem

Approximately 11 million people in the United States have diabetes, a disorder with acute and chronic medical complications which cost an estimated $20 billion annually ("Standards of Medical Care," 1998). Over 7 million Americans over the age of 65 years have diabetes, with a prevalence as high as 40% after the age of 80 years. Diabetes is almost 10 times as common among those over 65 years as those in the 20- to 44-year-old age group.

In 1997 a total of 159,719 deaths were attributed to diabetes representing a loss of 2 million years of life ("Standards of Medical Care," 1998). Treatment of diabetes and its acute metabolic complications accounted for $7,681 million (17.4%), whereas chronic complications of diabetes accounted for $11,841 million (26.8%) ("Standards of Medical Care," 1998). Diabetes not only depletes community, state, and federal resources but also induces considerable concern for suffering patients, caregivers, family, and health care providers. "Consequently,

management of the disease is of paramount importance and an overwhelming task" (Brown, Duchin, & Villagomez, 1992, p. 47).

According to Rosenthal, Fajardo, Gilmore, Morley, and Naliboff (1998), older Americans with diabetes have been hospitalized more often than elderly patients without diabetes. The most common reason for hospitalization cited was poor diabetes control (Tu, McDaniel, & Gay, 1993). Good diabetes control may be achieved with the use of intensive insulin therapy. Insulin therapy is necessary for individuals with Type 1 diabetes mellitus to sustain life through injections of exogenous insulin. Type 2 diabetic individuals are not dependent on exogenous insulin, but over prolonged periods of time, most will have decreased insulin production, thereafter requiring exogenous insulin for adequate blood glucose control ("Standards of Medical Care," 1998).

Accurate insulin administration influences the reduction of acute complications and chronic complications associated with diabetes. As a result of poor insulin administration practices, acute diabetic complications occur more often in older diabetic patients (Rosenthal et al., 1998). Insulin administration is a survival skill

required for the maintenance of any individual dependent on exogenous insulin. Therefore, the identification of effective teaching methodologies which enhance knowledge retention about insulin administration practices is crucial for patient survival and the reduction of acute and chronic complications in the elderly population. The focus of this study was to investigate the effect of two teaching methodologies on older adults' knowledge of insulin administration.

Establishment of the Problem

Diabetic individuals with poor insulin management and poor disease control are much more prone to develop health-related complications. When compared with persons of the same age group without diabetes, those with diabetes are 25 times more likely to become blind, 17 times more likely to develop kidney disease, 20 times more likely to develop gangrene, 15 times more likely to require an amputation, and twice as likely to have a stroke or heart attack (Rosenthal et al., 1998). Diabetes also is the leading cause of new blindness in adults 20 to 74 years old and end-stage renal disease, accounting for about 40% of new cases. About 60% to 70% of people with diabetes have mild to severe forms of nervous system

damage which often includes impaired sensation or pain in the feet or hands, slowed digestion of food in the stomach, carpal tunnel syndrome, and other nerve problems (Center for Disease Control, 1997).

To prevent the acute and chronic complications of diabetes, blood glucose must be controlled. Effective and long-term diabetes control is best accomplished by diabetics' participation in self-care activities that involve continuous monitoring and managing of the disease (Tu et al., 1993). The diabetic treatment regimen must be followed on a daily basis, usually without the benefit of direct supervision by health care providers. Consequently, teaching the client self-care management is essential for the control of diabetes and poses a major challenge to health care professionals (Becker, 1985).

While diabetes education is considered an effective and essential component of health care for diabetic patients, not all people with diabetes attend educational programs or receive teaching about their illness beyond their health care provider's office visit (Anderson, Hiss, Stephen, Fitzgerald, & Funnell, 1994). A national goal specified in Healthy People 2000 is that 40% of all people with chronic and disabling conditions receive patient

education, and 75% of all patients with diabetes receive diabetes education (1995). Ideally, all patients required to use insulin for glycemic control should receive insulin administration instructions ("Standards of Medical Care," 1998).

Instructions related to insulin administration are essential to self-care management skills taught as part of diabetes education ("Standards of Medical Care," 1998). Education is required for insulin users to learn proper injection techniques. The ability to self-inject is a skill which requires proper training through educational activities to ensure the maintenance of good blood glucose control.

Insulin dependent diabetics with sufficient knowledge and skills not only experience desirable long-term health outcomes but require fewer hospital admission and minimize acute glycemic episodes. Better disease management through better diabetes education ultimately reduces diabetes related complications and diabetes related health costs (Mazzuca et al., 1986).

Several researchers concluded that patient education interventions increase patient knowledge about self-care management skills. The Diabetes Control and Complications

Trial Study (DCCT) (1993) by the DCCT Research Group, the Diabetes Education Study (DES) by Mazzuca et al. (1986), and Diabetes in a Mexican-American Population by Brown et al. (1992) cited that improved glycemic control has a dramatic, positive impact on the reduction of complications associated with the disease process of diabetes. Despite guidelines in American Diabetes Association Standards of Medical Care for Patients with Diabetes Mellitus, which were designed to prevent most serious diabetes complications, many older adults do not receive adequate care in the form of equipment, medicines, or education for prevention of complications (Anderson et al., 1994).

The results of a study by Hulka, Kupper, Cassel, Efird, and Burdette (1995) revealed an alarming number of elderly patient errors in management which directly correlated with the complexity of the medical regimen. Additionally, Watkins, Williams, Martin, Hogan, and Anderson (1997) substantiated similar findings. These researchers determined that 80% of diabetic subjects made errors in insulin administration, 75% failed to comply with their diet, 50% demonstrated inadequate foot care, and 95% performed incorrect urine testing. The most

distressing finding was that some of the elders made numerous errors after they had described or demonstrated correct techniques (Watkins et al., 1997). Due to the limited number of studies about older adults and insulin administration and conclusions of these researchers, knowledge and skill acquisition of correct technique for insulin administration among older adults should be further studied.

Significance to Nursing

Many health care providers are involved in teaching self-management skills to diabetic patients. Management skills consist of medication administration (insulin or oral hypoglycemic agents), dietary modifications, exercise and behavioral modifications. As a health care provider in a primary care setting, the nurse practitioner has teaching opportunities to facilitate patient education, and the patient has an opportunity to receive learning. The acquisition of knowledge by the patient enhances compliance with self-care management skills, such as insulin administration, thereby reducing the risk of diabetes related complications and disabilities. Hence, effective teaching methodologies and favorable outcomes contribute to improved quality care for diabetic patients

and reduce cost of overall health care related to complications secondary to diabetes.

The practitioner's role as an educator evolves from one of communicating specific information to one of selecting, organizing, and packaging knowledge, and skills and identifying resources to further patient learning. The accelerating rate of change in clinical facilities along with diminished educational resources, shortened time frames, and increased diversity among learners make it difficult for practitioners to address learning needs. This study helps to identify effective methods for teaching patients in a timely manner.

Nursing practice. Professional nurses are generally the most instrumental force for health care implementation. Patient care outcomes bridge nursing implementation with evaluation to provide results of nursing care. Nurses provide patients with information about self-care management skills such as insulin administration. Insulin administration is a component of self-care management skills which carries special significance to nursing because of long-term diabetic complications and overwhelming health care cost. The comparison of two teaching strategies for providing

insulin administration instructions in older adults provided the identification of effective teaching methods to enhance learning and empower patients. Nurse practitioners could use the results of this study to develop and implement effective educational programs in primary care practices.

Nursing research. Limited research was found comparing teaching methodologies in older adults for the purpose of insulin administration. This current study sought to provide a catalyst for nursing research and a base to expand current research relevant to teaching methodologies for insulin administration in an older adult group.

Nursing theory. Knowles' Adult Learning Theory and King's Theory of Goal Attainment were the theoretical foundations for identifying the effect of two teaching methodologies. Knowles' (1978) theory has served as one of the frameworks to conduct research by identifying adult learning characteristics and their impact on knowledge retention. King's Theory of Goal Attainment was selected as the second theoretical framework for this study. The concepts of goal attainment identifies and describes the intricate components necessary for older adults to

participate in the learning process. This research substantiated the value of Knowles' and King's theories.

Theoretical Framework

The approach to teaching older adults necessitates the presentation of learning as meaningful, useful, and applicable to life. The significance of proper insulin administration has solemn health care ramifications. The accentuation of adult learning characteristics are addressed in Knowles' Andragogical Theory of Adult Learning and Imogene King's Theory of Goal Attainment. Both Knowles' Andragogical Theory and King's Theory of Goal Attainment were selected as theoretical frameworks to provide a solid foundation for teaching older adult correct insulin administration practices.

According to Knowles (1978), "until the education of adults has been a concern of the human race for a very long time, it is curious that there has been so little thinking, investigation, and writing about adult learning until this century" (p. 50). Knowles alluded to the fact that, "the adult learner has indeed been a neglected species" (p. 79). The following are assumptions of the andragogical model (the art and science of helping adults learn) which were utilized in the current study:

      1. The learner is self-directing. Adults
are capable individuals who are responsible for
their own lives. When others impose decisions on
adults, feelings of resentment and resistance
may surface.

      2. Adult learners possess experiences and
can serve as resources for one another. Adults
define their self-identity from their
experiences. If experiences are ignored or not
valued, adults may feel rejected. (Knowles,
1978, p. 80)

For the purpose of this study, Knowles' self-

directness and experience assumptions were applied to

teaching older adults. As adults, individuals develop a

need to be perceived by others as being self-directed. The

basic premises underlying self-directed learning are that

the learner signifies personal control, takes the

initiative and responsibility for learning, and then

identifies personal strengths and weaknesses. This

assumption is appropriate to the research undertaken due

to the connotation of self-directed learning for self-care

management activities and the description of an adult

learner.

The Andragogy Model is based on the notion that

adults learn best when treated as adults and that the

ultimate purpose of andragogical education is to empower

individuals through the process of learning (Knowles &

Associates, 1985). Consequently older people can be taught

about diabetes from an adult learning perspective using Knowles' Andragogical Adult Learning Theory. Although developmental changes in cognitive, physical function, and health status confront older adults more so than any other age group, lifetimes of personal and individual experiences result much in less similarity between two 70-year-olds than between two 20-year-olds (Ahroni, 1996).

Self-care management activities are designed to help patients and families understand the respective conditions and skills required to deal with conditions affecting optimal health. By determining how patients perceive the ability to perform a behavior, health educators can predict the likelihood of patients actually performing it. If variables are shown to be predictive of adherence to behaviors, then adherence might be improved by modifying those variables (Johnson, 1996). Therefore, self-directed learning activities provide a tool for the learner to actually comply with learning activities set by the learner. Learning activities, such as self-glucose monitoring and self-insulin injections, are components of self-care management skills.

In summary, Knowles' Adult Learning Theory implies that the adult learners' (e.g., elders) previous life

experiences create a need for individualized teaching programs (Knowles, 1984). Adults are ready and motivated to learn when they perceive a need in their life situation to acquire new information (Knowles, 1984). Diabetics are often put in this situation without any option because of poor glycemic control due to noncompliance with medication, diet, and exercise regimen. Hence, providing instruction utilizing Knowles' theory incorporates the life situation needs of the learner.

Imogene King's Theory of Goal Attainment augments Knowles' Adult Learning Theory. The utilization of King's theory in the current study is relevant because of required interactions between the patient and nurse practitioner in the interpersonal system context (King, 1989). According to Marriner-Tomey (1994), King derived the Theory of Goal Attainment from the conceptual frameworks of interpersonal systems. However, due to King's observation of the intricate nature of nursing, an open system consisting of three parts was developed. King's conceptual framework components are personal, interpersonal, and social systems. For the purpose of this study, only the concepts of interaction, perception, and communication in interpersonal system were employed.

The interpersonal system includes the personal and social system which are applicable to this study because of the correlation that exists between the components of the theory and the learning process with interaction required from the subjects and the health care providers (King, 1989).

The first concept of the interpersonal system is interaction. Interactions are defined as actions and reactions between persons or between persons and the environment. The nurse practitioner and patient meet in a health care organization, as a patient needing help and a nurse practitioner offering help. The practitioner and patient perceive one another, act and react to the nurse-patient role, interact, and transact (Chinn & Kramer, 1995). Purposeful interactions establish a frame of reference, and goal-related decisions are made. The concepts of interpersonal system are germane to the study because of the communication process between the practitioner and the patient. Through interactions, mutually acceptable goals can be established for the purpose of exerting control over events to achieve goals.

Another concept integral to King's model is perception. Perception is defined by King as "a process of

organizing, interpreting and transforming information from sense data and memory" (King, 1989, p. 20). A person's perceptual and intellectual tools are related to past experience, concept of self, biological inheritance, educational background, and socioeconomic group. Accurate perception, by which both nurse and patient interpret sensory data, is a primary step toward mutual goal identification and determination of strategies for goal attainment. For insulin users, the ability to interpret numeric readings on a syringe as units is the foundation for teaching insulin administration. Also, patients may not perceive a problem with insulin administration practices. A conflict between the nurse and patient in the perception of problems and the resolution may delay the patient's return to a healthy state.

Another concept integral to King's model of the interpersonal system is communication. Communication is the information component of interactions and may be direct (verbal) or indirect (nonverbal). Effective communication assists individuals in gaining a sense of understanding about themselves and facilitates emergence of meaningful relationships with others. The complexity of the medical management regimen for diabetes in older

adults buttress the need for two-way communication for the attainment of goals. Hence, the researcher and subjects must communicate effectively to complete the goals for the study.

Assumptions

For the purpose of this study, the following assumptions were made:

1. Patients receive knowledge of proper self-care management skills from a health care provider.

2. Older adults are motivated to learn when they perceive a need in their life situation which requires new information (Knowles, 1984).

3. Older adult learners are self-directed.

4. Purposeful interactions between older adults and practitioners establish a frame of reference in which mutually agreed upon goals are acceptable for teaching-learning sessions.

Statement of the Problem

The use of effective teaching methodologies are required to maintain and reinforce self-care skills such as insulin administration. Little research information is available comparing teaching methodologies on insulin

administration practices in older adults. Therefore, the purpose of the current study was to compare individualized teaching instructions and audiovisual instructions to determine the most effective method of teaching insulin administration practices to older adult patients with diabetes.

Research Hypothesis

The following null hypothesis guided the current research: There will be no significant difference in knowledge about insulin administration practice for older adults who receive individualized instructions and older adults who receive audiovisual instructions.

Definition of Terms

For the purpose of this study, terms were defined as follows:

Individualized instructions:

Theoretical: the planning, implementation, and evaluation of a teaching program described to address a particular patient's need (McCloskey & Bulecek, 1996).

Operational: the planning, implementation, and evaluation of 20-minute sessions taught by the researcher to older adult insulin dependent diabetes.

Audiovisual instructions

Theoretical: a form of media consisting of motion pictorials and sound effects.

Operational: Audiovisual instructions will be a 17-minute videotape on insulin administration, facilitated by the researcher and viewed by individual older adult patients with insulin dependent diabetes. Subjects were tested prior to the audiovisual instructions and immediately preceding the session.

Older adult

Theoretical: having attained full growth or maturity.

Operational: individuals 40 years or older, ability to make own health care decisions, diagnosed with diabetes for the first time, nonresident with someone taking insulin injections, no prior attendance at an insulin injection diabetic class, and able to speak and read English.

Knowledge about insulin administration

Theoretical: the cognitive ability to effectively verbalize and demonstrate the ability to self inject insulin.

Operational: the ability to sequence the steps of drawing up insulin in a syringe, correctly verbalizing the

number of units of insulin in the syringe, and correctly identifying the sites for insulin injection.

Chapter II

Review of Literature

This chapter provides a review of select research literature related to educational intervention and knowledge retention in diabetic patients. This researcher reviewed many publications regarding diabetes and the management of diabetes but found few studies related to knowledge retention and teaching methodologies. Although diabetes education is an intricate component for managing diabetes, a paucity of studies compared the effectiveness of different teaching methodologies in diabetes education and the utilization of different media to convey instructions to diabetic patients. Therefore, the focus of this literature review was to examine interventions used in diabetes education with emphasis on self-care management skills which included insulin administration and the outcome of those interventions.

Research studies which influenced this current research included: (a) the efficacy of group-support intervention in a community-based, culturally sensitive

education program, (b) the metabolic functional and knowledge outcomes of insulin treated adult patients with diabetes, (c) a researcher-based videotape in a Mexican-American population, (d) diabetes education, and (e) the effectiveness of educational and behavioral instructions of a diabetes program. A final study which influenced this current study was done by Brown and Hanis (1995). Due to the scarcity of research found in the area of comparing teaching methodologies among older adults, the study was included in the review of literature because of shared concepts related to teaching methodologies.

The pilot project of Brown and Hanis (1995) was implemented to determine the feasibility of providing community-based diabetes education and group support intervention. The project was facilitated by a bilingual, Mexican-American master's prepared clinical nurse specialist (CNS), a registered dietitian, and a community lay worker and designed specifically for the Mexican-American culture.

The research took place in the southern part of Texas. A telephone survey elicited participation from 50 adults with diabetes. Seven subjects were randomly selected from a population of previously selected adults.

Criteria for study inclusion were greater than 35 years of age, informed by primary physician of a diagnosis of noninsulin dependent diabetes mellitus, currently taking insulin or hypoglycemia agents for at least 1 year after the diagnosis of diabetes, and willing to participate in the 9-week intervention involving educational and support group sessions which included a family member or a close friend.

Brown and Hanis (1995) utilized a one-group, pretest-posttest design. The researchers collected demographic data and outcome variables at baseline and collected data from outcome measures at 3 months after completion of the 9-week intervention. The educational setting was selected to provide an informal, supportive, and social atmosphere rather than a formal environment to promote effective learning.

The interventions were implemented by two health care professionals, which consisted of a bilingual registered dietitian and a bilingual CNS. The training sessions used a curriculum guide developed by the researchers under the auspices of the American Association of Diabetes Educators. Several unique aspects of the intervention included Mexican-American health care providers,

instructions provided in Spanish (the preferred language of the participants), the participation of a family member, and incorporated a series of Spanish language patient education videotapes (Brown & Hanis, 1995). According to Brown and Hanis (1995), the purpose of the intervention was to provide participants with the knowledge, skills, and support necessary to improve health behaviors and manage their diabetes.

The pilot study interventions were abbreviated and consisted of eight weekly 2-hour education sessions and one 2-hour group session. A series of videotapes (each 15 to 20 minutes in length) were used as the primary intervention. The researcher developed videotapes that provided basic information about diabetes in a colorful, graphic, interesting, and culturally-relevant manner. Interventions utilized in the study consisted of videotape instructions and discussion. The subjects were given the option to either watch the video and then take the knowledge test (experimental group, n = 15) or take the knowledge test and then watch the video (control group, n = 15). The researchers indicated that the videotape was not the actual intervention but rather provided a focus

for the diabetes education and served as the stimulus for discussions and demonstrations.

Outcome measures of videotape effectiveness were analyzed from a 20-item knowledge test and interview data about the acceptability of videotapes as a method of learning for this population (Brown & Hanis, 1995). Due to the small number of subjects in the study, data analysis was very limited. The Wilcoxon signed-rank test was used to compare the pre-intervention and post-intervention measures. Statistically significant improvements occurred in glycosylated hemoglobin levels (p = .04), fasting blood sugar levels (p = .04), and knowledge of diabetes self-management (p = .04). Of the seven subjects who completed the study, only data from five were analyzed. One subject withdrew from the study at the end and one had surgery but returned to the study 2 weeks later.

Brown and Hanis (1995) documented the feasibility of providing an acceptable intervention in a Mexican-American community. The researchers concluded that diabetes potentially had an impact on the entire family, and that while the benefit of the intervention on the family/support persons was not determined in this study,

patients reported that it was helpful to have those individuals present during the sessions.

The pilot study by Brown and Hanis (1995) characterized the intervention team's ability which provided educational and support group sessions while maintaining the interest of the participants in learning self-management of their diabetes. The team also successfully presented the culturally relevant intervention to the Mexican-American population which impacted positive health outcomes of adults with diabetes.

After the intervention and posttest, qualitative information was solicited from the participants and providers of the intervention. According to Brown and Hanis (1995), participants made some of the following comments and/or recommendations:

1. The centrally located community site was the best possible site.

2. One additional month of educational sessions was needed.

3. An increased amount of time to learn the nutritional content of foods was needed.

4. Group size was appropriate.

The research conducted by Brown and Hanis (1995) was relevant to the study undertaken because of shared interest on self-management skills and the potential ability of positive impact on health outcomes, which are evidenced by compliance with medical regimen and decreased complications caused by improved glycemic control. The key component of research by Brown and Hanis (1995), which is germane to the current study, is the use of videotape to provide information and instructions to diabetes patients. Equally important was the utilization of video and discussion teaching modalities in Brown and Hanis (1995).

Diabetes education program goals differ among institutions. Even though many diabetes education programs focus on the same components of a self-care regimen, teaching methodologies and knowledge outcome may differ. Literature reviews revealed that a common goal for diabetes management is to enhance patient knowledge and skills to manage self-care needs. As a result of the literature review, one study was identified in which needs were emphasized.

Abourizk, O'Connor, Crabtree, and Schnatz (1994) investigated the impact of an outpatient model of integrated diabetes treatment and education on function,

metabolic, and knowledge outcome. The Diabetes Care Center (DCC) Model used an outpatient, 4-day program recognized by the American Diabetes Association, that included evaluation, treatment, dietary consult podiatry care, follow-up, and the opportunity for future attendance to repeat educational classes. "This model constituted a theoretical and practical response to the question of how diabetes care can be provided effectively and economically" (Abourizk et al., 1994, p. 416).

The DCC model integrated education with treatment. The DCC team was comprised of teaching nurses, dietitian, endocrinologist/diabetologist, podiatrist, social worker, and exercise physiologist. The program's short-term goal was to improve metabolic control and functional status, and the long-term goal was to achieve maximum health and remain free from complications of diabetes.

The design of the study was a prospective cohort design. Subjects were selected from a sample of convenience of patients attending outpatient diabetes education classes. Subjects met the following criteria: > 18 years old, receiving insulin treatment at conclusion of DCC program, English speaking, and free of terminal disease, substance abuse, or severe mental health

problems. Comparison subjects outside the DCC referral area met the same inclusion criteria.

A cohort of 137 adults was evaluated at baseline prior to attending diabetes education classes at the DCC program and follow-up visits at 2, 4, 8, and 12 months. During each visit subjects were administered questionnaires, and a glycosylated hemoglobin assay was collected from subjects. Knowledge of diabetes was measured using the Rand Knowledge of Diabetes Scales (0 to 100%) and the functional health status was measured with the Duke-UNC Health Profile.

Subjects were contacted by telephone during a 12-month follow-up period and requested to identify the referring physician to enable the researcher to acquire the number of office visits during the year before and after attending DCC. For comparison purposes, data were obtained on a cohort of patients with diabetes seen at a primary care office of a regional health maintenance organization (HMO). Data were collected from chart review over a subsequent 2-year period.

According to Abourizk et al. (1994), data were analyzed using SAS statistical procedures. Knowledge scores were measured using an updated version of the Rand

Knowledge of Diabetes Scales. Scores reflected the percent of correct answers on a scale of 0 to 100. Higher scores indicated a greater knowledge of diabetes and the complications associated with poor glycemic control.

Initial knowledge scores for subjects with diabetes of short duration improved as hemoglobin (HbA_{1c}) assays decreased. The HbA_{1c} improvement was sustained at follow-up even though knowledge scores deteriorated rapidly after 4 months. Among subjects with diabetes of long duration, improvement in knowledge scores and HbA1c assays both were sustained throughout the follow-up period.

Abourizk et al. (1994) reported that of the 137 subjects referred to the DCC who completed baseline studies, only 69 completed the study through at least 8 months of follow-up of HbA_{1c}. Sixty of the 69 completed the questionnaire data on knowledge of diabetes, functional health status, and family and social support. There were no significant differences in baseline measures of knowledge of diabetes, functional health status, and family and social support.

Abourizk et al. (1994) used McNemaris chi-square to analyze the data and determined that the odds of improving glycemic control were 34 times greater than the odds of

deteriorating metabolic control in patients attending the DCC. Sixty-nine patients attended follow-up care at 8- and 12-month intervals. Fifty-eight (84%) of the 69 patients had a decreased HbA_{1c} and 11 (16%) of the 69 patients HbA_{1c} stayed the same or increased. Mean improvement in physical function scores was 3.4. Patient's duration with diabetes was the only variable that had a significant change, $r = 3.49$, $p = .07$, at an alpha level of $p = .05$. Mean social function improved +3.6 with a range of -6 to +60 and a median change of zero.

Abourizk et al. (1994) used a comparison group from a regional HMO. Seventy-two subjects comprised the comparison group. Only 54 patients of the subjects from the population of 72 patients had adequate data to classify glycemic control. Twenty-four of the 54 subjects had serial HbA_{1c} assays, 14 of the 54 subjects had fasting glucose measures, and 16 of the 54 subjects had random serum glucose measures over a mean follow-up period of 12.3 months.

According to Abourizk et al. (1994), the average follow-up period was 12.3 months for these subjects. During that period 54% of these subjects had worsening glycemic control, 43% improved, and 3% showed no change.

Among the HMO subjects with insulin, 47% showed a decrease in HbA_{1c} assays. No data were available on knowledge level, functional status, or locus of control, and the patients had no formal educational intervention during their observation period.

Abourizk et al. (1994) suggested that patients with a shorter duration with diabetes had greater improvements in assay as a result of the DCC program. The researchers indicated that the improvement may have been mediated initially by improved knowledge of diabetes care. Another possible explanation cited by Abourizk et al. (1994) is that these patients translated care knowledge into new daily routines which incorporated diabetes self-care principles.

The inclusion of the study by Abourizk et al. (1994) has application to the current study and was appropriate because both researchers used similar educational interventions and the implementation of a knowledge test to reflect impact on knowledge acquired after the utilization of an intervention. Also, both studies included diabetic subjects and the evaluation of knowledge level before interventions and after interventions.

A second study utilizing a research-based videotape as a teaching methodology was conducted by Brown et al. (1992). The aim of the study was to investigate efficacy of a research-based patient education videotape, developed, designed, and piloted in a population of Hispanic diabetic adults. The videotape was the first in a series of six to be developed.

Brown et al. (1992) proposed the following research questions:

> 1. Is the videotape an effective method for short-term knowledge acquisition with this Hispanic population as determined by a knowledge test given pre-intervention (control group) and post-intervention (experimental group)?
>
> 2. What is the effect of the videotape on increasing awareness of the diabetic population with regard to available community resources?
>
> 3. To what degree do Hispanic diabetic adults accept videotape instruction as a method of learning about diabetes self-care principles? (p. 48)

The videotape was developed in collaboration with the University of Texas Health Science Center-Houston professional television staff. A content expert viewed the script for correctness of information. Content was translated into Spanish by professional translators and submitted for review to residents and researchers in the county. Content focused on aspects of physiology and

pathophysiology related to blood glucose levels in normal as compared to diabetic adults. The major goal for videotape was to convey a positive approach to diabetes self-management.

The knowledge instrument, designed specifically for the needs of the local diabetic subjects, was developed by authors and bilingual researchers who had worked with the Hispanic population in the target community for 10 years. The items for the instrument were based on National Standards for Diabetes Patient Education programs. The tool was tested on nine Spanish-speaking diabetic residents of the same community. The reliability was calculated using the Ruder-Richardson formula for nominal data, $r = .88$, which indicated that the knowledge instrument was reliable. The tool consisted of 20 items that correlated with videotape content and three objective type responses.

A convenience sample of 30 subjects was selected from patient rosters of an ongoing epidemiology study of diabetes conducted in the area by the National Institute of Health (NIH). Subjects were randomly assigned to either an experimental group or a control group. Fifteen subjects were assigned to a control group, and 15 subjects received

videotape educational intervention. The inclusion criteria

for participating in the study were (a) > 18 years of age,

(b) diagnosed with diabetes, (c) able to read and speak

English and/or Spanish, (d) willing to view the videotape

and take the 20-item knowledge test, and (e) a subject of

the longitudinal epidemiology study.

Brown et al. (1992) used a randomized posttest-only

control group design. The videotape was viewed by groups

of 3 to 5 subjects. Groups of individuals were randomly

assigned to either (a) watching the videotape and then

taking the knowledge test (experimental group, n = 15), or

(b) taking the test and then watching the videotape

(control group, n = 15). Knowledge test scores were

compared for the two groups. At the end of the

intervention, descriptive data were obtained regarding

subject impressions of the usefulness of the videotape.

Subjects had a mean age of 59 years and 22 of the

subjects were female. Approximately 15 of the subjects

spoke Spanish, and the remainder spoke English. Subjects

had diabetes for an average of 13 years. Also, subjects

reported that there were no known diabetes patient

education classes in the community. Forty percent of the

subjects managed diabetes control with insulin, another

40% to 50% managed diabetes control with oral hypoglycemic agents, and the remaining 10% by diet alone.

A moderate size effect was determined by the current research, which addressed the first research question about the use of a videotape as an effective method for short-term knowledge acquisition as determined by knowledge pretest given pre-intervention (control group) and post-intervention (experimental group). The score of the average individuals in the experimental group exceeded 73% of the individuals in the control group. Brown et al. (1992) determined that 24 of the 30 subjects had not been aware of a local diabetes support group, which addresses the question about the videotape on increasing awareness. The third question focused on the degree to which Hispanic adults with diabetes accepted videotape instruction as a method of learning about diabetes self-care principles. Brown et al.'s (1992) research results revealed that 25 to 30 subjects unanimously agreed that videotape was an acceptable method of conveying information in a positive manner.

Due to the small sample size, the effect size formula was used to calculate the videotape intervention which resulted in 0.61, a moderate effect size. The effect sizes

are generally categorized as follows: 0.20 = small, 0.50 = moderate, and 0.80 = large. The control group had a standard deviation almost twice as large as the experimental group. One of the findings indicated that approximately 40% of diabetic patients use folk remedies (e.g., herbs) to self-treat diabetes.

Brown et al. (1992) concluded that these findings provided for optimum effectiveness of such interventions in the management of diabetes in diabetic patients. The interventions in the Brown et al. study are germane to the current study because of the use of audiovisual instructions and group instructions as teaching methodologies. The research designs differ, but the expected outcome variables, such as knowledge retention, are comparable.

A more recent study by Campbell, Redman, Moffit, and Sanson-Fisher (1996) cited that programs which incorporate skills training and/or behavioral strategies can favorably affect the knowledge level and affect at least some of the metabolic outcomes compared with usual health care skills provided by minimal education programs. The purpose of the study was to evaluate the relative effectiveness of several diabetes education programs that taught a range of

self-care elements for noninsulin dependent diabetics (NIDDM) patients with no previous diabetes education (diet, exercise, urine and blood glucose monitoring, medication, foot care, and visiting health care professionals).

Campbell et al. (1996) included a randomized trial in which NIDDM patients referred to a Diabetes Education Service (DES) in NSW, Australia, were assigned to either a minimal instruction program (Minimal), an education program of individual visits (Individual Education), an education program incorporating a group education course (Group Education), or a behavioral program. The first three programs used an educational approach with a minimal program, individual education, and group education. The minimal program consisted of two visits to the diabetes educator. The Individual and Group Education programs were more extensive. The fourth program implemented cognitive behavioral strategies and was presented to individuals rather than a group.

The criteria Campbell et al. (1996) used for selecting subjects to participate in the study included the following: (a) less than 80 years of age, (b) had been diagnosed with NIDDM for less than 5 years, (c) were able

to speak, read, and understand English, (d) had received no previous formal instructions in diabetes care, (e) were not taking over 75% of the maximum dose of oral hypoglycemic agents, and (f) did not have a terminal illness.

Patients were referred by and remained under the medical care of their general practitioner and also may have been consulting a diabetes specialist. According to the researchers, the four groups contained the following number of patients: Minimal Instructions (n = 59), an education program of individual visits (n = 57), education program incorporating a group course (n = 66), and a behavioral program (n = 59).

The programs differ in number of patient contact hours, delivery format, and types of instructional strategies. Campbell et al. (1996) used a pretest-posttest experimental design. The Minimal program also consisted of two one-hour sessions conducted within 2 weeks of referral. The educational materials on diabetes were discussed in less detail than the other programs. The subjects in this program received no additional diabetes education, but were referred for consultation with an

ophthalmologist and a podiatrist for eye and feet

problems, respectively.

The Individual program consisted of two sessions that

were conducted within 2 weeks of referral, then monthly

until 2 months from the initial visit. The initial

sessions were approximately one hour, and subsequent

sessions were 30 minutes. Educational materials were

discussed in more detail than for the Minimal program

(Campbell et al., 1996).

According to Campbell et al. (1996), the group

education program consisted of at least two individual

sessions and a 3-day small group education course. The

participants attended monthly sessions until a group

course was assigned. The 3-day course involved lectures,

small group exercises, and a practical session that

included all the topics covered in the other programs.

Upon completion of the course, subjects participated in

scheduled 2-hour group follow-up sessions at 3 and 9

months.

The final program consisted of individual visits,

with the initial visit taking place at DES and the

subsequent visits in the patient's home. Three

individualized visits occurred within the first month, and

session frequency was dependent on the patient's needs (Campbell et al., 1996). Instructions were provided on cognitive-behavioral techniques, and instructions were provided on cardiovascular risk in the diabetic patients. Self-care instructions were presented to subjects with emphasis on behavioral modifications. The sessions provided the subjects with specific concrete advice about managing diabetes through cognitive-behavioral techniques.

Campbell et al. (1996) analyzed the research data using t tests on results of each group pair in each program. The differences between the groups were compared using pair-wise comparisons. Both Behavioral and Group Education patients had greater improvements in knowledge scores than Minimal Education patients. The Behavioral Education patients' knowledge scores improved greater than the Individual Education patients.

The attrition rate increased drastically by the 12th month as 40% of the patients in the Minimal program dropped out, 42% of the patients in the Group Education program dropped out, and 9% of the patients in the Behavioral Program dropped out. The researchers determined the Behavioral Program had a significantly lower attrition rate ($p = .04$) than the Group Education at 3 months, and

lower attrition (p = .04) than both individualized (p = .18) and Group Education programs (p = .21) at 6 and 12 months.

The study undertaken by Campbell et al. (1996) indicated that formal diabetes education can have a positive effect on variables such as knowledge, with reasonable effects on HbA_{1c} and less marked impact on weight variable. According to the researchers, the Group Education and Behavioral Education had greater improvements in knowledge scores than subjects in the Minimal program. Campbell et al.'s (1996) study provided insight about the effects of educational and behavioral instructions on self-care elements in NIDDM patients. These findings accentuate the need for further examination of different program types, particularly the impact of minimal programs over longer duration and of behavioral programs. The knowledge scores were greater in subjects participating in longer duration and more intensive program than minimal programs. Therefore, findings indicate the need for more intensified diabetes education.

In summary, the Campbell et al. (1990) study supports previous reports that differences in knowledge comprehension between programs may not be as important as

other outcomes. Both the Behavioral and the Group Education programs resulted in greater knowledge improvement than the Minimal or Individual Education program. These findings are consistent with existing literature that suggest greater improvements in knowledge are not necessarily reflected in greater improvements in variables such as HbA_{1c} assays and weight loss (Campbell et al., 1990). The study is germane to the current study because of the implementation of different teaching methodologies, e.g., individualized instructions and the evaluation of subjects' knowledge level pre-intervention and post-intervention.

Due to the scarcity of studies on comparing teaching methodologies in older diabetic patients, an older study was included in the review. Mazzuca et al. (1986) conducted research on a population similar to that in the current study. The study by Mazzuca et al. (1986) emphasized education and its effect on the diabetic patient confirmed the inclusion for this review.

Mazzuca et al. (1986) developed and implemented a systematic education program for diabetes patients. The study focused on the effect of a systematic education program on knowledge, skills, self-care behaviors, and

relevant physiologic outcomes for diabetic patients. The goal of the Diabetes Education Study (DIABEDS) was to determine whether didactic and behavioral methods could be combined into a systematic comprehensive education program for patients with diabetes.

According to Mazzuca et al. (1986), education is an essential component of effective disease management and one of the roles of the health care provider is that of an educator. During the study, "the health care facility had no formal diabetes education program, neither clinic approved protocols for compliance behavior modification, nor guidelines for follow-up and reinforcement as part of routine diabetes care" (p. 3).

Therefore, Mazzuca et al. (1986) tested the following hypothesis: Patients receiving a systematic education program in self-management of diabetes mellitus will be more likely than their control group peers to (a) be knowledgeable about diabetes mellitus, (b) possess skills necessary to comply with therapeutic regimens, (c) comply with self-care recommendations, (d) control glucose homeostasis, and (e) decrease the risks of chronic complications.

A convenience sample was obtained from the diabetic population in the general medicine clinic at a northern metropolitan medical center. The subjects were predominantly elderly black women, and 95% of subjects had noninsulin dependent diabetes mellitus. The criteria used for study inclusion were as follows:

1. The clinic record contained either two fasting blood glucose (FBG) values of 130 mg/dl, one FBG > 160 mg/dl, or a 2-hour post prandial blood glucose value > 250 mg/dl, (b) able to perform at least two basic self-care tasks (e.g., insulin administration, urine glucose and ketone testing, food selection), (c) have no concurrent psychiatric or terminal illness, (d) have a primary care provider be an internal medicine resident, and (e) give informed consent.

Research in Mazzuca et al. (1986) consisted of three teams which included 3 to 4 residents, a nurse practitioner, a registered nurse, and a senior staff physician from the hospital department of medicine. The nursing staff dispensed written patient education materials, taught insulin injection technique, and reinforced physicians' orders regarding compliance with therapeutic regimens.

The original sample consisted of 532 diabetic patients from the general medicine clinic. Subjects were assigned to a control group (1 and 3) or an experimental group (2 and 4), which was labeled DIABEDS. Two hundred seventy-five subjects remained in the study throughout baseline, intervention, and post-interventions from August 1978 to July 1982. Subjects were randomly assigned to patient education modules. The modules contained didactic instructions, goal setting exercise, and a reinforcement schedule for post-intervention assessment. The groups consisted of 135 experimental participants and 140 control participants.

Reasons for attrition were as follows: 30 patients by death, 43 physically or psychologically incapacitated, 32 transfers to senior staff physician, 24 relocation or work conflict, 45 personal reasons, 11 multiple failure to keep appointment, and 58 lost contact by telephone. Results of the study indicated that 85% of patients in both groups satisfied knowledge objectives for the patient education modules. According to Mazzuca et al. (1986), there was a significant difference in the group's ability to list causes of hyperglycemia (experimental, 51.1%; control, 30.9%; Fisher's exact $p < .001$) and in knowledge of urine

test conditions that indicated the need for a health care professional (experimental, 92.5%; control, 78.8%; p < .005). Findings indicated a significant increase in patient knowledge about the diabetes exchange list system. Experimental patients scored an average of 73.3% on a 50-item written test of exchanges, compared with 70.2% (t = 2.937, df = 240, p < .005) of the control patients.

A significant effect of patient education was demonstrated as in the study by Mazzuca et al. (1986). Even though the researchers' systematic education protocols had an effect on self-care skills and behaviors, the potential for knowledge regression over prolonged periods poses a problem for all health care providers. Any amount of education was bound to improve matters; however, further research in this and other settings is needed to determine the most effective teaching methodology to enhance knowledge retention. The researchers' teaching and didactic methodologies are congruent with the current research interest.

The previous review of studies from scholarly literature was focused on diabetic patients. The next study reviewed compared teaching methodologies in a different population of diabetic adults. Although the

study's population differs, the utilization of two teaching methodologies and the effect of the methodologies on knowledge retention provided rationale for the inclusion of this study. The purpose of Gibson's (1995) study was to test a strategy for improving patient's retention of discharge teaching. Gibson (1995) cited the importance of discharge instructions for those who assume care for themselves and provide care for others.

Gibson (1995) used a convenience sampling method and included 40 volunteer females at a metropolitan hospital. The subjects ranged in age from 16 to 40 years and were randomly assigned to an experimental or a control group. Gibson (1995) controlled for extraneous variables, such as cultural differences, educational levels, socioeconomic status, and prior experience, by the randomization of subject's group assignment. Gibson (1995) used a pretest/posttest control experimental design to demonstrate a direct cause-effect relationship between overlearning and retention in patient education.

During the initial stage of the study, the control and the experimental groups were administered the Infant Feeding Questionnaire, an instrument designed by the researcher. Mothers completed the Infant Feeding

Questionnaire as pretest before they had received any instructions and as posttest after instructions (Gibson, 1995). Soon after the delivery during the hospital stay, subjects were given a brief explanation of the study procedures, the consent form, and the pretest.

The mothers were given 20 minutes of instructions on first-year infant feeding practices, then immediately following instructions, the mothers were given posttest 1. The experimental group received an additional 10 minutes of instructions, but in the form of a film. Two weeks after the first session, the mothers were scheduled to see a pediatrician. At that time the researcher gave the mothers posttest 2. The results were used to determine how much of the material given in class had been retained (Gibson, 1995). The researcher indicated that 40% of the patients missed the 2-week scheduled visit or had delayed it. These subjects were telephoned by the researcher and a home visit was arranged.

The attrition rate was 90 due to the researcher's inability to reach the subjects within the time limit of 15 days after the teaching session. Data were analyzed using a t test for comparing the percent of knowledge retention in the control and experimental groups. Gibson

(1995) determined there was not a significant difference between the two groups prior to the instructions (t = 1.48, p = .15).

Gibson's (1995) hypothesis for the study was that the experimental group would retain significantly more content than the control group. The hypothesis was tested by conducting a t test on the 2-week posttest mean scores. The amount of retention (posttest minus pretest) for the experimental group was significantly more than the knowledge retention of the control group (t = 2.33, p < .001), thus supporting the hypothesis (Gibson, 1995).

Gibson (1995) concluded that both groups learned and retained a significant amount of knowledge regardless of the teaching strategy used. However, the experimental group which received 50% overlearning retained significantly more of the material than mothers in the control group (p < .001). Although this study used the concept of overlearning to reinforce knowledge retention, positive effects and similar results could possibly be found in teaching other types of patients. This study needs to be replicated in other areas of health care, such as diabetes patient care areas, to determine if the

retention of knowledge effect applies in other patient groups.

In conclusion, in this review of literature studies revealed different teaching methodologies used among diabetic patients were highlighted. To date, very few studies have been conducted with insulin diabetic dependent patients in which teaching modalities and the effect on knowledge retention were compared, therefore, validating the need for this current study. Three of the studies (Brown et al., 1992; Brown & Hanis, 1995; Gibson, 1995) reviewed were intervention studies with similar educational modalities to that of this current study. Two of the studies (Abourizk et al., 1994; Campbell et al., 1996) reviewed were intervention studies with the use of only one of the educational modalities, but focused on outcomes of educational and behavioral instructions among noninsulin diabetes and insulin users. One of the studies reviewed (Mazzuca et al., 1986) included a systematic comprehensive education program for patients with diabetes.

However, none of the studies reviewed emphasized the comparison of two teaching modalities and its effect on knowledge of insulin administration practices in older

adults. Each of the studies reviewed supported that knowledge retention was influenced by teaching modality. Therefore, because of the findings from previous research, the paucity of literature regarding the comparison of teaching modalities on insulin administration practices in older adults, and the recommendations from the current literature review, the focus of this study emerged.

Chapter III

The Method

The purpose of this study was to determine the effect of individualized instructions or audiovisual instructions on the knowledge of insulin administration practices in an older adult group. Methods used to study the variables of interest are identified in this chapter. The instruments used to measure knowledge of insulin administration practices, the procedure for data collection, and the methods for data analysis are discussed in this chapter. The research setting, design, population, and sample also are described.

Design of the Study

The research design for this quantitative study was quasi-experimental. Quasi-experimental designs "involve the manipulation of an independent variable that is, the institution of an experimental treatment but, lack at least one of the other two properties that characterize true experiments: randomization or a control group" (Polit & Hungler, 1995, p. 168). The current study lacks

randomization. However, the current study does have comparison groups and institutes experimental treatment interventions.

Variables

The independent variables identified in this study were the teaching modalities of audiovisual instructions and individualized instructions. The dependent variable was the patient's knowledge retention as evidenced by pretest and posttest scores. The controlled variables were patient's age, educational level, and ethnicity. Extraneous variables may have included the exposure to insulin administration instruction by other health care professionals, visual disturbances, and physical dexterity affecting the ability to draw up and administer insulin.

Setting, Population, and Sample

The study was conducted in two hospitals located in a large metropolitan area in West Tennessee. The institutions which were chosen provide care to a diverse population of IDDM patients. The patient population is made up of 75% African American, 10% Caucasian, and 15% Hispanic. One institution's outpatient setting and the other institution's inpatient setting were used to contact

potential study participants. The diabetes educator served as the point of contract for the outpatient clinic. This outpatient education program provides education to groups and individuals requiring instructions about diet, medication, and exercise. The patients are referred by health care providers from various clinics within the institution. The institutions selected had 100- and 500-bed capacities, respectively. The diabetes educator helps patients to set treatment goals, identify areas where more attention or self-management training is needed, and assess the quality of diabetes treatment provided. The diabetes educator and staff members for the second institution were the contacts for the inpatient setting. There is no developed inpatient diabetes education program at this institution. The diabetes educator provides inpatient base education to diabetic patients through individualized instructions.

The target population included all insulin dependent diabetic individuals with no previous history of insulin use. The researcher encountered difficulty in identifying only first-time insulin users so criterion for admission were changed and also included previous insulin users. Subjects were selected from a convenience sample and met

the following criteria: diagnosis of insulin dependent diabetes for the first time, age of 40 years or greater, nonresident with someone taking insulin injections, no prior attendance at insulin injection diabetic classes, and the ability to speak and read English. The sample consisted of 11 subjects who met the criteria and were willing to participate in the study.

Methods of Data Collection

Techniques/instrumentation. The instruments used to collect the data were the Patient Questionnaire (see Appendix A), Insulin Administration Pretest/Posttest (see Appendices B and C), and the Pieh Performance Checklist (see Appendix D). The Patient Questionnaire was administered over 5 minutes to potential subjects to validate inclusion criteria. The Patient Questionnaire consisted of seven items. Participants answering no to question 3 which indicated their attendance to diabetic classes were excluded from the study because previous knowledge about insulin administration may have been obtained from the attendance at diabetic classes. The Patient Questionnaire also provided information relative to ethnic background, gender, educational level, and salary range.

The Insulin Administration Pretest/Posttest was developed by the researcher. The Insulin Administration Pretest/Posttest assessed patient knowledge of insulin administration and consisted of 10 multiple-choice questions. Each question was assigned a weight of 10%. The Insulin Administration Pretest/Posttest scores were based on the number of correct answers and was interpreted as follows: 9 to 10 correct answers indicated excellent knowledge, 7 to 8 correct answers indicated a need to reinforce instructions, and fewer than 6 correct answers indicated a need for insulin instructions. The greater the number of "I don't know" responses, the greater the need for instructions on insulin administration. The range of scores on the test was 0 to 100. Ten minutes were allowed for subjects to complete the Insulin Administration Pretest/Posttest. The Insulin Administration tool was administered twice, once as the pretest and once as the posttest. The results of pretest scores and the results of the posttest scores were compared to determine the effect of the teaching methodologies on knowledge scores.

The knowledge return demonstration performed by the subjects was observed by the researcher. The successful accomplishment of insulin administration was determined by

the subjects' ability to draw up insulin using the correct sequence as indicated by the printed material and/or audiovisual instructions within one unit of accuracy of 15 units of insulin. The return demonstration was performed at the end of the audiovisual and the individual sessions. The researcher-designed checklist was used to determine the subjects' ability to perform a return demonstration. The checklist consisted of 11 items numbered according to the sequence for drawing up and injecting insulin. Each step performed correctly was marked yes, and each step performed incorrectly was marked as no. The scoring of the return demonstration was determined by using the following grading scale: 9 to 11 correct indicated excellent application of knowledge, 6 to 8 correct indicated good application of knowledge and need for reinforcement, and 5 or less correct indicated poor application of knowledge and a need for repeat demonstration.

Procedures

Permission to conduct the study was first obtained from the Mississippi University for Women Committee on Use of Human Subjects in Experimentation (see Appendix E) and from the University of Tennessee Institution Review Board (see Appendix F). Potential participants meeting study

criteria were referred by staff nurses, staff endocrinologists, and diabetes educators at both institutions. Participants were then contacted by telephone to validate desire to participate in the study and were given an explanation of the study. Verbal agreement was obtained during the initial interview, and the investigator informed participants about the right to withdraw from the study at any time. Following verbal agreement to participate in the study, an initial appointment was scheduled at the convenience of the potential subject. The informed consents (see Appendices G and H) were obtained during the initial interview, and then the Patient Questionnaire was administered to ensure potential subjects met the inclusion criteria for the study. Upon completion of the Patient Questionnaire, subjects meeting the inclusion criteria were administered the pretest over 10 minutes. Subjects were then given a code to warrant confidentiality, and only the researcher had access to the codes. Subject codes were determined by the researcher using the following information:

1. The first two digits represented the chronological order in which participants were selected by the study.

2. The third digit represented the subject's race.

3. The fourth digit represented the gender.

4. The fifth digit represented the teaching methodology implemented.

Even-numbered participants received individualized instructions. Odd-numbered participants received audiovisual instructions.

The interventions were provided in the patient's room in the hospital setting and in a classroom for the outpatient setting. The subjects were given learning objectives (see Appendix I) and individualized instructions or audiovisual instructions on insulin administration for approximately 15 to 20 minutes. The first teaching methodology was individualized instructions which consisted of insulin preparation, insulin types, sites for insulin administration, and the correct method for drawing up and injecting insulin. A pamphlet (produced by Becton-Dickinson) with drawings also illustrated the steps of drawing up and injecting insulin. The investigator provided demonstrations and required subjects to provide a return demonstration. The second methodology consisted of audiovisual instruction including a videotape produced by the American Diabetes Association. The videotaped instructions included insulin preparation,

insulin types, sites for insulin administration, and the correct method for drawing up and injecting insulin. Participants in both the individualized instructions session and audiovisual instructions session were receptive to learning about drawing up and injecting insulin. The content validity of the researcher-designed tools was analyzed by an expert in the field of diabetes. The response given by the endocrinologist revealed that the tools represented the information elicited in the research study. The reliability of the instrument was tested by administering the test to a research group which consisted of two endocrinologists, two registered nurses, one nurse practitioner, and one clinical nutritionist. The overall results of the test revealed consistent correct responses to the pretest and posttest.

Data Analysis

Demographic data from the Patient Questionnaire and data from the return demonstration checklist were analyzed using descriptive statistics methods. Analysis of data was accomplished utilizing a two-tailed t test to test the research hypothesis and to assess for significant difference in individualized and audiovisual pretest and posttest scores. The basic parametric procedure for

testing differences in group means is the t test (sometimes referred to as Student's t) (Polit & Hungler, 1995). Therefore, the t test was selected to analyze data from the results of the pretest and posttest on insulin administration. The pretest analysis sample was comprised of 11 older adult responses, and posttest data analysis sample consisted of 11 older adults with 11 return demonstration checklist responses.

Chapter IV

The Findings

A quasi-experimental design was used in the study to determine the effects of two teaching modalities on the knowledge level of insulin administration practices in older adults. A description of the sample and the results of data analysis related to the research hypothesis are described in this chapter.

Description of Sample

The sample consisted of older adults (N =11) who were inpatients (n = 4, 37.3%) and outpatient (n = 7, 63.7%) diabetic clients. Of the 11 participants, 5 (45%) received audiovisual instructions and 6 (55%) received individualized instructions. Participants' age ranges were from 40 to 72 with a mean age of 61. This convenience sample consisted of 8 females (72.7%) and 3 males (27.3%). Seven (63.6%) of the participants were African American, 3 (27.3%) of the participants were Caucasian, and 1 (9.1%) participant did not indicate her race. All participants

were diagnosed with type 2 diabetes. Pretest score ranges were from 20 to 90%, and the posttest score ranges were from 60 to 90%.

Results of Data Analysis

The hypothesis tested was the following: There will be no significant difference in knowledge about insulin administration practices for older adults who receive individualized instructions and older adults who receive audiovisual instructions. Data from posttest scores were analyzed using a two-tailed independent t test. Posttest mean difference score for the audiovisual instruction group was 22.0, SD = 32.7, and posttest mean difference score for the individualized instruction group was 30.0, SD = 23.66. Since $t(11)$ = 1.206, p = .301, no significant difference emerged; therefore, the researcher failed to reject the null hypothesis. There is no difference in knowledge scores for older adults who had audiovisual instruction and older adults who had individualized instruction (see Table 1). A part of determining effectiveness of each teaching modality was a demonstration of drawing up and injecting insulin performance by the participants.

Table 1

Insulin Assessment Post-Scores for Older Adults with Diabetes

Group	n	M	SD	t*
1	7	30	23.66	
				1.206
2	4	22	32.71	

*p < .05.

The results of the performance checklist scores were analyzed using descriptive statistics. Audiovisual pretest mean score was 54 (SD = 25.09), and the individual mean score was 50 (SD = 25.29). The audiovisual posttest mean score was 76 (SD = 15.16), and the individual mean score was 80 (SD = 8.94). The performance checklist scores ranged from 1 to 11 with a mean score for both groups of 10.0. Since both groups yielded excellent application of knowledge performance by return demonstration, the researcher determined that either teaching modality was effective in impacting insulin administration skills of older adults (see Figure 1).
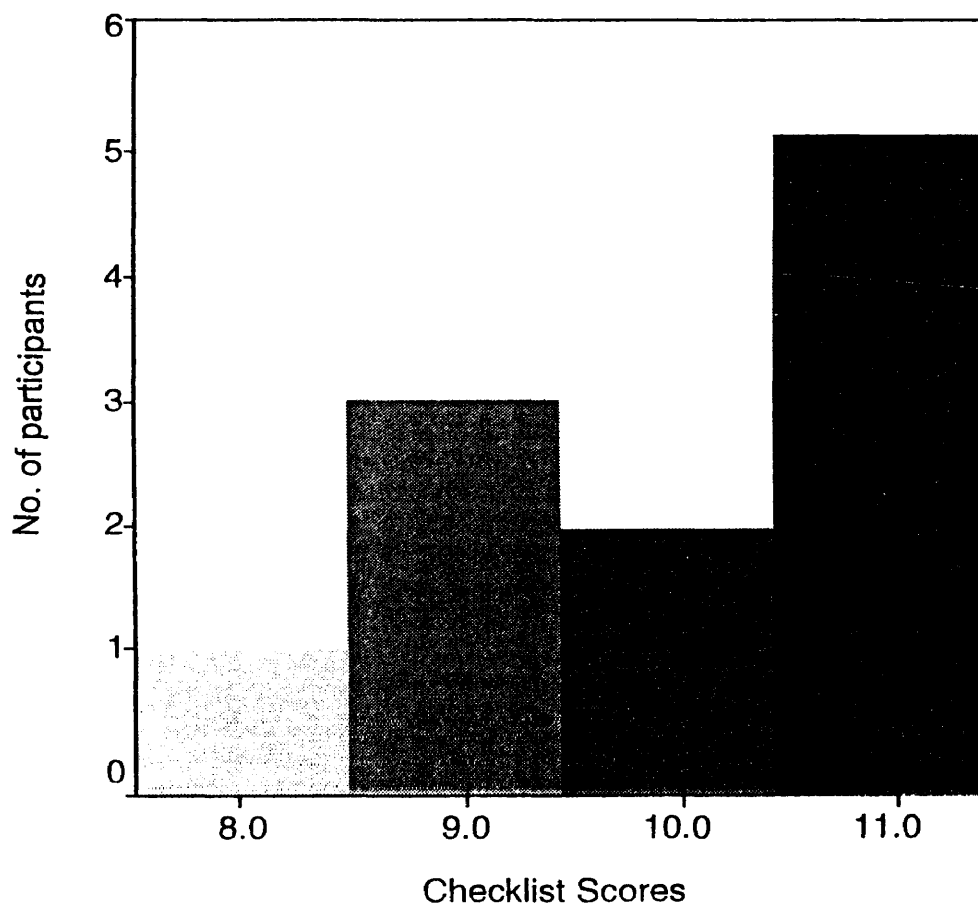
Figure 1. Performance checklist: Return demonstration of participants' drawing up and injecting insulin.

Additional Findings

The researcher was interested in determining whether overall scores improved with teaching interventions. The overall mean pretest score was 51.81 (SD = 24.0), and the overall mean posttest score was 78.18 (SD = 11.67). Data were subjected to t-test analysis. Since $t(11)$ = 3.246, p = .009, a significant difference emerged. Therefore, teaching interventions improved older adults' knowledge about insulin administration practices. The researcher further evaluated scores by inpatient and outpatient sites. The inpatient sample (n = 7) had a mean difference of 8.0 (SD = 24.10), and the outpatient sample (n = 4) had a mean difference of 8.0 (SD = 35.0). When mean scores were subjected to t-test analysis, no significance emerged, $t(11)$ = 1.045, p = .33. There is no difference in knowledge scores for subjects from different settings.

Summary

The sample as well as the data collection and analysis for this study have been presented. Statistical findings revealed that there was no significant difference in knowledge of insulin administration practices and performance checklist scores of older adults whether instructed individually or instructed by the use of

audiovisual methods. In Chapter V outcomes of the findings will be presented, including discussions, limitations, conclusion, implications for nursing, and recommendations for further study.

Chapter V

The Outcomes

Approximately 11 million people are affected with acute and chronic complications of diabetes. An estimated $20 billion is spent annually on the diagnosis and management of diabetes. Client adherence to self-care practice is essential to the control of diabetes. The self-care practice of injecting insulin is imperative for the management of both patients with type 1 and type 2 diabetes. Teaching modalities which effectively increase patient knowledge about insulin administration need to be developed and implemented. Therefore, the purpose of this study was to determine whether individualized instructions or audiovisual instructions increased the knowledge of insulin administration practices in older adults. Knowles' Andragogical Adult Learning Theory and King's Theory of Goal Attainment were used to guide this quasi-experimental study. Data were collected using a researcher-designed tool called the Insulin Administration Pretest/Posttest, and results analyzed using independent t tests. A summary

of findings, conclusions, implications for nursing, limitations, and recommendations are presented in this chapter.

Summary of Findings

Eleven participants were recruited from two metropolitan hospitals located in either an inpatient or outpatient educational setting. The majority of the sample were female (72.7%), African American (63.6%), between the ages of 61 and 70 years (63.6%), and were diagnosed with type 2 diabetes. Data were analyzed using a two-tailed independent t test. There was no statistical significant difference in posttest knowledge scores for participants provided with individualized instructions and participants provided with audiovisual instructions (p = .301). Both groups demonstrated excellent injection skills performance as indicated by an average of 10 out of 11 on the performance checklist. Regardless of the teaching modality implemented during the study, participants achieved increased knowledge levels about insulin administration as evidenced by the increase in knowledge (posttest) scores (p = .009).

Discussion

Since no prior research has addressed the comparison of these two teaching modalities, the findings of no significant difference between individualized and audiovisual instruction can neither be supported nor refuted. Brown et al. (1992) lend support to the use of audiovisual education as an effective method of education. Brown et al. used a posttest only with a control group and experimental group to investigate efficacy of a research-based patient education videotape, which was developed, designed, and piloted in a population of Hispanic diabetic adults. The researchers discovered that 25 of the 30 subjects unanimously agreed that the videotape was an acceptable method of conveying information in a positive manner and effective intervention in the management of diabetes in diabetic patients.

In another instructional modality study, Campbell et al. (1996) used an individual instruction intervention for one of four program interventions to improve HbA_{1c} levels. Although subjects in this group did not have significantly improved assay $HbA_{1c,}$ the researchers attributed this outcome to the length of time rather than teaching modality. This conclusion may be applied to the current

study. Perhaps it was not the individualized teaching program, but the duration of instructions which yielded no significant knowledge increase.

Both teaching modalities individualized and audiovisual seemed to have an equal impact on older adult knowledge of insulin administration. One explanation for this finding may be that these elders are adult learners and their previous life experiences may have conveyed information to them related to insulin administration. The researcher purports that these older adults perceived a need in their life situation to acquire new knowledge. This explanation is supported by the fact that subjects were cooperative and eagerly participated in the study regardless of teaching modalities. Knowles' (1984) learning concepts endorse this explanation as he suggests that adults are ready and motivated to learn when they acknowledge a need for more education. Also, participants were able to perceive the need to identify information from sense data (learning input) and memory and that either learning strategy was effective in achieved health care goals. According to King (1989), this perception is defined as a process for organizing, interpreting, and

transferring information from sense data and memory. This process explains the improved scores.

Other results from a study performed by Mazucca et al. (1986) lend support to increased knowledge levels overall result. Mazucca et al. (1986) determined the effect of a systematic education program on knowledge, skills, self-care behaviors, and relevant physiologic outcomes for diabetic patients. A significant positive impact on patient knowledge was demonstrated. According to the researchers, education is an essential component of effective disease management, and the role of the health care provider included education. These findings are similar to the current study which also used a systematic education program to incorporate effective teaching methodologies for instructing older adults with diabetes.

There were two potential limitations which may have impacted study outcomes. First was the sample size, which was small. Initially, the target sample was 30 participants for each intervention with a diagnosis of new insulin users. However, the researcher had to redefine criteria for subjects in order to get 11 participants. The small sample size hindered the possibility of emerging significance and promoted the possibility of committing a

type I error. However, the sample composition does reflect national demographics related to type 2 diabetic clients as the majority were female, African American, and older adults. The second limitation was the possibility of a pretest-posttest sensitization. The lack of significance may have been due to memory, recall, or cues to right responses by the participants on the posttest. The researcher is mindful of the fact that pretest scores do establish a baseline to compare to post interventions. Perhaps parallel tests could be instituted to garner this data and prevent sensitization results. However, there were no established tools available at this time to accomplish this data gathering.

Conclusions

There is no significant difference in knowledge about insulin administration practices for older adults who receive individualized instructions and those who receive audiovisual instruction. No prior research has been established to support or refute this finding. The researcher determined that both teaching modalities, the audiovisual instructions and individualized instructions, did significantly improve levels of older adult knowledge of insulin administration as indicated by overall posttest

scores. After instructions, both the individualized group and audiovisual group were able to demonstrate excellent skills in drawing up insulin as indicated by the performance checklist scores. Knowles' (1984) Andragogical Adult Learning Theory supports the explanation that these participants perceived a need for more education and were motivated to learn. According to King's Theory of Goal Attainment, this perception is a process for organizing, interpreting, and transferring information to memory.

Implications for Nursing

Research. Few research studies have been done to evaluate the effects of teaching modalities on knowledge of insulin administration practices in older adults. The results of this current researcher are inconclusive, but findings could be used as a pilot study to stimulate more research. During group assignment, the researcher did not allow participants the option to select their preferred teaching methodology. One of the subjects preferred audiovisual instructions rather than the individualized instructions she had been designated to receive. This issue should be considered when further studying teaching methodologies for patient education in clinical practice.

Education. The results of this study may make the nurse practitioner more aware of the significant role of diabetes education as an adjunct to improved treatment adherence. Nurse practitioners should incorporate different teaching modalities for diabetes education in the primary health care of older adults, their families, and caregivers. Either individualized or audiovisual instruction positively increased the knowledge level of insulin administration practices for these older adults. The intervention as a whole is viewed as a means to empower these adults to become increasingly proficient in insulin administration. Should this premise be accurate, patients will better manage their illness and make less office visits.

Practice. The nurse practitioner is in an ideal position to help facilitate health prevention, health maintenance, and health promotion activities. The practitioner has to begin by identifying learning needs of the patient to facilitate prevention measures, health maintenance, and health promotion. There are several implications for clinical practice.

One implication for clinical practice include the prevention of complications developing from an acute or a

chronic illness. A second implication for clinical practice is the possibility of the reduction in the number of patient visits made to the health care provider. Patient empowerment to make trustworthy health care decisions is a third implication for clinical practice. Another implication for the clinical setting is the possible enhancement of patient's self-esteem. Finally, the last implication is the provision of a collaborative approach for educating patients.

Theory. Application of adult and nursing theory to provide a foundation for initial and continuing care of adult patients is appropriate. These frameworks can provide structure for assessment in primary health prevention, maintenance, and health promotion activities. Additionally, theory such as King's (1987) and Knowles' (1984) are the bases for management plans.

Recommendations

Research

1. Replication of this study using different teaching modalities.

2. Replication of this study with a larger sample size.

3. Replication of a study to implement a posttest only design.

<u>Practice</u>

1. Implementation of adult learning principles to identify learning needs of patients prior to teaching interventions.

2. Implementation of teaching intervention options for every older adult with diabetes.

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APPENDIX A

PATIENT QUESTIONNAIRE

Patient Questionnaire

Complete the following information:

Age: Gender:
_____ 40-50 years   _____ Female
_____ 51-60 years   _____ Male
_____ 61-70 years
_____ 71-80 years   Race:
_____ 81-85 years   _____ (Specify)

Directions: Please circle your answer. Select only one
answer for each statement.

1. This is the first time I have been told I need
    insulin to control my blood sugar.
            Yes   No

2. I have used insulin before.
            Yes   No

3. I am between the ages of 45 and 85 years.
            Yes   No

4. I have taken medication for high blood sugar before.
            Yes   No

5. I have attended diabetic classes.
            Yes   No

6. I know how insulin works.
            Yes   No

    If yes, who taught you about diabetes and insulin?
    _____
    (Example: nurse, doctor, friend, or family member)

7. I know where to give insulin shots.
            Yes   No

APPENDIX B

INSULIN ADMINISTRATION PRETEST

Test Number_____

Insulin Administration Pretest

Pretest Score_____

ID #_____

Date_____

Directions: Circle one answer for each statement/question.

1. If you inject less than 30 units at one time, use a 1 cc syringe.

    True   False   I don't know

2. Insulin may be injected in the next same spot on the body everyday.

    True   False   I don't know

3. Any type of insulin may be used by a diabetic person.

    True   False   I don't know

4. The plunger on the syringe must be pushed up to let in units of air before each use.

    True   False   I don't know

5. Air bubbles in the syringe indicates that you will have more insulin.

    True   False   I don't know

Multiple Choice (select the best choice):

6. The **first** thing you should do before giving an insulin injection:

    _____ a. Roll the bottle of insulin in your hands.
    _____ b. Wash hands.
    _____ c. Wipe top of insulin bottle with soap and water.
    _____ d. I don't know.

7. When administering insulin, you must first:

    _____ a. Press down the skin.
    _____ b. Pick injection site.
    _____ c. Pull the needle through the skin.
    _____ d. I don't know.

8. Regular insulin effects last for
    _____ a. a 6-8 hour time period.
    _____ b. a 22-24 hour time period.
    _____ c. a 34-36 hour time period.
    _____ d. I don't know.

9. Insulin should be injected
    _____ a. after eating all meals
    _____ b. after the first bite of each meal
    _____ c. before meals
    _____ d. I don't know.

10. When a person who takes insulin becomes sick with an infection frequently requires
    _____ a. more insulin.
    _____ b. less insulin.
    _____ c. no insulin.
    _____ d. I don't know.

APPENDIX C

INSULIN ADMINISTRATION POSTTEST

Test Number_____

Insulin Administration Posttest

Pretest Score_____
Date_____

ID #_____

Directions: Circle one answer for each statement/question.

1. If you inject less than 30 units at one time, use a 1 cc syringe.
   True   False   I don't know

2. Insulin may be injected in the next same spot on the body everyday.
   True   False   I don't know

3. Any type of insulin may be used by a diabetic person.
   True   False   I don't know

4. The plunger on the syringe must be pushed up to let in units of air before each use.
   True   False   I don't know

5. Air bubbles in the syringe indicates that you will have more insulin.
   True   False   I don't know

Multiple Choice (select the best choice):

6. The **first** thing you should do before giving an insulin injection:
   _____ a. Roll the bottle of insulin in your hands.
   _____ b. Wash hands.
   _____ c. Wipe top of insulin bottle with soap and water.
   _____ d. I don't know.

7. When administering insulin, you must first:
   _____ a. Press down the skin.
   _____ b. Pick injection site.
   _____ c. Pull the needle through the skin.
   _____ d. I don't know.

8. Regular insulin effects last for
    _____ a. a 6-8 hour time period.
    _____ b. a 22-24 hour time period.
    _____ c. a 34-36 hour time period.
    _____ d. I don't know.

9. Insulin should be injected:
    _____ a. after eating all meals.
    _____ b. after the first bite of each meal.
    _____ c. before meals.
    _____ d. I don't know.

10. When a person who takes insulin becomes sick with an infection frequently requires
    _____ a. more insulin
    _____ b. less insulin
    _____ c. no insulin
    _____ d. I don't know.

APPENDIX D

PIEH PERFORMANCE CHECKLIST

Pieh Performance Checklist

Drawing up and injecting insulin **return demonstration**
checklist.

1. Wash hands prior to performing insulin
    administration.
                _____ Yes   _____ No

2. Gently rolls bottle of insulin between hands to mix.
                _____ Yes   _____ No

3. Wipes (simulates or verbalizes wiping of bottle top)
    top of insulin bottle with an alcohol prep.
                _____ Yes   _____ No

4. Pulls plunger down to the desired number of insulin
    units required for injection.
                _____ Yes   _____ No

5. Pushes needle and plunges air into insulin bottle.
                _____ Yes   _____ No

6. Pulls plunger down to desired number of insulin
    units.
                _____ Yes   _____ No

7. Checks for air bubbles and eliminates bubble when
    needed.
                _____ Yes   _____ No

8. Pick injection site and wipes with an alcohol prep.
                _____ Yes   _____ No

9. Pinch up skin (if thin, if obese flattens skin),
    pushes needle into skin and pulls needle out.
                _____ Yes   _____ No

10. Disposal of syringe and safety precautions taken.
                _____ Yes   _____ No

APPENDIX E

APPROVAL OF MISSISSIPPI UNIVERSITY FOR
WOMEN'S COMMITTEE ON USE OF HUMAN
SUBJECTS IN EXPERIMENTATION

MISSISSIPPI UNIVERSITY FOR WOMEN

Columbus, MS 39701

April 8, 1998

Ms. Clara D. Pieh
c/o Graduate Program in Nursing
Campus

Dear Ms. Pieh:

I am pleased to inform you that the members of the Committee on Human Subjects in Experimentation have approved your proposed research as submitted; however, the Committee urges that the consent form contain confidentiality provisions, that a statement be included that failure to participate will not affect the standard of care, and that a statement be included that participation is voluntary.

I wish you much success in your research.

Sincerely,

Susan Kupisch, Ph.D.
Vice President
  for Academic Affairs

SK:wr

cc: Mr. Jim Davidson
     Dr. Mary Pat Curtis

Where Excellence is a Tradition

APPENDIX F

APPROVAL OF THE INSTITUTIONAL REVIEW
BOARD OF THE UNIVERSITY OF TENNESSEE

THE UNIVERSITY OF TENNESSEE
MEMPHIS
The Health Science Center

May 14, 1998

Ms. Clara D.J. Pich
Department of Graduate Nursing
College of Nursing
620 Alexander Building
UT Memphis

Dear Ms. Pich:

On May 14, 1998, the UT Memphis Administrative Section of the Institutional Review Board reviewed your application entitled "The Effects of Two Teaching Methodologies on Knowledge of Insulin Administration Practices in an Older Adult Group" (IRB #6571) which includes human subjects and/or tissue for investigative purposes.

The administrative section of the IRB determined your application to fall under the guidelines of expedited review, therefore your application was approved in this regard as complying with proper consideration of the rights and welfare of human subjects, the risk involved, and the potential benefits of the study.

Any further alterations in the protocol must be promptly reported to and approved by the UT Memphis Institutional Review Board. In addition, **annual reapproval** is required by the IRB, and it is the responsibility of the Principal Investigator to initiate the request for reapproval regardless of the time the activity has been approved by the sponsoring agency.

Any further alterations in the protocol must be promptly reported to and approved by the UT Memphis Institutional Review Board.

Sincerely,

Clair E. Cox, M.D.
Chairman
Institutional Review Board

APPENDIX G

CONSENT FORM

Consent Form

I agree to participate in a research study designed to assess the effect of individualized instructions and audiovisual instructions on older adults' knowledge of insulin administration. To ensure the maintenance of good blood glucose control, effective teaching methodologies must be implemented. Therefore, the desired outcome of this study is to identify an effective teaching methodology to curtail knowledge deficits and minimize complications.

I will be one of the 60 participants enrolled in the study. Thirty of the participants enrolled in the study will be patients at UT Bowld Hospital. The other 30 participants will be enrolled in an outpatient diabetes education class at the Regional Medical Center. The study will require approximately 1.25 hours total of my time. I will be given a questionnaire to complete to determine my inclusion in the study. A pretest will be given to me and then the individualized or audiovisual instructions will be presented, followed by a posttest.

I understand that participation in this study has minimal risk of self-imposed needle stick as a result of manipulating a sterile needle and syringe during the return demonstration. The benefit of this study is that it may provide information on the most effective teaching methodology for instructions on insulin administration in older adults. I will not be given any payment for my participation in this study, and I will not incur any additional health care expenses as a result of the study.

I have been informed that my participation in the study will be confidential and my health care will not be affected by my participation or withdrawal from the study. I have also been informed that the principal investigator will be the only person with access to information obtained during the study, and the results will be kept in a separate file, which is available only to the principal investigator.

I understand that I am not waiving any legal rights or releasing the University of Tennessee or its agents from liability or negligence. I understand that in the event physical injury resulting from research procedures, the University of Tennessee does not have funds budgeted for compensation either for lost wages or for medical treatment. Therefore, the University does not provide for treatment or reimbursement for such injuries.

If I have questions about the study, I may contact Clara Pieh at (901) 448-7142. If I have any questions about my rights as a participant in this study, I may contact Dr. Clair E. Cox, UT Memphis, IRB Chairman at (901) 448-4824.

I have read or have had read to me the description of the study as outlined above. The investigator or her representative has explained the study to me and has answered all of the questions I have at this time. I have been told of the potential risks, discomforts, side effects, and adverse reactions as well as the possible benefits (if any) of the study.

I freely volunteer to participate in the study. I understand that I do not have to take part in this study and that my refusal to participate will involve no penalty or loss of rights to which I am entitled. I further understand that I am free to later withdraw my consent and discontinue participation in this study at any time. I understand that refusing to participate or later withdrawing from the study will not adversely affect my subsequent medical care.

_____   _____

Signature of Research Subject or   Date
Legally Authorized Representative

_____   _____

Signature of Witness   Date

_____   _____

Signature of Principal Investigator   Date

APPENDIX H

CONSENT OF RESEARCH PARTICIPANT

Consent of Research Participant

Title of Research Study

    The Effect of Two Teaching Methodologies on Insulin
    Administration Practices in an Older Adult Group

Clara Pieh is a registered nurse and graduate nursing
student at Mississippi University for Women (MUW). She is
studying the effect of two teaching methods on insulin
administration practices in older adults. The study has
been approved by MUW's Committee on Use of Human Subjects
in Experimentation and the Institutional Review Board of
the University of Tennessee.

If I agree to do this study, I will fill out one
questionnaire, two pen-and-paper multiple-choice tests,
and receive individualized or audiovisual instructions.
The study is being conducted to help health professionals
understand the best method of instructions for adult
learners.

I will have an opportunity to talk with Clara Pieh about
the study. I may reach her at (901) 448-7142 between the
hours of 8:00 a.m. and 5:00 p.m.

I have been offered a copy of this form to keep for my
personal records. I have also been informed of the option
to withdraw from this study at any time and will be given
an up-to-date analysis. My participation will remain
confidential. I also have been informed that my quality of
care will not be affected by participating or not
participating in the study.

_____   _____

Participant's Signature   Date

_____   _____

Researcher's Signature   Date

APPENDIX I

TEACHING OUTLINE:
ADMINISTRATION OF INSULIN

Teaching Outline:
Administration of Insulin

I. Introduction

   A. Pretest
   B. Distribution of materials, including pamphlet, syringes, and alcohol wipes

II. Lesson Presentation

   A. Objectives
      After the presentation, the learner will be able to:
      1. Verbalize the name and type of insulin used for glycemic control.
      2. Identify sites for subcutaneous insulin administration.
      3. Demonstrate correct method for drawing up insulin and injection techniques.

   B. Individualized or Audiovisual Instructions

   C. Return Demonstration by Participants

   D. Administration of Posttest