Intentional learning and change: diabetes related health changes by Type II diabetics
by Patricia Monahan Lundgren

A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Education
Montana State University
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Abstract:
Diabetes education efforts have traditionally attempted to provide people with the knowledge and skills needed to comply with prescribed changes. This study holds that diabetics need to assume more responsibility for controlling their disease—not passively comply with instructions. The main purpose of this study was to examine selected dimensions of intentional learning and change in diabetes related health areas made by persons with Type II diabetes. The sample for the study was 46 self-selected Type II diabetics who were members of the American Diabetes Association residing in Southwestern Montana.

Volunteers were interviewed using a structured schedule which solicited quantitative and qualitative data. They were asked to identify the most significant intentional diabetes related health change that they had achieved in the previous five years. Other questions examined the processes, resources, and learning involved in those changes.

Eighty-five percent of the interviewees had made at least one intentional change. Major change categories included eating habits, blood glucose monitoring, curtailing the use of alcohol and tobacco, and exercising.

Crediting themselves with primary responsibility for their changes, individuals used health professionals as a major resource for their changes. Depending on the type of change, persons experienced more difficulty with different tasks of the change process. Diabetics express an unmet need for support from individuals with diabetes and from support groups. Triggers motivated persons' decisions to change.

Learning both motivated decisions to change and was deliberately pursued in order to accomplish a change. Learning projects were goal-oriented, took from 7 to 1000 hours to complete, and were planned primarily by learners. Reading was the major learning activity.

Health professionals need to consider taking a more person-centered approach to managing diabetes and to the diabetes teaching-learning interaction. Emphasis should be placed on helping diabetics choose to make changes, and on involving them in planning subsequent learning and actions. Health professionals should determine the degree of control which persons prefer, and attempt to use effective amounts of direction and control.

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by

Patricia Monahan Lundgren

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Date December 29. 1987

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ABSTRACT

Diabetes education efforts have traditionally attempted to provide people with the knowledge and skills needed to comply with prescribed changes. This study holds that diabetics need to assume more responsibility for controlling their disease--not passively comply with instructions. The main purpose of this study was to examine selected dimensions of intentional learning and change in diabetes related health areas made by persons with Type II diabetes. The sample for the study was 46 self-selected Type II diabetics who were members of the American Diabetes Association residing in Southwestern Montana.

Volunteers were interviewed using a structured schedule which solicited quantitative and qualitative data. They were asked to identify the most significant intentional diabetes related health change that they had achieved in the previous five years. Other questions examined the processes, resources, and learning involved in those changes.

Eighty-five percent of the interviewees had made at least one intentional change. Major change categories included eating habits, blood glucose monitoring, curtailing the use of alcohol and tobacco, and exercising.

Crediting themselves with primary responsibility for their changes, individuals used health professionals as a major resource for their changes. Depending on the type of change, persons experienced more difficulty with different tasks of the change process. Diabetics express an unmet need for support from individuals with diabetes and from support groups. Triggers motivated persons' decisions to change.

Learning both motivated decisions to change and was deliberately pursued in order to accomplish a change. Learning projects were goal-oriented, took from 7 to 1000 hours to complete, and were planned primarily by learners. Reading was the major learning activity.

Health professionals need to consider taking a more person-centered approach to managing diabetes and to the diabetes teaching-learning interaction. Emphasis should be placed on helping diabetics choose to make changes, and on involving them in planning subsequent learning and actions. Health professionals should determine the degree of control which persons prefer, and attempt to use effective amounts of direction and control.

CHAPTER 1

INTRODUCTION TO THE STUDY

Introduction

Diabetes mellitus affects approximately 5% of the persons in the United States. Seven million people are known diabetics, and an estimated 3 to 4 million others have the disease but are not aware of it. In addition, the incidence of this chronic disorder is increasing at a rate of approximately 6% per year. The American Diabetes Association has predicted that by 1999 there will be nearly 20 million people with diabetes in the United States. Major factors behind this increasing incidence of diabetes include an aging population, sedentary lifestyles and poor dietary habits (Elliott, 1984).

Diabetes is the third leading cause of death by disease in the United States (National Diabetic Commission Report, 1981). Diabetics have twice the incidence of cardiovascular disease as nondiabetics. Diabetes is the leading cause of blindness; the second leading cause of foot amputation; and causes 25% of all end stage renal disease (Elliott, 1984).

In order to control this disease, the person with diabetes must make several significant lifestyle changes. Ultimately, success in controlling diabetes depends on how

well informed and prepared the diabetic is to deal with the problems which will arise and on the daily choices he or she makes.

Traditionally, diabetes educational efforts have attempted to provide people with the knowledge and skills needed to control the disease. The focus was on persuading the individual to follow the regime prescribed by the physician. Patients were viewed as passive recipients of care whose role was to follow the doctor's orders. Certainly this approach to care is still being widely used. However, it is now recognized by many health professionals that it is the patient who must implement the treatment on a daily basis, and therefore the patient who is ultimately responsible for control of the diabetes. Health professionals need to focus their attention on the patient, on communicating with him or her, and on supporting his or her learning or lifestyle efforts. An example of this approach is Strowig's (1982) model of diabetes self-management, which suggests that diabetes education efforts need to focus on providing the individual with choices and assistance in taking health actions.

Relevant to understanding the changes which diabetics make in an effort to control their illness are the findings of recent studies on adults' intentional change. In 1982, Allen Tough reported on a series of interviews during which 150 adults were asked to describe the most important

intentional change they had recently implemented. The two main areas of change were: (1) career, job, and training; and (2) human relationships, emotions, and self-perception. These areas comprised 54% of all reported changes. In addition, physical health was the focus of 7% of the changes. The critical importance of the person in his or her own change process became evident in this study. Tough stated:

> People usually serve as the manager or navigator of their own intentional changes. They may receive advice, encouragement and information from other people and books, but they fit this help into their own ongoing self-managed process (1982, p. 55).

Several findings came out of Tough's work and other studies on intentional change. Adults are highly active in their personal change efforts; these changes are largely the result of the individual's ability and effort; and their intentional changes are large, successful, and beneficial to themselves and others (Tough, 1982). Sixty-seven percent of all changes are intentional, while 33% are unintentional (Neehall, 1983). Although changes are largely self-directed, adults feel they could use help with their change processes from persons with specialized knowledge and experience (Blackwell, 1981). Friends and family members are significant resources for persons making life changes; however professionals are credited with 5% of the responsibility for accomplishing change (Tough, 1982). Most adults are reasonably successful in achieving changes that

they choose (Tough, 1982).

An understanding by health professionals of successful intentional change efforts by diabetics could radically alter their perspectives of these individuals' abilities to change and could dramatically alter their philosophies and approaches to diabetes education. Having this information could provide health professionals with insight into the processes and resources persons use in change efforts, and where additional assistance would be helpful. In addition, because learning is one means through which personal change is accomplished, gaining an understanding of the learning involved in achieving personal change will enhance caregivers' ability to support diabetics' learning efforts.

Statement of the Problem

The problem of this study is to examine selected dimensions of intentional learning and change in diabetes related health areas made by persons with Type II diabetes. Dimensions examined include:

- most significant intentional change;
- percentage of change which was actually accomplished;
- importance of the change;
- benefits of the change to self and others;
- most difficult part of the change;
- resources used in choosing, planning, and implementing the change;

- activities involved in choosing, planning, and implementing the change;
- learning undertaken in order to achieve the change;
- number of hours spent in these learning efforts;
- learning activities pursued;
- primary planner of each learning project;
- number of learning projects;
- additional resources which would have been helpful to the change process;
- benefits expected as a result of the change;
- unintentional changes in diabetes related health areas; and
- desired health change which was not achieved.

A second purpose of the study is twofold: first, to determine the extent to which relationships exist between selected demographic variables and both the identified areas of intentional change and the topics of learning projects; and second, to determine the relationship between their most important diabetes related health change and topics of learning projects.

Research Questions

The questions addressed in this study are:

1. What are the areas of intentional diabetes related health change undertaken by Type II diabetics?
2. What are the characteristics of intentional change

efforts?

3. What learning is undertaken in the context of the intentional change process?
4. What are the characteristics of these learning efforts?
5. What types of additional assistance would have been helpful to the change process?
6. What benefits were anticipated as a result of the change?
7. Were there unintentional changes made in diabetes related areas of health?
9. Were there desired changes which were not achieved?
10. To what extent do relationships exist between demographic variables and areas of intentional learning and change?
11. What is the relationship between areas of most significant health change and topics of learning projects?

Significance of the Study

The past five or six years have seen a change of focus begin to emerge in diabetes education. Previously, education for Type II diabetics focused solely on learners' acquisition of knowledge and skills. There was an assumption that if persons understood diabetes and its treatment, they would subsequently change their health

behavior. The result of education efforts which took this approach were, and continue to be, very poor: some knowledge gain, but little evidence of behavior change, or improvement in clinical diabetes control (Graber, Christman, Alogna, & Davidson, 1977; Mazzuca,1982; Scott, Beaven, & Stafford, 1984; Watkins, Williams, & Martin, 1967; Williams, Martin, & Hogan, 1967).

Some success is currently being accomplished. Behavior change and improvement in metabolic control are occurring in some persons. The concurrent change which is occurring in the education process is an integration of behavioral and attitudinal components into the learning program (Kurtz, 1986; Leichter, 1986; Mazucca, 1982; Rettig, Shrauger, Becker, Gallagher, & Wiltse, 1986; Schlenk & Hart, 1984). Whether success continues to be demonstrated over the long term process of a person's chronic disease remains to be demonstrated.

Despite this apparent improvement in the effectiveness of diabetes educational efforts, the predominant approach taken in the teaching-learning interaction remains one which is based on the medical model approach to care. This medical approach views caregivers as experts and patients as uninformed, passive recipients of care. Caregivers treat the disease while patients follow orders; patients are expected to adhere to their prescribed regimen. Those who do not are considered "noncompliant". The wide use of this

traditional medical approach to patient education is demonstrated by the major attention patient compliance receives in the literature (i.e.,Becker & Maiman, 1980; Eraker & Becker, 1984; Mushlin & Appel, 1977; Kinnaird, Yoham, & Kieval, 1982; and Rainwater & Giordano, 1985).

Anderson (1985) makes an excellent argument for the fact that using this traditional medical approach in the care of diabetics in inadequate. He states that in diabetes, it is the person with the disease and not the caregiver who must implement the treatment on a daily basis. Therefore, caregivers should focus their attention on the patient rather than on the treatment of the disease. Anderson recommends what he calls an "educational approach" to diabetes care. This approach requires very different expectations in the caregiver/patient relationship. It focuses on communication between the caregiver and patient. Problems of noncompliance need to be viewed through the patient's perspective. Caregivers need to:

> ...understand and work through the patient's frame of reference .... Patients are seen as basically capable and responsible for managing their own lives. The practitioner is an ally who facilitates the growth of patients by helping them discover and develop the capacity to solve their own problems (Anderson, p.32).

Anderson's "educational approach " reflects many of the assumptions and conditions of adult learning delineated by Knowles (1970), and, as such, is a legitimate approach to take in the diabetes education process. Five relevant

assumptions about the characteristics of adult learners which are noted by Knowles include:

1. self-concept moves from being dependent toward being self-directing;
2. a growing reservoir of experience becomes an increasing resource for learning;
3. readiness to learn becomes oriented increasingly to developmental tasks of social roles;
4. time perspective changes from one of postponed application of knowledge to immediacy of application; and
5. orientation toward learning moves from subject-centeredness to problem-centeredness. (1970, p.39)

In reviewing the related literature, this investigator found very little evidence of an approach such as Anderson's being taken in diabetes education efforts. In an exception to this lack of evidence, Strowig (1982) presents a model of patient education in which diabetics make choices and take deliberate action toward the goal of controlling their diabetes.

According to Strowig, it is critical for the patient to see him or herself as being in charge of his or her diabetes and the educator as someone who is available to help the person deal with the diabetes. The educator's role is to understand and enhance the individual's capabilities and to strengthen his or her ability to make choices and take

deliberate action.

Strowig stresses the need to protect individuals' rights to choose their management plan, to prepare them for decision making regarding the day-to-day management of the plan, and to thereby support them in taking actions directed toward controlling their own disease. This is reflected in the following statement:

> The therapeutic regimen for a diabetic individual requires the coordination of medications, diet and exercise into a daily routine of work, school and recreation such that extremes in blood glucose levels are avoided. Careful thought, decision-making and, ultimately, action on the part of the patient are required to implement such a regimen. Action is impossible, however, if an individual is unaware of his options or incapable of making a choice. The patient, not the doctor or educator, is the determiner. The denial of choice eliminates the possibility of action (1982, p.1295).

Strowig suggests the need to study human capabilities, how these capabilities are used in self-care, and ways capabilities can be enhanced by health professionals.

Strowig's concepts of capabilities, decision-making, and action are very similar to the natural change processes described by Tough (1982). A difference lies in the fact that Tough views the individual as needing "an optimal range of control" (p.106) of his or her own change efforts (the range depending on the person and the situation), whereas Strowig simply encourages health professionals to allow persons to be more in charge of their change.

Tough's research, reported in Intentional Changes, describes the most significant changes recently made by persons and the processes and resources they used to accomplish these changes. He argues that understanding these natural change processes will enhance the ability of professionals to promote beneficial and effective changes. In fact, more recently, Tough (1985) suggested that a study such as the one presented here would contribute insight and bring about important implications for the diabetes education profession.

Tough suggests seven practical implications of having a better understanding of natural change processes. These include:

1. improve individual competence in managing change;
2. develop better help with goals and planning;
3. increase information about opportunities and resources;
4. reduce undue restrictions on freedom of choice;
5. widen the range of opportunities and resources;
6. improve ongoing support from nonprofessionals; and
7. improve the effectiveness of professional help (1982, p.77).

Gaining an understanding of the types of intentional health changes that diabetics make and the processes and resources they use in these efforts could enhance diabetes educators' abilities to facilitate learning and change by

diabetics. Emphasizing the person's capacity to be in charge of controlling his/her own diabetes is a much needed perspective. Taking this type of approach could dramatically improve the effectiveness of diabetes education efforts and ultimately improve the quality of life for persons with diabetes.

In addition to its implications for the practice of diabetes education, this study has implications for diabetes education research and for adult learning research. From an adult learning perspective, it enlarges the body of intentional changes research; it provides data on the learning projects of a population which was previously unexamined; and it examines the relationship between learning and change by persons who are living with a chronic illness. From a diabetes education research perspective, this study examines diabetes education from a vantage point which was previousy unexamined--the diabetic's. If Type II diabetics do, in fact, make successful, intentional diabetes related health changes for which they see themselves as being primarily responsible, then health professionals' role as facilitator rather than director of persons' change is validated. Given the validation of this role, health professionals would be free to explore the effectiveness of using less control over diabetes teaching-learning situations. In addition, there would be a need to develop strategies for integrating learner-centered approaches into

the teaching-learning interaction and to evaluate whether using learner-centered modes of instruction are effective in influencing diabetes related health changes.

General Procedures

The population for this study was all persons in the Bozeman and Billings, Montana areas with known Type II diabetes who are members of the American Diabetes Association. From this group, a sample was drawn from which the data were collected using an interview technique. An adaptation of the interview schedule developed by Tough (1982) was used to guide these interviews. Tough's schedule was originally developed and refined over the course of interviewing 180 persons.

Information sought through the interviews included: (a) most significant intentional change in diabetes related health areas; (b) intentional learning undertaken in support of the change process; (c) characteristics of intentional learning and change; and (d) various demographic information.

Data regarding persons' learning and change processes were discussed narratively and were analyzed using basic descriptive statistics. Hypotheses regarding the relationship between areas of intentional change and topics of learning projects with demographic variables were tested using the chi square test of independence.

Assumptions and Limitations

Assumptions of this study are:

1. Many persons with Type II diabetes make intentional changes in diabetes related health areas.
2. Intentional learning is a component of the process of intentional change.

Limitations of this study were:

1. Data were collected from a small sample of persons (N = 49) with Type II diabetes living in the Bozeman and Billings, Montana areas.
2. Since data were collected from persons who are members of the American Diabetes Association, the generalizability of the results to the general population of Type II diabetics is limited as members of this organization may not be representative of the general population of these persons.
3. Interviewer inconsistency and bias should have been controlled by consistently following the interview schedule. However, inconsistency and bias remain possibilities.
4. The researcher/interviewer interpreted the data collected. It is possible, given the qualitative nature of some of the data, that someone else could interpret it differently.

Definitions of Terms

Diabetes Mellitus--A chronic disorder characterized by abnormalities in the metabolism of carbohydrates, protein and fat. It encompasses many disorders which affect insulin secretion or action. Glucose intolerance is the common factor among these disorders (American Diabetes Association 1884; Guthrie & Guthrie, 1983).

Health--A dynamic state, components of which include physical, emotional, social, and spiritual wellbeing.

Intentional Change--A change in which the person definitely and voluntarily chooses the change and then strives to achieve it by taking certain steps (Tough, 1982). Intentional responses to unintentional events, such as having diabetes, will be included in this definition.

Intentional Learning -- Learning that occurs as a result of a person's deliberate efforts to acquire new knowledge, attitudes, or skills.

Learning--The acquisition of knowledge, attitudes or skills.

Learning Project--" A series of clearly related learning efforts adding up to at least seven hours of effort" (Hiemstra, 1975, p.23). The learning effort must include activities designed to obtain new information, to develop new skills, or to acquire new attitudes or beliefs. "Deciding, planning, traveling time to a learning activity,

and evaluating personal progress will be considered as part of the learning project time" (Hiemstra, 1975, p.23).

Type II Diabetes--A disorder characterized by impaired tissue sensitivity to insulin. Also referred to as non-insulin-dependent diabetes because these individuals produce endogeneous insulin (American Diabetes Association, 1984; Guthrie & Guthrie, 1983).

Type II Diabetic--A person medically diagnosed as having Type II diabetes.

Unintentional Change--"Change which is forced on the person required by circumstances such as events, maturation, and so on" (Tough, 1982, p.48).

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

In 1983, Kidd wrote that the profession of adult education has experienced a "radical transformation" in the last 25 years. He stated that a dramatic change in perspective has occurred. The vantage point is no longer adult education but adult learning. Tough (1978) also reflected this theme calling it a "shift of focus." The traditional focus of adult education was the provision of education or instruction; the emerging focus is on facilitating relevant learning.

Tough has described adults' learning efforts as being analagous to an iceberg. The tip of the iceberg, about one-fifth of all learning, had been visible prior to the change of focus. The visible portion centers around learning through organized adult education opportunities such as classes, programmed instruction, correspondence study, workshops and apprenticeships. However the major portion of the iceberg has been submerged and below view. He proposes that the adult learning efforts which comprise 80% of the iceberg center around self-planned learning projects. In recent years, research has been conducted

in an effort to bring to light the phenomenon of adults' independent learning activities. The implications of this understanding have been and will be tremendous. It is this knowledge which has contributed to Kidd's "radical transformation" in the profession of adult education.

In 1982, Tough acknowledged the connection between learning projects and personal change, and studied adult's intentional change. He believed that by understanding adults' natural change processes, professional helpers would gain insight into how to facilitate these change processes in a more effective manner.

Diabetes is a disease which requires major behavior change by persons who are afflicted with it. Persons who have diabetes need to be involved in daily self management activities which attempt to balance their food intake, physical activity, and medication taking. Whereas more simple physical ailments can be effectively dealt with when health care providers recommend and direct the treatment, an effective approach to diabetes care requires the person with diabetes to be centrally involved in controlling his or her illness.

A recent technological development which is particularly important for diabetics is the availability of blood glucose monitors for their daily use. A monitor provides individuals with a measurement of their current blood glucose levels. With this information, they can

adjust food intake, exercise, or medication attempting to normalize blood glucose levels. For the first time, individuals have access to the information they need to manage their own disease. This development makes the concept of diabetes self-care a viable one.

Strowig and Anderson are two persons who have called for a change of focus in the diabetes teaching-learning interaction. Anderson (1985) has proposed that health professionals focus their attention on supporting the diabetic in his or her learning and lifestyle efforts (and away from the health professionals' ideas regarding the diabetic's learning and lifestyle needs). Strowig suggests that diabetes education needs to focus on the development of capabilities and of individual choice, thereby facilitating individual's deliberate action. (1982, p.1304).

Education is a vital component of diabetes care. Persons with diabetes not only need a good understanding of diabetes and its control, they need to gain an appreciation of the need to assume responsibility for control of their disease, to learn various psychomotor and decision-making skills, and to discover ways to cope with their environments and life demands. It is proposed that an approach to diabetes education is needed which focuses on helping persons assume responsibility for control of their diabetes and choose to make lifestyle changes.

The present study attempts to gain an understanding of diabetics' intentional learning and change--and thereby, gain insight into how to more effectively facilitate this sort of change by persons with Type II diabetes. This literature review will be organized around the following headings: Intentional Learning, Reasons for Learning Projects, Intentional Change, Diabetes, and Diabetes Education.

Intentional Learning

The first major evidence of adults being engaged in independent learning projects was uncovered by Johnstone and Rivera (1965). They were conducting a national survey which examined the educational pursuits of American adults. Unexpectedly, the study found that self teaching was a common activity among adults. Nine million adults were estimated to have been involved in a self instructional activity in the year prior to the study. This incidence was much greater than anticipated by the researchers. Johnstone and Rivera suggested that "the category (of self teaching) may well represent the most overlooked avenue of activity in the whole field"(p.37).

Soon afterward, Tough became involved in trying to correct this oversight. A major theme of Tough's work has been understanding adults' self-planned attempts to learn new knowledge and skills. In his book, The Adults' Learning

Projects, Tough presented information on the learning efforts of 66 persons. He defined a learning project as:

> ... a sustained, highly deliberate effort to learn knowledge or a skill; a series of related episodes, adding up to at least seven hours. In each episode, more than half of the person's total motivation is to gain and retain certain fairly clear knowledge and skill, or to produce some lasting change in himself (1979, p.7).

The focus was on the person's highly deliberate efforts to learn. These intentional learning activities were directed at acquiring new knowledge, understanding, beliefs, skills, or behaviors. These learning efforts comprised a broad range of activities which included self-planned learning, and all forms of organized adult education activities.

Tough (1979) conducted intensive, highly structured probing interviews with 66 persons. Major findings from this study revealed that 98% of the interviewees conducted at least one learning project in the prior year and an average of eight learning projects were conducted by each person in one year. In addition, it was determined that the typical person spent from 700 to 800 hours per year engaged in learning projects and nearly 70% of the learning projects were self-planned. Attempting to help people recall their learning projects and details of the projects, Tough used lists of subject matter and learning methods in this interview process.

On the basis of this study, Tough called for additional research to further the understanding of the phenomenon of

adults' learning projects. As of 1985, over 55 research studies had been performed.

In 1974, Coolican reviewed six of the major research studies on self-planned learning which had occurred up to that time. The following is a summary of her review. Researchers conducting these studies included Tough (1971), McCatty (1973), Johns (1973), Denys (1973), Johnson (1973), Coolican (1973), and Peters and Gordon (1974).

Small and very diverse populations were sampled for these studies. McCatty studied 54 professional men in a suburb of Toronto, Canada; Johns, 39 pharmacists in Atlanta, Georgia; Denys, 40 African professionals; Johnson, 40 adults who had recently completed high school degrees or equivalency certificates in Fort Lauderdale, Florida; Coolican, 48 mothers with preschool children in Syracuse, New York; and Peters and Gordon, 443 persons in two Tennessee counties (one rural and one urban).

All of the studies utilized Tough's interview schedule, and explored learning projects which had occurred within the 12 months prior to the interview. Almost every adult had been involved in learning during the preceeding year. Tough reported a participation rate of 98%, Peters and Gordon reported a rate of 91%, and the other five studies reported a 100% participation rate. The extent of these learning activities was examined by the number of learning projects undertaken and the estimated number of hours spent for the

learning projects.

Numbers of learning projects ranged from a median of three by persons in the Tennessee study to 13 by recent high school graduates. The estimated number of hours spent ranged from a median of 160 by mothers of preschool children to 1058 by professional men.

Tough determined that learning projects are planned in four modes. These modes include: self-planned learning, group-planned learning, one-to-one learning and resource-planned learning. Tough found that 68% of learning projects were self-planned. Pharmacists (Johns, 1973) reported the smallest number of self-planned learning (56%), while professional men (McCatty, 1973) reported the highest (76%). Group planned projects ranged from 11% by professional men (McCatty, !973) and African professionals (Denys, 1973) to 23% by recent high school graduates (Johnson, 1973). One-to-one planning was used most frequently (14%) by recent high school graduates (Johnson, 1973), and least frequently (6%) by African professionals (Denys, 1973). Pharmacists (Johns, 1973) used a resource planned learning approach (19%) much more frequently than others whose use of these prepared instructional materials ranged from 1 to 5%.

Most learning projects were initiated for practical reasons, career and family being the two most frequently cited topics. Coolican (1973) asked persons to name the

primary resources used for each learning project. Friends/relatives/neighbors and paid experts were mentioned most frequently. Books and pamphlets were the next most frequently cited resources. Activities most often involved in the learning were practice, reading and discussion.

Coolican also discovered the phenomenon of "quick learning", projects which could be completed in less than seven hours and which in many cases develop into longer projects. McCatty (1973) found that professional men's most common reasons for planning their own projects were the desire to learn particular things and not gain general information. In Peters and Gordon's (1974) study of Tennesseans, one half of the persons interviewed needed additional assistance at some point in their learning.

After 1974, research continued into the phenomenon of adults' learning projects. In Nebraska, Hiemstra (1975) conducted a study of 256 adults who were at least 55 years of age. He investigated their learning interests, activities and obstacles, and found that adults were involved in an average of 3.3 learning projects per year which took an average of 324 hours. Fifty-five percent of the projects were self-planned; and books, pamphlets, and newspapers were the most common source of information (31% of the resources used).

Hiemstra found that older adults are interested in and are carrying out more "instrumental learning activities"

than "expressive activities"--instrumental activities being designed to enhance the mastery of old age challenges, and expressive activities being ones which are designed to increase a person's enjoyment of life (p.16). He also determined that upper middle and upper class persons, college graduates and white collar workers engaged in significantly more learning projects than other persons (p.64).

Group-planned learning was the focus of Farquaharson's (1975) research. Specifically, he was interested in the effectiveness of self-help groups in assisting people to cope with personal problems. Farquaharson interviewed 40 persons from the Toronto, Ontario area who had accomplished some positive personal changes as a result of being involved in self-help groups. These groups helped people deal with a wide variety of problems. A few of these problems included drinking, weight, bereavement, and child raising. Not only were persons supported with their changes, more than one half reported major positive changes in self confidence and ability to relate to others, one third indicated positive changes in their ability to admit or accept their problem, and one third reported an improved capacity to be helpful to others. Although all persons reported at least some degree of positive change in themselves as a result of membership in their group, less than one quarter viewed their achievement as major personal changes.

The findings of Farquaharson's study revealed that certain kinds of personal problems can be effectively dealt with if persons join together for mutual assistance. Persons are provided with a stimulus for change, observe several different coping styles which help them to plan their own behavior, and build a sense of hopefulness.

Penland's (1977) study was particularly important because it was the first national survey of persons' self-planned learning. Having interviewed 1500 adults who were drawn from a national probability sample, Penland could, for the first time, generalize his results to the entire population of the United States. He found that learners could be characterized according to four groups: (1) continuing learners--persons involved in learning who used either self-planned or course-like activities; (2) self-initiated learners--persons who planned their own projects; (3) persons involved in courses or school like activities; and (4) non learners--persons not engaged in any intentional learning.

A great majority (78.9%) of persons in America see themselves as continuing learners (i.e., they had been engaged in learning activities in the year prior to the interview). Of all persons interviewed, 76.1% had planned one or more of their own learning projects. Eighty three percent of these projects took seven hours or more time to complete. The average number of projects per person was

3.3, and the length of time involved in each project ranged from one to more than 900 hours. The average number of hours was 155.8.

Based on persons' stated reasons why they prefer to learn on their own rather than taking a course, Penland writes "a great many people are concerned with setting their own learning pace and exploring their own style of learning rather than submitting to formal course oriented experiences" (1979, p.174). An additional finding is the fact that no demographic variables were strongly associated with various learning characteristics. "Self-planned learning is more uniformly distributed in the population as a whole than previously suspected" (1979, p.173). Based on this fact, Penland suggested that individuals' contextual situations may be of value in understanding their participation versus non participation in self-planned learning.

Discussing the need for professionals to encourage and support people who are potential learners, Penland writes:

> Learning is almost an ubiquitous response to a situation. The stronger the contextual imperative, the more likely is (the learning) to occur. However, sustained effort is impossible to maintain when life coping skills are difficult to perform and the availability of professional help is distant (1977, p.108).

Two more recent learning project research studies were conducted by Hassan and Addleton. Hassan (1981) examined adults' learning projects in relation to their self-directed

learning readiness. She found that highly self-directed learners engaged in more learning projects and were more satisfied with their learning than low self-directed ready people. She also identified a negative correlation between the number of perceived obstacles to learning and readiness for self-directed learning. Addleton (1984) studied the self-directed learning projects of 43 continuing educators. Characteristics of these learning projects were not different from those identified in previous studies. A distinct finding was that 12% of their projects were influenced by previously offered continuing education programs, and fully 61 continuing education programs were designed as a result of these personal learning experiences.

Brookfield (1981) discusses and refutes three criticisms which had been made of learning project research. One criticism is the reliance placed on structured interviews. It was suggested that a high degree of prompting brings about overstated findings, and that it prevents truely revealing sharing by the interviewee. Brookfield acknowledges the potential for this concern, but rebuts it for this particular research approach by quoting Tough's (1980) description of his leisurely, probing interview mechanism. A second criticism is that the sample used for Tough's initial study was highly educated and nonrepresentative of the general population. Brookfield argues that subsequent learning project research covered

broad and diverse populations. This criticism was neutralized. The last criticism is that self-planned learning is an inappropriate topic for adult education research; that attention needs to be focused on supporting institutionally sponsored learning programs. This is refuted by the statement that adult education faces a tremendous and legitimate challenge with regard to supporting self-planned learning, and hence there is a need for this sort of research to be performed.

In summary, the major focus of the learning project research was to describe the extent to which adults are involved in learning projects, and what and how they learn in these self-planned situations. It was identified that participation in learning projects is almost universal. From 79% to 100% of all adults are involved in at least one learning project per year. The average adult conducts four or five learning projects per year, and spends around 100 hours on each learning project. Further, about 70% of adults' learning projects are self-planned.

Learning projects most frequently deal with career and home/family topics. Health is consistently mentioned as a learning project topic. It usually accounts for about 5% of all projects. Learning projects most frequently deal with problems of everyday life for the individuals, and persons frequently need help with their learning. Areas where assistance is needed include goal setting, acquiring

resources and locating expert assistance for learning.

Reasons for Involvement in Learning Projects

It has been established that adults do, in fact, participate in various learning projects. Related questions which remain to be addressed pertain to the reason for adults' learning and its timing: what causes adults to learn, and why do they set out to learn when they do? The following is a brief discussion of a few theories relative to these questions.

Attempting to understand adults' motivations for learning, Houle (1961) interviewed 22 persons who were highly active adult learners. On the basis of the interviews, he proposed a three-way typology of orientation to participation in continuing learning. These include goal-oriented, activity-oriented, and learning-oriented. Goal-oriented learners engage in learning in order to accomplish specific objectives. Activity-oriented learners participate in learning activities for the sake of the activity itself rather than the learning which may occur because of their involvement. Learning-oriented persons are involved in learning for its own sake.

A substantial amount of motivational orientation research has followed Houle's. Although most of this research has produced more than three orientation factors, the hypothesis that there are three basic orientations

prevails. Notably, Boshier's (1971) Education Participation Scale (E.P.S.) has been used to collect data in over 80 studies on the motivational orientation of an estimated 60,000 persons across different populations and cultures (Boshier & Collins, 1985, p.116). Boshier and Collins (1985) examined the E.P.S. data of 13,442 learners who were from four continents in order to determine the extent to which Houle's typology fits the picture of motivational orientation which emerged from those studies. The result was that the goal-orientation and the learning-orientation were validated, while the activity-orientation was identified as being complex and multifaceted. It was identified as being comprised of a combination of factors which were identified as Social Stimulation, Social Contact, External Expectations, and Community Service (p.125).

This motivational research focused on adults' involvement in formalized adult education programs and, as such, is not directly related to involvement in learning projects. However, it is relevant to the present discussion because of the assumption that diabetics become involved in diabetes and health related learning projects due to their "goal-orientation" to understand and control their disease.

Tough's early study (1968) of adults' learning projects examined the area of motivation. He drew a number of conclusions which were relevant to adults' motivation for engaging in self-directed learning projects. These

conclusions include:

1. Most learners have more than one reason for engaging in learning.
2. Adult learners are most frequently motivated by the desire to use the knowledge or skill gained through the learning.
3. There are three patterns from which people start learning projects: wanting to do something, curiosity, and a desire to learn; and
4. Most participants enjoy learning, and hence, continue to pursue it over time (Cross, 1984, p.83-85).

It seems important to note the similarity of Tough's conclusions regarding involvement in learning projects with Houle's typology regarding participation in formalized adult education activities.

A different approach to understanding adults' involvement in learning projects examines life stages and life events. The human life span has been conceptualized as being comprised of various stages or phases--infancy, childhood, adolescence, and adulthood (Erickson, 1959). Each of these stages is characterized by "developmental tasks" which predictably arise during that phase of life and which need to be accomplished in order to function effectively during that stage of life. Havinghurst (1961) divided the adult years into three phases--early adulthood,

middle age, and later maturity. He identified ten roles of adulthood and further delineated several developmental tasks of adulthood (p.72-98).

Adults facing these tasks require new knowledge, new skills, adjustments in attitudes, and behavior changes. Dealing with these life crises or transitions creates in adults a readiness to learn. Knowles discusses the implications of developmental psychology for adult educators and presents a list "Life Tasks of American Adults" (1980, p.263-264). This list includes tasks in the areas of career, home/family, personal development, leisure, health, and community living. These tasks provide insight into the causes of adults' motivation to learn.

Rather than seeing adult learning as being motivated by developmental tasks, Knox (1977) examined life changes and linked learning with "change events". He characterized adult life as being punctuated by change events. These change events require alterations in role-relationships and, as such, require adaptation. He proposes several ways in which adults try to adapt to change events. These include frantic activity, action, educative activity, seeking assistance, contemplation, and withdrawal (p.538). So, for at least some adults, there is a heightened readiness to learn as a result of a change event.

> The resulting educative activity may be directly or indirectly related to the change event, and the relation may or may not be recognized by the individual ... The educative activity may include

> all types of informal information seeking such as reading and talking with others, as well as more formal participation in part-time, externally sponsored educational programs. Familiar instances of increased educative activity related to change events occur in relation to the birth of the first child, the purchase of a new car, or a major job change (p.539).

Knox goes on to state that:

> "There is no tested knowledge ... about when readiness to engage in educative activity is highest, when educational participation is most likely to occur, or when learning effectiveness is likely to be greatest" (p.539).

Aslanian and Brickell also examined life changes. They discuss life transitions as posing challenges and offering opportunities for growth--i.e., as precipitating learning. These researchers developed the idea of "latent learners". They theorize that adults frequently experience the need, the opportunity, and the desire to learn. But the presence of these three factors is not sufficient to actually cause the person to engage in learning activity. They propose that an "identifiable event triggers an adult's decision to learn at a particular point in time" (1980, p.37).

In discussing the relationship between life transitions and trigger events, Aslanian and Brickell consider transitions to be changes in life status which make learning necessary; that is, transitions are the reasons for learning. Triggers are events which happen in the adult's life which bring about a decision to learn at that point in time (p.38 39). "Transitions are marked by identifiable

events, and it is the timing of these events that causes many adults to decide to learn now rather than at some other point in time" (p.56). Depending on life's events, learning can precede (in anticipation of), accompany, or follow a transition.

After interviewing 744 adult learners by telephone, Aslanian and Brickell found that 83% of these persons stated that they had learned in response to a life transition. Career and family events are the major triggers for learning. Fifty-six percent and 13% respectively of the interviewees cited these as reasons for learning. Health serves as a minor trigger (cited by 5% of the persons) for learning. Two major motivations for learning in the area of health were moving into good health (or recovering from personal injury or illness) and avoiding moving out of good health (maintaining physical fitness). The triggering event can be an injury or an illness, or an event which causes the person to realize that his or her health will deteriorate/is deteriorating, and that new health behaviors are needed (p. 81-84). While Brockett and Darkenwald (in press) have noted that this study has been criticized because of a disproportionately middle-class sample and the use of certain questions that might have been leading, the findings nonetheless lend support to the notion that adults often undertake learning efforts in response to major life events.

Intentional Change

The Original Study

In The Adults' Learning Projects (1979), Tough stated that learning projects are a primary means through which adults change. One major motivation for adult learning is persons' desire to make major changes in skills, behavior, emotions, attitudes, life situations, or daily routines. There is a connection between intended learning and intentional change.

In Intentional Changes (1982), Tough expanded his focus from adult learning projects to intentional changes undertaken by adults. For this study, 150 men and women from Canada, England, and the United States were interviewed. The interview schedule which was used to guide these interviews was developed and refined over the course of interviewing an additional 180 adults. Persons were asked to describe the most important intentional change they had made in the previous two years. All other questions sought information regarding the benefits of this change, the process through which it was accomplished, and the resources used in the process.

Specifically, this study focused on highly intentional changes. Tough defined intentional change as "a change in which the person definitely and voluntarily chooses the change and then strives to achieve it by taking

certain steps" (1982, p.22). This was distinguished from unintentional change which was considered "change which is forced on the person or required by circumstances"(1982, p.48). Not included in the study were intentional responses to unintentional events such as loss of job, illness, or death of a loved one.

Tough conceptualized the intentional change process as being comprised of three tasks: choosing the change, planning the strategy, and implementing or achieving the change. He was careful to not call these tasks "steps" because many people's changes do not follow the linear progression which is implied in the word. In fact, each task might be performed several times at various stages of the change process. He goes on to describe what individuals actually do while performing these tasks. A generalized discussion of this process follows.

An opportunity, triggering stimulus, or a change in the external environment often leads persons to examine and evaluate themselves and their lives. Such a self-examination often leads to a tentative and then to a definite decision to proceed with a change (p.59). While planning the details involved in the strategy for the change, persons gather information and seek advise from others. "This can involve weeks of exploration or 10 minutes of thought" (p.63). The result of this activity is a tentative plan of strategies and resources. Once the

initial plan is underway, further strategy decisions may be needed. Some changes are very easy to achieve, others very difficult. Depending on the type of change, a wide variety of efforts may be required. Behavior modification techniques, control of environment, and highly deliberate learning episodes are a few implementation efforts. Other efforts could include looking for a job; finding a suitable home, support group or doctor; or persuading another person to cooperate with the change (p.64).

Tough found that the two primary areas of change were job/career/training, and human relationships/emotions/self perceptions. Changes in these areas comprised 54% of all intentional change. Other areas of change were: enjoyable activities (11%); residence location (10%); maintenance of home and finances (7%); physical health (7%); volunteer helping activities (3%); religion (3%); and basic competence in reading, goal-setting, driving, and other changes (3%).

It should be noted that changes in the area of physical health accounted for only 7% of all changes. Some of the changes in the area of physical health included smoking cessation, cessation of alcohol consumption, becoming physically fit through an exercise program, changing physician, and changing eating habits.

The majority of changes (71%) were rated as being of fairly large or of huge importance. Half of those interviewed had achieved 100% of their desired change; the

mean was 80% of the desired change achieved. Ninety-three percent of the persons felt that other persons benefited from their changes. Toward the end of the interview series, an additional question was asked of respondents. Of 56 persons who were asked, 55 said they had, in the previous two years, experienced an unintentional change which had been more important than the most important intentional change. Examples of unintentional changes were pregnancy, death, loss of job, and divorce.

Additional data collected by Tough in the same study pertained to who chooses, plans and implements the changes. He found that the person himself or herself is largely responsible for these activities. The person assumed 70% of the responsibility for these tasks. Friends, family, and other nonprofessional persons were given 23% of the credit, while professional persons were given only 3% of the credit. Books, magazines, films, tapes, and other non-human resources were also credited with about 3% of the responsibility for directing the choosing, planning, and implementing of the change.

This study demonstrated that adults are highly active in their own natural change efforts and that their intentional changes are large, successful, and beneficial to themselves and others. Additionally, it became clear that the person is of central importance in choosing, planning, and implementing intentional changes.

Replications of the Intentional Change Methodology

Among the persons who worked with Tough in his intentional change study were David Blackwell, Joan Neehall and Margaret Brillinger. Each of these persons went on to do research in the area of intentional change utilizing Tough's interview schedule or an adaptation of it.

Blackwell's (1981) study of major intentional changes among adults reports findings similar to Tough's. Blackwell interviewed 50 men living in southern Ontario. He wanted to gain an understanding of the one most important intentional change that these men had made in the preceeding two years. He found that the job was the area where changes occurred most frequently, and over half of the men achieved 100% of their desired change. These men preferred help in their changes from people rather than material resources, and expressed a desire for help from persons who had specialized knowledge or skills in the area of their change.

Neehall (1983) interviewed 100 persons to measure the degree of intentionality of their changes over a period of four years. Eight areas of change were considered. The rank order of importance of these areas of change was: job and career; human relationships, self perception and assertiveness; location of residence, material possessions and maintenance; knowledge of the world, skills and basic competencies; enjoyable activities; physical health;

volunteer helping activities; and basic understanding, spiritual growth, and religion.

Neehall considered changes as if they were on a continuum--highly intentional to highly unintentional. Interviewees experienced several large changes over the four year period; an average of five were rated at least of medium importance. Sixty-one percent of all changes were measured as being of at least medium importance. She found that 67% of all changes were intentional. And most importantly, Neehall found that the benefits derived from intentional changes were significantly higher than those from unintentional changes.

Two additional studies focused on specific areas of change. These include the work of Brillinger (1983) and Mortier (1984). In studying intentional changes related to marriage, Brillinger (1983) interviewed 40 persons who had been married for at least 10 years and who had positive feelings about their marriages. It was found that companionship was the largest ingredient in marital satisfaction. Interviewees made an average of nine intentional changes over a three year period to improve their marriage relationship. Some of the most common changes included communications with partner, scheduling time together, entrance into counseling or a group learning experience, play, job, physical environment, shared responsibilities, conflict and problem solving, sex, and

spiritual beliefs.

Mortier (1984) studied intentional changes by secondary teachers. She determined that teachers make intentional changes in their instructional behavior, and identified the resources they use in the change process. In addition, Mortier determined that, as a group, the principals of these teachers were inconsistent in their ability to identify the resources use by the teachers in the change process.

Critiques of Intentional Change Research

Several criticisms have been aimed at Tough's intentional change research. Littlefield (1984) attempted to understand the conditions under which intentional actions evolve. He interviewed 45 adult runners and found that they formed intentions only after testing their environments and evaluating several sources of information. Littlefield proposed that Tough's approach of examining actual instances of intentional behavior is "conceptually imprecise" and suggested that research should focus on an evolutionary or developmental approach to intentional change.

In book reviews of Intentional Changes, Sisco (1983) and Caffarella (1983) both criticized the book because the concepts presented, methods used, and recommendations made were similar to those made in The Adults' Learning Projects. Among other comments, Caffarella suggested that the value of the book could have been strengthened by showing more

relationships and interrelationships among various categories of data rather than simply presenting information as discrete data. Despite criticisms, both reviewers ultimately recommended the book. Caffarella stated that Tough provides:

> ...a new way of thinking about the self-directed or 'natural process' of changing by focusing on the concept of intentional change vs. learning in general. He moves this concept of the self-directed person from a 'learning' context in adult education to a broader framework of change as it relates to a wider spectrum of professional fields including counseling, health, psychology and social work...I believe the publication will be helpful in bridging the gap among the various professional fields (p.188).

Sisco stated "Intentional Changes is an important contribution to the field of adult education and the helping professions"(p.27).

Martin (1983) wrote that although Tough has provided good suggestions regarding personal freedom and responsibility in learning and change, his "data are too flawed to be persuasive"(p.207). Specific criticisms included conceptual vagueness in the interview data; a non-representative sampling problem (which Tough himself acknowledged); questionable statistical analyses; lack of control of the potential for self fulfilling data being collected through the interviewers; and conceptual difficulties regarding the definition of intentional change.

Brookfield (1984), however, in discussing some of the methodological and substantive shortcomings in adult

learning research commended Tough's intentional change research because it represented an attempt to compare adult learning changes across three countries using a standard interview schedule. He also discussed the benefits which are gained because Tough's interview schedule was devised after being utilized and continuously refined through the process of 180 interviews. It provides a framework through which persons are helped to recall their changes, while encouraging a large amount of dialogue which allows interviewees to share important ideas that are not specifically addressed in the interview schedule.

This researcher believes that in spite of the criticisms voiced regarding the intentional changes research, Tough's study is a valuable first step in examining the phenomenon of intentional changes made by persons with diabetes. An "evolutionary approach" (Littlefield, 1984) to the study of this area can be used in the future. At present, it needs to be determined whether Type II diabetics do, in fact, make intentional changes in diabetes related health areas and, if so, how they go about this process and how they can be assisted with the process.

To clarify the definition of intentional change which was used in this study, intentional responses to unintentional events (such as having diabetes) were considered intentional changes. This is different from the definition by Tough. He would consider changes made in

response to having diabetes to be unintentional. If this were accurate, diabetics' capacities to choose to make deliberate, voluntary diabetes related health changes is abrogated. It was the position of this researcher that diabetics have the same potential to make health changes as do nondiabetics. Therefore, as long as the person definitely chose a change and then strove to achieve it, the change was considered intentional.

The concepts and method of intentional change research are very similar to those used in learning project research (Caffarella, 1985; Sisco, 1983). The fact is, these two processes are strongly related. Learning is a primary means through which persons change. Because successful diabetes management requires both learning and behavior change by persons with the disease, this study investigated both factors and examined the relationships between areas of learning and change.

Whereas Caffarella (1985) suggested that Tough should have shown more relationships and interrelationships among study data, Martin (1983) questioned the multiplicity of statistical analyses performed. The present study examined discrete data and differences and/or relationships among selected study variables.

Implications of these intentional change studies for adult educators are important. In view of the fact that adults are reasonably successful in achieving intentional

changes, it is imperative that adult educators focus attention on helping persons choose to change. Once a deliberate choice is made, educators can provide assistance with goals and planning and with exploring available options and resources. The focus of attention is redirected from providing instruction to supporting the individual's change process.

Diabetes

Diabetes mellitus is a chronic disorder characterized by abnormalities in the metabolism of food. It is not actually a disease, but a syndrome--a group of diseases of different causes which have common signs and symptoms. The common denominator of these diseases is altered insulin secretion or action which results in an intolerance to glucose (American Diabetes Association, 1984, p. 3).

Diabetes Mellitus affects approximately 5% of the persons in the United States population. Seven million people are known diabetics, and an estimated three to four million others have the disease but are not yet aware of it. In addition, the incidence of this chronic disorder is increasing at a rate of approximately 6% per year. The American Diabetes Association has predicted that by 1999, there will be nearly 20 million persons with diabetes in the United States. Major factors behind this increasing incidence of diabetes include an aging population, sedentary

lifestyles, and poor dietary habits (Elliott, 1984).

This disorder holds great importance in the health care field not only because its incidence is so widespread, but because "it affects all organs and organ systems in the body as no other disease does" (Guthrie & Guthrie, 1983, p. 618). If a person with diabetes does not supply adequate insulin for metabolizing glucose, changes occur in the cell walls, vascular walls and nerves which result in the complications that occur secondary to diabetes. Diabetics have twice the incidence of cardiovascular disease as nondiabetics. Diabetes is the leading cause of blindness; the second leading cause of foot amputations; and causes 25% of all end stage renal disease (Elliott, 1984). Diabetes is the third leading cause of death by disease in the United States (National Diabetic Commission, 1981).

Type II diabetes is the most prevalent form of diabetes in the United States. Eighty to eighty-five percent of all known cases are of this type. Typically, persons are an average of 40 years old at the time of diagnosis. More than 75% of these persons are obese when the disease is diagnosed, and twice as many women have the disease as men. The major problem in almost all cases of Type II diabetes is insulin resistance or impaired tissue sensitivity to insulin.

After eating, a person's blood glucose level naturally rises. As part of the normal metabolic process, glucose

binds with insulin and enters into cells through receptor sites on the cell walls. Energy can then be produced in the cells. Persons with Type II diabetes have defects either at the receptor sites, in the number of receptor sites, or in intracellular functions. Due to any of these three reasons, the body does not use insulin properly to get glucose into the cells.

In addition to insulin resistance, some persons with Type II diabetes secrete insufficient amounts of insulin in response to the ingestion of food. As a result there is not enough insulin to bind with glucose to get it into the cells. However, other persons with mild Type II diabetes secrete normal or greater than normal amounts of insulin. Because the body produces its own insulin in Type II diabetes, this disorder is also called non-insulin-dependent-diabetes mellitus. This is distinguished from Type I diabetes in which the body produces no insulin or insignificant amounts of it. Type I diabetes is therefore commonly referred to as insulin-dependent-diabetes mellitus (Olson, 1984, p. 3).

The use of self blood glucose monitoring has become a recommended practice in the control of diabetes. Use of a blood glucose monitor provides persons with a measurement of their current blood glucose level. Having this information allows diabetics to make adjustments in their food intake, exercise, or medication in an attempt to normalize blood

glucose levels. Measuring blood glucose levels gives persons with diabetes regular feedback on the effectiveness of their self-care activities, and in fact, provides the information needed for them to manage their diabetes. Members of the health care team become resources for them in this effort.

Diabetes is unique in that it requires persons who have the disease to be involved in a daily self-management program. Basic lifestyle changes must be made in order to control the disease. Ultimately, success in controlling diabetes depends on how well informed and emotionally prepared the diabetic is to deal with problems which will arise and on the daily choices he or she makes.

Diabetes Education

It is acknowledged that education is a vital component of the process of managing diabetes. Assal, Mulhauser, Pernet, Gfeller, Jorgens, and Berger (1985) discuss the fundamental importance of patient education as an integral part of diabetes care. They state that active participation in the treatment of diabetes requires that diabetics learn about the disease and its management. Despite the accepted importance of diabetes patient education, a question remains to be answered. This question is what are effective approaches to take towards the diabetes teaching-learning interaction.

Approaches To Diabetes Education

Approaches to diabetes education can be organized around varying philosophical, structural, and content perspectives. From a philosophical point of view, education programs can stress persons' individual choice and participation in the learning process or can prescribe specific learning and behavior needs. From a structural perspective, education programs can be organized around such considerations as whether they are presented in group or person-to-person sessions, or are presented by one health care provider or by a multidisciplinary team. From a content perspective, programs can focus on persons' acquisition of knowledge and skills, emphasize changes in attitudes and beliefs, or focus on behavioral adaptations which support adherence to a diabetes care regimen. Each of these approaches is discussed further in the following sections.

Philosophical Perspectives. Until this decade, education for Type II diabetics focused solely on learners' acquisition of knowledge and skills. Although this generally remains the predominant approach at present, the need to involve patients in the learning process is being acknowledged.

Anderson (1985) states that, in diabetes, it is the

person with the disease and not the care giver who must implement the treatment on a daily basis. Therefore, care givers should focus their attention on the patient rather than on the treatment of the disease. He recommends an "educational approach" to diabetes care which focuses on communication between the care giver and the patient. Problems need to be viewed through the patient's perspective. Care givers need to:

> understand and work through the patient's frame of reference ... Patients are seen as basically capable and responsible for managing their own lives. The practitioner is an ally who facilitates the growth of patients by helping them discover and develop the capacity to solve their own problems (Anderson, p.32).

Orem (1980) has developed a self-care theory which involves deliberate actions. This theory has been used as a framework for both the clinical management of disease and patient education. She proposes that there are two phases of deliberate action: gaining the knowledge needed to make a decision regarding health, and carrying out the actions indicated by the decision.

Strowig adapted this theory and applied it to diabetes education. She suggests that diabetes education needs to focus on the development of capabilties and of individual choice, thereby facilitating deliberate action (1982, p. 1304). She criticizes diabetes education programs which do not teach diabetics how to apply their knowledge of diabetes and suggests that a decision making approach to diabetes

education is needed. This would allow persons to use the knowledge they have in understanding problems which arise, choosing a course of action, taking deliberate actions, and then evaluating the results of that action. Only if persons perceive that they have a choice and have the ability to make good decisions can successful deliberate actions be taken.

Strowig also makes clear that persons with diabetes should be told from the outset that they are in charge of managing their disease:

> The treatment plan, the degree to which it is followed, the levels of disease management achieved, and how 'well' the patient feels are ultimately his responsibility. The role of the educator is not to dictate what the patient must do, but rather to facilitate learning and achievement of goals (1982, p.1301).

Assal et al. (1985) discuss the fact that, at present, people have an increased interest in and desire to understand their disease and participate more actively in its treatment:

> The individual strives for more independence and personal involvement and rights during the decision making process which are relevant for the course of his life, such as defining the goals and the strategies for the treatment of his disease. These natural tendencies for the individual to emancipate himself from the hitherto habitual authoritarian structures (such as paternalistic doctor-patient relationships) have manifested themselves in the massive support for self-help groups and civil initiatives in many areas of our societies (p.604).

Lorenz (1987) recommended that the first objective of a teaching-learning interaction can be for the patient to

choose between different treatment goals or regimes. "Once a course of action is chosen, it is necessary to determine what the patient needs to know or do to pursue that course and to focus on mastery of the requisite knowledge and skills" (p.17). He further suggests that health care professionals can assist patients to learn on their own by clarifying problems and objectives, by suggesting alternative problem solving strategies, and by producing resources for independent learning.

In the same vein, Strowig (1982) states that health care professionals need to extend options to persons with diabetes and must allow them to reject recommendations made by health professionals if this rejection is an informed decision which considers the benefits and risks involved.

This type of approach to diabetes education and diabetes care management is clearly in line with current understanding of adult learning and change. Diabetes educators need to focus their attention on helping persons choose to change and encouraging learning which would enhance this change process. As Tough states, diabetes educators should:

> ...try to fit into the person's natural change process in a lighthanded manner. (Educators can) provide helpful information, offer suggestions and rationales, and point out each option's cost and benefits" (1985,p.24).

Structural Perspectives. Jovanovic and Peterson (1984) and Assal, et al. (1985) examined diabetes education from a

structural perspective. Jovanovic and Peterson analyzed eight diabetes education programs from a framework of several vantage points. Included in these considerations were whether the education was provided in an in-hospital or out-patient setting; in group sessions or one-to-one meetings between a learner and a health care provider; by one provider, or by multidisciplinary team; whether the instruction consisted of brief intermittent sessions or concentrated sessions over at least 35 hours; and how participation costs are borne by patients. Physicians' offices (Hiss, Frey, & Davis, 1986) and diabetics' homes (Rettig, Shrauger, Recker, Gallagher, & Wiltse, 1986) are additional environments in which diabetes education has been provided. In addition to these contextual concerns, Assal et al. (1985) consider whether the education program is a component of an integrated health care delivery system or is an education function independent from the provision of care.

Content Perspectives. As has been previously stated, the content perspective taken by a majority of diabetes education programs is one which is knowledge and skill based. Only in recent years has the need been discussed to address attitudes/beliefs and behavioral mechanisms which bring about adherence to a diabetes care regimen.

In 1982, Mazzuca screened 320 articles on patient education for chronic diseases. Using specific criteria for

controlled experimental studies, he found 30 articles which addressed compliance with therapeutic regimen, patients' physiological progress, and long-range health outcomes. (Only one of the studies which met these criteria pertained to diabetes education--Bowen, Rich, & Schlotfeldt, 1961.) Mazucca states "Efforts to improve health by increasing patient knowledge alone were rarely successful. Behaviorally oriented programs ... were consistently more successful at improving the clinical course of chronic disease" (p.521). He described programs which have a behavioral emphasis as ones which have two features:

> (These programs draw their) treatment principles and instructional examples from the patient's unique circumstances (as opposed to a standard presentation of facts and principles for all patients) ... The second feature is (that) behavioral instruction attempts to effect the patient's home or work environment in ways that promote effective self-management. Common experimental interventions were mnemonic aids, social support, medication monitoring and telephone follow-up (p.524).

Several other persons have referred to the need to utilize a behavioral approach, one which focuses on the diabetes care regimen rather than the disease, in the diabetes education process. Among them are Kurtz (1986), Bartlett (1986) and Leichter (1986).

There is another approach to diabetes education which differs from ones which are knowledge/skills based and behaviorally based. This approach focuses on persons' beliefs and attitudes. The Health Belief Model (H.B.M.) is

a behavioral-psychological theory which attempts to explain persons' health behavior. Originally formulated to explain why persons would or would not undertake preventive health behaviors (Rosenstock, 1974), the model was later used to predict compliance with prescribed therapies (Becker, 1974). Additions to the H.B.M. have been made since it was originally developed in the early 1950's.

The H.B.M. proposes that people are not likely to take a health action unless: (1) they believe they are susceptible to the given disease, (2) they believe the disease would seriously affect their lives, (3) they know actions which can be taken and believe that taking them would reduce its severity, and (4) they believe that the threat of taking the action is not as great as the threat of the disease. Cues to action serve as triggers or motivating events which affect the timing of actions taken. Demographic variables, knowledge of the disease and prior contact with it, and attitudes are seen as factors which affect persons' perceived threat of the disease (Redman, 1984). According to the model, the extent to which people are motivated or interested in their health and the extent to which they hold the four beliefs cited above determine how likely they are to perform recommended self-care behaviors.

A recent expansion of the H.B.M. is the concept of perceived self-efficacy. Rosenstock (1985) proposes that

this concept be added to the model as a fifth necessary belief for compliant behavior. Personal self-efficacy, a social learning theory concept proposed by Bandura (1977), is the conviction that one is capable of carrying out a health recommendation. "Patients may well believe in the efficacy of a regimen, but still not comply with it if they believe the regimen is too difficult for them to follow" (Rosenstock,1985, p.612).

The educational implication of the H.B.M. is that the perceptions and beliefs which make up the model have been demonstrated to be alterable (Haefner & Kirscht, 1970; Kirscht & Haefner, 1973; Becker, Maiman, Haefner, Kirscht, & Drachman, 1977). In addition, certain health beliefs have been found to be correlated with diabetes self-care behaviors (Alogna, 1980; Cerkoney & Hart, 1980; Harris, Skyler, Linn, Pollack, & Tewksbury, 1982; and Wilson, Ary, Biglan, Glasgow, Toobert, & Campbell, 1986). It is therefore believed that by identifying an individual's health beliefs, an "educational diagnosis" can be made; and the health care provider can make available educational interventions which attempt to change the individual's beliefs and attitudes. This would be a means of enhancing the possibility of the person performing appropriate self-care behaviors (Becker & Janz, 1985).

Diabetes Education Program Effectiveness

Some of the parameters by which the effectiveness of diabetes education programs have been evaluated include knowledge and skill assessment, documentation of behavior changes relative to the recommended diabetes care regimen, improvement of metabolic control, and prevention of short and long term complications of diabetes.

Determining whether participation in a diabetes education program prevents persons from developing long term complications of diabetes would require a longitudinal study. This type of study has not been performed. Researchers have, however, attempted to demonstrate the prevention of short term complications such as ketoacidosis and foot infections. Common measures are frequency of emergency room visits, hospitalization rates and length of hospital stay. Studies which have utilized this evaluative approach (Miller & Goldstein, 1972; Moffitt, Fowler, & Eather, 1979; Davidson, Alogna, Goldsmith, and Borden, 1981; and Rettig et.al., 1986) usually have provided education in an integrated care setting (i.e., when education and clinical care are provided in conjunction with one another). Because of this, the effects of the education cannot be separated from the effects of clinical care. Reductions in short term complications cannot be said to result from education alone but from the integrated program.

Improvements in metabolic control have been a frequently used measure of diabetes education program effectiveness. However, Edelstein & Linn (1987) and Wilson, et.al (1986) discuss the fact that there is no perfect or direct relationship between compliance with the diabetes care regimen and control of diabetes. It is a fact that, irregardless of self-care behaviors, the presence of stress and illness can affect individuals' blood glucose levels. Other factors can also cause fluctuations in glycemic control. Despite the fact that appropriate self-care behaviors cannot be said to cause glycemic control, they are acknowledged to be a major factor which affects control. For this reason, numerous research studies have used fasting blood glucose tests and glycosylated hemoglobin tests (a long term measure of blood glucose levels) as pre and post education measures of program effectiveness. The following is a discussion of the outcomes/benefits of several diabetes education programs. Measurements of glycemic control are a predominant mode of evaluation.

Williams, Martin, and Hogan (1967) studied diabetes control in four settings: two diabetes speciality clinics, a private physician practice which cared for predominantly diabetic patients and a prepaid group health program. Patient education was a component of the care provided in these settings. The study identified poor adherence to dietary instruction and widespread errors in insulin

administration, foot care and urine testing. A major finding of the study was a positive correlation between knowledge of diabetes and performance of recommended therapy -- i.e, the more persons know about diabetes, the better they carry out recommended therapy. However, there was no significant correlation between performance of recommended therapy and day-to-day control of the diabetes. In addition, they found that knowledge was inversely correlated with diabetes control. Persons who know more about diabetes (on the average) are in poorer metabolic control. An important point regarding this is that for a number of persons, good metabolic control was possible without knowing very much about diabetes.

Etzwiler (1973) discussed the results of a one week diabetes self-management education program. Scores on knowledge questionnaires revealed a significant improvement in knowledge immediately following the class. Three months later the improved knowledge was retained, however no improvement in metabolic control was found. Similar findings were discovered by Graber, Christman, Alogna and Davidson (1977). They evaluated several diabetes education programs and concluded that there is no correlation between knowledge gain and clinical control or improvement in control. In 1983, Karlander and Kindstedt reported that given a one year follow-up to their education program, patients' knowledge test scores remained high, however no

general changes in diabetes control were noted. Scott, Beaven, and Stafford (1984) had similar findings. Persons involved in their education program experienced knowledge improvement and anxiety reduction. They did have improved glycemic control at the end of the education sessions. Despite this fact, however the improvement diminished at a four week followup. They concluded that "the failure to observe sustained improvements in glycemic control is interpreted as a lack of effectiveness of this program to result in long term behavioral modification" (p.39). Campbell, Chisholm, and Barth (1984), at a nine month follow-up to their program, found that persons who entered into their education program with satisfactory metabolic control maintained the control. Persons who entered the program in unsatisfactory control did not improve it significantly.

In a study of the effects of a home diabetes education program by Rettig, et al. (1986), metabolic control measures were not used to evaluate the effectiveness of the education. Indirect measures of care were used. A six month post education evaluation revealed that the intervention group had significantly greater self-care knowledge and skills than control subjects. However, no differences between the groups were identified at a 12 month followup to determine hospitalization rates, length of hospital stay, diabetic foot problems, emergency room

visits, sick days and physician visits.

The studies by Williams, et al., (1967), Etzwiler (1973), Graber, et al., (1977), Karlander and Kindstedt (1983), Scott, et al. (1984), and Rettig, et al., (1986) did not report a significant improvement in metabolic control given persons' participation in diabetes education programs despite a demonstration of knowledge gain and skills improvement. In examining the information provided about the structure of the programs, it is evident that they were very diverse, reflecting many of the programatic approaches previously discussed. Similarities did exist among these education programs. A behavior modification approach does not appear to have been used; there was no specific mention of tailoring the education effort around the individuals' recommended plans of care; and there was no mention of programs taking a learner-centered approach. No mention was made of the diabetic being involved in decision making or planning, and there was no evidence of individual responsibility for learning being given to the individual with diabetes. There was also no evidence of an approach being taken which would influence individuals' beliefs or attitudes towards health, diabetes, or its treatment.

A few diabetes education programs have documented success in affecting glycemic conrol. Mazzucca, Mooreman, Wheeler, Norton, Fineberg, Vinicor, Cohen, and Clark (1986) report a study for which metabolic control of diabetes was

improved. Their study of 275 diabetics examined the effects of a systematic patient education program on patient knowledge, skills, self-care behaviors, metabolic control, and risk factors for chronic complications of diabetes. Education methodologies included didactic instruction, skills exercise, and behavior modification techniques. Their evaluation revealed some differences between experimental and control patients in knowledge of diabetes; statistically significant differences in self-care skills and compliance behaviors in experimental patients; and significantly greater reductions in fasting blood sugar and glycosylated hemoglobin in the same group of patients. The behavioral component of this program include a goal setting exercise during which patients negotiated regimen goals with their instructor. Patients signed a contract specifying these goals. In addition, two and six week post instruction telephone contact was made by instructors. During these calls, progress toward goals was assessed and reinforced, and there was a renegotiation of goals if patients had successfully achieved their predetermined goals.

Paulozzi, Norman, McMahon, and Connell (1984) reported that participants of their education program also showed significant improvement of metabolic control at a three month follow-up assessment. Knowledge, skills, and attitudes toward diabetes, and client reported satisfaction with diabetes control were also all significantly improved

at the time of the follow-up. Their educational activities included lectures, discussions, skills laboratories, and a group lunch at a restaurant. Also individual consultation was available for persons with specific problems, and participants were encouraged to maintain telephone contact with the nurse educator after completion of the course. Differences in outcomes of persons who used these available services versus those who did not were not discussed.

Assal, et al. (1985) report the success that has occurred in Europe through a "Diabetes Treatment and Teaching Program" approach. This approach integrates the provision of care and education. Although nonspecific regarding the programs and methods utilized, they discuss the long term improvement in metabolic control which has occurred in some settings. Jovanovic and Peterson (1984) cite four education programs which were successful in affecting metabolic control. Two programs were for gestational diabetes programs, two for nonpregnant persons. Persons involved in the gestational diabetes program experienced 100% of their glycosylated hemoblobin tests within normal range after participation. This is not unusual in these time-limited situations. Persons are highly motivated to control their glucose level because of their desire to have a successful pregnancy. The two non pregnancy programs revealed glycosylated hemoglobin within 60 and 70% of normal range at a six month follow-up. This

was considered an indicator of program success. Four additional programs were discussed which had unsuccessful results. The successful programs which utilized a group approach were taught by a team of health care professionals and were at least 35 hours long. A description of the two successful nongestational programs revealed approaches which were directed toward normalizing blood glucose levels. Medication, diet and exercise were discussed as strategies for controlling glucose levels.

Mazzuca's 1982 conclusion of the effectiveness of a behavioral approach to chronic disease seems supported. Each of the aforementioned successful programs cite educational methodologies which utilize a behavioral approach for at least a component of their programs.

In reviewing related literature, this researcher found no documentation of diabetes education studies which examined the effects of educational interventions that were based on an assessment of health beliefs. Neither was documentation found of research which examined the effectiveness of a learner-centered approach to diabetes education. Goal setting was used in one previously mentioned study (Mazzucca, et al, 1986), however this was as a component of a behavior modification approach--not as an approach which acknowledges the learners' need to be involved in the learning process. Problem solving strategies were not used in any of these studies. Despite

broad acknowledgement of the need for diabetics to be centrally involved in learning about and managing their illness, there is no evidence of research which examines the effectiveness of diabetes education efforts that utilize this type of approach to the teaching-learning interaction.

CHAPTER 3

PROCEDURES

Introduction

The basis for this study is the need to focus on how persons with Type II diabetes learn about and make diabetes related health changes. It is hoped that increased knowledge and information will assist health care providers to facilitate these learning and change processes, and will result in a more patient/learner-centered approach to diabetes education.

Allen Tough's (1982) structured interview approach to the study of intentional changes was the framework utilized in the research. Data were collected from a sample of Type II diabetics who live in the Bozeman and Billings areas of Montana.

This chapter is a description of the procedures which were followed in conducting the study. Included are: research design, description of study population and sample, method of collecting data, research questions and hypotheses, and methods of organizing and analyzing data.

Research Design

In this study, the researcher describes responses to each of the variables being studied, explores the relationship between the areas of most significant diabetes related health change and topics of learning projects, and examines the relationships between the variables of intentional learning and change and selected demographic variables. A cross-sectional survey research design was used for the study. In Survey Research Methods, Babbie discusses the cross-sectional survey design:

> In a cross-sectional survey, data are collected at one point in time from a sample selected to describe some larger population at that time. Such a survey can be used not only for purposes of description but also for the determination of relationships between variables at the time of the study (1973, p.62).

Data for this cross-sectional survey were collected through conducting structured, probing interviews. Two types of data were collected for this study: quantitative and qualitative. Quantitative data "rely upon the use of instruments that provide a standardized framework in order to limit data collection to certain predetermined response or analysis categories" (Patton, 1980, p.22).

> Qualitative data consist of detailed descriptions of situations, events, people, interactions, and observer behaviors; direct quotations from people about their experiences, attitudes, beliefs, and thoughts; and excerpts or entire passages from documents, correspondence, records, and case histories. The detailed descriptions, direct quotations, and case documentation of qualitative

> measurement are the raw data from the empirical world (Patton, 1980, p.22).

A few examples of the quantitative data which were collected include persons' ratings regarding the size and importance of their changes, time spent involved in learning projects, and demographic information. Examples of qualitative data which were collected are descriptions of persons' changes and descriptions of their unrealized changes. These qualitative data were handled in a manner which was similar to the way the quantitative data were handled. They were categorized and then discussed using descriptive statistics. The difference was that with quantitative data, categories were predetermined; whereas with qualitative data, categories were developed only after careful examination of all persons' responses. These responses were placed into several different groupings until the researcher believed that the groupings accurately represented distinct but representative categories for the data.

Description of Population and Sample

The population for this study was persons with Type II diabetes who are members of the American Diabetes Association (ADA), and who live in the Bozeman and Billings, Montana areas. Because the ADA membership list does not include information regarding whether members have diabetes

or what form of the disease they have, all members of the organization living in these areas were considered as part of the population.

A letter (see Appendix A) was sent to each member to explain the purpose of the study, to ask if they have Type II diabetes and, if so, to ask if they would be willing to participate in the study. An addressed, stamped postcard (see Appendix A) was enclosed with the letter. Interested persons were asked to mail this card after indicating their name, address and telephone number on the card. They were told that a telephone call would be made at a later time to establish a date and location for an interview.

This form of a self-selection process to identify potential interviewees was necessary in order to protect the confidentiality of ADA members. The organization was not able to provide access to its membership list because of its need to protect the confidentiality of members. In order to provide access to these individuals while not distributing their identities, the ADA mailed the first contact letter to members. Only persons who chose to return the enclosed postcard were in direct contact with the researcher. Thus, confidentiality was not violated.

Initially, only ADA members living in the Bozeman, Montana, area were contacted. There are approximately 300 members in that area. Of this number, it was estimated that

60-70% had Type II diabetes. From this entire group, only 33 returned post cards. Twenty-one of these persons had Type II diabetes and were interviewed; one person with Type I diabetes was interviewed. (This was because the researcher failed to screen out this individual during the telephone contact.) In addition, 10 people with Type I diabetes returned postcards but were not interviewed, and one person returned a postcard after the data analysis had started and was therefore not included in the study. Since these responses resulted in only 21 interviews with Type II diabetics, contact with additional persons was made.

ADA members from the Billings, Montana, area subsequently received letters inviting their involvement in the study. Of the approximately 600 persons contacted, 49 returned postcards indicating their willingness to be interviewed. Twenty-six of these persons had Type II diabetes and were interviewed; again, one person with Type I diabetes was interviewed because she was not screened out of the interview process during the telephone contact. In addition, 12 persons who have Type I diabetes returned postcards and were not interviewed, and two health professionals responded offering information regarding their diabetic patients. Contact with two persons could not be made during the time that Billings interviews were occurring, and one individual missed her interview by not being present at her home within two hours of her interview

appointment. Four persons returned postcards after data analysis had started and were therefore not interviewed. From the Billings responses, 26 persons with Type II diabetes were interviewed.

From the entire geographical area of Bozeman and Billings a total of 49 persons were interviewed, two of whom had Type I diabetes. These two interviews were not included in the study. In addition, one man had suffered a severe cerebral vascular accident and, as a result, was dependent on his wife for preparing meals, assisting with ambulation, and other tasks of living. It was determined that any changes he made could not be considered intentional on his part because of his dependence on her. He, too, was eliminated from the study. Therefore for the purposes of this study, 46 persons with Type II diabetes were interviewed.

The initial interview plan was to learn about persons' most significant intentional diabetes related health change that was made in the prior two years. During five trial or pilot interviews, two of five persons had not made changes within the prior two years, but had within a five year period. Because of this, the 22 people who were subsequently interviewed were evaluated to determine the time frame within which they had accomplished a significant intentional diabetes related health change (in the prior two or five years). A decision needed to be made regarding

whether the two year time limit would be maintained or extended to include changes which occurred within the preceeding five years. If the time period were extended, several interviews which would not otherwise fit into the study parameters could be utilized for the research. After the 22 interviews were completed, it was apparent that only 45% of the interviewees had accomplished an important intentional change within the preceeding two years. An additional 36% had accomplished a change in the prior five years. Because these additional persons were able to recall details of their change efforts, it was decided to extend the time frame to be examined from two to five years.

Overall, of the 46 persons who are included in this study, 39 had made a significant intentional diabetes related health change in the prior five years. Seven persons reported either no diabetes related health changes or no intentional diabetes related health changes.

Method of Collecting Data

Interview Schedule

Data related to intentional learning and changes in the area of diabetes related health were collected through structured, probing interviews which followed an adaptation of Tough's (1982) intentional change interview schedule. The interview schedule is presented in Appendix B.

Respondents were asked to identify the most important intentional change in a diabetes related health area which they had achieved in the past five years. Aside from obtaining demographic information, other questions were directed at understanding the process which the person followed in achieving this change.

Tough's interview schedule was modified in that its order was reorganized. Five questions regarding intentional learning were added. The reorganization of the schedule was similar to that done by Blackwell in his 1981 study of intentional change by men living in Southern Ontario. The questions pertaining to learning were developed based on a review of interview schedules from prior learning project research (Hiemstra, 1975; Peters & Gordon, 1974; Tough, 1979).

The interviews took place at locations preferred by interviewees. Locations included interviewees' homes and offices, restaurants, and the interviewer's office.

The interviews were conducted at an unhurried pace and required varying amounts of probing and dialogue. The most brief interview lasted one hour and 15 minutes while the longest lasted two and one half hours. Tough suggested that dialogue is particularly important at various times throughout the interview to help the person grasp the concepts which are being explored and the criteria being utilized to describe them. He stated that since changes are

complex, persons frequently need help clarifying their intentional change (p.163). This researcher found that the majority of persons needed much probing and discussion in order to identify their most important change.

Once the most important intentional change in the area of diabetes related health was identified, an examination of the nature of the change was made. Data were collected on areas including: percentage of the desired change which was actually accomplished; the perceived importance of the change; how it has contributed to the person's life; the benefits of the change for other people; most difficult part of the change; resources used in choosing, planning, and implementing the change; activities involved in choosing, planning, and implementing the change; learning undertaken in order to achieve the change; number of learning projects; number of hours spent in these learning efforts; learning activities; primary planner of the learning; additional resources which would have been helpful to the change process; benefits expected from the change; unintentional diabetes related health change; and desired health change which was not achieved.

After this major portion of the interview was completed, demographic information was sought in the areas of age, gender, years with known diabetes, method for controlling diabetes, marital status, years of education, employment status, and specific occupation. In past

research, these variables have been shown to have some relationship with health behaviors and the effectiveness of diabetes education (i.e., Hartman & Becker, 1978; Harris & Guten, 1979; Redman, 1984). Methods for controlling diabetes were examined to determine if intentional learning and change differences existed among persons who control their diabetes in various ways.

If, during the interview, persons could not identify an intentional diabetes related health change which they had made in the prior five years, they were asked if they had made any unintentional diabetes related health changes in the same time period. After obtaining a response to this and to demographic questions, the interview was terminated.

Two handouts which are supplemental to the actual interview were used throughout the interview process. Included were a diagram of the intentional change process (Sheet#1) and a handout (Sheet#2) which listed several changes in the area of diabetes related health. The diagram on Sheet#1 is a model which was used to explain what intentional change is and the steps which are a part of it. Sheet#2, the list of diabetes related health changes, was used to jog memories in an effort to help respondents recall their intentional health changes. (Both Sheets#1 and #2 are in Appendix B.)

During the interviews, two additional handouts were given to the respondents. One handout, Sheet#3 of the

interview schedule, listed interview questions numbers 3, 4, and 5. Respondents were asked to read the questions and to indicate on this sheet which answer from various options came closest to describing their intentional change. The other handout, Sheet#4, described the three components of the intentional change process--choosing, planning, and implementing. (Both handouts are in Appendix B) On this handout were listed various resources who/which may have contributed to performing each of these three components. Respondents were asked to divide credit or responsibility for performing each of the three tasks by indicating the percentage to which the different resources contributed to accomplishing each task. Percentages added up to 100 percent for each of the three tasks.

Sheet #5 listed interview questions numbers 23 through 28 which sought demographic information. Each person was given this sheet and asked to write the answers appropriate to him or herself. This sheet is located in Appendix B.

Results from the interviews were placed onto a data sheet by the interviewer. The data sheet is also located in Appendix B.

Consistency

Tough's interview schedule was developed and continuously refined in the process of interviewing 180 persons. In discussing how the reliability and validity of his interview schedule were determined, Tough stated that

"No specific tests or efforts along that line" had been made (personal communication, November 10, 1986). In the same conversation, Tough stated that the schedule has been "used by 10-12 researchers with basically the same results", and the questions are really based on "common sense". These comments were made in support of the consistency and face validity of the interview schedule. No efforts had been made by Tough as of November, 1986, to demonstrate the consistency of the interview schedule by reinterviewing individuals who had been previously interviewed and comparing both sets of responses (personal communication, November 10, 1986).

For the purposes of this study, two techniques were used to demonstrate the stability and consistency of the interview schedule or instrument. The adaptation of Tough's interview schedule was pilot tested with 5 Type II diabetics. Individual questions were checked for clarity, wording, and sequence. Methods of recording interview data, whether adequate information was being recorded, and whether the information as recorded could be analyzed according to the plan were also evaluated. This procedure was followed in an effort to standardize the interview protocol. The results of these interviews were that the interview schedule itself did not need to be altered. However, the data sheet on which information obtained during the interviews was recorded, was expanded and the need to record more direct

quotations was identified.

In addition, the consistency of the interview schedule was estimated by doing a telephone follow-up of five respondents two weeks after their interviews. Ten of the basic interview questions were asked again. The investigator then compared the responses to each of these questions with the original responses. It was planned that if seven or more of the ten questions were answered similarly, the interview schedule's consistency would be considered verified. The rationale behind the choice of at least seven out of ten answers needing to be answered similarly is discussed below. The result of this procedure was that the five persons answered an average of 8.4 of the repeated 10 questions in the same fashion as their actual interview questions. This is a rate of 84% of responses answered similarly.

When administering standardized instruments, a reliability coefficient for the data is usually calculated to determine the consistency of the instrument. One common method used to determine the consistency or reliability of a standardized instrument is to administer a particular test twice to the same individual with a time interval separating both administrations. A reliability coefficient is then calculated using both test results. The coefficient obtained would indicate the amount of variation between both measurements which is attributable to variation in true

score, and the amount that is attributable to error (Ferguson, 1981, p.436).

Because the interview schedule which was used for this study was not a standardized instrument, it was inappropriate to calculate a reliability coefficient for these sets of interviews. Instead, this investigator compared the responses to each of the questions on the second interview with the original responses. If seven or more of the ten questions were answered similarly, the interviews' consistency were considered verified. This minimum of seven out of ten questions was considered an acceptable standard based on Ferguson's (1981) rationale regarding the interpertation of correlations. He presents a framework which indicates that a .85 correlation indicates that 72% of the variance of one variable can be explained from the variance of another. Given the fact that a correlation of .85 is a strong one, this investigator accepted that a total of at least seven out of ten responses answered similarly in a follow-up interview would be equivalent to the 72% cited by Ferguson. The results of carrying out this procedure revealed that persons answered eight out of the ten questions similarly during the second round of questioning.

The reliability of the interview process was demonstrated through two techniques. Since only one person interviewed subjects for the study, it was important to

demonstrate intrarater reliability. "Intrarater reliabililty is a measure of the consistency of a specific interviewer" (Wiersma, 1986, p 212). The telephone follow-up described above demonstrated the interviewer's consistency over time. Two weeks after their actual interviews, five respondents were reinterviewed over the telephone regarding ten of the survey questions. Responses were compared in the same fashion mentioned above to identify consistency over both interviews. Persons answered an average of 84% of the two week follow-up questions similarly to their actual interview questions.

The reliability of the interviewer's process for coding interview data was demonstrated by having a second person listen to tapes of three of the pilot test interviews. After reviewing the interview procedure, schedule, and data sheet with the investigator, this person listened to the tapes and coded the interview data onto the data sheet. A comparison was performed of ratings which were made by the interviewer and ones which were made by this second person. If at least 70% of the second person's ratings were similar to the investigator's, the consistency of the interviewer's process for coding interview data would be demonstrated. The rationale for using 70% as a limit is the same as in the above discussion of interview schedule consistency. The results of this procedure indicated that all of the second person's listings were similar to the interviewer's.

Validity

A review of the literature regarding learning projects was the basis from which interview questions on intentional learning were developed. A group of three adult education experts were asked to review these questions in order to evaluate their face validity.

> Face validity refers to the evaluator's appraisal of what the content of the test measures. For example, if a test purports to measure reading achievement and if the items appear to deal with relevant content in this area, the test can be said to have face validity (Borg & Gall, 1983, p. 276).

Of the three adult education experts, one made comments regarding the interview process (i.e., how the interviewer should be seated in relation to the interviewees and how the interviewer might refer interviewees to the various sheets which were used during the interview process). Another person made suggestions regarding changing a few words or phrases in order to enhance the possibility of gaining the information desired. All three adult education specialists communicated that using the interview schedule should obtain the desired information.

The validity of the interview process was enhanced through the use of a diagrammed model of the intentional change process and a list of potential intentional health changes. Using these resources during the interview enhanced the clarity of the interviewer's explanation of the concept of intentional health change and augmented the

respondents' understanding of the concept and the information that was being sought.

Research Questions and Statistical Hypotheses

The questions answered in this study included:

1. What are the areas of most important intentional change in diabetes related health factors?
2. What are the characteristics of intentional change efforts?
    - A. What percentage of the desired change was achieved?
    - B. How large and important was the change?
    - C. To what extent did the change benefit the individual?
    - D. To what extent did the change benefit others?
    - E. What was the most difficult part of the change?
    - F. What resources were used in deciding to change?
    - G. What are the percentages to which each resource was used in deciding to change?
    - H. What resources were used in planning the change?
    - I. What are the percentages to which each resource was used in planning the change?

J. What resources were used in achieving the change?

K. What are the percentages to which each resource was used in achieving the change?

L. What activities were involved in deciding to change?

M. What activities were involved in planning the change?

N. What activities were involved in achieving the change?

3. What learning is undertaken in the context of the intentional change process?

4. What are the characteristics of these learning efforts?

A. How many hours were spent in each of these learning efforts?

B. What activities were pursued in order to accomplish this learning?

C. Who was the primary planner of each learning project?

D. How many learning projects did individuals undertake?

5. What types of additional assistance would have been helpful to the change process?

6. What benefits were anticipated as a result of the change?

7. Were there unintentional changes made in diabetes related areas of health?
8. Were there desired changes which were not achieved?
    A. What were these changes?
    B. What are ideas regarding why this change was not achieved?
    C. What resources might have been helpful to achieve this change?

Several hypotheses were tested in order to determine if a statistically significant relationship existed between selected demographic variables and areas of intentional change and topics of learning projects. In addition, the relationship between areas of intentional change and topics of learning projects was examined. The hypotheses tested in this study included:

1. H_0 No significant relationship exists between areas of intentional change and age.
   H_1 A significant relationship exists between areas of intentional change and age.
2. H_0 No significant relationship exists between areas of intentional change and gender.
   H_1 A significant relationship exists between areas of intentional change and gender.
3. H_0 No significant relationship exists between areas of intentional change and years with known diabetes.

H A significant relationship exists between areas of intentional change and years with known diabetes.

4. H No significant relationship exists between areas of intentional change and method for controlling diabetes.

H A significant relationship exists between areas of intentional change and method for controlling diabetes.

5. H No significant relationship exists between areas of intentional change and marital status.

H A significant relationship exists between areas of intentional change and marital status.

6. H No significant relationship exists between areas of intentional change and years of formal education.

H A significant relationship exists between areas of intentional change and years of formal education.

7. H No significant relationship exists between areas of intentional change and highest diploma/degree obtained.

H A significant relationship exists between areas of intentional change and highest diploma/degree obtained.

8. H_0 No significant relationship exists between areas of intentional change and employment status.

   H_1 A significant relationship exists between areas of intentional change and employment status.

9. H_0 No significant relationship exists between areas of intentional change and occupation.

   H_1 A significant relationship exists between areas of intentional change and occupation.

10. H_0 No significant relationship exists between topics of learning projects and age.

    H_1 A significant relationship exists between topics of learning projects and age.

11. H_0 No significant relationship exists between topics of learning projects and gender.

    H_1 A significant relationship exists between topics of learning projects and gender.

12. H_0 No significant relationship exists between topics of learning projects and years with known diabetes.

    H_1 A significant relationship exists between topics of learning projects and years with known diabetes.

13. H_0 No significant relationship exists between topics of learning projects and method for controlling diabetes.

H_1 A significant relationship exists between topics of learning projects and method for controlling diabetes.

14. H_0 No significant relationship exists between topics of learning projects and marital status.

H_1 A significant relationship exists between topics of learning projects and marital status.

15. H_0 No significant relationship exists between topics of learning projects and years of formal education.

H_1 A significant relationship exists between topics of learning projects and years of formal education.

16. H_0 No significant relationship exists between topics of learning projects and highest diploma/degree obtained.

H_1 A significant relationship exists between topics of learning projects and highest diploma/degree obtained.

17. H_0 No significant relationship exists between topics of learning projects and employment status.

H_1 A significant relationship exists between topics of learning projects and employment status.

18. H_0 No significant relationship exists between topics of learning projects and occupation.

H A significant relationship exists between topics of learning projects and occupation.

19. H No significant relationship exists between areas of most significant intentional health change and topics of learning projects.

H A significant relationship exists between areas of most significant intentional health change and topics of learning projects.

Methods of Organizing and Analyzing Data

Because this study describes intentional learning and change processes, descriptive statistics were used to analyze the information obtained. Data were either grouped into predetermined categories, or were examined and placed into categories which best reflected their meaning. Several discussions of narrative data augmented the statistical presentation. In addition, chi-square tests of independence were performed in order to test the research hypotheses. The approaches taken are described below.

The responses obtained for interview schedule questions 1, 2L, 2M, 2N, 3, 4B, 4C, 5, 6, 8A, 8B, and 8C were categorized into similar groupings in order to allow them to be more readily analyzed numerically. (The interview schedule is included in Appendix B.) In categorizing the responses, the researcher carefully examined responses, grouping and regrouping them to fit them into appropriate

categories based on similarities among responses. After the categorizations were accomplished, the total number, mean number, and percentage of persons in each category were determined.

In addition to the calculations mentioned above, the number and percentage of persons in various intervals were determined for questions 2A, 4A, and 4B; the number and percentage of persons responding in each of the available responses were determined for questions 2B, 2C, 2D, 2E, 2H, 2J. 4D, and 7; and the mean percentage of all resources used for each of the three tasks were determined for questions 2G, 2I, and 2K. Finally, all research hypotheses were tested by performing chi-square tests of independence.

CHAPTER 4

ANALYSIS OF DATA

Introduction

This chapter presents the results of the analysis of data which were collected through interviews with 46 persons who have Type II Diabetes. The analysis is divided into three sections: one which addresses descriptive information relative to the research questions; another which addresses the statistical hypotheses; and yet another which describes results of the study which were unanticipated in the original research proposal. The first section includes: (a) demographic information, (b) most significant intentional changes in diabetes related health areas, (c) characteristics of intentional change efforts, (d) learning undertaken in the context of the intentional change process, (e) characteristics of the intentional learning, (f) assistance which would have been helpful to the change process, (g) benefits anticipated as a result of the change, (h) unintentional diabetes related health changes, and (i) unrealized diabetes related health changes. The second section which covers the research hypotheses includes: (a) relationships between demographic variables and areas of intentional change, (b) relationships between

demographic variables and topics of learning projects, and (c) the relationship between areas of change and topics of learning projects. The third section discusses: (a) persons who were nonchangers, (b) persons' most significant change in relation to the most difficult step of their change process, and (c) reasons behind persons' decisions to change.

Descriptive Information

Demographic Information

The demographic information which was gathered for this study included age, gender, years with known diabetes, method of diabetes control, marital status, years of formal education, highest diploma or degree attained, employment status and occupation. This information not only provides data for use in answering the questions and testing the hypotheses, but it also gives a description of the respondents. Table 1 displays frequencies and percentages for the characteristics of age, gender and marital status. Table 2 displays frequencies and percentages for additional demographic characteristics. These include years of formal education, highest diploma or degree attained, and employment status and occupation.

TABLE 1 Frequencies and Percentages for Demographic Characteristics of 46 Type II Diabetics

Characteristic Description	Response Frequency	%	Cumulative %
Age			
20-24	1	2.2	2.2
25-29	--	--	2.2
30-34	--	--	2.2
35-39	2	4.3	6.5
40-44	1	2.2	8.7
45-49	2	4.3	13.0
50-54	3	6.5	19.5
55-59	7	15.2	34.7
60-64	3	6.5	41.2
65-69	12	26.1	67.3
70-74	11	23.9	91.2
75-79	3	6.5	97.7
80-84	1	2.2	99.9
TOTAL	46	99.9	99.9
Mean = 62.43	Median = 66	S.D. = 11.86	
Gender			
Male	21	45.7	
Female	25	54.3	
TOTAL	46	100.0	
Marital Status			
Married	36	78.3	
Widowed	6	13.0	
Divorced	2	4.3	
Single	2	4.3	
TOTAL	46	99.9	

TABLE 2 Frequencies and Percentages for Educational and Employment Characteristics of 46 Type II Diabetics

Characteristic Description	Response Frequency	%	Cumulative %
Years of Formal Education			
Less than 12	4	8.7	8.7
12	12	26.1	34.8
13-14	13	28.3	63.1
15-16	11	23.9	87.0
17-18	3	6.6	93.6
19-20	3	6.6	100.2
TOTAL	46	100.2	100.2
Mean = 14.07	Median = 14	S.D. = 2.75	
Highest Diploma/Degree Attained			
Less than High School	4	8.7	8.7
High School	23	50.0	58.7
2 Year Diploma	3	6.5	65.2
Bachelors	10	21.7	86.9
Masters	6	13.0	99.9
TOTAL	46	99.9	99.9
Employment Status			
Employed	22	47.8	
Retired	14	30.4	
Disability	1	2.2	
Unemployed	9	19.6	
TOTAL	46	100.0	
Occupation/Profession			
Executive/Self Employed	7	15.2	
Professional	17	37.0	
Clerical/Technical	5	10.9	
Homemaker	7	15.2	
Skilled Worker	10	21.7	
TOTAL	46	100 0	

Table 3 displays diabetes related demographic characteristics. These include years with known diabetes, and method of diabetes control.

TABLE 3 Frequencies and Percentages for Diabetes Related Demographic Characteristics of 46 Type II Diabetics

Characteristic Description	Response Frequency	%	Cumulative %
Years with Known Diabetes			
0-4	9	19.6	19.6
5-9	9	19.6	39.2
10-14	10	21.7	60.9
15-19	5	10.9	71.8
20-24	7	15.2	87.0
25-29	2	4.3	91.3
30-35	4	8.7	100.0
TOTAL	46	100.0	100.0
Mean = 12.9	Median = 11.5		S.D. = 8.81
Method of Diabetes Control			
Diet	5	10.9	10.9
Oral Medication	15	32.6	43.5
Insulin	26	56.5	100.0
TOTAL	46	100.0	100.0

To summarize the data cited in Tables 1 through 3, subjects were approximately 55% female, all except one were Caucasion, and all were from a middle class background. Most persons were married, had at least a high school diploma, and were employed or retired from a wide range of occupations. Although persons were predominantly in the 65-75 year old age group, the actual age range was 23 to 82.

Sixty percent of the interviewees were older than 65. Only 9% were older than 75. Sixty percent had diabetes for 14 years or less; 20% for less than 5 years. Approximately 57% of the interviewees used insulin to control their diabetes, only 11 percent were controlled by diet alone.

Most Significant Intentional Change in Diabetes Related Health Areas

Of the 46 Type II diabetics interviewed for this study, 39 persons had made a diabetes related health change in the prior five years which they felt was a significant intentional change. Intentional was defined to mean a change which persons believed they had specifically and voluntarily chosen to make (i.e., they had not felt forced or coerced to make it). Seven persons either had not made a diabetes related health change or had not made a change which they believed was intentional.

The changes made by interviewees were categorized into similar groupings. These groupings included eating/weight loss, curtailing drug use (including alcohol and tobacco), self blood glucose monitoring, exercise, and miscellaneous. Using these groupings, the intentional changes which occurred most frequently were in the areas of eating and weight loss, self blood glucose monitoring, exercise and smoking cessation. These changes accounted for 69% of all diabetes related health changes.

To facilitate the data analysis, two combination groupings were developed. An area pertaining to the curtailment of drug utilization was developed by combining smoking cessation and the reduction or elimination of alcohol consumption. A miscellaneus category was also developed. Despite several efforts to sort the changes included in this miscellaneous grouping, no clear and distinct categories could be identified. Table 4 lists each of the change categories.

TABLE 4 Number and Percentage of Persons Whose Most Significant Change Was in Each Area (N=39)

Area	Number	%
Eating; Weight Loss	14	36
Curtail Drug Use:	6	15
Smoking Cessation	(4)	(10)
Eliminate/Reduce Alcohol Consumption	(2)	(5)
Self Blood Glucose Monitoring	5	13
Exercise	4	10
Miscellaneous	10	26
TOTAL	39	100

Eating and Weight Loss. The most important intentional diabetes related health change for just over one third of the persons was in the area of food consumption. There were three general types of changes in this area: alteration in general eating habits, alteration in one specific eating habit, and weight loss. Of the 14 persons whose change was in the area of eating, 8 cited broad dietary changes; 3 made

a change in one particular eating habit; while 3 lost a major portion of the weight which they had set out to lose.

One woman stated "Food is central to my family life and entertaining...I am trying to become more aware of what I need to do for our health and to protect our children from developing diabetes." This lady has known that she has had diabetes for 17 years. Her husband was diagnosed with diabetes this year. She has accomplished broad dietary changes which she described as eating lots of vegetables, no dessert, less meat and eggs, less fried foods, more boiled and broiled foods and more poultry and fish. A few other persons mentioned broad changes in general eating habits like those made by the woman just cited. Others were selective in trying to change areas which were particularly difficult for them. "I've reduced the amount of food I eat and decreased the amount and type of fat I eat: less beef, and more venison, fish and chicken." "I'm trying to leave sweets alone; eat no candy, have less sweet rolls and coffee klatch food, and eat less fruit. (She was eating 4 to 6 servings of fruit per day.) At the same time, I'm trying to increase the amount of fiber that I eat." Another person stated "I'm more responsible for my own eating." Yet another said "(Diabetes) has absolutely changed my lifestyle...I used to live on a diet of rolls, candy and anything else that was available...(now I) eat 3 meals a day, don't skip meals, eat meals on time, and have meat,

fruit, vegetables and milk every day."

Of the three persons who made a change in one particular eating habit, two eliminated the intake of foods high in sucrose from their diet. One man stated that he had learned over time that eating refined sugar foods resulted in "a downer" for him. After diagnosis, he didn't decide to take action on his diabetes control until he realized that the emotional and physical ups and downs which he was experiencing were affecting his family and career. These "constant gyrations" no longer occur since he has eliminated refined sugar from his diet. Another man has faithfully worked at controlling his diabetes since being diagnosed 17 years ago. Within the past year, he learned about the effect that eating high fiber foods has on maintaining a more stable blood glucose level. Because of this information, he has increased his ingestion of high fiber foods such as beans, prunes, and whole oats.

Three women reported that a loss of weight was the most significant diabetes related health change that they had made. One woman who had given up hope of ever losing weight had, four months prior, become involved in a weight loss program which is directed by a Billings physician. Within this time period, she had lost 66 pounds and had a goal of losing an additional 170 pounds. She stated, "I don't have a lot of discipline...but now there's hope...you have to decide to do it for yourself (then you are ready to

lose weight)." In her program, predominant nutrients are received in a protein/nutrient drink. A small amount of actual food is eaten in order to help persons learn to control eating and to develop healthy eating habits. Weekly group behavioral sessions, laboratory testing, and medical follow-up are also important components of the program. Two other women lost weight by cutting down on their food intake. Both started their weight loss endeavors by meeting with a dietician and receiving information on how to change their eating habits. Both have accomplished approximately 50 percent of their weight loss goals and have the perspective that although it will take time, they will accomplish their goals.

Self Blood Glucose Monitoring. Thirteen percent of all intentional changes related to the use of self blood glucose monitoring. The motivation for these five individuals' changes seemed to be quite varied, and the information gained by monitoring their blood glucose levels was used in very different ways by various persons.

One woman determines her morning insulin dosage on the basis of her blood glucose level. With support and suggestions from her physician, she worked out a baseline blood glucose level and insulin dosage. She adjusts her insulin dose plus or minus one unit for each 20 points that her blood glucose results are over or below the baseline. She had previously suffered from frequent insulin reactions

and was experiencing much better control because of making these changes. She stated that she feels she is controlling her diabetes now without the help of her physician. "Since I've been doing this, I haven't needed to go see the doctor" (a period of about two years). Before this, she says that she visited him at least once every month. Another woman also talked about her blood glucose monitoring as giving her control over her diabetes. "I'm more aware now that I'm the one that can control my diabetes. I was going to the doctor and expecting him to control it .... Having the monitor tells me what to do for myself." This lady does not adjust her insulin based on her results. Instead, she uses it to identify how various foods affect her blood glucose levels and to monitor these levels at various times throughout the day. One man stated the his blood glucose monitoring "gives me peace of mind and does control my sugar." To prevent hypoglycemic events at night, he eats extra food at bedtime if his blood glucose is below 100 and takes extra insulin whenever he eats desserts. Yet another woman started monitoring her blood glucose levels four months prior to the interview. Although her physician had previously recommended that she monitor her glucose levels, she did not start the testing until her opthalmologist recommended it. She had previously had a lense implant and the same eye had developed a film over it. The opthalmologist believed that by regular monitoring, it could be determined whether

irregular blood sugars might be the cause of the film.

It is interesting to note that two additional persons had begun to monitor their blood glucose levels. Their changes, however did not fit the criteria for intentional change. One woman felt her change was not chosen because her doctor had told her to do it. In another instance, a man monitored his glucose levels while evaluating its benefits. His motivation was to prove to his physician that blood glucose testing was no more beneficial than testing urine for glucose.

Exercise. Changes that were categorized as exercise-related included walking, taking an aerobics class, and generally increasing exercise. Only about 10% (or four) of the interviewees cited exercise as their most significant diabetes related intentional change. Despite this relatively low number, several persons had actually begun personal exercise programs in the past five years. Walking is without question the predominant activity. Only one man reported running regularly as his mode of exercise.

Of the four individuals for whom exercise was the most important change, two had specifically targeted goals for their exercise (walk 45 minutes every day after work and take an aerobics class twice a week), and two generally increased their exercise. One man stated, "I don't go in for regimentation .... I do as I damn well please .... I have no hard and fast goal. I just walk." He usually walks

five miles a day despite this lack of "regimentation".

Curtailing of Drug Use. Four persons, or about 10% of those interviewed, cited quitting cigarette smoking as their most important intentional change. The approach taken to this change varied tremendously among these persons. While one man was playing golf with a friend (a physician), he told his friend about the discomfort he had been experiencing in his legs. The friend told him, "If you want to keep playing golf, you should cut out the cigarettes." He said, "I decided that day to quit and I did."

From an opposite perspective, a woman spent from January to September of a given year making the decision to quit. After that time period, she "stopped cold turkey". Another woman visualized the damage she was doing to the circulation of her feet and legs by smoking. "I fantasized about how it would be if I quit--or if I didn't." Then she developed a plan for quitting. She cut down to four cigarettes per day smoking a little at a time, then cut down to three, then two. After one and a half weeks she was smoking no cigarettes. "I do still smoke a few cigarettes every few weeks though." Yet another woman devised behavior modification types of strategies for herself. She increased her exercise "because I can't smoke when I swim," and she anticipated times when she would have smoked and had nutritious snacks available to eat in order to get through those periods.

Two individuals' most important changes were reducing the amount of alcoholic beverages they consumed. One man cut down on his drinking and later eliminated it completely; another man "cut down on (his) social drinking of alcohol in order to cut down on sugar intake."

Miscellaneous. Ten persons made changes which could not be categorized into common groupings. These changes were categorized under the heading "miscellaneous." Three persons' changes reflected emotional adjustments or changes in lifestyle relative to having diabetes. One of these changes was "accepting having diabetes." The woman who claimed this as her major change stated, "you can't do nothing about the diabetes unless you accept it .... It's most important to tell yourself you've got diabetes, learn to live with this and go on from there...then you can handle the things you have to if you've truly accepted it. Then you'll do what you have to do." This lady says that as a result of her acceptance, she walks regularly, has adjusted her diet, avoids stress, monitors her blood glucose and sees her eye doctor, dentist, and physician regularly.

Another woman describes her major change as "scheduling my life." She states, "if I don't schedule myself, I don't feel well .... I schedule my meals, snacks, activities and rest." Yet another young woman is an artistic ice skater. She skates about 30 hours per week and competes frequently. "You are not supposed to bring food into the rinks where

competitive meets are held ... and once you're there you don't want to leave because you want to see what your competitors are doing ... so you eat the food they sell at the rink." Her change has been "rearranging priorities". "I leave the rink to get real food ... otherwise, I can't skate to capacity."

Doing daily foot care and examining their feet was the change discussed by two men. Both felt that this was very important because of the potential ramifications foot or leg amputation would have for them. As one gentleman put it, "It's not a master change like diet, but the potential importance is enormous."

For two persons, the use of insulin was their major change. One woman "decided to try to use insulin" after her physician had recommended it for some time. As a result of this trial, she takes insulin twice daily and says, "I'm finally satisfied with my diabetes control." Now she states, "I recommend that people go onto insulin. I believe if I had gone on it before, I wouldn't have lost my leg." (She has below the knee amputation.) Another person's insulin related changes came after he learned that he can adjust his insulin dosage on the basis of what he eats. "If I'm going out to dinner, or eating sweets, I give myself a little extra insulin .... After eight years of not eating sugar,when I was on oral diabetes medication, this is a wonderful freedom."

Three additional diabetes related changes were revealed. For one man, just seeing a doctor regularly was a significant change; for another, wearing a medic alert bracelet was highly significant. Two years prior to the interview, he was hospitalized after he had passed out after having had too many drinks and no food. He now wears a bracelet, believing that ambulance drivers will see it if they are called to help him at some time in the future. This, he feels, will prevent an unnecessary hospitalization from occurring again.

Preventing hypoglycemic reactions and recognizing signs of it early if they do occur has been a particularly important change for one man. "Given the fact that I have a decreased ability to recognize signs of hypoglycemia, I have given more thought than expected to hypoglycemic changes.... I am doing more to prevent hypoglycemia than earlier." In fact, this man states he's noticed a 25 to 50% decrease in his incidence of hypoglycemic episodes.

Characteristics of Intentional Change Processes

Success in Achieving the Desired Change. In order to determine the extent to which diabetics achieve their chosen changes, interviewees were asked, "What percentage of the change you decided to make did you actually achieve?" Forty-one percent of these persons had achieved 100% of their desired change; while 62% achieved 90% or more of

their desired change. Sixty-three percent of the persons who rated themselves as achieving less than 70% of their desired change were in the process of losing weight or changing eating behaviors. Table 5 cites persons' success in achieving their desired change.

TABLE 5 Success in Achieving the Desired Change: Number and Percentage of Responses

% of Change Which Was Achieved	Number	%	Cumulative %
100	16	41.0	41.0
90-99	8	20.5	61.5
80-89	6	15.4	76.9
70-79	1	2.6	79.5
60-69	2	5.1	84.6
50-59	4	10.3	94.9
40-49	1	2.6	97.5
30-39	--	--	97.5
20-29	1	2.6	100.1
TOTAL	39	100.1	100.1

Size and Importance of the Change. Attempting to evaluate how great and important their changes were, interviewees were asked to rate their changes on a scale using five statements which were listed on Handout Sheet 3. These statements were categorized as follows:

A. A huge or enormous change, or of central importance in my life

B. A fairly large and important change

C. A definite change with some relevance and importance in my life

D. Small, trivial, petty

E. Of no importance in my life

Their responses are cited in Table 6.

TABLE 6 Size and Importance of Change: Number and Percentage of Responses in Each Category

Size and Importance of the Change	Number	%	Cumulative %
Enormous change	15	38.4	38.4
Fairly large change	13	33.3	71.7
Some relevance	11	28.2	99.9
Small, trivial	--	--	99.9
Of no importance	--	--	99.9
TOTAL	39	99.9	99.9

Seventy-two percent (cumulative) rated these changes as being at least fairly large and important. None of the persons interviewed said that their change was small or of no importance in their lives.

Contribution of the Change to Personal Well-being. Persons were also asked, "How much has this change contributed to your happiness, your satisfaction with life, or your well-being?" Responses were selected from the following choices:

A. An enormous amount

B. A large amount

C. Some definite benefit

D. Little or nothing

E. It has done me more harm than good.

Responses are cited in Table 7.

TABLE 7 Amount of Benefit from the Change to Self: Number and Percentage of Responses in Each Category

Amount of Benefit	Number	%	Cumulative %
An enormous amount	10	25.6	25.6
A large amount	13	33.3	58.9
Some definite benefit	14	35.9	94.8
Little or nothing	2	5.1	99.9
Done more harm than good	--	--	99.9
TOTAL	39	99.9	99.9

Fifty-nine percent of the persons rated their changes contributing a large or enormous amount to their happiness, life satisfaction or well-being. Only 5% said the change brought little or no benefits. Several persons seemed to feel that their change brought better control of their diabetes, and therefore contributed to their well-being. However, it had not made them happier or more satisfied with their lives. For example, eliminating certain foods from the diet that they have enjoyed for years does not make them happier, but it does contribute toward enhanced well-being.

Amount of Benefit from the Change to Others. Attempting to determine whether diabetes related health changes benefited persons other than the diabetic, the following question was also asked on Handout Sheet 3. "Let's set

aside your own benefits for a moment, and look at any benefits for other people. Your change might already have been of some benefit to your family, your friends and relatives, your boss, people you work with, and so on. To what extent has your change provided some benefit to people other than yourself?" Options which were available for responses included:

A. Only a small amount

B. Medium amount: of some definite benefit to at least one or two persons.

C. To a fairly large extent

Responses are cited in Table 8.

TABLE 8 Amount of Benefit from the Change to Others: Number and Percentage of Responses in Each Category

Amount of Benefit to Others	Number	%	Cumulative %
A small amount	9	23.1	23.1
A medium amount	16	41.0	64.1
A fairly large extent	14	35.9	100.0
TOTAL	39	100.0	100.0

Seventy-seven percent of the persons stated that their changes provided a medium or large amount of benefit to others, that is, that they had benefited at least one or two other persons. Two examples of comments which demonstrated

the value that people's changes had for others follow. One woman, whose husband also has Type II diabetes, believes that their previous eating habits brought about their disease. Not only has her husband benefited from her new food preparation habits, her married daughters have changed the types of foods and methods of cooking which they use for their families. The other example is of a retired man who regularly helps out with his family members' and neighbors' home maintenance work. He stated, "As I keep in good health, I have a definite benefit to many people." Not feeling well, he would not be able to provide this assistance.

Most Difficult Step of the Change Process. Persons were asked, "Looking back over your total experience in choosing, planning, and achieving this change, what was the one most difficult part of the whole thing for you?" Responses to this question are presented in Table 9. The step which involved actually implementing and achieving the change was selected more often by respondents as the most difficult to accomplish. Thirty-six percent of those interviewed stated that achieving the change was the most difficult step for them. The step selected second most often (31%) was choosing the change, or making the decision to make their particular change. At the same time, 18% of the persons stated that for them, no one step was more difficult than any other step. Only 13% of those interviewed

felt that planning their change was the most difficult part of the change for them.

TABLE 9 Most Difficult Step in the Change Process: Number and Percentage of Responses

Most Difficult Step in Change Process	Number	%
Choosing	12	30.7
Planning	5	12.8
Achieving	14	35.9
None more difficult	7	17.9
All were difficult	1	2.6
TOTAL	39	99.9

Resources Utilized in the Change Process

The three tasks involved in the change process are choosing, planning, and implementing. In order to learn who was responsible for accomplishing these three steps, interviewees were asked what resources were used in accomplishing each of the steps. After reading Handout Sheet 4, Three Tasks of the Intentional Change Process, interviewees were asked to share who or what resources, including themselves, were used in performing the steps. Options listed on the handout included self, nonhuman resources, a professional, a group with a leader, a group without a leader, and family or friends. In addition to listing these various resources, the handout described the three tasks of the intentional change process in detail.

Choosing the change is "Deciding to go ahead with this particular change. As part of making this decision, you or someone else or a book might have examined various aspects of your life, obtained information, identified a tentative possible change, estimated the costs and benefits of this change and so on." Planning is "Planning the strategy and deciding the steps for achieving the change." Implementing the change is "Actually taking the steps for achieving the change."

Percentage to Which Resources Were Used. After sharing the resources that were involved in each step of the change process for each task, interviewees were asked to "divide credit for getting the task done" by indicating the percentage to which each resource was used, the total for all percentages was to equal 100.

Individuals themselves assumed the major responsibility for each of the three steps involved in their change--choosing, planning and implementing. Whereas persons assumed a mean of 60% of the responsibility for their change, the percentage credited to "self" was greatest for achieving the change (75%) and least for choosing the change (45%). The findings are listed in Table 10.

TABLE 10 Extent to Which Various Resources Contributed to Choosing, Planning and Implementing the Changes

Resource	Choosing	Planning	Implementing	Mean%
Self	45.0	60.5	74.5	60.0
Books, etc.	9.7	8.9	4.5	7.7
Health Professional	21.1	16.3	5.3	14.2
Group with a Professional Leader	6.8	4.7	0.9	4.1
Group without a Professional Leader	1.4	--	--	0.5
Family/friends	13.4	9.6	8.9	10.6
God/Church	1.3	--	6.0	2.4
TOTAL	98.7	100.0	100.1	99.5

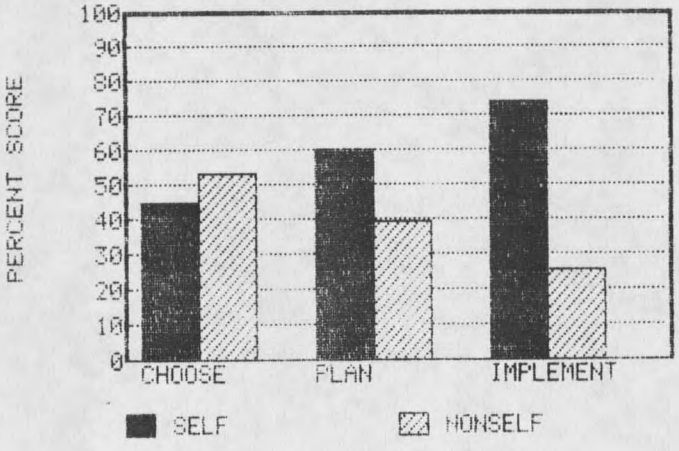
Note. Numbers cited are the percentage to which each resource category was used in each of the three steps.

As individuals assumed more and more responsibility for their change through the steps of choosing, planning, and implementing, other resources were used less and less. That is, the extent to which nonself resources (professionals, nonprofessionals, groups, and nonhuman materials) were used decreased through the steps of choosing, planning, and implementing the change. The differences between how self and nonself resources were credited with responsibility for the three tasks of the change process are illustrated in Figure 1.

Resources external to the person played a very important role in the process of choosing to make the change. In choosing to make the change, health professionals were responsible for 21% of the accomplishment

and family, friends and others nonprofessional persons were responsible for 13%. Nonhuman materials and groups with a professional leader also served as important resources in making the decision to change. In planning the change, self was the major resource used (61%) with health professional being the next major resource (16%).

Figure 1 Differences in the Percentage to Which Self and Nonself Resources are Credited with Responsibility for the Three Tasks of the Change Process



The person him or herself was credited with 75% of the responsibility for achieving the change. The resource which was used to the next greatest extent is family, friends and other nonprofessionals. This category was given 9% of the responsibility for implementing the change.

In analyzing the data, it became apparent that an additional resource category needed to be added to those listed on Sheet 4. Three persons mentioned God, the Church and spiritual materials as resources which were critical contributors to their change processes. "Strength from God,

"Strength from the Church" and the combined strength of "me, my husband, and the Lord", were all given credit in either choosing (1.3%), or implementing (6%) these individuals' changes.

Degree of Use of Each Type of Resource. The number of persons who cited using different types of resources for each of the three change process tasks is presented in Table 11. The distinction between Table 10 and Table 11 is the fact that Table 11 presents the mean percentages to which each category of resource was utilized by all persons for each of the change tasks.

TABLE 11 Number and Mean Percentage to Which Persons Credit Using Each Resource Category for Choosing, Planning, and Implementing the Change

Resource	Choosing	Planning	Achieving
Self	37 (47.4)	37 (60.5)	37 (78.5)
Books, etc.	15 (25.3)	13 (25.3)	6 (29.2)
Health Professionals	27 (30.5)	21 (28.7)	11 (18.6)
Group with a Professional Leader	13 (20.4)	7 (25.0)	2 (17.5)
Group without a Professional Leader	2 (27.5)	--	--
Family/Friends/etc	18 (29.1)	9 (39.4)	14 (24.6)
God/Church	1 (50.0)	--	3 (78.33)

Of the 39 persons who made a significant intentional diabetes related health change in the prior five years, 37 persons (95%) cited "self" as a resource utilized in choosing, planning and achieving the change. While the actual number of persons who reported self as a resource remained the same for these three tasks, the mean percentage to which self was credited with responsibility varied from 47% in choosing the change to 79% in achieving the change. So, despite the fact that self was a resource used by the same number of persons in all of the tasks, "self" was credited with much more responsibility for actually implementing the change than for choosing or planning it.

"Health professionals" were cited as being the next most frequently utilized resource category. Twenty-seven persons cited professionals as being responsible for an average of 30% of their choice to change, while 11 persons credited them with 19% of the responsibility for implementing the change. "Family/friends/other nonprofessionals" was given the next greatest responsibility with 18 persons using this resource in choosing and 14 in achieving their change. Percentages to which family and friends were credited with responsibility remained somewhat constant among the three tasks with most assistance being received from this group in planning the change.

The amount of responsibility credited to "Books, etc." remains relatively constant among the three tasks. Despite

this fact, the number of persons citing the use of these types of materials was much greater for choosing (15), less for planning (13), and even less for achieving (6). "Groups with a professional leader" followed the same pattern with more persons citing it as a resource for choosing and less for achieving. "God/Church" were a major factor in implementing the change for three persons who credited this category with a mean of 78% of the responsibility for the task.

Specific Resources Used in the Change Process. The resources which were actually cited by persons when they were interviewed are listed in Appendix C. Nonhuman resources were divided into reading, audiovisual and miscellaneous materials. The Diabetes Forecast magazine, a monthly publication of the American Diabetes Association, was the single most frequently used reading material. Various types of books, such as ones on the general topic of diabetes, and menu planning or cooking, were a major resource. Informational booklets or pamphlets which, are prepared by pharmaceutical companies or other diabetes related agencies, and television programs on the topic of diabetes were other frequently utilized nonhuman resources.

Physicians were, without question, the health professional most frequently cited as being responsible for a portion of the change. Nurses and dieticians were also credited with a large amount of the responsibility.

Interestingly, dieticians were cited most frequently as resources for the process of planning the change, while physicians and nurses follow the previously identified pattern of being used predominantly in choosing the change, then in planning and least frequently in implementing the change.

The American Diabetes Association was the predominant group cited, while a hospital education program received the second greatest amount of credit in the category of "group with a professional leader." Spouses were cited most frequently in the category of "family/ friends/other nonprofessionals" while family in general or specified non-spouse family members were also given a large amount of responsibility for the various tasks of the change process.

Activities Involved in Choosing, Planning and Implementing the Change

In an attempt to learn the processes involved in change efforts, persons were asked what they actually did when choosing to make the change, planning how to achieve it, and finally achieving it.

Activities Involved in Choosing the Change

Persons were asked, "What are some of the main things that you did when (deciding to make the change)? What you considered, any information you gathered, how you arrived at the decision to change, and any other step you took." Responses to this question were organized into nine

categories: feedback from health professionals, perceived threat, assistance from support systems, learned information, personal reflection, spiritual strength, perceived benefit, product evaluation, and protect others. These categories summarize either things which the individuals actually did, or things which influenced them to make the change. The results are cited in Table 12. (This table and the one following it do not list the percentages of persons performing categories of activities because some persons performed more than one type of activity.)

TABLE 12 Activities Performed in Choosing the Change: Number of Persons Citing Each Category

Activities Performed in Choosing Change	Number
Feedback from health professionals	16
recommends/encourages	(14)
threatens	(2)
Perception of threat	15
personal experience	(10)
family history/experience	(5)
Assistance from support systems	8
family	(4)
friends	(2)
group	(2)
Learned information	6
Spiritual strength	3
Personal reflection	2
Perception of benefit	2
Product evaluation	2
Protect others	1

Feedback From Health Professionals. The most frequently cited category includes the influence which health professionals had on an individuals' decision to make a change. This grouping was categorized into two sub-headings: recommendations that the professional made and threats that they made. Fourteen persons said that receiving a recommendation from a health professional was a factor involved in deciding to make their change; two persons mentioned their physicians threatening them with the use of insulin as being an influence toward their decisions. Although this professional feedback is not an activity in the sense that the diabetic did something, these were major factors behind how the persons arrived at the decision to change. Professionals' recommendataions include ideas such as exercising, losing weight, using insulin, taking extra insulin to cover foods eaten, seeing another health professional, and using a blood glucose monitor. In all cases, except two, the recommending professional was a physician.

Perception of Threat. A very important factor in persons making a choice to change a diabetes related health behavior is their perception of a threat to their health or well-being. This category was divided into two sub-components: family history/experience and personal experience. Five persons stated that exposure to diabetic family members influenced them to decide to make the change.

One man stated, "I made up my mind not to fall apart like my father did (with diabetes) ... He sat down after he was diagnosed ... What happened to him wasn't going to happen to me." This man's change is exercising daily. Ten additional persons had other experiences which played a role in their decision. Most, in one way or another, made them aware of their physical vulnerability. A few examples of these experiences follow. One man said he had been "feeling badly" for a long while with "physical and emotional gyrations". He decided to watch his intake of refined sugars and, as a result, felt better and had much more energy. "I made a decision to control it (the diabetes) rather than it control me." Another man who had an alcohol problem stated, "I realized I was hurting myself" (with the drinking), so he stopped using alcoholic beverages. Yet another man developed a foot infection which "could have easily needed amputation ... after it, I knew I had to do foot care, and did it."

Assistance from Support Systems. Eight persons made their decisions by discussing the problem with family members or friends, or as a result of attending a group activity. The influential group activities included attending a "smoke out" event and an American Diabetes Association meeting at which a diabetic woman informally shared the benefits she had gained from blood glucose monitoring.

Acting on Learned Information. Seven persons' decisions were made as a result of information which had been learned. Examples include the following. One woman stopped smoking after reading about how smoking affects circulation in fingers and toes. A man who "was looking for a way to reduce my blood glucose" learned that by decreasing his alcohol intake he could lower his blood glucose levels. This man has generally eliminated his use of alcohol. Another woman stated, "I learned that diet is central to control" and eventually began a major weight loss program.

Spiritual Strength. Three persons discussed the strength they gained from spiritual resources for making their decisions. One woman gained encouragement from her religious readings for making the change. Another woman said that she talked about whether to start using insulin with the Lord; and yet another woman stated that she asked God for strength to do what she needed to do (i.e., not to eat sugar).

Personal Reflection. Two persons' activities fit into this category. One woman stated, "I thought about losing weight over a long time" prior to actually losing weight. Another woman said that she "fantasized about how it would be if I quit or didn't quit" as a step to deciding to stop smoking.

Perception of Benefit. Two persons cited activities in this category. One woman joined an exercise spa and exercised. She felt so much better that she decided to discipline other areas of her life. A man who had back surgery walked in order to strengthen his back. In walking, he became aware that the activity reduced his blood glucose levels. He therefore decided to walk for longer periods and more regularly in order to control his blood glucose levels.

Product Evaluation. One individual evaluated several different glucose monitors attempting to determine which one he should purchase. Another person used a blood glucose monitor for two days on a trial basis in order to decide if she wanted to buy it.

Protect Others. One woman's boss had experienced a myocardial infarction and was returning to work. She did not want to smoke around him. Her desire to avoid putting him in contact with her smoke was one factor which contributed to her decision to stop smoking. She was the only person who fit into this category.

Activities Performed in Planning the Change

Persons were asked, "What did you do when you were planning the change? For instance, did you collect information, make a list, or take any other steps in order to plan your change?" Responses were grouped into five

categories. These categories are listed in Table 13 and are discussed below.

TABLE 13 Activities Performed in Planning the Change: Number of Persons Citing Each Category

Activities Performed in Planning Change	Number
Identification of activities which would support the change	21
Learning activities	10
Receive support/assistance	6
Evaluate/purchase a product	4
No definitive plan	3

Identification of Activities Which Would Support the Change. This category is certainly the largest and most broad. Twenty-one persons' statements fit into this grouping. These persons did not indicate specific planning activities, but things which they did that supported accomplishing their change. Two examples include a woman who "bought new types of foods, gave away foods (she) couldn't eat, and got new menus and recipes" and another woman who decided that swimming more would help her to stop smoking. She also decided to bring food to work that she could eat at times when she would ordinarily smoke. Other persons activities are listed in Appendix C. The specific processes that persons followed in setting up these plans were not explored further.

Learning Activities. Ten persons' planning activities centered around learning related activities. Activities mentioned included reading, studying, trial and error, adjusting insulin dosage, observing, practicing (giving insulin and doing blood glucose monitoring), going to American Diabetes Association meetings, listening to a cassette tape, learning to cook using stir fry techniques, thinking about stopping to smoke, and asking restaurants if foods have sugar added to them.

Receiving Support/Assistance. Six persons gained help from other people in planning their changes. One person talked with his wife, three met with dieticians for suggestions, one gained help from a nurse, and one received suggestions from his physician.

Evaluating/Purchasing a Product. Four persons' planning activities focused on purchasing a product. One woman bought new pans and a cooking utensil; another bought a food scale. A man purchased a medic alert bracelet, and a woman tried four different exercise opportunities before locating an aerobic exercise program which she committed to attending.

No Definitive Plan. Three persons stated that there was no real planning focus to their change. Regarding their smoking cessation two persons said "there was no plan--I

just did it" and "with the decision there was not much planning." A man who walks five miles a day said, "I'm not conscious of a plan. I just walk every day."

Activities Involved in Implementing the Change

In general, the changes made by the persons involved in this study were straightforward, matter of fact, behavior changes. Because of this, in answer to the question, "What methods did you use for achieving your change?," persons' responses were similar to the actual change that they had made. For example, a man whose change was exercising regularly said, "I just walk"; a woman who started using insulin said, "I take insulin two times a day"; a man who started seeing a physician said, "I went and continue to see a doctor." Responses which repeated the intended change will not be discussed here except to say that 22 persons' responses (or 48%) generally fit into this category.

The remaining persons made statements which gave further insight into methods used for accomplishing their actual change. These methods can be divided into four groups: encouragement/support from others; strength from God; physical activity; and reflection regarding the behavior needed in order to accomplish the change. Nine persons mentioned gaining the support of others as being a way to accomplish their change. Two men exercise in support of their eating changes, while one woman "kept busy" in order not to smoke. Examples of reflection regarding

necessary behaviors are two persons who stated, "I think about what I eat more than I did" and "I plan the day's food in the morning." The actual responses given to this question are listed in Appendix C.

Learning Undertaken in the Context of the Intentional Change Process

An assumption of this study is that learning is a component of the intentional change process (i.e., that persons deliberately set out to learn in order to accomplish a change which they have decided to make). In order to identify what learning persons undertook in support of their change processes, interviewees were asked, "Many times, in order to make changes in our lives, we need to learn new ideas, information or skills. Is there anything that you deliberately set out to learn in order to make this change in your life?" Of the 39 persons who had made an intentional diabetes related health change in the prior five years, 17 stated that they had deliberately set out to learn new information, skills or ideas. The operational definition of a learning project which was used for this study was, "'A series of clearly related learning efforts adding up to at least seven hours of effort.' The learning effort must include activities designed to obtain new information, to develop new skills, or to acquire new attitudes or beliefs. 'Deciding, planning, traveling time to a learning activity, and evaluating personal progress

will be considered as part of the learning project time'" (Hiemstra, 1975, p.23). Only 15 of the 17 persons who deliberately set out to learn, reported spending seven hours or more on the learning they pursued in support of their change efforts. No persons reported being involved in more than one learning project as they proceeded through their change process.

The themes of the learning projects were divided into five categories. These categories include diabetes in general, diet, blood glucose monitoring, exercise, and emotions in alcoholism (i.e., dealing with the emotions present in relationships affected by alcoholism). The two predominant themes were diabetes in general and diet. Six persons' learning projects were in the category of diabetes in general, and six were in the category of diet. One person had been involved in learning projects in each of the other three categories, (See Table 14).

TABLE 14 Themes of Learning Projects: Number and Percentage of Persons in Each Category

Theme of Learning Project	Number of Persons	%
Diabetes in General	6	40.0
Diet Related	6	40.0
Blood Glucose Monitoring	1	6.6
Exercise	1	6.6
Emotions in Alcoholism	1	6.6
TOTAL	15	99.8

There was quite a bit of variation in individuals' descriptions of the topics of their diet related learning. Themes included "cooking and eating healthy," "nutrition," "nutrition and exchanges," "eating right/controlling diabetes through diet," "general good eating habits; what foods have sugar, fats and salt," and "better eating habits in general."

Persons whose learning was related to diabetes in general did not have as much variation in their stated themes. Four persons stated "diabetes in general" or "diabetes" while two others stated "diabetes in general and how to control it" and "how does diabetes affect the body."

Midway through the process of interviewing the 46 persons, one individual stated that he did not set out to learn something in order to accomplish his change, but that he had learned new information and, as a result of it, made his change. It was at this point that the interviewer realized that she had been phrasing her question regarding learning projects in a manner which did not seek information of this sort. Persons were asked if there was anything they deliberately set out to learn in order to make their change, but they were not asked if they initiated their change in response to something they had learned.

Attempting to gain this additional perspective, the interviewer in subsequent interviews asked an additional question if persons had responded negatively to the inquiry

regarding whether they had set out to learn something in order to accomplish their change. This question was, "Did you make your change because of something you had learned previously?"

Quotes from interviews which preceded the use of this question were examined to determine if persons' statements indicated that their decision to change followed rather than preceded learning. A total of nine persons made some sort of a statement which indicated that they were acting on information they had learned previously. Examples of a few statements include: "I knew it already --I put prior knowledge into practice."; "I did it as a result of new knowledge."; and "I already knew what I had to do and why I had to do it." The results of this procedure are cited in Table 15.

Fifteen persons either had not been involved in a learning project that fit the operational definition or had made no statement regarding learning preceding their change. These persons were placed into a category called "no learning." It is important to note that several of the persons in this category indicated that they had read or had set out to learn about diabetes, but that these activities did not fit the definition of learning projects set forth to guide the study.

TABLE 15 Timing of Learning in Relation to the Decision to Change: Number and Percentage of Persons in Each Category

Timing of Learning	Number	%
Learning followed decision to change	15	38.5
Learning preceded decision to change	9	23.1
No Learning	15	38.5
TOTAL	39	100.1

Characteristics of Learning Efforts

Number of Hours Spent in Each Learning Effort. Interviewees were asked, "About how many hours did you spend involved in these learning efforts? Include time spent deciding, planning, traveling to an activity and evaluating your progress, in addition to actual time learning." Their responses are presented in Table 16.

Nine persons spent up to 100 hours on their learning projects; five spent between 101 and 1000 hours. One woman was unable to identify the number of hours which she had spent on her learning. She stated, "I have been learning about diabetes ever since I was diagnosed (in 1953 ... I've been learning about it every day of my life for the last 30 years."

TABLE 16 Hours Spent in Learning Efforts: Number and Percentage of Persons in Each Category

Number of Hours	Number	%	Cumulative %
7-50	4	26.7	26.7
51-100	5	33.3	60.0
101-150	--	--	60.0
151-200	1	6.7	66.7
201-250	--	--	66.7
251-300	1	6.7	73.4
301-350	--	--	73.4
351-400	1	6.7	80.1
401-450	--	--	80.1
451-500	1	6.7	86.8
. . .			
951-1000	1	6.7	93.5
unable to identify number of hours	1	6.7	100.2
TOTAL	15	100.2	100.2

Activities Performed to Accomplish The Learning. In response to the question, "What sorts of activities were you involved in when you were trying to accomplish this learning?", persons provided several answers which were grouped into eight categories. These categories and the number of persons who selected each category are listed in Table 17. Percentages are not listed in the table because some persons cited more than one type of category. All 15 persons cited "reading" as a learning activity. Items which were read included books, magazine articles, pamphlets, booklets, newspapers, and labels on food products. "Attending classes/group meetings" was an activity performed

by nine persons. Four persons attended American Diabetes Association meetings and four attended hospital sponsored diabetes education classes. One woman took a YWCA cooking class. "Meal preparation/diet related activities" were cited by seven persons. Activities varied from collecting new recipes and menu planning to keeping a diary of food exchanges eaten.

"Talking to health professionals" was another frequently cited activity with six persons mentioning it. The professionals included physicians, nurses, dieticians and the director of the American Diabetes Association. Other activities included talking with peers, watching special television programs, making a telephone call to a company which makes blood glucose monitors, and working to change one's outlook on life.

TABLE 17 Categorization of the Number of Persons Citing Various Activities in Pursuit of Learning

Activities in Pursuit of Learning	Number
Reading	15
Attending classes/group meetings	9
Meal preparation/diet related activities	7
Talking with health professionals	6
Talking with peers	3
Watching TV specials	2
Miscellaneous	3
TOTAL	45

Primary Planner of Learning Projects. Persons were asked, "Who is the person who planned the major portion of each of your learning efforts?" The individual himself or herself overwhelmingly was given credit for being the primary planner of the learning. Twelve individuals, or 80% of those who engaged in learning projects, stated that they had planned the major portion of their learning endeavors. Two persons gave credit for the majority of their learning plans to the dieticians who worked with them in their change efforts. Both change efforts pertained to a broad change in eating habits. One of these people stated, "She (the dietician) told me what to do, and I did it." This same woman assumed only 20% of the responsibility for choosing her change. She cited her physician with 80% of the responsibility saying, "If the doctor hadn't told me I needed to eat differently, I wouldn't have done it." She also gave herself only 10% of the credit for planning her change process. The dietician was given 50% and her husband was given 40%.

The other person for whom a dietician was the primary planner of his learning also assumed very little responsibility for his change process: 15% for choosing the change, 10% for planning it, and 30% for achieving it. These individuals were among the 6 persons who credited themselves with the least amount of responsibility for their change processes.

TABLE 18 Primary Planners of Learning Projects: Number and Percentage of Categories

Primary Planners of Learning Projects	Number	%
Self	12	80.0
Dietician	2	13.0
Psychologist	1	6.6
TOTAL	15	99.6

Another individual credited his psychologist with being the primary planner of his learning. In fact, his learning project consisted of reading books which the psychologist had recommended. Primary planners of persons' learning projects are presented in Table 18.

Number of Learning Projects Undertaken. As previously stated, none of the persons interviewed had engaged in more than one learning project relative to their change.

Assistance Which Would Have Been Helpful to the Change Process

Questions in this area were twofold: ones which attempted to identify the nonhuman resources which would have been helpful to persons' change processes; and ones which identified the human resources persons could have used in their change processes.

Nonhuman Resources. To identify the nonhuman resources, persons were referred to the three tasks in the change process--deciding, planning and achieving. In

relation to this reference, they were asked, "Suppose with each of these tasks additional help had been available in the form of a book, some other printed material, a tape, a film or a TV program. Is there additional help of this sort that you would have liked?" Ten persons stated a desire for additional nonhuman resources. This represents 26% of all of the persons interviewed.

Three persons expressed an interest in having books on specific topics available to them. These references were how to live with diabetes, how to stop smoking and how the body works. Three persons stated that they would have benefited from additional reading materials with dietary information (recipes, exchange list formulas that are more clear cut and information on foods that contain sugar). Library opportunities were desired by two persons. One of these people wanted more time to spend doing research in the library; the other stated that information he was seeking was not available in the Billings Library. One woman wished that she had had access to films and tapes on diabetes that she could have watched on her videocassette recorder at home; another woman said that having "case studies" would have benefited her, i.e., examples of people who did or did not do certain things in caring for their diabetes and what actually happened to them as a result of it. Two persons expressed a desire for information on specific topics: one woman wished that she had known information was available on

how to adjust her insulin dosage based on her blood glucose levels; and a man was interested in information on the effects of alcohol on diabetes. Table 19 lists an itemization of the nonhuman resources to which persons wished they had had access.

TABLE 19 Number and Percentage of Persons Desiring Additional Nonhuman Resources by Category

Nonhuman Resources	Number	% of Resources Cited
Reading materials	6	50
Dietary information	(3)	(25)
General information	(3)	(25)
Library opportunities	2	16.7
Films/videocassette tapes	1	8.3
Case studies	1	8.3
Information	2	16.7
On adjusting insulin dose	(1)	(8.3)
On effects of alcohol on diabetes	(1)	(8.3)
Total	12	100.0

Human Resources. Fifteen persons (38%) stated that additional assistance from persons would have helped their change processes. This was in response to the question, "Suppose additional help would have been available in the form of an expert, a particularly helpful or encouraging person, a group, or a health professional. Would you have benefited from any of these types of people?"

Six persons expressed a desire for a support group or access to laypersons who have diabetes. Three persons shared a common concern that their physicians had not

provided them with the information they needed when they learned that they had diabetes. These concerns were reflected by one woman who stated, "When I was diagnosed, I wasn't given any information. I was just told to 'take this pill' .... Give me information and let me make my own decisions." Three persons stated that they would like to see a physician who is a specialist in diabetes; two people would have liked earlier exposure to a diabetes education program; one woman would have liked family and friends to exercise with her; and another woman wished that her physical therapist had been available to give her a rubdown. Table 20 lists an itemization of the human resources to which persons wished they had had access to.

TABLE 20 Number and Percentage of Persons Desiring Additional Human Resources by Category

Human Resources	Number	%
Support group	6	37.5
MD giving more information upon diagnosis	3	18.8
Diabetes specialist	3	18.8
Earlier exposure to diabetes education program	2	12.5
Family/friends support	1	6.3
Physical Therapist	1	6.3
Total	16	100.2

Benefits Anticipated as a Result of the Change

In order to identify the benefits persons expected as a result of making their changes, interviewees were asked,

"Why did you want this change? In this question I'm looking ahead to the ultimate benefits you expected--the benefits that you thought you would gain from this change." The majority of persons cited multiple benefits which were anticipated. An example of this combination of benefits was "lose weight, feel better, control my blood glucose and blood pressure, and I hope to be able to stay off insulin." Table 21 lists those benefits by category with the number and percentage of individuals selecting each.

TABLE 21 Benefits Anticipated as a Result of the Change: Number and Percentage of Persons Citing Various Categories

Benefits	Number	Percentage
Control diabetes	18	21.7
General health improvement	16	19.3
Control weight	9	10.8
Require less/no medication	7	8.4
Prevent health problems	6	7.2
Prevent progression of diabetic complications	6	7.2
Benefit others	4	4.8
Improve emotional wellbeing	3	3.6
Control hypoglycemia	3	3.6
Improve appearance	2	2.4
Fit into clothing	2	2.4
Improve physical performance	2	2.4
Control blood pressure	2	2.4
Miscellaneous	3	3.6
Total	83	99.8

The most frequently cited benefit categories were "control diabetes" and "improve general health" with 18 and 16 citations respectively. "Control weight" and "require

less or no medication" were the next most frequently cited categories occurring 9 and 7 times respectively. Six persons mentioned "prevent health problems" and "prevent further progress of diabetic complications." Other categories included "benefit others" (examples are not being a burden and better health for the family), "improved emotional well-being," "control hypoglycemia," "improve appearance," "fit into clothing," "improve physical performance," and "control blood pressure." Three benefits are listed under the miscellaneous category: "no diabetes if the Lord sees fit," "eat more types of foods," and "heal back". (This man started walking in order to strengthen his back after surgery.)

Unintentional Changes Made in Diabetes Related Areas of Health

One of the seven persons interviewed who had not made a diabetes related intentional health change had made two changes which were very significant for her, but she stressed that she had not chosen to make them. She made these changes only because her physician told her to do them. "I always feel with diabetes that I don't have much choice. If the doctor tells me to do something, I do it." She is the only individual of the 46 interviewed who had made significant changes which did not fit the criteria that intentional change needs be chosen by the person. Six persons had not made a significant diabetes related health

change in the prior five years; 39 persons had made a change which fit study parameters.

All 46 persons interviewed were asked if they had made an unintentional diabetes related health change in the prior five years. "We've been talking about a change that was chosen and intentional. Can you think of any unintentional diabetes related health change that you have made over the past five years?" Twenty-three persons (50% of those interviewed) cited unintentional changes which they had made. These changes are presented in Table 22. Some persons made more than one unintentional change. This accounts for the 29 changes which are listed in the table.

TABLE 22 Persons Who Made Unintentional Diabetes Related Changes: Number and Percentage by Category

Unintentional Diabetes Related Changes	Number	% of Changes
Medication related	5	17.2
Changes in Eating	4	13.8
Slow down physically	4	13.8
See MD regularly	3	10.3
Blood glucose monitoring	2	6.9
Economic adjustment to having diabetes	2	6.9
Exercise	2	6.9
Unintentional changes immediately after diagnosis	2	6.9
Miscellaneous	5	17.2
Total	29	99.9

The most frequently cited unintentional change was medication related. Taking insulin was mentioned by four

persons; taking oral medication by one person. Changes in eating were cited by four persons; slowing down physically by four persons. This was an interesting change because people are usually encouraged to become more active in order to enhance the control of their diabetes. Each of the persons who mentioned slowing down mentioned not having the energy that they previously had. Three persons said that seeing a doctor regularly was an unintentional change. And two persons had made a change in each of the areas of blood glucose monitoring, economic adjustment to having diabetes, and exercising. Two persons stated that they made several unintentional health changes soon after being diagnosed. One person made unintentional changes in each of four areas. These included smoking cessation, changing physician, gaining weight and adjusting to sexual changes.

Unrealized Changes

In an effort to identify whether persons had been unable to achieve desired diabetes related health changes, they were asked the following: "Looking back over the past five years, has there been some diabetes related health change that you very much wanted, but did not achieve?" Twenty-two persons responded affirmatively to this question. This represents 56% of all persons who had made an intentional diabetes related health change.

What Were These Changes? Seventeen of the 22 persons with unrealized changes desired changes in the categories of losing weight and altering eating habits. This represents 77% of persons with unrealized changes and 44% of all persons who made an intentional change. Six persons would have liked to have exercised more, while one person did not accomplish each of two desired changes: having blood glucose levels never over 120 and breaking the habit of not being "regular or disciplined." Details of these unrealized changes are listed in Table 23.

TABLE 23 Unrealized Diabetes Related Health Changes: Number and Percentage of Persons Citing Various Categories

Unrealized Health Changes	Number	% of the Unrealized Changes
Lose weight	10	40
Alter eating habits	7	28
Exercise	6	24
Miscellaneous	2	8
Total	25	100

Ideas Regarding Why This Change Was Not Achieved

The following responses are discussed according to category.

Losing Weight. Table 24 cites the number and percentage of persons who gave various reasons why they did not lose weight.

TABLE 24 Reasons Why Weight Was Not Lost: Number and Percentage of Persons Citing Various Categories

Reasons for No Weight Loss	Number	%
Enjoy eating	2	14.3
Food is security	2	14.3
Cope with stress	2	14.3
Feel it is impossible to loose weight	2	14.3
Drink alcohol	2	14.3
No discipline	1	7.1
Lazy	1	7.1
Hungry	1	7.1
Second helpings	1	7.1
Total	14	99.9

Five responses were mentioned twice as being reasons why persons were unable to lose weight. These were: "I enjoy eating," "Food is my security," "I cope with stress by eating," "Drinking alcohol," and "I believe it's impossible to loose weight." Responses which were mentioned once include "No discipline," "Laziness," "Hungry," and "Have frequent second helpings."

Alter Eating Habits. One response was given three times as being a reason why people were not able to alter their eating habits. This was a love of food. All other reasons were mentioned only once. Examples of these include, "I need to cook quick meals," "I haven't made up my mind completely to change my eating habits," and"I'm tired after work." A numerical listing of the reasons given for failing

to alter eating habits is given in Table 25.

TABLE 25 Reasons Why Eating Habits Were Not Altered: Number and Percentage of Persons Citing Various Categories

Reasons Eating Habits Not Altered	Number	%
Love food	3	33.3
Need to cook quick meals	1	11.1
Haven't made up mind completely to make changes	1	11.1
Bored with menu planning	1	11.1
Tired after work	1	11.1
Stress	1	11.1
Hunger	1	11.1
Total	9	99.9

Exercise More. A numerical listing of the reasons given for failing to exercise more is given in Table 26.

TABLE 26 Reasons Why Persons Did Not Exercise More: Number and Percentage of Persons Citing Various Categories

Reasons Did Not Exercise	Number	%
Laziness	2	22.2
Need to be told to exercise	1	11.1
Allergic to pollen	1	11.1
Stationary cycling is boring	1	11.1
Injured tendon	1	11.1
Tired after work	1	11.1
Busy	1	11.1
Don't follow through on exercise plan	1	11.1
Total	9	99.9

Two persons said that a reason why they did not exercise more was laziness. Only one person mentioned each of the other reasons. These include: "I need to be told to exercise to do it, "I'm allergic to pollen," "Stationary cycling is boring," "injured tendon," "tired after work," "busy," and "I don't follow through on exercise plans."

Miscellaneous. Two persons' unrealized changes are listed in this category. These are "failing to have blood glucose never go over 120" and "not being disciplined." The reason given for failing to have blood glucose not exceed 120 was it is an "unrealistic expectation based on perfectionism and a fear of complications." The given reason for a lack of discipline was "a habit of nondiscipline."

Resources Which Might Have Helped Achieve The Change

Resources which might have been helpful in achieving the unrealized change are presented in Appendix C. The number and percentage of responses in each of the categories discussed below are cited in Table 27. Responses are grouped into ones which are internal to the person and ones which are external. Internal resources include ones such as self control, and better time management. External resources are subgrouped into material, human and miscellaneous resources. The one material resource which was mentioned is buying a special cooker which broils meats easily and quickly (in response to needing to cook quick

meals). Human resources were divided into family, support groups and persons (overeaters anonymous/health club with everyone overweight), and professional helpers (physician specialist/hypnosis). There were two miscellaneous resources. Both were similar in that they were looking for restrictive types of assistance in relation to losing weight. One woman desired negative reinforcement: "I need to have it rammed down my head that complications may affect me," and a man wished he would be given "more stringent regulations to enhance my self discipline."

TABLE 27 Resources Which Might Have Been Helpful to Achieve the Unrealized Change: Number and Percentage of Persons Citing Various Categories

Category	Number	%
Internal Resources	3	17.6
External Resources:		
Material	3	17.6
Human		
Family	2	11.8
Support Group or Person	5	29.4
Professional Helper	2	11.8
Miscellaneous	2	11.8
Total	17	100.0

Testing of Statistical Hypotheses

Several hypotheses were tested which examined the relationships between demographic variables and areas of persons' most significant intentional change, between demographic variables and topics of persons' learning

projects, and between areas of most significant intentional change and topics of learning projects. Chi-square tests of independence were performed to examine these relationships. The results are presented and discussed in this section.

Areas of intentional change included: eating/weight loss, curtailment of drug use, self blood glucose monitoring (SBGM), exercise, miscellaneous, and no change. Topics of learning projects included: diabetes in general, diet related learning, self blood glucose monitoring, exercise, emotions in alcoholism (emotional conflict in relationships with alcoholics and in alcoholics themselves), no learning project, and no change. Demographic variables included: age, gender, years with known diabetes, type of diabetes control, marital status, years of formal education, highest diploma/degree, employment status, and occupation.

Because the population for this study was comprised of 46 persons, Cochran's guidelines for small expected frequencies were utilized for the tests. "When df>1, i.e., when K>2, the chi-square test for the one-sample case should not be used when more than 20% of the expected frequencies are smaller than 5 or when any expected frequency is smaller than 1" (Siegel, 1956, p.46).

Upon placing results into contingency tables, it was realized that several expected frequencies were less than one. Because of this fact, some adjacent categories were collapsed. This was done only when these combinations could

be meaningfully made. Collapsing cells allowed values of chi-square to be calculated.

In testing relationships between demographic variables and both areas of change and topics of learning projects, columns were collapsed similarly. Collapses were made until no expected value was smaller than 1. Collapses included:

1. Age was initially broken down into 10 year increments (i.e., 20-29 years old, 30-39 years old, etc) and then into increments of 20 years (20-39 years old, 50-69 and 70-89). Finally, a break down of 20-59 years old and 60-89 years old was utilized for calculating chi square.
2. No collapse of columns was needed for gender.
3. Years with known diabetes was initially broken down into five year increments. However, 10 year increments were finally used with 20 or more years being used in the last column.
4. Type of diabetes control was initially broken down into three categories: diet, oral medication, and insulin. In calculating chi square, a collapse of diet and oral medication columns was made.
5. Marital status was initially broken down into the categories married, widowed, divorced, and single. Then divorced and single were combined into one category. Finally, two categories were utilized. These were married and widowed/divorced/single.

6. Years of formal education were initially broken down into four categories: less than 12 years, 12 years, 13-16 years, and more than 16 years. The final categorization was divided into 12 years or less and more than 12 years.
7. Highest diploma or degree obtained was initially broken down into five categories: less than high school, high school, two year degree, Bachelors, and Masters; then into four categories by collapsing two year degree with Bachelors. A further collapse into two categories was made: high school or less and two year diploma/Bachelors/Masters.
8. Employment status was broken down into three categories: employed, retired/disabled, and unemployed.
9. Occupation was initially broken down into five categories: executive/self employed, professional, clerical/technical, homemaker, and blue collar worker. It was then broken down into two categories by collapsing executive/self employed with professional and clerical/technical, and homemaker with blue collar worker.

In addition to these columnar collapses, the number of rows was reduced by collapsing different categories of learning projects. The subject area categories of self

blood glucose monitoring, exercise, and emotions in alcoholism were combined into one miscellaneous category; and the categories, no learning project and no change, were combined into a no learning category.

The Kern Statistics Software for Microcomputers was used to perform the statistical calculations. The formula used to calculate chi-square was $\chi^2=\Sigma [(O-E)^2 / E]$. The level of .05 was determined to be the point at which significance would be identified.

> Usually in evaluating an experimental result, it is unnecessary to determine the probabilities with a high degree of accuracy. For most practical purposes it is sufficient to designate the probability as $p \leq .05$, or $p \leq .01$, or possibly $p \leq .001$ if the result is highly significant (Ferguson, 1976, p.162).

Contingency tables for each of the hypotheses are located in Appendix D.

In examining the relationship between demographic variables and areas of intentional change, eight hypotheses were tested. (Hypothesis 5 was not tested because the expected frequency for one value in its contingency table was lower than 1. This is documented in Table 35 which is located in Appendix D.) No values of chi square were found to be significant at the .05 level. No significant relationships were found to exist between areas of intentional change and demographic variables. Chi square values which were obtained are summarized in Table 28.

TABLE 28 Chi Square Values of Relationships Between Areas of Intentional Diabetes Related Health Changes and Demographic Variables

Relationship of Areas of Change vs.	Value of χ^2	Degrees of Freedom	Significance Level
Age	5.254	5	.38563
Gender	3.746	5	.58649
Years with known diabetes	16.268	10	.09218
Type of diabetes control	7.372	5	.19445
Marital status	--	--	--
Years of formal education	5.202	5	.39174
Highest diploma/ degree	1.248	5	.94018
Employment status	15.096	10	.12862
Occupation	3.114	5	.68244

In examining the relationship between demographic variables and topics of learning projects, five hypotheses were tested. (Hypotheses 12, 14, 17, and 18 were not tested because expected frequencies for at least one value in each contingency table were lower than 1. The contingency tables are Table 42, Table 44, Table 47, and Table 48 respectively. These tables are located in Appendix D.) No values of chi square were found to be significant at the .05 level. No significant relationships were found to exist between topics of learning projects and demographic variables. Chi square values which were obtained are summarized in Table 29.

TABLE 29 Chi Square Values of Relationships Between Topics of Learning Projects and Demographic Variables

Relationship of Topics of Learning Projects	Value of χ^2	Degrees of Freedom	Significance Level
Age	6.924	3	.87500
Gender	4.1567	3	.24503
Years with known diabetes	--	--	--
Type of diabetes control	2.5367	3	.46869
Marital status	--	--	--
Years of formal education	1.6106	3	.65699
Highest diploma/ degree	.7121	3	.87034
Employment status	--	--	--
Occupation	--	--	--

Hypothesis 19, which examined the relationship between areas of intentional change and topics of learning projects, could also not be tested because of several low expected values in its contingency table.

Additional Results of the Study

The following results were not planned in the original study proposal. However, they are of sufficient importance to be reported here.

Description of Nonchangers

Seven of the persons who were interviewed had not made an intentional diabetes related health change in the five years prior to the interview. Demographic variables were

examined in an effort to determine if any nonchangers' characteristics varied from persons in the entire group.

Three characteristics seemed particularly significant. Nonchangers were older, had had diabetes for a longer period of time, and were overrepresented with homemakers. Whereas the mean age of all persons' interviewed was 62, the mean age of nonchangers was 72. The population had diabetes for a mean of 13 years, whereas nonchangers' mean was 19 years. Seven unemployed homemakers were included in the entire population (n=46). Of the seven nonchanging persons, all of the women (4 persons) were unemployed homemakers; of the 39 changers, 3 of 22 women were unemployed homemakers.

Most Significant Change in Relation to the Most Difficult Step of the Change Process

In order to examine whether one particular step of the change process seemed more difficult for persons who made different types of changes, a table was developed which looked at the relationship between the most difficult step of the change process and areas of change (See Table 30).

By examining this table, it is apparent that two important points can be made. Persons who made changes in the area of eating/weight loss had much more difficulty achieving their change than with other steps of the change process. Persons whose changes pertained to curtailing drug use had much more difficulty deciding to make the change than other steps of the change process.

TABLE 30 Relationship Between Most Difficult Step of the Change Process and Areas of Intentional Change

	Deciding	Planning	Achieving	None	All	Total
Eating/ weight loss	3	2	9	0	0	14
Curtail drug use	4	0	1	0	1	6
SBGM	2	2	1	0	0	5
Exercise	0	0	1	3	0	4
Miscell.	3	1	2	4	0	10
Total	12	5	14	7	1	39

Reasons Behind Persons' Decisions to Change

Although questions regarding persons' motivation to change were not asked directly, information regarding why they made their changes was gleaned from responses to several other interview questions. The predominant motivations behind persons' changes were their desire to control their diabetes and to maintain or improve their general health. Events occurred which caused them to realize that their health had deteriorated, was in the process of worsening, or would, in fact, become impaired unless they made a change in their health behaviors.

Three types of triggering events predominated: developing an actual physical problem, having a family person experience a serious complication of diabetes, and

becoming aware of feedback from their bodies regarding the positive benefits of doing something which is advocated as being necessary to control the disease. One man's statement seems to summarize other people's feelings about physical problems triggering changes: "With my first problem with my feet, it really came home to me ... it (knowing I needed to do foot care) didn't seen to apply to me until I had problems." Physical problems which triggered changes included: diagnosis with diabetes, recurring athletes foot, hypoglycemic attacks (one person's episode resulted in hospitalization), pain in feet and legs, foreskin and foot infections, surgery, myocardial infarction, and developing a "film over my eye."

Complications of diabetes which affected family members included blindness, amputation, and death. Comments regarding the feedback from their bodies that persons became aware of included: "I felt so much better after joining an exercise spa, that I made other changes, too.", "If I eat right, I feel good; if I feel good, I'm not grumpy.", "When I ate (bad foods), I didn't feel well ... I had to consciously say 'I am going to do this because I feel better when I do' .... I didn't feel sick before, but basically unwell.", and "I wasn't going to let it (having diabetes) slow me down or impact me ... but with how poorly I felt at times after eating sugar, I learned I needed to do these things."

Other events which triggered changes included having a physician or chiropractor convince the individual of his or her need for the change, and being threatened with the need for insulin if the changes were not made. As mentioned previously, learning played a role in motivating nine persons (20% of those interviewed) to make their changes. These persons made statements which indicated that in changing, they were acting on information which they had learned previously.

In summary, several findings resulted from this study. These include:

1. Persons with Type II diabetes make intentional diabetes related health changes.
2. Diabetics' changes are successful and are viewed as being important, benefiting the individual and other persons.
3. Dietary change is the area of change which is most frequently seen as being significant to Type II diabetics.
4. With one exception, persons' most significant changes were in the area of physical health.
5. Triggers which motivated persons' decisions to change included developing a physical problem, having a relative experience a serious complication of diabetes, and gaining positive feedback regarding the benefits gained from taking

appropriate diabetes care actions.

6. Individuals see themselves as being primarily responsible for their change.
7. Health professionals play a major role in persons' choosing to make a change and planning how to accomplish it.
8. Family and friends are the most important resource for persons while they actually implement their diabetes related health changes.
9. Reading materials are an important resource throughout the entire change process.
10. Persons who made dietary changes reported experiencing more difficulty implementing their change than in deciding to make it or in planning how to make it.
11. Persons whose changes pertained to curtailing the use of cigarettes and alcohol reported more difficulty in deciding to make the change than in planning and implementing it.
12. The major benefits anticipated as a result of changes were an improvement in the control of diabetes and general health improvement.
13. Diabetics express an unmet need for support from individuals with diabetes and from support groups.
14. Major factors which influenced persons' decisions to make their changes included receiving feedback

from health professionals, perceiving the threat of diabetes for them, receiving assistance from support persons, and learning.

15. Learning projects were goal-oriented.
16. The majority of persons did not engage in learning projects in order to support the accomplishment of their change.
17. Learning served two purposes relative to intentional diabetes related changes: it motivated persons to make changes, and it was a means through which persons accomplished changes.
18. Diabetics are the primary planners of their learning projects.
19. Reading is the major learning activity engaged in by diabetics as they accomplish diabetes related health changes. Attending classes and group meetings for diabetics are another frequent learning activity.
20. Being required to take insulin or oral medication is the most frequently cited unintentional change made by Type II diabetics.
21. Nonchangers were older, had had diabetes for a longer period of time, and were overrepresented by homemakers.
22. There is no relationship between areas of change or topics of learning projects and the demographic

variables which include age, gender, years with known diabetes, type of diabetes control, marital status, years of formal education, highest diploma/degree, employment status and occupation.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

The purpose of this chapter is to present an interpretation of the results of the study and to make recommendations for further research and for practice. The chapter is divided into three components which (a) present a summary of the study, (b) state the conclusions of the study, and (c) list recommendations for practice and research.

Summary

Overview of Related Literature

Diabetes is a disease which requires major attention by persons who are afflicted with it and by health care providers who work with diabetics. In order to control the disease, the person with diabetes needs to make several major lifestyle changes and to maintain them over a lifetime. Health care professionals need to work with each individual to develop a management plan and to ensure that the person understands diabetes and its treatment, and makes the necessary lifestyle adjustments. Diabetes education is a major mechanism through which these tasks are achieved.

Traditionally, diabetes education efforts have attempted to provide people with the knowledge and skills needed to control the disease. The focus was on persuading persons to follow the regimen prescribed by the physician. In recent years, it has been acknowledged that this type of approach is ineffective in bringing about satisfactory diabetes control. The diabetic, not the care giver, is ultimately responsible for control of the disease. Because of this perspective, an approach to diabetes education is being advocated which gives the person responsibility for planning, decision making, and problem solving relative to control of the disease (Strowig, 1982; Anderson, 1985; Assal, 1985; and Lorenz, 1987).

Besides this more patient-centered approach, two additional approaches to diabetes education are advocated. Both approaches focus on compliance with the diabetes care regimen rather than on the individual's potential or capacity to make necessary diabetes related health changes. They include programs which have a behavior modification foundation and ones which focus on persons' health beliefs. Diabetes education programs which utilize behavioral approaches have demonstrated some success in enhancing diabetics' adherence to their care regimens and in improving metabolic control of the disease (Mazzucca, 1986). The Health Belief Model (Rosenstock, 1974) is being proposed as a framework through which persons' perceptions and beliefs

about diabetes can be identified and modified through an educational process, with the result that the possibility of persons performing appropriate self-care behaviors is enhanced.

Tough (1971) pioneered study in the area of adults' independent learning projects. He established the notion that a great majority of adults regularly engage in self-planned learning activities . Following up on the idea that learning is a means through which adults accomplish life changes, Tough investigated adults' significant intentional changes (1982). His purpose in this endeavor was to understand how adults naturally change. Gaining insight into processes they follow and resources they use could assist professionals to facilitate better these change processes.

The basis for the present study was the belief that persons' capacities to be responsible for their diabetes need to be emphasized in care provision and in education efforts. The purpose of this study was to examine selected dimensions of intentional learning and change in diabetes related health areas made by persons with Type II diabetes.

Population and Sample

The population for this study was persons with Type II diabetes who are members of the American Diabetes Association and who live in the Bozeman and Billings, Montana areas. A self-selected sample of 49 persons was

interviewed. Forty-six of these interviews were utilized for the study. Interviewees were approximately 55% female, all except one were Caucasian, and all were from a middle class background. Most persons were married, had at least a high school diploma, and were employed or retired from a wide range of occupations. Although persons were predominantly in the 65-75 year old age group, the actual age range was 23 to 82. Sixty percent of the interviewees were older than 65. Only 9% were older than 75. Sixty percent had diabetes for 14 years or less; 20% for less than five years. Approximately 57% of the interviewees used insulin to control their diabetes, and only 11% was controlled by diet alone.

Methodology

Data were collected through structured, probing interviews which followed an adaptation of Tough's (1982) intentional change interview schedule. Respondents were asked what was the most significant intentional change in diabetes related health areas which they had achieved in the previous five years. All other questions were directed at understanding the processes which the persons followed in achieving their change, the learning which occurred in relation to the change and demographic information.

In an effort to establish the validity of the interview schedule, three adult education specialists were asked to examine the instrument's face validity. Some suggestions

about wording were made, and resulting changes were integrated into the schedule. Following these revisions, five interviews were conducted prior to the actual interviews. The purpose of these interviews was to check the interview schedule for clarity, wording and sequencing. Also evaluated were methods of recording interview data, whether adequate information was being recorded and whether the information as recorded, could be analyzed according to the plan. The result of these interviews was that the interview schedule itself did not need to be altered. However, the data sheet on which information obtained during the interviews was recorded was expanded, and the need to record more actual quotations was identified. In addition, an initial plan to study changes which had occurred in the prior two years was expanded to include changes which had occurred in the previous five years. This allowed more persons' changes to be examined.

In an effort to demonstrate the consistency of the interview schedule and to demonstrate the intrarater reliability of the interviewer, five respondents were contacted by telephone two weeks after their interviews. Ten of the basic interview questions were asked again. These responses were compared with original responses. Persons answered an average of 84% of the responses similarly. This was considered a verification of interrater and interview schedule reliability.

The reliability of the interviewer's process for coding data was demonstrated by having a second person listen to tapes of three of the pilot testing interviews. This person coded interview data while listening to the tapes. Both the interviewer's and this person's data sheets were compared. This process revealed that both persons' ratings were similar in all cases.

Conclusions

Study findings warrant the following major conclusions: Houle's (1961) goal-oriented learning motivation seems to be represented by persons in this study; Aslanian and Brickell's (1980) theory regarding triggering events spurring learning seems substantiated; and the characteristics of Type II diabetics' learning projects fit easily into the characteristics of previous learning project research. In relation to intentional change research, it can be said that this population used the help of professionals to a much greater extent than any previously researched population.

Specific conclusions are drawn on the basis of the findings of this study.

1. Adults with Type II diabetes make significant intentional diabetes related health changes.

It was established that Type II diabetics do make intentional diabetes related health changes. Eighty-

five percent of the persons interviewed had voluntarily and deliberately chosen to make what they believed was a significant intentional change in the five years prior to their interview. Most persons had made several changes; few had made only one. Seven of the persons interviewed either had made no diabetes related health changes, or had made no intentional changes in that time period.

In discussing their most significant change, 41% of the individuals stated that they had achieved 100% of their desired change; 62% had accomplished 90% or more of their desired change. These changes were viewed as being very important by diabetics. Seventy-two percent of these persons rated their changes as fairly large or important, or of central importance in their lives. The changes were viewed as contributing a large or enormous amount to 59% of the interviewees' satisfaction with their lives; and 77% stated that their changes had benefited at least one or two other persons.

Because Tough's (1982) study examined broad life changes and this study focused on diabetes related health changes, a comparison of the percentage of persons who made intentional changes cannot be made. It is interesting to note, however, that the health changes which Tough specified were similar to the major

ones identified in this study. These include smoking cessation, cessation of alcohol consumption, exercise, and change in eating habits. The only difference in this study's results was the use of blood glucose monitoring as a major change category. It can be said that diabetes related health changes are changes which are basic to general good health.

At the start of this study, the researcher expected that a smaller percentage of Type II diabetics than are discussed above might have made intentional diabetes related health changes. This expectation was based on the observation that because health professionals have a tendency to maintain a high degree of control in interactions with patients, diabetics might not have felt that they had an opportunity to make intentional changes (i.e., to voluntarily and deliberately choose to make changes). It was anticipated that people would express feelings of being forced to make changes, of not having had a choice, or of being threatened into doing something.

Given the fact that 85% of those interviewed had made an intentional diabetes related health change, this concern by the researcher was unwarranted. Two factors seemed to contribute to persons making unintentional changes: being diagnosed with diabetes and perceiving a need for insulin. Immediately after

diagnosis, several individuals made unintentional changes; however, with the passage of time, they accepted the need for the changes they had made and went on to make subsequent intentional changes.

Additionally, the "threat" of needing to start using insulin did prompt three individuals to make changes which they hoped would prevent the need for this treatment.

2. Dietary change is the area which is most frequently seen as having great importance for Type II diabetics.

Altered eating habits and losing weight accounted for 36% of all reported changes. This area was also the one in which the largest number of persons experienced unrealized changes. Thirty-seven percent of all persons interviewed had unrealized dietary changes, i.e., they wanted to make dietary changes, but were unable to accomplish them. Combining persons whose most significant change was in the area of diet and who had unrealized dietary changes, 73% of all persons interviewed discussed dietary changes as having great importance for them.

Previous research revealed that understanding and adhering to the dietary component of diabetes care regimens is the biggest problem in the overall management of diabetes (Lockwood, Frey, Gladish, & Hiss, 1986). In the present study, persons interviewed

did not communicate that they had difficulty understanding the dietary component of their care regimens. They did, however, experience difficulty in consistently following through on the behavior changes that they knew needed to be made.

3. Type II diabetics' most significant intentional diabetes related health changes were in the area of physical health.

With one exception, changes which persons' saw as their most significant were in the area of physical health. This was despite the fact that an approach to the interviews was used which reflects a wholistic perspective of health. A memory jogging sheet was referred to while persons were trying to recall their most significant diabetes related health change. This sheet listed several changes which persons with diabetes might anticipate making. Changes included ones which reflect physical, emotional, social and spiritual perspectives. The intent was to define health broadly in a way which reflects the whole person. While reviewing individuals' changes and delineating their most significant intentional change, the interviewer used four examples of diabetes related health changes, one from each of the four areas. Despite this fact, and despite trying to keep the door open for persons to consider non-physical changes, all interviewees, except one, stated that their most

significant diabetes related health change was in an area related to physical health.

The fact that physical changes are, by and large, the only change made by diabetics suggests that health care providers' orientation is focused on physical changes. It can be assumed that health care professionals do not direct strong attention to emotional, social, and spiritual aspects of persons lives, or to the effects of these on their physical health. Because of the broad nature of the adjustments diabetics need to make in their lives in order to control their illness and enhance their health, it seems critical that several facets of their lives receive attention. Persons' capability to adopt needed lifestyle changes could be greatly enhanced by health professionals dealing with emotional, social and spiritual needs and concerns. There is a need for mechanisms through which an individual's whole life is assessed. Areas where support and assistance are needed can be identified, and appropriate referrals made and resources acquired. Areas of strength can be used to support needed changes.

A few individuals in this study experienced great emotional strength to accomplish their changes because of their religious faith. One woman's most significant change was acccepting the fact that she had diabetes.

She stated that being able to do what needed to be done to control her illness resulted from having dealt with this emotional issue. It seems probable that other persons might benefit if spiritual or emotional support were made available to them.

Family and friends played an important role in many persons' change processes. Feasibly, more persons might have accomplished more changes if their significant others were helped to understand their needs and how to support them as they worked at managing their illness. A definite expressed need which came out of the interviews was for a nonfamily support system. Despite the fact that persons are able to control blood glucose levels by being able to reduce and manage personal stress, very few people discussed learning to deal with stress as a diabetes related change.

All of these factors are indicators of the need for a wholistic approach by health care professionals who work with persons with Type II diabetes.

4. Individuals see themselves as primarily responsible for their change process.

Individuals see themselves as being primarily responsible for their intentional diabetes related health changes. The mean percentage to which persons credited themselves with responsibility for the tasks

of the change process varied from 45% in choosing the change, 61% in planning it and 79% in implementing it. They assumed a mean of 60% of the responsibility for their total change.

These figures differ from those found by Tough (1982). Persons he interviewed regarding general changes reported assuming 70% of the responsibility for accomplishing their change with a more narrow spread of responsibility among the three tasks: 68% in choosing, 69% in planning and 73% in implementing. These discrepancies reflect the different situation which exists for persons making diabetes changes. Other persons influence diabetics' decision to make diabetes related health changes to a much greater extent than others influence persons who are making general changes. In addition, diabetics assume more responsibility for achieving their intentional diabetes related changes than persons do when making general changes.

This conclusion substantiates Knowles (1970) assumption regarding the self-directedness of adults. Pragmatically, it demonstrates the need for health professionals to give individuals ultimate control over achieving their changes.

5. Individuals use several resources as they accomplish diabetes related health changes.

Health professionals play a major role in persons choosing to make diabetes related health change and in planning how to accomplish it. In this study, health professionals were credited with a mean of 18% of the responsibility for achieving individuals' change: 28% for choosing, 21% for planning, and 6% for achieving.

Tough found professionals were responsible 3.3% for choosing, 8% for planning, and 8% for implementing general types of changes. This difference demonstrates that diabetics' rely on assistance from health professionals as they choose to make their changes and as they plan how to accomplish their changes. Physicians were reported as the most important resource for persons' decision to change, whereas dieticians and nurses were the most frequent resource for planning how to accomplish the change.

Next to the person him or herself, family/ friends/and other nonprofessionals were cited as being the most important resource for implementing persons' diabetes related health changes. These persons were credited with 9% of the responsibility for implementing the change (and 15% for choosing and 10% for planning). This is much less than Tough's 25% for choosing, 21% for planning, and 17% for implementing. A reason for the lesser importance of these

nonprofessionals seems to be the large responsibility credited to professionals.

Nonhuman resources were used to a greater extent in diabetes related health changes than in general intentional changes. Whereas in this study nonhuman resources were credited with a mean of 8% of the responsibility for the total change, Tough found that they were credited with about 4% of the responsibility. This probably reflects the wide array of printed material resources which are available for use by diabetics.

7. Depending on the type of change made, persons experience more difficulty in certain tasks of the change process.

When asked about the most difficult task of their change process, persons who made changes in areas other than diet, alcohol and cigarettes gave responses which were spread out among the three tasks, i.e., choosing, planning, and implementing. However, persons who made changes in the area of eating and weight loss experienced more difficulty implementing their change than in deciding to make it or planning how to make it. Persons whose changes pertained to curtailing the use of cigarettes and alcohol reported more difficulty in deciding to make the change than in planning and implementing it.

This suggests the need for health care professionals to make available additional assistance and support to persons as they implement dietary changes and to work with diabetic smokers and drinkers to help them as they work through a decision to stop these habits.

8. Diabetics express an unmet need for support from individuals with diabetes and from support groups.

The major additional resource which persons would have liked to have had for their change process was a diabetes support person or a support group. In addition, the predominant resource which persons believed would have benefited them in achieving an unrealized change was also a diabetic support person or a support group.

It is important to note that persons interviewed were all members of the American Diabetes Association. Both the Bozeman and Billings local Diabetes Association chapters hold monthly informational meetings. These meetings were apparently not dealing with persons' needs for support. Almost one-third of the interviewees expressed an unmet need for support from non-family persons. A few expressed needs included ones such as the desire to talk daily with a person who could offer support, an individual and a group with which to exercise, a person with whom to

share ideas and experiences, and a health club where everyone is overweight.

This finding validates Farquarhson's (1978) and Papatheodeau's (1984) ideas regarding the importance of self-help groups in persons' dealing with life problems. Also, Jennings, Morgan, and Barnett, (1987) demonstrated an improvement in persons diabetes knowledge and control after six months of participation in monthly group meetings.

9. Triggers motivated persons' decisions to change.

Aslanian and Brickell's (1980) theory regarding "life transitions" motivating learning and "triggering events" spurring a person's decision to learn at a particular point of time has relevance for this study. An identifiable trigger event preceded the changes.

The major motivation behind persons' changes were the desire to control their diabetes and to improve their general health. This concurs with Aslanian and Brickell's contention that people learn (in health related areas) because they have lost their health, are loosing it, or are afraid of loosing it (1980, p.81). Events occurred which made persons acutely aware of their need to change. These events fit Aslanian and Brickell's (1980) definition of triggering events. Three major types of triggers predominated in this study: developing an actual physical problem, having a

family person experience a serious complication of diabetes, and becoming aware of feedback from their bodies regarding the positive benefits gained as a result of doing something which is advocated as being necessary to control diabetes.

10. Learning occurs in relation to intentional change. It can either motivate a decision to change or occur as a result of a decision to change.

Learning served two purposes relative to intentional diabetes related health changes: persons either gained new information and made a change as a result of the new knowledge, or they decided to make a change and set out to learn new information in order to accomplish their change. Thirty-nine percent (15) of the persons interviewed learned in response to their decision to change, whereas 23% (9) of these persons' learning projects preceded the decision to change.

Knox (1977) and Tough (1982) both suggest that persons are likely to respond to a change event or problem by engaging in a learning effort. Aslanian and Brickell (1980) also suggested that life changes are reasons for adult learning. It is Aslanian and Brickell who suggested that learning can occur in anticipation of (prior to), accompany (in conjunction with), or follow (result from) a transition (life change). This idea is suported by the findings of the present study. Indeed, learning occurs in relation to

intentional diabetes related health changes. The relationship between learning and change is probably, as suggested by Knox (1977), dependent on the individual, his or her environment and resources, and the particular change.

11. Learning projects were goal-oriented.

The learning projects which were reported occurred in the context of change processes. As such, it is not surprising that the learning was goal-oriented. All of the learning projects by diabetics were directed at either understanding their disease and its effects on their bodies, or at providing them with the knowledge and skills needed to implement a specific change. The concurrence of this goal-oriented purpose of the learning with Houle's (1961) typology of learning motivation is noteworthy.

12. The majority of Type II Diabetics do not engage in learning projects in support of accomplishing their intentional diabetes related change.

Tough stated in 1979 that learning projects are a primary means through which adults change. A major motivation for adult learning is the persons' desire to make changes. Despite the fact that learning occurs in relation to intentional change, only 39% (15) of the persons who had made intentional diabetes related health changes in the prior five years had engaged in

learning projects as a way to support accomplishing their changes. Tough estimated that 30% of all intentional changes involve deliberate learning efforts (1982, p.64). Of the persons who were involved with projects, 80% (12) were the primary planners of their learning. This percentage falls within the general range identified in previous learning project research (Tough, 1971; McCatty, 1973; Johns, 1973; Denys, 1973; and Johnson, 1973). Reading was the major learning activity engaged in as persons accomplished diabetes related health changes. Attending classes and group meetings, meal preparation activities such as learning new recipes and cooking techniques, and talking with health professionals were other forms of learning activity.

Of the persons who did not engage in learning projects, two indicated that they had been involved in learning endeavors which took less than seven hours. In addition, most persons seemed to have engaged in random learning activities which resulted from their interest in diabetes. For example, if a program on the subject of diabetes was shown on television, they would watch it, or if they encountered an article on diabetes in the newspaper, they would read it. But this random activity does not fit into an organized plan of learning.

The fact that the majority of persons did not engage in learning projects in support of their changes suggests a need for persons to be introduced to the concept and process of self-directed learning, for material resources to be acquired and made available, and for information to be made available regarding opportunities and persons that might serve as information and support resources.

13. No significant relationships were found to exist between demographic variables and areas of intentional diabetes related health change or topics of learning projects.

No statistically significant relationships were found to exist between types of changes which persons made and various demographic variables. Nor were significant relationships found to exist between topics of learning projects and demographic variables. The variables tested include age, gender, years with known diabetes, type of diabetic control, marital status, years of formal education, highest diploma/degree obtained, employment status and occupation.

Because no significant relationships were found, diabetes educators cannot assume that diabetics who are from one demographic group versus another are more likely to be amenable to or successful in certain types of change versus other types. In addition, there is no indication that persons from various demographic groups

would be more likely to be involved in learning about one topic versus another.

Recommendations

On the basis of the findings of this study, several recommendations for future practice and research are made.

Recommendations for Practice

Practice recommendations include the following:

1. Health professionals who are involved in providing diabetes education need to focus on the fact that the primary purpose of diabetes education is to help persons gain access to the information, skills, assistance and support needed to make necessary changes in order to adapt to having diabetes.

2. Health professionals need to consider taking a more learner-centered approach to the diabetes teaching-learning interaction. This recommendation is based on the fact that persons do make successful intentional diabetes related health changes, that they see themselves as primarily responsible for these changes, and that learning occurs in relation to their changes. Professionals, family members, friends and material resources are seen as resources to their changes,

but the diabetic him/herself is responsible for his/her own change. Allowing adults to be responsible for their own learning and change is central to the concept of andragogy.

3. Given the above recommendation, there is a need for persons with diabetes education responsibilities to explore ways to encourage persons to take more control over their diabetes related learning. A few avenues to explore include:

   A. Work out learning priorities with the diabetic's active involvement;

   B. Involve individuals in planning learning strategies which support the diabetes related health changes they have chosen to make;

   C. Determine individuals' preferred learning style and make available resources which allow them to function within that preferred mode;

   D. Regularly evaluate with the individual his/her progress toward learning goals, mutually revise goals and strategies; and

   E. Teach persons about the self directed learning process and encourage their independent pursuit of learning goals.

These avenues are representative of many teaching activities that would enhance the conditions under which adult learning occurs (Knowles, 1970).

4. A special emphasis needs to be made regarding health professionals' role in helping persons choose to make diabetes related health changes. Intentional changes, ones which are deliberately and voluntarily chosen, are ultimately more successful than unintentional changes (Neehall, 1984). In addition, this study revealed that health professionals (especially physicians) are the most frequently used resource by persons as they decide to make diabetes related health changes. These two factors are indicators of the need for health professionals to focus attention/efforts toward a goal of influencing persons to choose to make the changes needed in order to control their diabetes. If an individual makes a wholehearted, deliberate decision to change a particular lifestyle area or to engage in a particular health behavior, the possibility of him or her following through on that change should be much greater than if the change were recommended or required. This idea is aptly represented by a statement one of the interviewees, "Give me information, and let me make my own decisions."

5. Health professionals need to address the issue of control over the management of individuals' diabetes. This issue was raised by Tough in 1982 and by Strowig in 1982. It is recommended that health professionals use the amount of control in learning and care situations which corresponds with an individual diabetic's needs for control over his/he own learning or change. An individual may require a great degree of direction when dealing with a certain area at one point in his/her disease, while needing greater independence when coping with a different problem at yet a different stage of the disease process. In an effort to maintain an optimum amount of control over persons' learning and change, health professionals should determine the degree of control which persons prefer to have over their learning and change processes, become aware of the degree of control they tend to maintain in the diabetes care and education settings, and attempt to assist persons' processes with effective amounts of direction and control.

6. Diabetics should be provided with access to a wide array of learning and change resources. Health professionals should become aware of opportunities, collect a broad assortment of information which is

available in different formats, become aware of persons who are potentially valuable resources, and have access to written materials which are at various reading levels. Diabetics need to be linked with these resources and opportunities for their individual needs to be met.

7. Family members and friends should be involved as support persons in diabetics' learning and change processes. Health professionals can help persons to create a support system which assists him/her to accomplish predetermined learning or change goals. Family members need to be encouraged to participate in learning activities with the diabetic; in addition, they would benefit from being involved in activities during which they plan ways to enhance the diabetic's change efforts.

8. If diabetics are religious or spiritually aware persons, their spiritual resources could be used as a means to support the accomplishment of needed diabetes related health changes.

9. The sooner after referral to a diabetes education program that an individual becomes involved in that program, the greater the possibility of constructive diabetes related health change occurring (Scott, et al., 1984). In addition, this

study has demonstrated that for some individuals, learning motivates diabetes related health changes. On the basis of this information, it is recommended that persons become involved in a learning mode as soon as possible after being diagnosed with diabetes. They can become involved with a diabetes education program, be provided with reading materials on the subject of diabetes, be provided with copies of diabetes publications, and be introduced to an active member of the American Diabetes Association who would bring them to ADA meetings. In short, they could be helped to experience the value of staying current in their knowledge of diabetes and its treatment, in having a support person or group, and in being a member of the Diabetes Association. This may enhance the possibility of them making the lifestyle adjustments which are critical to controlling their diabetes and maintaining their health.

10. Diabetes educators should seriously consider developing a means through which they can maintain regular contact with persons in whose diabetes related learning they have been involved. This would accomplish a twofold purpose. It would provide an opportunity to reinforce individuals' work at controlling their diabetes and maintaining

their health, and it would provide an opportunity to identify persons who might act as resource persons to other diabetics in support of their diabetes related changes. A diabetic who has successfully made the change which another individual is dealing with can provide incentive toward deciding to make the change, offer ideas regarding how to accomplish the change, or give support in maintaining the change which has been accomplished.

11. Dietary changes are the most frequent type of significant intentional diabetes related health changes which people make, and they are their most frequent unrealized changes. Despite the fact that diet is a cornerstone of therapy, it is suggested that health professionals seriously consider recommending changes other than diet initially after diagnosis. Exercise is an example of a change which, if made, can frequently lower blood glucose in Type II diabetics. Successful accomplishment of an alternative type of change might enhance persons' perceived ability to accomplish difficult dietary changes.

12. Because diabetics report more difficulty with certain tasks of the change process dependent on

the type of change they are making, health professionals should ensure that persons who are making dietary changes have extra support and assistance in implementing their changes, and that persons who need to curtail their use of tobacco and alcohol have extra support and assistance in deciding to make their changes. Examples of the latter type of assistance are linking persons with another diabetic who has successfully made the change which the individual is considering, and helping the diabetic to examine the losses and benefits which result from their use of alcohol or tobacco.

13. Certain persons are less prone to make intentional diabetes related health changes. This includes older persons, persons who have had diabetes for a longer period of time, and homemakers. Health professionals would do well to develop special strategies for working with these persons.

14. Health professionals and the American Diabetes Association should make available a system of support persons and groups. Health professionals can assist with development of, communicate regarding the availability of, and introduce persons to a network of diabetics who will support

other diabetics as they grapple with learning or change in specific areas. In addition, health professionals can work with diabetics who express a need for support groups to assist them in developing the networks that they need.

15. The American Diabetes Association can provide continuing education opportunities for health professionals on topics relative to the recommendations made above. Topics might include but not be limited to: learner-centered teaching, self-directed learning, optimum levels of control over the management of diabetes and the diabetes teaching-learning interaction, and health professionals' roles in this interaction.

16. The majority of persons interviewed conveyed a very real sense of trying to cope with their disease. They were reacting to having diabetes and trying to maintain their lives in spite of it. A few individuals, however, talked about having diabetes as being a spark which illuminated other areas of their lives. They mentioned dramatically improved health and sense of well-being; renewed sense of priorities; enhanced family relationships; and the ability to be more accepting of people and of life in general. This perspective of "disability as

growth" could be encouraged and supported by health professionals. In individual and group settings, professionals can challenge persons with diabetes to find meaning in their experience with the disease. Approaching diabetes from the framework of it being an opportunity for growth could ultimately benefit not only the diabetic, but also their family members, friends, and health care providers.

Recommendations for Research

Based on the findings of this research, the following recommendations for further research are made:

1. Replicate the present study with persons from diverse geographical areas in order to validate this study. Specific questions which might be examined include:
    A. Do persons from various population segments make different types of changes and, do they accomplish their changes differently?
    B. Are persons from various health professions utilize differently by diverse persons?
    C. Is persons' emphasis on the utilization of specific types of resources based on the materials which were available to them or on a real preference for that mode?

D. Do persons who have functioning diabetes support networks available to them express the unmet needs for support which were identified in the present study?

2. Examine in more depth persons' decision making processes relative to diabetes related health change. Intentional changes have been demonstrated to be more successful than changes which were not deliberately and voluntarily chosen. Qualitative research which specifically examines the motivations and cognitive processes of persons who have made intentional diabetes related health changes would provide valuable insight into the process of deciding to make changes. Better understanding this process would enhance health professionals' ability to facilitate diabetes related health change by persons with diabetes.

   One approach could be evaluating this decision making process using the Health Belief Model (Rosenstock, 1974) as a framework. This process could help to validate to a further extent the Health Belief Model's applicability for intentional change toward the goal of diabetes control.

3. Research is needed which examines the effectiveness of learner-centered approaches to diabetes

education and which compares the effectiveness of this type of approach with the behavioral approaches which are presently being advocated. Is a humanistic, learner-centered perspective a viable approach toward the goal of diabetes related health change? This type of approach has been suggested in the literature; however, in reviewing related literature, research which examines its effectiveness in the diabetes teaching-learning interaction was not found.

4. There is a need to understand how learning is related to the process of diabetes related health change. To what extent is learning involved in this change? How do life events relate to decisions to change and to learn? For what persons under what conditions does learning precede, occur in conjunction with, or follow change? How can the diabetes teaching-learning interaction function more effectively as a vehicle towards diabetes related health changes?

5. There is a need to study diabetics' expressed need for support: to identify types of unmet needs and opportunities and networks which people believe would satisfy these unmet needs. Persons in the present study who expressed unmet needs for support

from nonfamily persons and groups were members of the American Diabetes Association. This organization could benefit from evaluating its purpose and goals relative to providing support networks for persons with diabetes. If it sees this as one of its purposes, a need exists to develop, implement and evaluate strategies for making available a support network for members and their families.

6. There is a need to develop additional instruments which identify the degree of control diabetics prefer over their diabetes care and learning situations. Rulzicki's (1984) Participation/ Prescription Preference Scale is one instrument which measures this construct. Given appropriate instrumentation, there is a need to examine the interrelationships among the degree of control persons desire in relation to the degree of control allowed them by health care providers and their knowledge gain, behavior change, and diabetes control.

7. It would be very interesting and potentially valuable to examine persons who successfully accomplish diabetes related health changes in relation to their self directed learning readiness

and the degree of control they desire over their diabetes care and learning situations.

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APPENDICES

APPENDIX A

COMMUNICATIONS:

LETTER TO DIRECTOR, AMERICAN DIABETES ASSOCIATION

LETTER TO MEMBERS OF THE AMERICAN DIABETES ASSOCIATION

FORMAT OF RETURN POSTCARD FROM MEMBERS OF THE AMERICAN DIABETES ASSOCIATION

Kellogg Adult Learning Research Project
132 Reid Hall
Montana State University
Bozeman, Montana 59717

Ms. Stanlee Dull, Executive Director
American Diabetes Association
P.O. Box 2411
Greata Falls, Montana 59403

Dear Stanlee,

Enclosed is a copy of the letter I propose to send to each of your members in the Bozeman area. A stamped, self-addressed post card will be included with each letter and will state:

> Yes, I am interested in being a part of your research project. Please contact me so that we can set up a time and place for an interview.
>
> Name:
> Address:
> City and Zip Code:
> Telephone Number:

I'm aware that you want to make a statement that the ADA is not sponsoring the study. It's my wish that you do this in a location other than on the actual letter, as I believe such a statement on the letter would negatively affect the potential number of responses I might receive. I hope this request will not cause too much of a problem for you.

Thanks so much for the opportunity to do this research through your office. Please feel free to contact me regarding any questions or problems you have. I will get copies of 200 letters/post cards to you within a few days of receiving your response.

Sincerely yours,

Pat Lundgren

LETTER TO MEMBERS OF THE AMERICAN DIABETES ASSOCIATION

As a doctoral student with the Kellogg Adult Learning Research Project at Montana State University, I am conducting a study on how persons with Type II diabetes make changes in their lives as a result of having diabetes. Specifically, I will be talking with several persons who have Type II diabetes to learn about the health related changes they have made. Information gained through these interviews will help health professionals better support persons with diabetes as they make necessary changes. This information can also help future diabetics deal with the problems they will encounter as they try to cope with the disease. In order to do this study, I need your help.

If you have Type II diabetes, would you consider volunteering to meet with me for an interview? This interview will take about one hour. It can take place in your home, or anywhere else you choose. The discussion will be confidential, and your name will not be attached to the information that you share.

I hope you will seriously consider volunteering to be interviewed for this project. Your participation will be an extremely important contribution to the study. If you are willing to talk about your experiences, please complete the post card which is attached in this letter and drop it into the mail sometime in the next two weeks. Within a few days of receiving it, I will get in touch with you to set up a time and place to meet.

Sincerely yours,

Pat Lundgren, R.N.,
Kellogg Fellow,
Doctoral Candidate

MESSAGE ON POSTCARDS RETURNED BY PERSONS WILLING TO BE INTERVIEWED

Yes, I am interested in being a part of your research project. Please contact me so that we can set up a time and place for an interview.

Name:

Address:

City and Zip Code:

Telephone Number:

APPENDIX B

INTERVIEW MATERIALS:

INTERVIEW SCHEDULE

DATA SHEET

SHEET # 1: DIAGRAM OF THE INTENTIONAL CHANGE PROCESS

SHEET #2: MEMORY JOGGING SHEET

SHEET #3: QUESTIONS 3 THROUGH 5

SHEET #4: THREE TASKS OF THE INTENTIONAL CHANGE PROCESS

DEMOGRAPHIC INFORMATION

CONSENT TO PARTICIPATE IN RESEARCH PROJECT

INTERVIEW SCHEDULE

1. Identifying the most important intentional change

During the past five years, you have probably experienced various changes in yourself, in your activities, and in your life.

Some of these changes probably happened accidently, but today I'd like to focus on the intentional changes -- the changes you wanted -- the changes you decided to achieve.

The type of changes that I'm interested in are ones which you've made in the area of your health -- specifically, in health factors which are related to your diabetes.

Some of your changes might seem small or not very important to you. But today I'd like for us to look at health changes that were large and important for you. In fact, our first step is to select your largest, most important diabetes related health change during the past five years.

I'd like to assure you that all of the information you give me will be confidential -- I will not attach your name to any of this information. You are free to ask questions at any time, and to stop the interview at any time.

(Give Sheet#1. Point to appropriate parts of it during the following paragraphs.)

Here's a summary chart of the change process. At some point, you decided to change something about yourself and your health. This decision was made sometime within the past five years. Then you took one or more steps to achieve that change. And then you actually did achieve the change.

(Explain the rest of the chart and ensure that the person is clear about what is being requested of him or her.)

Take your time and look over this sheet, feel free to mark it if you wish. If you think of any changes that you have made, please let me know.

(Talk about any tentative choices.)

Before you make the final selection of your largest change, I'd like you to recall all of your diabetes related health changes during the past five years that might qualify. But it's hard to remember all of your changes -- even the big, important ones -- over a five year period. So I have a

memory jogging sheet here. It may help you to recall some especially large change that you haven't thought of yet.

(Give Sheet#2.)

Take your time.

(Give the person time to go through Sheet#2 carefully. Move toward selecting the largest intentional change in the area of diabetes related health. Check to see if the changes identified meet the criteria on Sheet#1.)

(The nature of the change may be made more precise by asking a question like "What is different now compared to the time before your decision to make the change?")

(Check your understanding of the change for accuracy by repeating it to the person in your own words.)

2. Success in Achieving the Desired Change

What percentage of the change you decided to make did you actually achieve?

(Use Sheet #2 again to clarify the question, if necessary.)

3-5

Here are three further questions. Just circle the answers that come closest to describing your intentional change.

(Give Sheet #3. On it are listed questions three through five.)

3. Size and Importance

Which response comes closest to describing the size and importance of your change (the intended portion of your change)?

A. A huge or enormous change, or of central importance in my life
B. A fairly large and important change
C. A definite change with some relevance and importance in my life
D. Small, trivial, petty
E. Of no importance in my life

4. Contribution to Personal Well-Being

How much has this change contributed to your happiness, your satisfaction with life, or your well-being?

A. An enormous amount
B. A large amount
C. Some definite benefit
D. Little or nothing
E. It has done me more harm than good

5. Benefits to Others

Let's set aside your own benefits for a moment, and look at any benefits for other people. Your change might already have been of some benefit to your family, your friends and relatives, your boss, people you work with, and so on. To what extent has your change provided some benefit to people other than yourself?

A. Only to a small amount
B. Medium amount; of some definite benefit to at least one or two persons
C. To a fairly large extent

6. Most Difficult Part of the Change

Looking back over your total experience in deciding, planning, and achieving this change, what was the one most difficult part of the whole thing for you?

7-9

Now, let's turn our attention to three major tasks that you may have performed -- of that someone else may have performed for you -- in order to achieve your change. The top part of this sheet outlines the three tasks.

(Give Sheet#4. Help the person understand the three tasks, and relate them to his or her particular change.)

The bottom part of the sheet lists various possibilities for who or what might have had a part in performing the tasks. For example, the first possibility on the list is you, and the second is books, booklets, etc.

(Pause long enough for the person to read through the list.)

7. Resources Used in Choosing the Change

Now, let's look at the first major task right at the top of the sheet -- deciding to make the change. How would you

divide the credit for getting this task done? That is, what percentage of the credit would you give to yourself, and what percentage to each to the others on the list? Don't worry about being perfectly accurate with this question -- just your best estimate and don't bother including any category that was under 10%.

(Before recording the percentages, be certain that they add up to 100. Also, for resources other than "you", jot down a few words to identify the particular book, person or group.)

8. Resources Used in Planning the Change

Now, Let's do the same for the second task -- planning the change.

9. Resources Used in Achieving the Change

Now, the third task -- achieving the change. What were the percentages for that?

(Omit any of the next three question where the person was not responsible for at least 10% of the task.)

10-12 Activities Involved in Choosing, Planning, and Achieving the Change

10. Going back again to the tasks at the top of Sheet#4, What are some of the main things you did during that task?-- What you considered, any information you gathered, how you arrived at the decision to change, and any other step you took.

11. Moving on to the second task, just what did you do when you were planning the change? For instance, did you collect information, make a list or take any other steps in order to plan your change?

12. The third task refers to actually taking the steps for achieving the change. What methods did you use for achieving your change?

13. Learning Related to the Change

(If the person has already discussed learning activities, refer to them at this point.)

Many times, in order to make changes in our lives, we need to learn new ideas, information or skills. Is there anything that you deliberately set out to learn in order to make this change in your life?

(Probe to identify all learning projects, if there are more than one.)

14. Time Spent in Learning Activities

About how many hours did you spend involved in these learning efforts? Include time spent deciding, planning, traveling to an activity and evaluating your progress, in addition to actual learning time.

(Return to question 13. Star every project that utilized seven or more hours of effort. These are learning projects that meet the time criteria. List the total number of learning projects.)

15. Learning Activities

What sorts of activities were you involved in when you were trying to accomplish this learning?

(Cite for each learning project.)

16. Primary Planner of Learning Projects

Who is the person who planned the major portion of each of your learning efforts?

(Cite for each learning project.)

17. Number of Learning Projects

(List all learning projects cited in prior question.)

18. Non-Human Resources Desired

This next question refers back to deciding, planning, and achieving your change. Suppose with each of these tasks additional help had been available in the form of a book, some other printed material, a tape, a film, or a TV program. Is there additional help of this sort that you would have liked?

(If necessary, probe with a question like "What sorts of additional help would you have liked?")

19. Human Resources Desired

Suppose additional help would have been available in the form of an expert, a particularly helpful or encouraging person, a group, or a health professional. Would you have benefited from any of these types of people?

20. Benefits Expected

Why did you want this change? In this question I'm looking ahead to the ultimate benefits you expected -- the benefits that you thought you would gain from this change?

21. Unintentional Diabetes Related Health Change

(Explain that we are now turning our discussion away from the change that we have been discussing.)

We've been talking about a change that was chosen and intentional. Can you think of any unintentional diabetes related health change that you have made over the past five years?

(If the answer is yes, record the unintentional change or changes.)

22. An Unrealized Change

We've been talking about a change that you did achieve. Looking back over the past five years, has there been some diabetes related health change that you very much wanted, but did not achieve?

(If yes, get information about what the change was and any ideas about why it was not achieved, and about what help/resources would have been helpful.)

23-28

Here are some questions about yourself. Would you take a minute, read them, and fill in your answers?

(Give Sheet #5. On it are listed questions 23 through 28.)

23. Age

What is your age?

24. Gender

(circle correct answer)

Male Female

25. Years With Known Diabetes

How many years have you known that you have diabetes?

26. Diabetes Control

How do you control your diabetes? (circle correct answer)

Insulin Oral Medication Diet

27. Marital Status

What is your marital status? (Circle correct answer)

Single Married Divorced Seperated Widowed

28. Level of Formal Education

How many years of formal education have you completed?

What is the highest diploma or degree you have received?

29. Occupation

Are you employed?

If yes, what is your occupation?

Are there any further comments you'd like to make, any questions you have about the study?

Thank you for all of the time and thought you have given for this interview. It has been very helpful for me.

I'd like to send you a summary of the findings when I finish. Would you like to receive a summary?

Again, thank you much for all of your help.

DATA SHEET

1. Most important intentional change:

2. (%) Sheet#3 3. 4. 5.

6. Most difficult part of change:

Sheet#4

7. Resources in choosing the change:
   a. you
   b. material resource
   c. person-paid
   d. group-leader
   e. group-no leader
   f. family/friend

8. Resources in planning the change:
   a. you
   b. material resource
   c. person-paid
   d. group-leader
   e. group-no leader
   f. family/friend

9. Resources in achieving the change:
   a. you
   b. material resource
   c. person-paid
   d. group-leader
   e. group-no leader
   f. family/friend

10. Activities involved in choosing the change.

11. Activities involved in planning the change.

12. Activities involved in achieving the change.

13-16. learning project:
# of hours:
learning activities:
primary planner:

learning project:
# of hours:

learning activities:
primary planner:
learning project:
# of hours:
learning activities:
primary planner:

18. Non human resources desired:

19. Human resources desired:

20. Benefits expected:

21. Unintentional diabetes related health change?

yes no If yes, record unintentional change:

22. Unrealized Change?

yes no If yes:

What was it:

Why not achieved:

Help/resources:

23. Age:

24. Gender: male female

25. Years with known diabetes:

26. Diabetes control: insulin oral med diet

27. Marital status:

single married divorced seperated widowed

28. Level of fromal education:

years: highest diploma/degree:

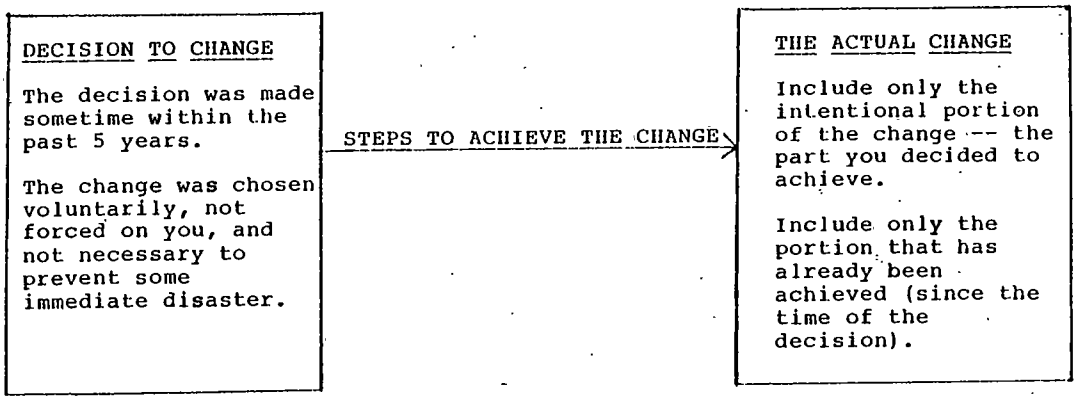
29. Occupation:

employed? occupation:

SHEET # 1

DIAGRAM OF THE INTENTIONAL CHANGE PROCESS

From all of your intentional diabetes related health changes during the past five years, please select your largest, most important change. If in doubt between two changes, choose the one that will affect you and your life the most, or the one that will last longest.



SHEET # 2: MEMORY JOGGING SHEET

To help you recall your intentional diabetes health changes over the past five years, here are some areas in which people sometimes change.

reduced or stopped smoking
increased exercise or exercised regularly
began to get more or adequate relaxation
dealt with or accepted changes in sexual activity and/or sexual responses
reduced or stopped alcohol consumption
changed medical doctor
dealt with or began dealing with emotional problem(s)
increased sense of humor; took time for fun
developed a hobby
began to practice meditation
lost weight
changed eating habits
began to use stress reduction technique(s)
saw a counselor/therapist/clergyperson for counseling
reduced or stopped chewing tobacco
began to use blood glucose monitor
joined a support group
began to pray more/go to church or synagogue more
saw eye doctor regularly
saw dentist regularly
saw medical doctor regularly
became more accepting of my emotions and/or emotional changes worked on improving relationships with relatives or friends worked on becoming more religious and/or spiritual
reduced or stopped using unnecessary prescribed and/or nonprescribed medications
began to use blood pressure monitor
talked with significant others about having diabetes
adjusted to the economic stress created by having diabetes
began to read spiritual material
began to get more or adequate rest
began to do foot care regularly
grieved for a lost life style or lost body image of a perfect body
coped with the uncertainty of the future
sought spiritual experiences; that is, going to the mountains, meditating on nature, etc.
began to use medications as prescribed; rotated injection sites
began to wear Medic Alert bracelet
began to carry a snack or source of quick glucose and/or protein
began to carry a drug record in wallet

SHEET # 3

QUESTIONS 3 THROUGH 5

3. Which response comes closest to describing the size and importance of your change (the intended portion of your change?)

A. A huge or enormous change, or of central importance in my life
B. A fairly large and important change
C. A definite change with some relevance and importance in my life
D. Small, trivial, petty
E. Of no importance in my life

4. How much has this change contributed to your happiness, your satisfaction with life, or your well-being?

A. An enormous amount
B. A large amount
C. Some definite benefit
D. Little or nothing
E. It has done me more harm than good

5. Let's set aside your own benefits for a moment, and look at any benefits for other people. Your change might already have been of some benefit to your family, your friends and relatives, your boss, people you work, and so on. To what extent has your change provided some benefit to people other than yourself?

A. Only to a small amount
B. Medium amount; of some definite benefit to at least one or two persons
C. To a fairly large extent

SHEET # 4

THREE TASKS OF THE INTENTIONAL CHANGE PROCESS

Three tasks

1. Deciding to go ahead with this particular change. As part of making this decision, you or someone else or a book might have examined various aspects of your life, obtained information, identified a tentative possible change, estimated the costs and benefit of this change, and so on.

2. Planning the strategy and deciding the steps for achieving the change.

3. Actually taking the steps for achieving the change.

Who Performed the Task?

a. You.
b. Books, booklets, magazines, television, films, tapes, phonograph records.
c. A person who was paid to help, or was doing so as part of his or her job, or was designated by some organization to help, or was trained to help -- and your interaction with this person was individual one-to-one interaction (possibly with one or two other persons also present).
d. A group in which the same sort of person as above (paid, employed, designated, or trained to help) was the leader or at least was an important resource. (The group, class, workshop, or audience could be of any size, as long as it had at least four persons meeting in the same room.)
e. A group who met fairly regularly, and who almost always met without a professional or expert as the leader or resource person.
f. One of more family members, friends, relatives, acquaintances, coworkers, or neighbors -- in individual one-to-one interaction (possibly with one or two other persons also present).

SHEET #5

DEMOGRAPHIC INFORMATION

Here are some questions about yourself. Would you take a minute, read them, and fill in your answers?

23. What is your age? _____

24. What is your gender? (circle correct answer)

    Male Female

25. How many years have you known that you have diabetes? _____

26. How do you control your diabetes? (circle correct answer)

    Insulin Oral Medication Diet

27. What is your marital status? (circle correct answer)

    Single Married Divorced Seperated Widowed

28. How many years of formal education have you completed? _____

    What is the highest diploma or degree you have received? _____

29. Are you employed? _____

    If yes, what is your occupation? _____

CONSENT TO PARTICIPATE

IN

INTENTIONAL LEARNING AND CHANGE RESEARCH PROJECT

Name of Researcher/Person Briefing Participant:

Patricia M. Lundgren

I, _____ am a willing

(please print name of participant)

participant in this project and have been informed of the following items:

I. I have read or had the opportunity to read a proposal which includes the general description of this research project, its purpose and benefits;

II. I have been given an explanation of the interview procedures and why I have been asked to participate;

III. I have been assured of confidentialilty of records identifying me as a subject;

IV. I have been given assurance that minimal risk is involved in my participation in this study;

V. I understand as a voluntary participant that I may request to end the interview at any time;

VI. I have been given the opportunity to ask questions at any time about the interview process and the interview questions. All questions have been answered to my satisfaction.

_____ _____

Signature Date

APPENDIX C

STUDY DATA:

RESOURCES USED IN INTENTIONAL CHANGE EFFORTS

ACTIVITIES PERFORMED IN PLANNING THE CHANGE

ACTIVITIES PERFORMED IN ACHIEVING THE CHANGE

RESOURCES WHICH MIGHT HAVE BEEN HELPFUL TO ACHIEVE THE UNREALIZED CHANGE

RESOURCES USED IN INTENTIONAL CHANGE EFFORTS

	Choosing	Planning	Implementing
NON-HUMAN RESOURCES			
Reading Materials			
Books			
Menuplanning/ Cooking/Recipe	1	3	1
Living Heart Book	1		
Book on Diabetes	4	1	
Calorie Book	1		
Religious Books	1		
Telephone Book	1		
Total	9	4	1
Journals			
Diabetes Forecast	5	5	1
Magazines in General	2	1	1
Total	7	6	2
Booklets/Pamphlets			
Food Exchange		1	1
Insulin:How it Affects Vision	1		
General Diabetes Info	3	2	1
Blood Glucose Monitoring		1	
Total	4	4	2
Newspapers	1		1
General Reading Materials	1	1	1
Audio Visual Materials			
Television	4	1	1
Films	1	1	
Cassette Tapes	1	1	
Miscellaneous			
Lung Capacity Test	1		
Blood Glucose Monitor			1

Exercise Class Announcement		1	
Medic Alert Bracelet		1	
HUMAN RESOURCES			
Health Professionals			
Physician	16	9	6
Nurse	6	5	2
Dietician	5	7	1
Chiropractor	1		
Urologist		1	1
Opthomologist	2		
Pharmacist		1	1
Total	30	23	11
Group with a Leader			
American Diabetes Assn	7	3	1
St. Vincents Clinic	5	1	
Exercise Class	1	1	
Cooking Class		1	
Weight Loss Clinic		1	1
Total	13	7	2
Group without a Leader			
Church Council	1		
Skating Club	1		
Total	2	0	0
Friends/Family/Other NonProfessionals			
Wife	3	3	5
Husband	3	3	2
Family	6	3	5
Friend	3		3
Coworker	2		
Total	17	9	15
God/Church			
Strength from God			1
Strength from the Church			1
Me,My Husband and the Lord Together	1		1
Total	1		3

ACTIVITIES PERFORMED IN PLANNING THE CHANGE

Identification of Activities Which Would Support the Change

1 bought new types of foods, gave away foods couldn't eat, got new menus and recipes
2 looked for new recipes
4 get up earlier, exercise, quit drinking alcohol, sell my businesses and land, take better care of myself
6 decided to stick with it regularly and not rationalize
7 decided to cut down on drinking, later decided to cut it out completely
8 followed Dr. Johnsons's weight loss program plans
12 cut down on everything, not eat at night, cut out sweets
13 reworked diet based on insulin
16 reschedule activities for each skating rink and eat meet
18 cut out sweets, decided to shop differently, had foods that are good to eat in the house
22 I used my own experience of hypoglycemic reactions. (I know what's caused them.) Avoid situations and compensate for potential problems.
23 decided to swim more (I can't smoke when I swim), bring food to work to get through times when I would smoke
25 not keep food out of the cupboard, bring in more fresh fruit and vegetables, leave sweets alone as much as possible, have regular blood pressure and weight checks
26 looked in phone book for doctor's name, called and got an appointment
30 do a regular exam of my feet, wear good shoes and warm socks
35 decided to keep busy
32 wife would cook right meals, follow through on what learned
36 avoid places where it would be difficult to not drink
37 change type of meat eaten (venison), grow vegetables, use food exchanges
38 decided to monitor blood glucose with Chemstrips, then decided to use a monitor
41 cut down to 4 cigarettes per day

Learning Activities

2 learned different ways to cook (stir fry)
3 reading and studying
5 got booklet about Accuchek II, observed it being used
9 went to Billings twice to ADA meetings, studied nutrition to find out what foods were the best
11 trial and error
13 husband learning to give insulin
19 would read labels and ask resturants if things had sugar

41 think it through over and over again, planning to not smoke in my head almost dramaticising it
44 listened to a tape, read a booklet, practiced
45 reading

Evaluate/Purchase Product

2 bought new heavy pans, bought a gadget to cut up vegetables
10 went to the YWCA and to Nautillus -- not pleased, walking good, but not disciplined to do, an ad in the Gazette about aerobics class but stopped going when it was moved to a hotel, an ad about a new aerobics class in the church newsletter (presently attending)
18 bought a food scale
27 purchased medic alert bracelet to wear

Receive Support/ assistance

17 dietician helped plan what to eat
18 dietician recommended portions and specific guidelines
28 talk with dietician, use ADA exchange list, planned menus, start reading labels
29 talked with doctor, start at baseline of 34 units of insulin, with every 20 points adjust by one unit
31 discussions with wife
34 nurse educator taught about using blood glucose monitoring and diabetes in general

No Definite Plan

21 no plan, just did it
24 not conscious of a plan, would walk every day
33 with decision, not much planning

ACTIVITIES PERFORMED IN ACHIEVING THE CHANGE

1 kept eating the different foods, when I go to potlucks and parties I bring my own food
2 cooked differently, shopped differently, experimented with different types of vegetables, ate differently
3 regular walking, no high calorie foods, small servings, no cocktails, lost weight, avoid stress, go to ADA meetings, SBGM, to eyedoctor and dentist
4 control my schedule, don't travel anymore, check with doctor every 6 months to make sure everything is OK
5 bought monitor, learned to use it, use it, adjust insulin
6 just walk
7 got rid of vodka at home, stopped going to bars
8 followed program, fell off December 5, developed strategy: look at positive things I have accomplished and go through a 15 minute 4 step process before eating what I want
9 support group encouraged, able to say no to certain foods and people, take own food to social events
10 called instructor regarding my diabetes and past disc surgery, assured to go at my own pace, work at own speed and get a good workout
11 doing it whenever I eat sweets or go out to dinner and eat too much
12 did thing I decided to do
13 take insulin 2 times a day, learned to avoid insulin reactions, keep candy at bedside, check blood glucose and adjust diet
16 leave to eat when I can
18 measured and weighed food, bought 8 ounce cans of vegetables so I have no leftovers, take a "1 day at a time" approach, in the morning I plan the food for the day, eat more basic foods
19 did not eat sugar, trusted the Lord to take away take desire for sugar, He gave me the strength -- it wasn't mine
21 with the decision, I simply eliminated the smoking
22 carry through on the plan, wife recognizes signs of hypoglycemia and tells me
23 cheated a few times but realized "now you have to start over again", family/friends encouragement, swim, anticipate food to eat to get over desire for a cigarette 24 after walking for my back I became aware of its benefits for diabetes. I work at it now because I can see the results
25 done things planned --still eat sweet rolls and sugar foods sometimes
26 went and continue to see the doctor
27 wear it all the time

28 weekly menu planning, measured food, weekly visits with the dietician for 5 months, told friends what I can and cannot eat, at resturants twell what I want and how to cook it
29 just have done it and adjusted it for 2 years
31 change eating -- no refined sugar, run 4 miles 4 times a week
32 more walking, pass up certain foods at grocery stores, eat alot less than used to, passup some foods ate resturants and potlucks
33 began to purchase more beans, prunes, whole oats, etc.
34 doing it
35 kept busy, went out for lunch with friends, involved in projects
36 avoided alcohol situations
37 grandson hunted for venison, think about what I eat more, plan meals, cook differently
38 use monitor for a few days, stop and 3 weeks later feel like blood sugar is high, check it, and it is. Start again then stop again
39 do what needed to do
41 cut down to 4 smoking a little at a time, then down to 3, then 2, etc. Took about one and a half weeks
42 do it every day, not miss a day
44 used machine
45 talk with other diabetics, compare notes, just do it

RESOURCES WHICH MIGHT HAVE BEEN HELPFUL TO ACHIEVE THE UNREALIZED CHANGE

Internal Resources
- I could do it on my own, but I wouldn't be happy with the discipline required
- time -- using it as a regulating regimen (for eating)
- discipline self to not binge and stay away from social events

External Resources

Material
- buy a special cooker
- buy a rebounder
- make a financial committment to a gym

Human

Family
- assistance from wife with cooking and serving the right foods
- reminder of schedule (for SBGM) by wife

Support Group or Person
- see someone every day who would be a support person (not a family member)
- wish I had a reference person to share ideas and experiences with
- go to Overeaters Anonomous
- a support group where everyone works on a goal (exercise related) together
- a health club where everyone is chunky

Professional Person
- see dietician again
- hypnosis

Miscellaneous
- I need to have it rammed through my head regularly that complications may affect me
- more stringent regulations to enhance my self discipline

APPENDIX D

CONTINGENCY TABLES

TABLES 31 THROUGH 49

CONTINGENCY TABLES

The following are contingency tables for each of the study's hypotheses. These tables are comprised of observed and expected values for the variables being examined. Expected values are consistently listed in parentheses.

1. Ho: There is no significant relationship between areas of intentional change and age.

TABLE 31 Contingency Table Showing Relationship Between Areas of Change and Age

Areas of Change	20-59 years old	60-89 years old	Total
Eating/weight loss	6 (4.87)	8 (9.13)	14
Curtail drug use	3 (2.43)	4 (4.57)	7
SBGM	2 (1.39)	2 (2.61)	4
Exercise	2 (1.39)	2 (2.61)	4
Miscellaneous	3 (3.48)	7 (6.52)	10
No change	0 (2.43)	7 (4.57)	7
Total	16	30	46

2. Ho: There is no significant relationship between areas of intentional change and gender.

TABLE 32 Contingency Table Showing Relationship Between Areas of Change and Gender

Areas of Change	Male	Female	Total
Eating/weight loss	4 (6.39)	10 (7.61)	14
Curtail drug use	3 (2.74)	3 (3.26)	6
SBGM	2 (2.28)	3 (2.72)	5
Exercise	2 (1.37)	1 (1.63)	3
Miscellaneous	7 (5.02)	4 (5.98)	11
No change	3 (3.2)	4 (3.8)	7
Total	21	25	46

3. Ho: There is no significant relationship between areas of intentional change and years with known diabetes.

TABLE 33 Contingency Table Showing Relationship Between Areas of Change and Years with Known Diabetes

Areas of Change	0-9 years	10-19 years	≥20 years	Total
Eating/weight loss	10 (5.78)	4 (4.57)	0 (3.65)	14
Curtail drug use	2 (2.48)	3 (1.96)	1 (1.57)	6
SBGM	0 (2.07)	2 (1.63)	3 (1.3)	5
Exercise	2 (1.65)	1 (1.3)	1 (1.04)	4
Miscellaneous	3 (4.13)	4 (3.26)	3 (2.61)	10
No change	2 (2.89)	1 (2.28)	4 (1.83)	7
Total	19	15	12	46

4. Ho: There is no significant relationship between areas of intentional change and type of diabetes control.

TABLE 34 Contingency Table Showing Relationship Between Areas of Change and Type of Diabetes Control

Areas of Change	Diet/Oral medication	Insulin	Total
Eating/weight loss	8 (6.09)	6 (7.91)	14
Curtail drug use	3 (2.61)	3 (3.39)	6
SBGM	0 (2.17)	5 (2.83)	5
Exercise	3 (1.74)	1 (2.26)	4
Miscellaneous	3 (4.35)	7 (5.65)	10
No change	3 (3.04)	4 (3.96)	7
Total	20	26	46

5. Ho: There is no significant relationship between areas of intentional change and marital status.

TABLE 35 Contingency Table Showing Relationship Between Areas of Change and Marital Status

Areas of Change	Married	Widowed/ Divorced/ Single	Total
Eating/weight loss	9 (10.96)	5 (3.04)	14
Curtail drug use	4 (4.7)	2 (1.3)	6
SBGM	5 (3.91)	0 (1.09)	5
Exercise	3 (3.13)	1 (.87)	4
Miscellaneous	9 (7.83)	1 (2.17)	10
No change	6 (5.48)	1 (1.52)	7
Total	36	10	46

6. Ho: There is no significant relationship between areas of intentional change and years of formal education.

TABLE 36 Contingency Table Showing Relationship Between Areas of Change and Years of Formal Education

Areas of Change	≤12 years	≥13 years	Total
Eating/weight loss	3 (4.87)	11 (9.13)	14
Curtail drug use	1 (2.09)	5 (3.91)	6
SBGM	2 (1.74)	3 (3.26)	5
Exercise	3 (1.39)	1 (32.61)	4
Miscellaneous	4 (3.48)	6 (6.52)	10
No change	3 (2.43)	4 (4.57)	7
Total	16	30	46

7. Ho: There is no significant relationship between areas of intentional change and highest diploma or degree.

TABLE 37 Contingency Table Showing Relationship Between Areas of Change and Highest Diploma or Degree

Areas of Change	High school or less	Two year/ Bachelors/ Masters	Total
Eating/weight loss	7 (7.91)	7 (6.09)	14
Curtail drug use	4 (3.39)	2 (2.61)	6
SBGM	3 (2.83)	2 (2.17)	5
Exercise	3 (2.26)	1 (1.74)	4
Miscellaneous	5 (5.65)	5 (4.35)	10
No change	4 (3.96)	3 (3.04)	7
Total	26	20	46

8. Ho: There is no significant relationship between areas of intentional change and employment status.

TABLE 38 Contingency Table Showing Relationship Between Areas of Intentional Change and Employment Status

Areas of Change	Employed	Retired/ Disabled	Unemployed	Total
Eating/weight loss	8 (6.09)	3 (4.26)	3 (3.65)	14
Curtail drug use	1 (2.61)	2 (1.83)	3 (1.57)	6
SBGM	2 (2.17)	2 (1.52)	1 (1.3)	5
Exercise	4 (1.74)	0 (1.22)	0 (1.04)	4
Miscellaneous	4 (4.35)	5 (3.04)	1 (2.61)	10
No change	1 (3.04)	2 (2.13)	4 (1.83)	7
Total	20	14	12	46

9. Ho: There is no significant relationship between areas of intentional change and occupation.

TABLE 39 Contingency Table Showing Relationship Between Areas of Change and Occupation

Areas of Change	Executive/ self employed/ professional	Clerical/ technical/ homemaker/ blue collar	Total
Eating/weight loss	8 (7.61)	6 (6.39)	14
Curtail drug use	4 (3.26)	2 (2.74)	6
SBGM	3 (2.72)	2 (2.28)	5
Exercise	3 (2.17)	1 (1.83)	4
Miscellaneous	5 (5.43)	5 (4.57)	10
No change	2 (3.8)	5 (3.2)	7
Total	25	21	46

10. Ho: There is no significant relationship between subject areas of learning projects and age.

TABLE 40 Contingency Table Showing Relationship Between Subject Areas of Learning Projects and Age

Learning Project Topics	20-59 years old	60-89 years old	Total
Diabetes in general	3 (2.43)	4 (4.57)	7
Diet related	1 (1.74)	4 (3.26)	5
Miscellaneous	1 (1.04)	2 (1.96)	3
No learning	11 (10.78)	20 (20.22)	31
Total	16	30	46

11. Ho: There is no significant relationship between subject areas of learning projects and gender.

Table 41 Contingency Table Showing Relationship Between Learning Project Topics and Gender

Learning Project Topics	Male	Female	Total
Diabetes in general	3 (2.74)	3 (3.26)	6
Diet related	2 (2.74)	4 (3.26)	6
Miscellaneous	3 (1.37)	0 (1.63)	3
No learning	13 (14.15)	18 (16.85)	31
Total	21	25	46

12. Ho: There is no significant relationship between subject areas of learning projects and years with known diabetes.

Table 42 Contingency Table Showing Relationship Between Learning Project Topics and Years With Known Diabetes

Learning Project Topics	0-9 years	10-19 years	≥20 years	Total
Diabetes in general	3 (3.04)	3 (2.13)	1 (1.83)	7
Diet related	4 (2.17)	1 (1.52)	0 (1.3)	5
Miscellaneous	1 (1.3)	1 (.91)	1 (.78)	3
No learning	12 (13.48)	9 (9.43)	10 (8.09)	31
Total	20	14	12	46

13. Ho: There is no significant relationship between subject areas of learning projects and type of diabetes control.

Table 43 Contingency Table Showing Relationship Between Learning Project Topics and Type of Diabetes Control

Learning Project Topics	Diet/Oral medication	Insulin	Total
Diabetes in general	4 (3.04)	3 (3.96)	7
Diet related	4 (2.61)	2 (3.39)	6
Miscellaneous	1 (1.3)	1 (1.7)	3
No learning	11 (13.04)	19 (16.96)	30
Total	20	26	46

14. Ho: There is no significant relationship between subject areas of learning projects and marital status.

Table 44 Contingency Table Showing Relationship Between Learning Project Topics and Marital Status

Learning Project Topics	Married	Widowed/ Divorced/ Single	Total
Diabetes in general	6 (5.48)	1 (1.52)	7
Diet related	4 (3.91)	1 (1.09)	5
Miscellaneous	3 (2.35)	0 (.65)	3
No learning	23 (24.26)	8 (6.74)	31
Total	36	10	46

15. Ho: There is no significant relationship between subject areas of learning projects and years of formal education.

Table 45 Contingency Table Showing Relationship Between Learning Project Topics and Years With Formal Education

Learning Project Topics	≤12 years	≥13 years	Total
Diabetes in general	2 (2.43)	5 (4.57)	7
Diet related	2 (1.74)	3 (3.26)	5
Miscellaneous	2 (1.04)	1 (1.96)	3
No change	10 (10.78)	21 (20.22)	31
Total	16	30	46

16. Ho: There is no significant relationship between subject areas of learning projects and highest diploma/degree obtained.

Table 46 Contingency Table Showing Relationship Between Learning Project Topics and Highest Diploma/Degree Obtained

Learning Project Topics	High school or less	Two year/ Bachelors/ Masters	Total
Diabetes in general	4 (3.96)	3 (3.04)	7
Diet related	2 (2.83)	3 (2.17)	5
Miscellaneous	2 (1.7)	1 (1.3)	3
No learning	18 (17.52)	13 (13.48)	31
Total	26	20	46

17. Ho: There is no significant relationship between subject areas of learning projects and employment status.

Table 47 Contingency Table Showing Relationship Between Learning Project Topics and Employment Status

Learning Project Topics	Employed	Retired/ Disabled	Unemployed	Total
Diabetes in general	4 (3.83)	2 (2.09)	2 (2.09)	8
Diet related	2 (1.91)	1 (1.04)	1 (1.04)	4
Miscellaneous	1 (1.43)	1 (.78)	1 (.78)	3
No learning	15 (14.83)	8 (8.09)	8 (8.09)	31
Total	22	12	12	46

18. Ho: There is no significant relationship between subject areas of learning projects and occupation.

Table 48 Contingency Table Showing Relationship Between Learning Project Topics and Occupation

Learning Project Topics	Executive/ self employed/ professional	Clerical/ technical/ homemaker/ blue collar	Total
Diabetes in general	4 (4.72)	3 (2.28)	7
Diet related	5 (3.37)	0 (1.63)	5
Miscellaneous	2 (2.02)	1 (.98)	3
No learning	20 (20.89)	11 (10.11)	31
Total	31	15	46

19. Ho: There is no significant relationship between areas of most significant health change and topics of learning projects.

Table 49 Contingency Table Showing Relationship Between Areas of Most Significant Health Change and Topics of Learning Projects

	Diabetes in General/ Diet Related	Miscellaneous	No Learning	Total
Eating/ weight loss	6 (3.65)	0 (.91)	8 (9.43)	14
Curtail drug use	1 (1.57)	1 (.39)	4 (4.04)	6
SBGM	1 (1.3)	1 (.33)	3 (3.37)	5
Exercise	0 (1.04)	1 (.26)	3 (2.7)	4
Miscel.	4 (2.61)	0 (.65)	6 (6.74)	10
No change	0 (1.83)	0 (.46)	7 (4.72)	7
Total	12	3	31	46

INTENTIONAL LEARNING AND CHANGE:
DIABETES RELATED HEALTH CHANGES BY TYPE II DIABETICS

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1987

Abstract

Diabetes education efforts have traditionally attempted to provide people with the knowledge and skills needed to comply with prescribed changes. This study holds that diabetics need to assume more responsibility for controlling their disease--not passively comply with instructions. The main purpose of this study was to examine selected dimensions of intentional learning and change in diabetes related health areas made by persons with Type II diabetes. The sample for the study was 46 self-selected Type II diabetics who were members of the American Diabetes Association residing in Southwestern Montana.

Volunteers were interviewed using a structured schedule which solicited quantitative and qualitative data. They were asked to identify the most significant intentional diabetes related health change that they had achieved in the previous five years. Other questions examined the processes, resources, and learning involved in those changes.

Eighty-five percent of the interviewees had made at least one intentional change. Major change categories included eating habits, blood glucose monitoring, curtailing the use of alcohol and tobacco, and exercising.

Crediting themselves with primary responsibility for their changes, individuals used health professionals as a major resource for their changes. Depending on the type of change, persons experienced more difficulty with different tasks of the change process. Diabetics express an unmet need for support from individuals with diabetes and from support groups. Triggers motivated persons' decisions to change.

Learning both motivated decisions to change and was deliberately pursued in order to accomplish a change. Learning projects were goal-oriented, took from 7 to 1000 hours to complete, and were planned primarily by learners. Reading was the major learning activity.

Health professionals need to consider taking a more person-centered approach to managing diabetes and to the diabetes teaching-learning interaction. Emphasis should be placed on helping diabetics choose to make changes, and on involving them in planning subsequent learning and actions. Health professionals should determine the degree of control which persons prefer, and attempt to use effective amounts of direction and control.

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