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**CONTINUITY OF CARE FOR MIGRANT FARMWORKERS UTILIZING
COMPUTER DISKS**

by

Shirley Louise Bayham-Hicks

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A Thesis Submitted to the Faculty of the

COLLEGE OF NURSING

**In Partial Fulfillment of the Requirements
For the Degree of**

MASTERS OF SCIENCE

In the Graduate College

THE UNIVERSITY OF ARIZONA

2000

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ACKNOWLEDGMENT

I wish to thank my thesis director, Dr. Judy Effken, for her support, flexibility and patience in helping to see this thesis to completion. She allowed this project, and me, the freedom needed to make it happen.

I am grateful to my other committee members, Dr. JoAnn Glittenberg and Laurie Monti, PNP, for their support and critique.

I am indebted to the Rural Health Program at the College of Nursing for use of their laptop computer these two years as well as financial support for many of the miles covered.

I am especially grateful to the Willcox School District's Migrant Outreach Office staff, Dolores Mendoza and Ruth Ruiz who were the "change agents" who helped to bridge the gap between cultures.

Special thanks also to Janice Graham of the Cochise County Health Department for leading me to Dolores.

Thank you also to Tracey Pachuillo, paralegal, for helping create the template on Word.

Also, thank you to Carol Sutton of the Chiricahua Community Health Center for an idea on templates and Jill deZapien of the University of Arizona's Rural Health Program for material in my literature review.

And my husband, Perry L. Hicks, for the original idea.

DEDICATION

To my children

Ginny, Bobby, Sarah, Perry and Katie

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ABSTRACT

Not much has changed for the migrant farmworker in the last thirty years. In one of the wealthiest countries on earth, migrant farmworker health status remains comparable to that found in Third World countries because of poor sanitation, poor nutrition and exposure. Current estimates show that migrant clinics are serving less than 20% of this population, leaving about 2,000,000 farmworkers without medical care. The barriers to health care for this population are numerous. This study will focus on the barrier to care resulting from lack of continuity in care due to poor inter-clinic communication. In this study it has been shown that computer disks and a standard word-processing program can be used to create a portable medical health history for the migrant to improve inter-clinic communication. In the process of carrying out this study, it was also shown how other barriers to care for this vulnerable population might be removed as well.

CHAPTER ONE

INTRODUCTION

Migrant farm laborers move restlessly over the face of the land but they neither belong to the land nor does the land belong to them. They pass through community after community, but they neither claim the community as home nor does the community claim them. As crops ripen, farmers anxiously await their coming; as the harvest closes, the community with equal anxiety, awaits their going (President's Commission, 1951).

Migrant workers are a crucial ingredient to the agricultural system in the United States which produces around 28 billion dollars' worth of fruits, vegetables, and horticultural products. Their labor is vital to performing labor-intensive farm chores such as weeding and thinning row crops and harvesting fresh market fruits and vegetables too fragile to be picked by machine. American agriculture utilizes the latest developments in modern technology, including genetically engineered seeds, laser-leveled field, optically scanned sorting, computer-controlled soil analysis, and satellite systems to position tractors and map fields. Many growers study at universities. Ironically, living in primitive impoverished conditions, the farm labor force is still composed of the most vulnerable laborers in the country, who are increasingly poor Latin American immigrants (Rothenberg, 1998).

The Office of Migrant Health estimates there are three million migrant and seasonal farmworkers and their dependents in the United States who provide the manual labor to grow and harvest the fruits and vegetables we consume. Other estimates are closer to five million. Only twenty percent of this population receive services from the migrant farmworker health care system. Barriers to health care are numerous, as well as

the problems encountered by the migrant in day to day existence.

Farmworkers are exposed to a wide variety of occupational risks and hazards while performing strenuous tasks. Low socioeconomic status and poor access to health care contribute to health problems. Although no comprehensive epidemiologic studies have assessed the magnitude of these health problems due to lack of a standard data collection instrument, they are numerous and include accidents, pesticide-related illnesses, musculoskeletal and soft-tissue disorders, dermatitis, noninfectious respiratory conditions, reproductive health problems, climate-caused illnesses, communicable diseases, bladder and kidney disorders, and eye and ear problems (Mobed, Gold & Schenker, 1992).

Most of today's migrant farmworkers are immigrants from Latin American countries; 73% are male with a median age of 31 and about 20% of the 55% who are foreign born are not legally authorized to work in the United States. Most farm workers are married, and approximately 57% reside with their families at their work site (Napolitano & Goldberg, 1998).

In 1980, the executive director of the Colorado Migrant Council, Ricardo LaFore, stated that "modern day conditions for farmworkers in this country are tantamount to the worst found in some third world and underdeveloped countries." (Farmworker Data Network, 1980). Still, in 1998, farmworkers remain the poorest of American workers, a situation which has not improved over the last twenty years despite various governmental and private initiatives (Rothenberg 1998). Poverty is a significant issue with nearly half of all farmworkers and three quarters of undocumented farmworkers living below the

poverty threshold, although only 20% get need-based social services such as food stamps (Napolitano & Goldberg, 1998). Assistance requirements vary from state to state and the application process is lengthy.

The Problem

Farmworkers exhibit the type of health status that one sees in the Third World, including infectious diseases because of poor sanitation, poor nutrition, and exposure. It is one of the most dangerous occupation in the United States, exposing workers to heavy machinery, pesticides, and accidents. The National Center for Farmworker Health (2000) acknowledges the existence of multiple and complex health problems in this population, which include musculoskeletal disorders, respiratory conditions, dermatitis, reproduction health problems, communicable diseases, climate-caused illnesses such as heat stress and dehydration, bladder and kidney disorders. Forty-four percent of farmworkers screened by the CDC in recent studies showed positive TB skin results. Conditions such as diabetes, cancer and HIV, which require careful monitoring and frequent treatment, are a special problem due to frequent relocations and lack of follow-up. The incidence of hypertension, associated with increased stress from lack of employment security and decision making, influences health, as well as depression as a result of isolation, economic hardship, weather conditions, discrimination and “fugitive” status if the worker is an illegal immigrant. Infant mortality rate among farmworker children is more than twice the national average. Alcohol and drug abuse are also frequently encountered in the migrant farmworker as a result of poverty, stress, mobility, and lack of recreational opportunities. Something is not working when only twenty

percent of the migrant farmworker population utilize the Migrant Health Centers, and then, only for acute or urgent treatment. Changes need to be made in the health care system to facilitate its usage as intended by the Migrant Health Act of 1962. Barriers to health care have been enumerated by a variety of sources concerned with this problem. Among those barriers are the lack of continuity of care and information transfer, poverty, poor diet, low education levels, lack of cultural and linguistic understanding, rural isolation, unreliable transportation and constant mobility. Solutions are being sought to change and remove these barriers. To remove all of those listed, however, would entail a change of the migrant's social and cultural system as well. There is a large gap between the migrant health care systems and the cultural system which must be bridged to improve health care and utilization of existing resources. Improved inter-clinic communications would be one way of reducing barriers.

Presently, there is no standard method of inter-clinic communication of medical records in the migrant healthcare system to ensure continuity of care. There have been medical history forms and fold-up wallet-sized forms developed in the past for this purpose; however, these are not being utilized. Each clinical encounter in a different facility requires that another lengthy intake form be filled out. There is not yet a health data reporting system nor a centralized source of health records on the farmworker population which would help insure consistency and quality in health care provided when the migrant farmworker does utilize primary care services. Even morbidity and mortality data, as well as data about the incidence and prevalence of disease in the migrant farmworker population, is lacking. When such data have been collected in the past,

another gap is that occupational status has not been reported. The poor health of the migrant workers is as much related to their environment as it is to their lack of interaction with the health care delivery system. Poor housing, difficult working conditions, and undesirable social factors accentuate their condition.

Barriers to care resulting from poor communication systems between clinics can be removed to improve information transfer and continuity of care for the migrant worker. "The existing technology surrounding computerized medical records is sufficient to allow for such a system" (Napolitano & Goldberg, 1998, p. 273). Farmworker programs must make full use of technological developments, but take into account the population they serve. Research and technology should not be two more hurdles that the deprived must learn to jump over in order to obtain the just assistance they deserve (Farmworker Data Network, 1980). There must be cultural sensitivity, as well as a cultural link or change agent, to assure the adoption of this new innovation by those it would best serve.

Purpose

The purpose of this study is to explore ways of improving inter-clinic communication by establishing a record keeping system using a portable medical record that is easily handled and accessible.

Research Question

Can computer disks and a standard word processing program be used to create a portable medical health history and physical for the migrant farmworker?

Definitions of Terms

Migrant farmworker: an individual “whose principal employment is in agriculture on a seasonal basis, who has been so employed within the last 24 months and who establishes for the purpose of such employment a temporary abode” (U.S. Department of Health and Human Services [USDHHS], 1980 cited in Napolitano & Goldberg, 1998, p. 261). Those farmworkers who do not migrate are considered a distinct population called “seasonal farmworkers”. However, data on both types of farmworkers are usually combined (Napolitano & Goldberg, 1998). This study will also combine the two types of farmworkers.

Undocumented: an immigrant who has not obtained legal permission to reside in the United States by obtaining a valid “green card,” which is an identification card issued to immigrants that provides proof of immigration status and permission to be legally employed in the United States. These persons are also referred to as “illegal aliens” and UDA’s or “undocumented aliens.” It became a misdemeanor in 1929 to enter the United States by fraudulent means (Messias in Gift, 1997).

Medical history: record of the patient’s complete health background. According to Bates (1995), this health history should include identifying data, source of referral, source of history, reliability, chief complaint or the reason for presenting at the clinic, and a

clear, chronological account of the problems for which care is sought. The past history includes the patient's general state of health, childhood illness, adult illnesses, psychiatric illnesses, accidents and injuries, operations, and hospitalizations. Current health status includes any medications being taken, allergies, tobacco use, alcohol and/or drug use, typical daily diet, screening tests such as tuberculin tests, Pap smears, mammograms, stools for occult blood, and cholesterol tests along with dates on which they were performed. Immunizations, sleep patterns, exercise and leisure activities and environment hazards, as well as safety measure or precautions taken, are included. Occupational and environmental history are especially important to the migrant farmworker to detect work-related disease in an early stage, determine exposure and risk status, stimulate preventive activities, provide an epidemiologic connection between work and health or illness; and raise an index of suspicion for possible work-related illness (Occupational Safety and Health Administration, 1999). This study will also include "Work History" as a part of the medical history. For this study, a family history will document the occurrence of tuberculosis, asthma, hypertension, arthritis, birth defects, diabetes, coronary artery disease, epilepsy, cancer and retardation. Mental health problems, alcoholism, drug addiction, kidney disease, and high cholesterol will be considered under "other". The "psychosocial history" is not specifically included in this study, but is generally recommended. However, elements of the "psychosocial history," including religion, marriage, and significant others, are included. This study does not assess financial situation or present and future outlook. The review of systems follows, which is a systematic questioning about common complaints related to various locations

of the body and allows a thorough search for symptoms that may be relevant to present illness and otherwise overlooked as well as informing the practitioner of problems the patient may not consider important (Fowkes & Hunn, 1973).

Continuity of Care: ongoing access to health services and required medications with documentation and knowledge of previous health care and health history available to all health care providers.

Disk: an inexpensive, external storage medium that uses a flat, circular magnetic surface to store computer data and is enclosed in a 3 ½ inch hard plastic shell.

Significance

The significance of the study lies in assessing the feasibility of using generic computer technology to improve continuity of care for migrant farmworkers. Good record keeping is essential to the provision of quality medical care and to insure continuity of that care. The health history guides the physician in setting health care priorities, guides the physical exam, and is essential in obtaining an accurate diagnosis (Fowkes & Hunn, 1973).

“Ninety percent of diagnoses are made on the basis of the subjective history, five percent are made on the basis of the physical examination, and five percent are made on the basis of laboratory and X-ray studies...The standard of care requires that a complete history be gathered and documented on all patients” (Wenner, Ferrante & Belser, 1994, p. 1036). As Sir William Osler remarked, “Talk to a patient long enough and he will tell you what is wrong with him” (Wenner, Ferrante, Belser, 1994. p. 1036).

Obtaining a thorough history at each encounter is an expensive and time consuming process for both patient and provider. When the migrant farmworker does seek health care, it is usually an urgent need situation when time is of the essence. With immediate access to the relevant health history of a transient patient, thorough and appropriate medical attention is more likely, and thus a potential improvement in the quality of health along with optimal use of time with the patient as well as reduction in costs.

The medical record not only enhances communication between providers and guides patient care, it also provides data for billing, research and education (Gagan, 1998). The disk is in the control of the carrier, the farmworker. It can provide a source of security in knowing that there will be proper communication between those who provide the health care he/she needs. It will be the farmworker's responsibility to make sure he presents the disk when seeking care. This in itself has significance because it allows the individual some control in a system where he inherently has little if any.

“Information systems will simplify the monitoring of the health status of individual farmworkers as they migrate and will contribute to population-based health services research” (Gwyther & Jenkins, 1998, p. 66). The need for the development of a standard data collection instrument for both health and scientific assessment of farm work exposures is overdue. This research was designed to evaluate the feasibility of using a computerized, portable health history to not only help insure continuity of care for this transient population, but also provide a mechanism for collecting basic health data on this mobile population.

Summary

Chapter One provided an overview of migrant farmworkers in today's society and the many problems faced in their daily existence due to transient lifestyle, environmental exposure, as well as low socio-economic status. The purpose of this study was clarified, along with the research question. A definition of terms was included and finally, the significance of this study was described.

CHAPTER TWO

CONCEPTUAL ORIENTATION AND LITERATURE REVIEW

The conceptual orientation for this thesis includes a combination of the concepts from general system theory, change theories, change agent roles and culture. Utilizing the systems model, the complex interaction of living creatures with a single environment can be viewed. Any diffusion of new ideas or innovation requires that a change take place. If the change is to succeed, it must be accepted or adopted by those it affects (Rogers, 1978).

A synthesis of these theories was necessary to explain the interactions which were expected to take place between the social and cultural system of the migrant farm worker and his environment when a change is attempted. A knowledge of the potential patterns of interaction and feedback, processes of change and the vital role of the change agent, along with a cultural awareness of migrant farmworkers population and their unique problems, guided this research.

System Theory

Von Bertalanffy (1968) defines systems as “sets of elements standing in interaction”. The parts of a system are continuously interconnected and interacting to function as a whole. The whole is different than the sum of its part . “Understanding only is possible by viewing the whole” (Klein & White, 1996, p. 156). Wholeness means that the system, as an entity, has its own character, communication style, strengths and weaknesses (Crouch & Roberts, 1987). This phenomenon cannot be attributed to the parts acting alone. A change in one component is inevitably associated with change or

adaptations in other related components.

A central concept of systems theory is circular causality, including input, output and feedback. It is a means to view processes and interactions. “The basic model is a circular process where part of the output is monitored back, as information on the preliminary outcome of the response, into the input thus making the system self-regulating; be it in the sense of maintenance of certain variables or of steering toward a desired goal” (von Bertalanffy, 1968, p. 161).

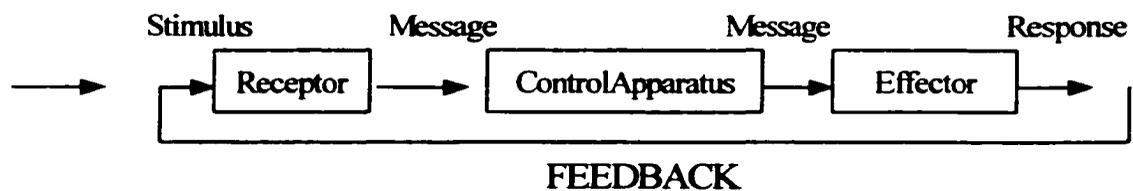


Figure 1: Von Bertalanffy’s (1968) simple feedback scheme (p. 43).

Modifying inputs based on feedback from system outputs produces an adaptive balance between living systems and their environments (Friedman, 1998). Adaptation is the adjustment within the system to demands of the environment. This may also be called homeostasis. Every living organism is essentially an open system that maintains itself in a continuous inflow and outflow, a building up and breaking down of components to maintain a steady state. “The same final state may be reached from different conditions and in different ways (von Bertalanffy, 1968, p. 40). Conversely, a closed system is isolated from its environment and is a self-contained unit, not dependent on continual

environmental exchange for its survival, which lacks any energy exchange with its environment. No totally closed system has been demonstrated in reality (Friedman, 1998). Systems have the ability to change and adapt to maintain stability and equilibrium through self-regulation of inputs and outputs and feedback loops.

Output is what is released back into the environment in the form of energy, matter or information or communication. Self-regulating processes in a system are dependent on two-way communication, or feedback, loops which are circular causal chains (Friedman, 1998).

Feedback is the dynamic part of the system and can be positive or negative. The quality of the feedback will either stabilize or direct the subsequent action (von Bertalanffy, 1979). Depending on the type of feedback, the system will either move towards growth and change or maintain equilibrium, homeostasis or the status quo. Positive feedback moves the system toward change and negative feedback promotes equilibrium. To grow and differentiate, the system must adjust by finding a balance between stability and change. This comes from energy inputs flowing into the system (Friedman, 1998).

All systems have structure and function. Structure includes arrangement and organization in the systems, as well as hierarchies, roles, patterns and wholeness. Hierarchical organization “means that a system at any level is made up of component subsystems on one hand, and is itself, in turn, a component subsystem of supra systems. The events with which we are concerned take place at multiple levels: molecular, biochemical, cellular, organic, organic systemic, psychological, familial, institutional, and

societal” (Henoa & Grose, 1985, p. 49). “There is an increasing level of complexity from cell to organ to organism, family, community, nation, and earth ecosystem” (Henoa & Grose, 1985, p. 43).

The system’s function is its purposes and goals (Berg, 2000). This would include growth and differentiation and achieving homeostasis and equilibrium, adapting to feedback, replication and historical continuity (Henoa & Grose, 1985; Friedman, 1998; von Bertalanffy, 1968; McDaniel, Campbell & Seaburn, 1990; Minuchin, Colapinto & Minuchin, 1998).

Boundaries, also a characteristic of all systems, are both structural and functional. The elements of the system exist within that boundary and everything else is external to it (Henoa & Grose, 1985). Boundaries are selectively permeable with a constant exchange of matter and information, and energy between the system and its environment, a kind of filter. This selective permeability is a screen for information and input and output and is the key to successful adaptation. The amount of information that a system can handle adequately is limited, with an excess of information or conflicting information from the outer environment causing disequilibrium. Conversely, too little information can also threaten stability (Friedman, 1998). “A stable system under stress will move in the direction that tends to minimize the stress; for example, it will seek help from external sources when its internal resources are inadequate” (Friedman, 1998, p. 163). It would then seem that if boundaries are impermeable, there will be no interaction with the environment. This would be a closed system. If the boundaries are non-existent or fluid, there is no means of control within the system. “The ability of a

boundary to control the degree of exchange is of great significance, because it regulates the amount and type of input from the environment at any time, enabling the system to maintain equilibrium or to adapt to new demands” (Freidman, 1998, p. 157).

Within the hierarchy of systems is the one under study or the focal system, and the supra systems and subsystems relative to that system. For example, if the family is the focal system, then one supra system might be the family’s cultural reference and the subsystems would consist of the sets of family relationships (Friedman, 1998).

A social system is composed of two or more persons or social roles tied together by mutual interaction and interdependence (Anderson & Carter, 1974). “All social systems are held together by a generally agreed upon structure in which group goals, norms of conduct, statuses and roles, and the matters essential to group persistence are understood” (Ryan, 1969, p. 6).

Change Theory

“Change is an inherent property of all functioning systems” (Ryan, 1969, p. 110). Change develops out of interaction itself as a process rather than an invention. However, the introduction of an innovation at any point in such a system implies adjustive change in every other part. Change of some sort, whether due to invention or diffusion, is always going on. The process by which an individual or system accepts an innovation begins with knowledge of the innovation, forming an attitude towards it, deciding to adopt or reject it, implementation of the idea, and finally confirmation of the decision to implement it (Ryan, 1969).

Rogers (1983) identifies five phases in the adoption of change. These phases

include awareness, interest, evaluation, trial and adoption. In the awareness phase, there is motivation to create some sort of change. This is a cognitive phase, when the problem is diagnosed or identified, and a solution selected from alternatives. In the interest, evaluation and trial phases, there is a review of ways to solve the problem and possible solutions. The change is planned in detail and then initiated. The adoption phase is when the change is integrated into the individual's system. Rate of adoption is the relative speed with which an innovation is adopted by members of a social system. "Innovations that are perceived by individuals as possessing greater relative advantage, compatibility, and the like, have a more rapid rate of adoption" (Rogers, 1983, p. 23). Different social systems will have different rates of adoption.

Rogers' theory of change necessarily considers the background of the individuals involved in the change as well as the environment in which the change takes place. Within Rogers' theory, there is a need for the individual to be interested in the change and be committed to making the change occur (Welsh, 1979)

"It is as unthinkable to study diffusion without some knowledge of the social structures in which potential adopters are located as it is to study blood circulation without adequate knowledge of the structure of veins and arteries" (Rogers, 1983, p. 25). "A social system is defined as a set of interrelated units that are engaged in joint problem solving to accomplish a common goal...The social system constitutes a boundary within which an innovation diffuses" (Rogers, 1983, p. 24). There is a communication structure that exists in the interpersonal networks linking a system's members, or patterned communication flows. There is a homophily principle, whereby most individuals in a

system talk with others who are similar to themselves.

Rogers (1983) summarizes characteristics of innovation that are significant for its diffusion: 1) relative advantage over that which it would replace, 2) compatibility with existing values and experiences of the adopter, 3) lack of complexity and ready understanding and application by potential adopters, 4) ability to test the innovation on a limited basis, and 5) communicability or ease in which it can be observed or communicated.

The Change Agent

The change agent is the key to the success of the implementation and the “communication link between a resource system of some kind and a client system” (Rogers, 1983, p. 313). “His or her success in linking the change agency with his or her client system often lies at the heart of the diffusion process” (Rogers, 1983, p. 315).

The change agent provides a communication link between a resource system of some kind and a client system usually to seek the adoption of new ideas. The change agent’s main role is to facilitate the flow of innovations from a change agency to the clients. To be effective, the innovations must match the client’s needs and problems. “Feedback from the client system must flow through the change agent to the change agency so that it can make appropriate adjustments on the basis of previous successes and failures. Change agents would not be needed if there were no social and technical chasm between the change agency and the client system” (Rogers, 1983, p. 313). The diffusion process or change depends on the change agent’s ability to bridge the gap between two differing systems.

Rogers (1983) identifies seven roles for the change agent. These include: 1) developing the need for change, 2) developing rapport with the client creating credibility, trustworthiness, and empathy with their needs and problems, 3) diagnosing the problems by viewing the situation from the clients' perspective, 4) motivating an interest in the innovation, 5) translating intent into action possibly by activating peer networks, 6) stabilizing adoption and preventing discontinuation, and finally 7) achieving a terminal relationship by developing self-renewing behavior and self-reliance on the part of the client system.

Knowledge of the culture of individuals and their social systems is necessary to provide culturally congruent care and relevant change or innovation. The change agent will be guided by the emic perspective with the knowledge of the client's belief pattern, values, and health care systems, as well as a basis for understanding culturally diverse individuals.

Culture

Culture is defined as the "learned, shared, and transmitted values, beliefs, norms, and life ways of a particular group that guide their thinking, decisions, and actions in patterned ways" (Leininger, 1991, p. 47). Other components of culture include customs, laws, symbolic meanings as in language, technologies and artifacts, and concepts of good and evil. Culture is a socio-psychological and not a physical phenomenon. Culture is the manner in which a society directs and expresses its life as an interacting, functioning group entity (Ryan, 1969). Culture, along with social status and support systems, influences the way people feel about themselves and how they

interact with their environment. We learn culture from our families during socialization (Ebersole & Hess, 1990).

“Group,” “society,” and “social” are terms pertaining to inter-relationships among people. Societies are made up a variety of sub-groups or sub-systems such as families, work groups, or religious groups and communities. Unlike a social system, culture refers to the “creations of interacting men,” not the interacting men (Ryan, 1969). It is all that is not inherited genetically. Members of a society must interact with reference to the tools, knowledge, and precepts in their culture. Neither society nor culture can exist without the other. “Out of society comes culture. Out of culture comes the plan and the knowledge whereby the society functions, orders, and maintains itself” (Ryan, 1969, p. 9). The cultural environment, then, both guides and restrains the social system in which it is in constant interaction.

The culture that develops within ethnic groups is a powerful determinant of how its members react in a situations. Responses to situations are culturally dictated attitudes and behavioral patterns that are acceptable. There are differences in the incidence of certain disease conditions, life styles, and food customs as well as interactional patterns between, not only cultures, but between urban and rural populations, and residents of the southwestern United States and those of the East (Byrne & Thomptson, 1972) One would then expect a variation in interactional patterns between stable populations and transient populations as well.

The poor share certain characteristics, which include long experiences with powerlessness, hopelessness for improvement of their socioeconomic status, and a lack of

orientation to education. This contributes to a desire for immediate gratification and a present-orientation because it is futile to think of the future when the present is so uncertain (Byrne & Thompson, 1972, p. 83). "A family is classified as poor if its pretax cash income falls below the minimum standard established by the official poverty measure. In 1993 poverty threshold for a family of four was \$14,334" (Allen, 1994, p. 381).

The task of understanding another culture is not different from that of understanding another language. Those that would understand another culture must be willing to acknowledge the differences. We must learn about and identify what those differences are from the most imperceptible behaviors to the obvious characteristics of that culture which make it unique (Mead, 1970).

Human beings "seem to hold on more tenaciously to a cultural identity that is learned through suffering than to one that has been acquired through pleasure and delight. Children who have grown up happily in comfortable homes can be more secure and adaptable under new circumstances than those whose early lessons have been painful and frightening. The sense of cultural identity that is drilled in with punishment and threats of total rejection is curiously persistent" (Mead, 1970, p. 20).

Below is a diagram of the synthesis of the systems, change and culture theories into a model to depict the interactions in this study between the individual migrant farmworker or client system, the change agent, and the larger health care system. The model reveals a dynamic process of circular causality, the output from one aspect

influencing the feedback to the other through the change agent who serves as the link that bridges the gap. With effective changes, eventually the change agent will be gone, but the process will continue.

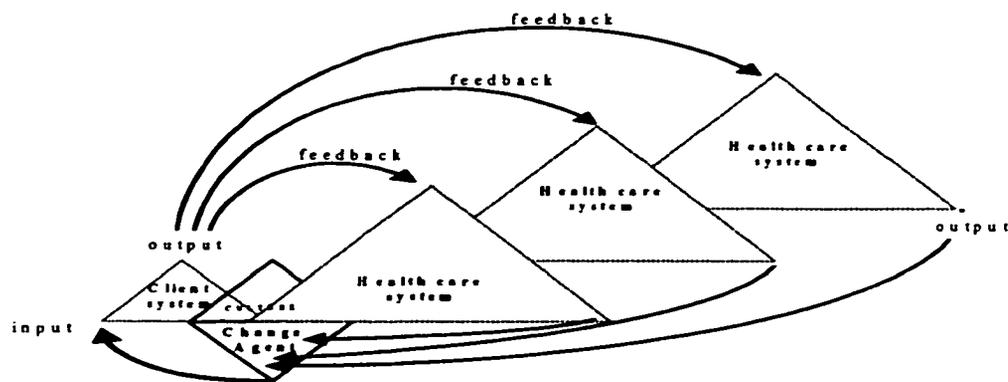


Figure 2. Organizing conceptual framework. The model depicts the interaction and relationship between the client system, culture, the change agent, and the multiple agencies of the health care system.

Literature Review

The literature review was conducted for this study to determine what is presently taking place to improve inter-clinic communication for the migrant farmworker. A general search of both texts and journals was carried out to identify concepts relative to the research question, including migrant farmworkers, transients, access to care, underserved populations and poverty. Topics related to communication systems, informatics, electronic medical records, computerized records and medical record keeping were also reviewed. Information from the National Farmworker Health Conference 1999 included presentations about electronic records for migrants, which had been used for other populations, but not yet realized for the migrant. The Migrant Health Newslines published by the National Center for Farmworker Health publishes all that is new and relevant in the field for lay and professional persons. Combination searches on Medline and Cinahl databases linking the above concepts were also helpful; however no databases linking farmworkers and electronic medical records was found. Two articles between 1966 and the present were found linking computers and migrants. This apparent lack of literature on the subject reinforced the need for this study to use today's technology to improve the communication for the migrant farmworker.

The Migrant Healthcare System

In the depths of the depression of the 1930's, the Farm Security Administration (FSA) first developed a system to make community health services more readily accessible to poor rural residents and adopted a health care model whereby outreach nurses would visit migrant labor camps on a regular schedule. Physicians recruited under

contract would regularly serve in camp clinics when workers were free to use their services. This model spread across the country and was then placed under a quasi-governmental non-profit organization called the Agricultural Workers Health Association. Following World War II, however, federal budget cutting ended the programs and any semblance of national migrant health care. Local communities, churches, volunteers and health departments then filled the void until the Migrant Health Act of 1962 (Johnston, 1985). In the 1950s, the Public Health Service was not responsible for migrant health; but recurring requests for their assistance prompted a special committee to research the problem. Recommendations were made to improve the migrant's health care, as well as to provide federal financial assistance, because the responsibility to provide care exceeded the authority or capacity of any single state. The Migrant Health Act was signed into law by John F. Kennedy in 1962. Its purpose was to improve the delivery of primary and supplemental health care services to migrant and seasonal farmworker in the United States. The Migrant Health Act is funded under Section 329 of the Public Health Service and administered by the Bureau of Primary Health Care which is one of four bureaus of the Health Resources and Services Administration (HRS), an agency in the Department of Health and Human Services.

“The Migrant Health Branch, Division of Community and Migrant Health, Bureau of Primary Health Care, is a federally-funded network of health centers and projects that provide primary health care to migrant farmworkers and their families throughout the U.S.” (NCFH, 2000). The services of the Migrant Health Program (MHP) and Migrant Health Centers (MHC) include primary care, preventive health care,

transportation, outreach, dental, pharmaceutical, and environmental health. These programs, which will be described later, use lay outreach workers, bilingual health personnel, and culturally appropriate protocols often developed by the Migrant Clinicians Network. The MHP, under new director Adolfo Mata, himself from a migrant farmworker family, provides grants to more than 120 public and private nonprofit organizations that support the development and operation of about 390 clinics (Bureau of Primary Health Care (BPHC) 1999).

Unfortunately, the National Advisory Council on Migrant Health (NACMH) (1995) and current estimates show that migrant clinics are able to serve less than twenty percent of this nation's migrant farmworker population (Farmworker Health (NCFH) 2000). That means that with an estimated total of a minimum of 2,500,000 farmworkers, 2,000,000 farmworkers are not receiving medical care from this system. "Utilization trends cannot be used to determine the extent to which health needs are being met, and this is certainly true for migrant workers" (Slesinger, 1981, p. 261) "The majority of farmworkers receive care on an emergency basis only, from health departments, from local providers, or not at all" (MCN, Current Projects & Programs, 2000, p. 1)

Lack of utilization cannot be due to lack of financing. Yearly appropriations to the program were \$78,000,000 in 1999, up from \$70,069,000 in 1998 (Migrant, 2000), as well as tobacco tax funds available to build clinics and provide care in rural areas. With existing cooperative agreements with state agencies and with state and regional primary care associations as well as partnerships with local health departments, hospitals, and social service providers, success should be enhanced (Migrant, 2000). However, the

health and plight of the farmworker has not improved in the last 30 years (Martin & Martin, 1994, Rothenberg, 1998).

“Developing networks and comprehensive systems primary care is critical to health services delivery success” (Migrant, 2000, p. 2). “Health centers have been handicapped in their efforts to focus attention on this gap in service by the lack of reliable data on the health status of the farmworkers they serve. While some data is available for individual clinics or regions, this information does not give a clear national picture of health problems experienced by these workers and their families”(Facts, 2000, p. 1).

Mobed, Gold, & Schenker (1992) report that the only national reporting system that tracks farm worker health data is the Migrant Student Record Transfer System maintained by the Office of Migrant Education of the U.S. Department of Education. This computerized system contains health records of the children of migrants, “but there exists no such collection of national data on adult farm workers” (p. 367).

Vital migrant support systems of health care for this population are the National Center for Farmworker Health (NCFH), formally known as the National Migrant Resource Program and the Migrant Clinician’s Network (MCN).

The group with the most complete information about the entire migrant health care system is the National Center for Farmworker Health also based in Austin, Texas. This organization provides medical referrals for patients and has a comprehensive library collection of literature and videos on the migrant worker, as well as bilingual educational pamphlets. The organization oversees the Migrant Health Newslines, a free publication since 1984, that serves as a communication link to the public about programs and events

related to farmworkers, educational opportunities for farmworkers, and current books on the subject. The Migrant Health Newsline is funded through the Migrant Health Program, Bureau of Primary Health Care, HRSC. The NCFH also publishes the Migrant Health Referral Directory, a national guide to migrant health centers. Its has a toll-free number, 1- 800-531-5120.

The Migrant Clinicians' Network (MCN), which is based in Austin, Texas and sponsored by NCFH, has numerous projects and programs in progress to help meet the needs of this population. The MCN (2000), on line, lists barriers to primary care and basic health services which include poverty, poor diet, low education levels, lack of linguistic and cultural understanding, lack of continuity of care and information transfer, rural isolation, economic uncertainty, unreliable access to transportation and constant mobility. Most importantly "a farmworker would risk loss of wages or even his or her job in order to keep a medical appointment" (MCN, 2000).

The MCN is currently overseeing a Binational Tuberculosis Tracking and Referral Network. This tracking system stores information on TB cases or suspected TB cases among migrant workers in a central database accessible through a toll-free number. Participants also carry a folded, pocket-sized TB record with written accounts of the patient's diagnosis and treatment regime, drugs, skin tests, X-rays, and sputum and culture results. Clinicians can have test results verified or add new data on patients through the toll-free number as well as receive expert advice on treatments. This system eliminates the need to re-diagnose and ensures continuity of care by "upstream" clinicians. To ensure confidentiality and prevent deportation, each patient is assigned a

“unique identifier,” which is necessary to access these medical records. This is a bi-national project whose portable records bear the seal of Mexican and U.S.. departments of health and written in both Spanish and English. There are presently 22 states and 73 clinics participating with a total enrollment of 509 individuals (TB Monitor,1996; MCN, 2000 Internet).

“While services provided by migrant health centers may have improved the overall health of migrant farmworker families by improving their access to health care, there are very limited data with which to prove this point” (Rust, 1990, p. 1216).

The Migrant Culture and Social System

The common thread in the migrant farmworker system is mobility and fluidity. This is a population of working poor, with signs of poverty omnipresent in their living environment. Because of frequent relocation between states and a patriarchal system, language and cultural barriers, and limited economic and political resources, there is restricted access to health and human services. The average annual income for migrant families in 1995 was \$7,000 per year, which is well below national poverty levels (Bechtel, Shepherd, & Rogers, 1995).

The qualities of drive and determination to find work, perseverance, and hard work are characteristic of this group. Many are unable to find other jobs, however they would prefer to work rather than live completely off the welfare system. There is an unpredictability, uncertainty and lack of order in this system to which the migrant must adapt. Migrant workers are present-oriented due to the non-permanence of their life style,

which affects both their behavior and their relationships (Nelkin, 1970).

“The main time cycle for migrant workers is the season, beginning late in May or June and extending for four to five months, depending upon the crops. Time is often killed by waiting and anticipation” (Nelkin, 1970, p.37). The majority of the workers come from the southern area of the United States via Mexico and Texas and move northward as crops ripen. A crew chief acts as the middleman between the migrant worker and the farmer, who alerts the migrants to available positions. Many times the migrant must drive day and night, moving from one camp to another as crops ripen with only the most essential of possessions. This interferes with children’s education and social development. Many times migrants are traveling without their families and that means of support. Average income is \$30.00 to \$60.00 daily, based on a 4 to 6 hour workday. Rain, injuries, and disease prevent maximum earnings, as well as inconsistent ripening of crops. Vehicles are used to transport the workers to the field, so those people left in the camps are generally without transportation, which include the women caring for the children (Betchel, Shepherd, & Rogers, 1995).

In this social system, “all face certain inherent problems; grueling, back-breaking work, poor pay, dilapidated housing, a displaced life in changing and often hostile surroundings, subjection to dangerous pesticides, and exploitation by growers and crew leaders who have almost total control over their lives. They endure all the inevitable problems of being uprooted: inadequate representation, few meaningful legal protections, no security, little opportunity to get out of the stream or to direct their children to a better life” (Goldfarb, 1981, p.12).

This substandard living environment places farmworkers and their families at greater risk for communicable and chronic health problems than the U.S. population in general, and adverse environmental, social, and economic circumstances associated with this lifestyle increases the risk for domestic violence in this group (Bechtel, Shepherd, & Rogers, 1995).

In separate extensive literature reviews of the subject, Slesinger (1992) and Rust (1990) identified the chronic health problems most common in this culture: hypertension, diabetes, obesity and, among men, alcoholism. Health problems most frequently reported at migrant health clinics according to Wilk (1986) included dermatitis, injuries, respiratory problems, musculoskeletal ailment, (especially back pain, eye problems, gastrointestinal problems and diabetes.) Most seek treatment for acute, rather than chronic illness or preventive services. They are less likely to obtain preventive care because they must take time off from work, which means less pay, and possibly loss of job. When asked about personal experiences with illness over the past year, the list expands to eye problems, depression, anemia, arthritis, high blood pressure, still births, kidney problems, obesity, problems related to pregnancy, asthma, intestinal parasites, deafness, and heart conditions (Slesinger, 1992).

“No large group of migrants has ever remained permanently migratory, the best evidence that people are not migrants by choice” (Martin & Martin, 1994, p.1). Federal programs help workers find non-farm jobs and better wages, but are then replaced by more desperate workers (Martin, 1994). The migrant system “depends on misfortune to build up our force of migratory workers and, when the supply is low because there is not

enough misfortune at home, we rely on misfortune abroad to replenish the supply” (Martin & Martin, 1994, p. 5). The cycle of misfortune continues. “One way the migrant adapts to a system he cannot himself control is by submitting to the crew leader system, accepting the exploitative consequences of this system for its protective and risk-reducing benefit” (Nelkin, 1970, p. 38).

In this mobile society, there is constant change in who is a member as well as the ethnicity of those members. In these multicultural and “fluid” communities, commonplace activities “assume uncommon cultural dimensions and ethnic repercussion” (Griffith & Kissam, 1994, p. 41). Local dance halls might sponsor a Mexican band, churches reproduce Haitian forms of Catholic worship, and native courtship behaviors such as gift giving occur between the young Guatemalan man and the local prostitutes. Two types of households were found to be most conducive to this existence, single person (lone-male/lone-female) households and “anchor” households, a nuclear family with a single attached to the unit by virtue of kinship or friendship. There are anchored “single” whose families live across our borders. Children are seen as a burden to the farm working lifestyle (Griffith & Kissam, 1994). There are extreme variations between family household size and structure in this population. There is the single individual and families who have ties to others in the crew. The apparent fluidity of household relations, with men able to attach themselves to and detach themselves from households with relative ease, has been called a “weak” social structure. This form of structure is common in families whose economic structure is unpredictable and requires geographic mobility and has also been noted throughout the Caribbean. Family life must

adapt to the labor market. “Some migrants still follow the ripening crops around the United States with their families, but a lack of temporary housing for families has discouraged family migration” (Martin & Martin, 1994, p. 5). “The prevailing type of marriage arrangement is that of temporary liaisons established during the summer and, interestingly, labeled ‘tramp’ or ‘muck’ marriages” (Nelkin, 1970, p.43).

Social networks are the means through which migrants have come to meet most of their basic needs and are the building blocks of the social infrastructure of migration and the most important feature of the farmworker’s lives. These networks may be based on kinship, friendship, common community of origin, ethnicity, national origin, common residence, or common job experience. The social networks serve the function of finding housing, transportation, financial assistance during crisis, labor market information and job contracts, as well as emotional support. They are extremely flexible institutions that have arisen primarily in response to the uncertainties and difficulties of migrant and farm working life and are constantly changing and adapting in response to labor market development, crop failures and individual rites of passage. These networks may become impenetrable by new entrants due to suspiciousness or mistrust of outsiders or open to new influences, new information and new services. Service-delivery systems that provide a wide range of services supporting the migrants’ network have been the most successful. “In contrast, programs that provide only a narrow, restricted and rigid set of services have just limped along among the migrant population”(Griffith & Kissam, 1994, p. 50)

Griffith & Kissam (1994) identify attitudes and values common to the migrant farmworker, including a preference for security of income which fosters a relationship of

dependence with farm-labor contractors. Another principle farmworkers are concerned with “seems to be one of dignity, of being treated with respect, like humans rather than animals in the fields” (p. 67). This is especially relevant when one considers the lack of drinking water and toilets in the field. There is also a common desire to be independent of supervision and to work for oneself. Only after these values are realized does attention focus on wages, field conditions, hours of work, pesticide exposure, and the strenuousness of the job.

Nelkin (1970) reports on farmworker lives from participant observations made by sociology students conducting research to better understand a social problem. The researchers identified a broad spectrum of behavior with respect to personal matters such as health and hygiene. “Self-neglect and apathy concerning health are widespread, reinforced by a prevalent mistrust of doctors and clinics. Home remedies are common....Root medicine has appeal in that it provides both an explanation of problems and a ritual means of controlling them. In this sense, it may help to put order into a poorly understood situation” (Nelkin, 1970, p. 39). This research group also identified an odd behavior of deliberate urination or defecation in strange places symbolic of something as yet undetermined, but possibly conveying contempt and disrespect (Nelkin, 1970).

Aspects of life which are adapted to, taken for granted, or ignored include everyday struggles such as getting enough to eat, having a place to stay, staying healthy enough to work, finding work, then finding a way to get to work.

Anxiety, depression, and hopelessness are common and real and appropriate in many cases, considering the desperate circumstances many find themselves in. “Exposure to middle class values through television exacerbates this frustration” (Nelkin, 1970, p. 72). Social change within this system is unlikely due to lack of cohesion and organization. “An intolerable situation, reinforced by adaptation to it, can only be penetrated by fundamental changes in the complex relationships that constitute the system” (Nelkin, 1970, p. 72).

Migrant farmworkers in the United States live, work, and travel in one of three main “streams,” all which originate in the south and flow upward. “The Western Stream originates in Mexico, southern Texas, Arizona, and California and moves up the west coast to and through California, to Oregon and Washington. The Midwest Stream starts in Mexico and southern Texas and travels through Arizona, Colorado, Kansas, and Missouri to Minnesota, Wisconsin, and Michigan. Finally, the Eastern Stream moves from south Florida up the coastal states to New York” (Slesinger, 1992, p. 229). The western stream is the largest, and consists primarily of Mexicans and Hispanics, some Native Americans and Southeast Asian workers (Gwyther & Jenkins, 1998). Eastern Stream are rural black, Hispanic, and non-Hispanic whites from southeastern states, Haitians, Filipinos, and Jamaicans. Hispanics are mostly Mexican; however, there are Puerto Ricans, Guatemalan, Hondurans, and other Latin American groups as well (Slesinger, 1992).

Estimates of the numbers of migrant and seasonal farmworkers vary. “The

discrepancies arise largely from technical difficulties in the enumeration of a mobile people” (Griffith & Kissam, 1994, p. 42). Estimates exist that there may be as many as 1.5 million migratory worker and 2.5 seasonal workers, but this number varies considerably from resource to resource between the above estimate and 5,000,000. (Rotherberg, 1998; Napolitano & Goldberg, 1998; Mobed, Gold & Schenker, 1992). Of the 600,000 served by the MHC’s, 50 percent are Hispanic; 35 percent are African-American and 15 percent Asian, White, or “other.” Of that total, 80% are either U.S. citizen or have legal permission to enter. The remaining 20% are illegal immigrants, mostly from Mexico (TB Monitor, 1996).

In this racially heterogenous population are a disproportionate number of both young and poor. One third are younger than 30 years, and only a few older than 60. On average, they have fewer than eight years of formal education, and less than half speak English. Spanish is the predominant language; however, small numbers of workers speak Haitian, French, Creole dialects, and Southeast Asian languages. Family income is about \$7,500 annually (Facts, 2000). Language and cultural differences between the worker and the surrounding culture create barriers to care, increase social and physical isolation and make health education more difficult. These cultural differences increase the likelihood that traditional forms of care, such as ‘curanderos’ or “brujas” will be used, and treatment will be sought in Mexico, not in the U.S.

Slesinger (1992) identifies political and economic powerlessness, and the inability to affect a change in the system, as the migrant workers’ main obstacle to adequate health. “They are powerless because they are extremely poor and mobile, and thus not

able to effect change through political participation and voting in their home communities” (Slesinger, 1992, p.232). In addition, migrant workers are excluded from many federal labor laws, including those that cover collective bargaining and overtime pay (Martin & Martin, 1994).

With shifts in physical locations from month to month, continuity of care for a chronic illness is almost impossible. Ill health stems from an impoverished life, poor environmental conditions, low levels of formal education, lack of insurance, lack of transportation to a health facility, language barriers, and clinic hours that conflict with working hours (Slesinger, 1992).

Communication Systems for Mobile Populations

“Medical efficiency is greatly dependent on the sharing of information between physicians, hospitals and pharmacies. Today there is no system that shares patient data between practitioners efficiently while ensuring confidentiality” (Healthcare, 1999, p. 1).

Twenty three years ago Anderson, Rowley & Cameron (1977) conducted their landmark but forgotten study “Evaluation of a Computerized Problem-Oriented Medical History in a Rural Outreach Clinic for Migrant Farmworkers.” It was an innovation that was lost in the system. Their final evaluation of their efforts noted that: First, it was found that the system did provide an effective means for determining secondary problems in the patient, i.e. problems not related to their primary purpose for the visit. Second, this system can be operated by personnel existing in the clinic with nominal additional training. Third, it was found that both physicians and patients exhibited credibility in the system and believed in its efficacy. Fourth, the system did not impose a large increase in

personnel needs for its utilization. They concluded that the level of patient care could be substantially increased with a nominal increase in physician time by utilizing the new computer technology. This was never acted on.

“Information systems will simplify the monitoring of the health status of individual farmworkers as they migrate and will contribute to population-based health services research” (Gwyther & Jenkins, 1998, p. 66). “There is little communication of medical information between physicians in the United States and Mexico. Although we don’t like to admit it, many physicians in our centers are not adequately able to deal with Latino patients, because of inadequate knowledge of language, culture and health beliefs, or common health problems. Important data is lost as the patients migrate back and forth between the U.S. and Mexico” (Migrant Health Newline, 11/1998).

At the National Farmworker Health Conference last year, the concept of the “Smart Card” and “Heart Fax Program” was presented to the attendants in a forum entitled “Health Data Management: solutions for Migrant Populations. The Smart Card is presently being utilized in three western cities, Bismarck, North Dakota, Cheyenne, Wyoming and Reno, Nevada in the Health Passport Project to store health related information on a computer chip. The purposes of the card use in these cities, according to the three governors, is to improve health care for parents and children with accurate and easily accessible health records, reduce health-care costs in terms of time and money, and give clients greater responsibility for managing their health care. The Health Passport is expected to expedite patient check-in, as well as provide up-to-date health information, support referrals, and promote access to preventative health information. Confidentiality

is insured with the use of a personal identification number (PIN). The users will also have PIN numbers which will limit the information they may access (National, 1999). This card stores basic information from an individual's medical record including: personal identification, emergency data, previous date and place of hospitalization, data on allergies, courses of treatment, vaccinations, and chronic diseases. Patients are able to carry their personal and medical information wherever they are treated. "The medical patient card helps to create a virtual information system network (31K) between the different parties, on a shared basis, for the delivery and the monitoring of health care services. It is more than a storage device, it can provide a secure access key to larger medical records such as images" (Healthcare, 1999, p. 1). This technology allows the healthcare professional to retrieve any necessary element of the patient's complete medical dossier on his PC. (Healthcare, 1999).

The Heart Fax is a patient record retrieval system designed to serve a mobile population. The patient's medical data is transmitted via fax to the central computer. To access the information, the patient or provider calls a toll free number, enters access code, PIN and receiving fax number. The Heart Fax computer then faxes the record to the requesting provider. This technology was to have been implemented in the Florida by late summer of 1999 (Williams & Weinman, 1999).

The Binational/Migrant Tracking System instituted by the MCN in Austin, as previously described, is a similar system to centralize data. However, this system is limited to tuberculosis related health information from a toll-free number, and records are not available by fax.

Prior to the passing of the Migrant Health Act, the committee commissioned by the Public Health Service and members of the Association of State and Territorial Health Officers (ASTHO) in 1950 recommended that “the need for continuity of services as migrants travel from one place to another should be recognized” (Johnston, 1985, p.125) and that “development of a basically uniform set of health record forms including a personal record for the people to carry” (Johnston, 1985, p 126) be instituted. Once established, the Migrant Health Unit enlisted the American Medical Association, the Academy of General Practice and state and local health officials in 1954 to develop the first portable personal health record printed on durable paper and folded to 2 5/8 x 4 inches (Johnston, 1985).

“Obtaining health data on highly mobile populations such as migrant workers is difficult” (Slesinger, 1981, p. 255). “No state or federal vital statistics reporting system requests information on the basis of occupation, thus making it virtually impossible to collect data on this or other occupation groups” (Slesinger, 1992, p. 229)

Napolitano & Goldberg (1998) emphasized the importance of the medical record’s accessibility to all those providing health services to migrant workers and their families. They also acknowledge that existing technology surrounding computerized medical records is sufficient to allow for such a system. The infrastructure and financial support for such a system must be established for widespread use, but it was felt that a centralized database would minimize duplicate paper work, documentation registration, and other data collection, thus using funding sources more efficiently (Neapolitan & Goldberg, 1998). To date, this has not been accomplished; however, the idea has been

presented at national conferences.

Meister (1991) emphasizes that “the need for documentation of migrant health status is genuine and urgent” (p. 512). He devised an occupational relevant medical history form in both English and Spanish, the “Farmworker Health History,” to attempt to elicit information regarding pesticide exposure and other occupationally related health problems over the previous five years. Pesticide exposure from direct spraying or drift from aerial spraying, contact with plant, eating or smoking with contaminated hands, and eating the fruits or vegetables being harvested, drinking cooking or washing with contaminated water and wearing contaminated clothing increase the risk of toxicity and subsequent health problems. There are links with this exposure to limb-reduction birth defects which are four times more common in this population. Exposure is also linked to childhood leukemias and brain tumors, adult lymphomas, and lymphosarcomas, as well as spontaneous abortions, sterility, menstrual dysfunction, immune system abnormalities, and various nervous system effects, including motor coordination, thought processes, anxiety, and depression (Meister, 1991).

Rust (1990) also identified the lack of basic data such as crude death rates, median survival, infant and maternal mortality, and incidence of permanent disability. This lack of data is partially due to the discrepancy in estimates of the size of this population, its transient nature and migrations into and out of the U.S., and the desire of many workers to avoid contact with government agencies. We know that common diseases such as diabetes and hypertension in adults are the most common causes of death in the U.S. However, there is no documentation of the incidence, prevalence, or risk factors for

cancer, heart disease, or stroke in this population.

Summary

Chapter Two described the conceptual framework which guided this study and was developed as a synthesis of several theories. A diagram was created to depict the interacting concepts. A review of literature confirmed the lack of existing communication systems in place to improve inter-clinic communication for the migrant farmworker.

CHAPTER THREE

METHODOLOGY

This chapter will describe the study design to determine the feasibility of using a computer disk as a portable medical record, along with the sample selection criteria, data collection procedure, and evaluation methods utilized to answer the research question. The literature reviewed identified the lack of a coordinated medical record system for migrants, which results in barriers to health care especially for those with chronic health problems. It has also been acknowledged in the literature that the technology exists to improve inter-clinic communications and that obtaining health data on highly mobile populations is difficult. The development of an instrument to address inter-communication problems will be described and its suitability as a tool for improving continuity of care will be evaluated.

Research Design

A descriptive qualitative case study methodology was chosen for this study. The purpose of a descriptive study according to Polit and Hungler (1999) is to observe, describe, and document aspects of a situation as it naturally occurs. Holloway and Wheeler (1996) confirm that the qualitative or “case study” approach to a research problem, can reveal processes that go beyond surface appearances. To conduct this study, interaction with the disk and the volunteers took place in natural settings, the home and health care facility, with observation and researcher participation ongoing. The processes involved in utilizing the computer disk were documented as they occurred. This study reveals the experience of using the disk to collect and impart important health

information. The process of using the disk was emphasized while also describing the experiences of the participants trying to use the disk in other settings which helped to identify potential problems with the disk while also revealing unanticipated benefits and obstacles. The ability of office personnel to readily access the data contained in the disk was assessed in this study. Specific areas of concern relevant to implementation of this innovation including time involved in its utilization, cooperation of migrant outreach office staff or promotoras, migrant farmworkers, clinic staff, and healthcare providers, and the availability of compatible computer systems and programs which can utilize the data base housing the history along with ease of use were observed and described. Costs and unforeseen problems, as well as cultural issues which result from the utilization of the computer disk to store and transfer medical information, were observed and described..

Sample Selection Criteria

The participants chosen for this study were migrant farmworkers or their immediate family members over eighteen years old who were believed to have some chronic health problem.

Data Collection Procedure

Following "Human Subjects Approval" (Appendix D), the process of solicitation for volunteer migrant farmworkers or their family members began. This was accomplished with the aid of the migrant outreach office staff of the Willcox School of District following written permission from the supervisor of the department and also the district's business manager, Bill Holloway. The purpose of the study was explained to the outreach workers as well as the need to find volunteer migrants who might have a

chronic health problem as they would need follow-up care and could use their disks. The outreach workers were knowledgeable of several migrants with health problems who might like to participate. Contact was then made with prospective participants through the school's office. I accompanied the outreach staff to the homes of the farmworkers after previous arrangements for my two hour visit had been made through the outreach office. Upon arrival to the volunteer's house, the oral consent (Appendix C) was read in Spanish and signed, and copies given to the participants. The disks were labeled with the appropriate name and its contents, "The Medical History and Physical of _____". The data for the portable history were collected on a laptop computer and stored on its hard drive under "My Documents" by the migrant's surname. The same information was placed on a the three and a half inch plastic disk given to the migrant farmworker along with a disk cover. "Directions for use of Disk" (Appendix E) was secured to the inside of the disk cover. The migrant farm worker was asked to present the disk to the office staff when health care was sought, at a scheduled appointment. The researcher would plan to be present for that appointment to observe the process of utilization of the disk. The interactions that took place between the migrant, the clinic staff, the physician and the disk were observed and comments about those interactions documented. Field notes were made of all interactions and observations, and subsequent interviews of participants took place following interview guidelines (Appendix F) and reported as case studies.

Evaluation Process

Structured interviews and direct observation of the participants provided the information to determine the feasibility of utilizing the computer disk for transmitting health records between clinics (Appendix F).

The migrant farmworkers were asked about their past experiences with health care providers obtaining histories prior to treatments, feelings of using the disk for this purpose, and any reservations they have about it, and if they felt it improved the quality of their treatment. The clinic staff were interviewed following the use of the disk to determine ease or difficulty of use of the disk and program it was stored in, what impact it had on the quality and process of the intake procedure and the effect it had on their time. The outreach worker's interview identified any cultural barriers encountered when soliciting participants and questions they had about the disk. The questions asked of the health care provider related to any influence the contents of the disk had on subsequent treatment and care given to the patient, their feeling of the disk compared to the system currently in place, and perceived time and ease of use in their clinic. All participants were asked about any problems encountered with the use of the disk, as well as suggestions for improvement.

Specific observations made included the time involved to collect the information contained in the disk, time involved in its utilization by the clinic, its reliability and perceived ease of use by the clinic staff, and compatibility with existing computer programs utilized in the clinic as well as verbal comments made by participant at the time of use. Advantages and disadvantages of using the disk to collect and transport medical

information were tabulated as they related to the client, the health care system and culture.

Instrument Development and Contents

The innovation developed for inter-clinic communication via disk entitled “The Portable History and Physical for the Migrant Farmworker” (Appendix A) followed standard medical textbook guidelines for information solicited for medical histories with modifications relevant to the migrant farmworker population. Modifications included focused on employment history, including the types of crops worked, location, length of time, protection used, responsibilities of their job, and living conditions. Specific information regarding pesticide and other environmental exposure was reviewed. Family health history was obtained, as well as causes of death and health status of children and pregnancy . Because hypertension, diabetes, obesity and alcoholism have been documented as the most common chronic health problems in this culture, a special area was devoted to those, along with a complete problem list.

The organizational format of the portable history was designed for ease of use and immediate access to the most relevant health information of the farmworker. As much relevant health information as possible filled each page to save time. “IDENTIFYING DATA” included the name, date of birth, place of birth, marital status, date of interview, language spoken, and religion. Next was the “FAMILY MEMBERS’ section with spaces for age, health status, and an indication of those living with client. “WORK HISTORY” followed, with space for occupation, location, job responsibilities, protection known exposures, injuries and living condition. There was space for only the

four most recent jobs, but others can be added below. The "PROBLEM LIST" located on the left hand side of the template under "Work History," documented the dates of onset of all health problems experienced by the migrant. Under this list was the client's smoking history, alcohol use and diet. "ALLERGIES" and reactions was followed by a section on "MEDICATIONS" taken, strength, frequency, and for what purpose as well as "VACCINATIONS AND FOLK REMEDIES." "SCREENING TESTS" followed which included tuberculosis, PAP, breast, mammogram, hemocult, PSA, blood pressure, cholesterol, glucose, electrocardiograms, CAT scans, MRI and other, with the month and year of testing and results when known.. The "PAST HEALTH STATUS" covered childhood illnesses, hospitalizations, accidents, and operations. For women only, age of menarche was solicited, last menstrual period, pregnancies and outcomes as well as birth control methods. The "FAMILY HISTORY" listed tuberculosis, asthma, hypertension, arthritis, birth defects, diabetes, coronary artery disease (CAD), epilepsy, cancer and type and retardation, as well as Other. Next to those health problems was a space for the family member and comments. The "CLINIC VISIT SUMMARY" followed and included a space for the date, place and provider's name. The vitals were followed by the height and weight, then review of systems (ROS). Also included was a space for skin, head-eyes-ears-nose-throat (HEENT), lymph, breasts, lungs, cardiovascular (CV), abdomen (ABD), gastrointestinal (GI), genitourinary (GU), neurological, musculoskeletal and psychological findings. A column for Subjective and Objective Findings, Assessment and Plan was provided. The entire "CLINIC VISIT SUMMARY" is then repeated several times, to allow additional practitioners to add their exams and findings

on subsequent visits.

Computer Technology

A template for the Portable History and Physical was created in the word processing program, Microsoft Word. This computer program found in Microsoft Office applications is believed to be widely accessible and utilized and can also be reformatted to use in other programs such as WordPerfect as well as on the Web. Its use will not require additional clinic costs to implement into their client intake system if this standard Microsoft Windows application is available when the patient presents the disk to the staff. A hard copy can be readily printed to keep in the medical record at that clinic. It is not intended that changes be made to the Portable History and Physical once completed by the initial interviewer; however, additional comments can be added and would be appropriate under the "Problem List" and "Screening Tests." The "Clinic Visit Summary" was intended to be used at each clinic to be filled in by the health care provider.

Summary

Chapter Three presented the research design which utilized case studies to qualitatively describe the process of collecting and transporting the history and physicals of migrant farmworkers on disk. The sample selection criteria and data collection procedure along with the evaluation process was described. Finally, the instrument development and contents as well as the computer technology selected for collecting and relaying the medical information was presented.

CHAPTER FOUR

RESULTS

Introduction

Chapter Four presents the results of the feasibility study using the disk containing the “The Portable History of the Migrant Farmworker” by describing the cases in which it was utilized. Included is a brief description of the community where the participant migrant farmworkers are presently living. Each of the case presentations includes a short biographical sketch, a medical synopsis and current health status. Use of the computer disk for initial information intake and its follow-up use by subsequent providers will also be described within each case study. Evaluation of the disk by the migrants and health care providers will be incorporated within the case studies and followed by an evaluation of the disk by the migrant outreach worker. These evaluations are guided by the interview questions in Appendix G and Table 1 summarizes the participants evaluations after use of the disk. Finally, there is a discussion of the technology itself and its applications as discovered in this study.

Description of the Sample and Environment

Recruitment of the volunteers who participated in this study took place in Willcox, Arizona and was realized with the cooperation of the Migrant Outreach Office, through the Willcox Unified School District No. 13. This office, located at the Willcox High School, is staffed by two full-time outreach workers employed by the district, Dolores Mendoza, and her assistant, Ruth Ruiz. Dolores and Ruth help newly arrived

migrant families enroll their children into school, as well as providing assistance in navigating other community resources such as the health care system and the department of economic security. They assist in completing whatever paperwork an agency requires, obtaining legal status for family members, and providing a safe and understanding haven for the migrant child in a new school system, as well as providing transportation and food and clothing when needed. Their office also organizes seasonal “Pack Meetings” at the school’s auditorium to which all the migrant families are invited. Free pizza and presentations are made by community organizations and individuals regarding services available to the farmworker families.

Willcox, located approximately 60 miles east of Tucson in Cochise County, is an agricultural community that was once known as the Cattle Capital of the nation. Located on I-10, the surrounding 15 mile area is the home of apple orchards and packing plants, pistachio and pecan groves, ostrich farms, and grape vineyards, and two hydroponic tomato green houses. Farms in the vicinity also grow chili, cotton, and small grains. Willcox has a population of approximately 3,700 year round residents, as well as migrant workers who are employed by the farms and factories on a seasonal basis. Many migrant workers live outside central Willcox, about 15 miles north of town, in an area known as “Winchester Ranches,” “Perras Flacas,” or “Little Mexico.” This haphazard community of trailer homes has a reputation with the local health department of being a “sanitation and developer’s nightmare.” Other migrant workers live in motels throughout the downtown area.

Case I

Mrs. C, a 61 year old Mexican immigrant born in Oaxaca, is the mother of 10 and has resided in this country for 7 years, but speaks only Spanish. I was directed to Mrs. C. by one of her children, who had a concern about her chronic cough. Contact with the daughter was made through the Willcox school's migrant outreach program. Arrangements were made by phone to meet Mrs. C. at her home in Winchester Ranches. She was babysitting her 3 small grandchildren at the time. An explanation of the thesis project was given and the Oral Consent in Spanish read (Appendix C), which she readily signed.

The laptop computer was set up on a chair in the sparsely furnished living room, and a new disk was placed in the A:drive containing a blank "History and Physical of the Migrant Farmworker" template. Questions were asked corresponding with the subject headings as they appeared on the template (Appendix A) and entered via computer to disk. The information was easily entered in the squares provided on the template. The boxes "grew" when more information than space was available. Directional arrows on the keyboard were used to move to each new content area. This portion of the interview took approximately one hour, partly due to discussions intermingled with direct questioning about the participant's life and clarification.

The second half of the visit, the physical exam, took about 30 minutes. Entering the information obtained from the physical exam onto the disk, along with an assessment and plan, took another 30 minutes. The file was then renamed with the participant's surname and saved in both the C:drive under "My Documents" and on the A:drive, which would

be the participant's own disk. The disk was then labeled and placed in a plastic cover with her name and its contents, "The Health History and Physical of: Mrs. C.," and her date of birth. On the inside cover was a short typed description about the disk's origins as a graduate thesis project and guidelines for its use (Appendix E). Directions for use and purpose of the disk could also be accessed on the A:drive under that heading.

Mrs. C. had no previous major illnesses. Her last pregnancy, 15 years ago, produced triplets, the first of her offspring to be born in a clinic. The only medication she takes is occasional cough syrup. She has noted the cough for at least one year, and states it is worse in the morning and with the cool weather. She denies hemoptysis, but has some related mid-thoracic back pain. She denies fever, chills, night sweats, appetite or weight loss, and is not overly tired. She had been seen and treated by health care providers a year earlier but was unclear about blood test results or other diagnostic exams done at that time. She stated that no one told her the results, nor did anyone speak Spanish in the Sierra Vista office to which she was referred for X-rays. She has also obtained medical attention in the Mexican border town, Agua Prieta, about 80 miles south of her residence, for this cough.

Mrs. C. agreed she needed follow-up treatment; and an appointment was made for the next week at the Chiricahua Community Health Center, to which she would bring her newly made disk containing her health history. The clinic however, canceled her appointment the day prior, saying her "eligibility" had expired and she needed to make an appointment to reapply to obtain further care. She had been seen at the clinic a year earlier for the same problem, but one needs to reapply for eligibility every six months.

The clinic receives funding from the Migrant Health Program to provide comprehensive primary care services to migrant and seasonal farmworkers. Unfortunately, this primary care clinic is located forty miles from her home, posing transportation problems. Because Mrs. C. babysits while other family member are “in the fields” she cannot leave until the children are picked up by their parents, at 3:00. Other arrangements were made to receive local medical attention. She was certain she had never had a tuberculin skin test, so I accompanied her to the Willcox Health Department with disk and \$5.00 in hand (the cost of the skin test). Wednesday afternoons are reserved for skin testing and this was a busy day. The receptionist, however, after a short verbal explanation about the disk by this researcher, did place it in her computer. I watched as she clicked the “My Computer” icon, then the A:drive icon when it appeared. The content options on the A:drive included: (a) Directions for use of the Disk, (b) “The History and Physical of the Migrant Farmworker,” and (c) the participant’s name. I had to tell the receptionist to click on the participant’s name. She clicked on the name, and the completed history appeared on the screen, which was then printed. This was a monumental moment and took less than two minutes from insertion of the disk to printing the hard copy. The hard copy was then attached to her permanent record. Her skin test was read in two days and the results, which were negative, were added to the disk by the health department receptionist. The disk was then returned to the client. The receptionist evaluated the disk as being easy to use and the information readily accessible. She stated she would use it again. She also pointed out that, because the disk was in the control of the client, no medical release form was needed for past health information, which “was nice.”

The Willcox district nurse, Janice, stated that about 45% of the clinic's clientele are seasonal or migrant farmworkers. They use clinic generated intake forms for family planning clinics, sexually transmitted disease clinics, well child clinics and active tuberculosis cases. A blue cardboard sheet is used for all other visits, vaccinations and screening tests. A small white paper that looks like a receipt contains test results and is given to the client to take home for future reference. Copies of all records can be obtained by the client once they sign a release form. The district nurse felt that more information on specific symptoms would have helped her under the "Client Visit Summary." She also noted that the disk would be very useful to other populations as well whose work required frequent moves, such as truck drivers, railroad workers and pipe line welders. This district public health nurse felt that the disk would be easier for clients to carry than papers.

The following week an appointment was made with a local physician, Dr. H. to evaluate Mrs. C's chronic cough. This was Mrs. C's first visit to this clinic, which was self-pay. She presented her disk to the receptionist, and I explained its purpose. The receptionist was able to access information on the disk immediately and printed a hard copy as well, which was attached directly to the patient's new record. This eliminated the need to answer additional questions regarding her past health history, which would have been difficult for this client since she does not read nor speak English. I noted that the "Portable History and Physical" had more information than requested on the office "New Patient Intake Form." However, some information requested on the intake form was not included in the health history: insurance data, person responsible for the bill, home

address, telephone number and name of present employer.

The doctor, upon entering the exam room, reviewed the hard copy of the “Portable History and Physical of the Migrant Farmworker” which was attached to the medical record. She concurred with my earlier physical exam’s findings and appreciated having the results of the TB skin test available. Her assessment and plan were initiated, which included a diagnosis of “allergic bronchitis” and an injection of “Kenalog” along with recommendations that a cough syrup be taken. She requested that the client have another TB skin test and return to her office in two weeks if her condition did not improve. Additional diagnostic procedures would then be ordered, but lack of insurance was also a consideration. This visit alone cost \$80.00 and Mr. C’s husband is presently unemployed. Following the exam, the physician graciously agreed to add her note via computer to the disk under the “Clinic Summary Visit” heading. Mrs. C. was the last patient of the day, which allowed the doctor time to accommodate the project. There was a problem bringing the document up on the computer in the reception area, even though it had done so 30 minutes earlier. Another computer was utilized, and the doctor added her findings, assessment, and treatment given. Inputting this information took her about seven to ten minutes, partially to become familiar with the format and use of keys to move around the page. This was saved on the disk, and is now a part of Mrs. C’s portable history.

An appointment was made for Mrs. C. with the local Department of Economic Security to assess her eligibility to obtain assistance with medical expenses through the Arizona Health Care Cost Containment System (AHCCCS) and to allow her to receive

additional treatment and diagnostic testing through this office, which she could not afford at present. Having only a “green card” she was informed that she must have residency for five years before she would be eligible for continual assistance. Her husband, who had been a resident for more than five years, was also denied assistance due to the status of other family members. However, emergency AHCCCS is available for the uninsured/undocumented, which must be solicited by the physician with an appropriate diagnosis. This will cover medical treatment for one month. Since hers was not an emergency condition, Mrs. C. was not eligible.

Another appointment was made at the Chiricahua Clinic 40 miles away. This time it was agreed that she could have her eligibility re-established and see the health care provider during the same visit. This appointment was also canceled by the clinic, the same day of the appointment, due to poor road conditions from recent rains and no doctor. She declined their request to reschedule her appointment. I encouraged her to return to the local Health Department for her second TB skin test as recommended by both the doctor and district nurse. The district nurse has also agreed to collect a sputum if warranted. She has agreed to do this soon. When questioned about the disk, Mrs. C.’s only response was “me gusto.” She liked it.

Case II

Maria G., 43 years old, was born in Jalisco, Mexico, and has lived in the United States for sixteen years. She and her husband of 21 years have lived near Willcox for the past four years, where her husband works. Both she and her husband are undocumented immigrants. She had been a farm laborer in the Phoenix area in 1985, but has been unable to work in the fields due to chronic pain in her back and legs. A friend with school-aged children suggested that Maria call the migrant outreach office at the school to find out about taking English classes, which are offered in the evenings. Upon hearing about her physical condition, Dolores, the migrant outreach worker, inquired if she would like to volunteer for this project and have a nurse come to her home. She agreed. Dolores accompanied me to her home within the week. The "Oral Consent" (Appendix C) was read to her in Spanish, and she then signed. The laptop computer was set up and a new disk inserted into the A:drive which was labeled "Medical History and Physical of Maria G." along with her date of birth. The information gathered was entered easily, following the template's format, and no problems were encountered with this intake or with documentation of her physical exam. Subjective/objective findings were multiple and the assessment and treatment plan took some extra time to enter. The interview and physical exam took approximately two hours. It was easy to scroll backward to input additional information, which surfaced, to the "Problem List." The information was saved under her surname on the disk, as well as on the laptop's hard drive. Maria was given the labeled disk with its hard plastic cover and made aware that it was important to present the disk where she would next receive medical attention. Maria had not seen a

health care provider for over four years. She agreed to follow-up at a Primary Care Clinic which sees patients on a sliding-scale basis, since she had no insurance nor legal documentation. An eligibility appointment was made at St. Elizabeth's of Hungary in Tucson. This initial appointment requires verification of income, residence, and a picture identification and determines what percentage of the bill will be paid by the client. Due to the presence of a "Border Patrol" checkpoint between Willcox and Elfrida, where the Chiricahua Community Health Center is located, she could not risk an appointment in that facility even though it was closer to her home. Transportation was arranged.

Two weeks from the initial home encounter, with disk in hand, Maria was seen at the St. Elizabeth's southside clinic by a nurse practitioner. The disk was presented at the desk, and the office staff informed of its contents. This was a bit awkward, since the staff were with the Women Infant and Children's (WIC) nutrition program and not with St. Elizabeth' clinic. The nurse practitioner uses a couple rooms one day a week at the center and has one staff person to help her and no access to a computer. However, the AC receptionist was agreeable to booting up the disk on her computer and printing out a hard copy for the nurse practitioner. A problem was encountered when printing the hard copy, and for some reason the words overlapped some of the lines on the template, although remaining legible. This receptionist stated she found the disk was easy to use and would use it again. (She kept her promise because there were two patients with disks visiting the clinic that day). The nurse practitioner made the hard copy a permanent part of the medical record. This health care provider stated that it guided her treatment of the patient, and felt the information it contained to be thorough. The information contained

in the “History and Physical of the Migrant Farmworker” also eliminated the need to fill out another initial intake form which the clinic requires on new patients. However an address and phone number were added. Due to a waiting room full of patients, there was no time for this provider to add to the disk under “Clinic Visit Summary.” Blood tests were ordered on this visit, and a subsequent appointment made for next month. Ideally, those results would be added to the disk as well as the practitioners assessment and treatment plan on follow-up visits.

Maria stated that having the disk helped her receive health care. It did in this instance. A condition of this study, clarified in the Oral Consent, is that “If a health problem is identified, the researcher will assist me in finding appropriate treatment.” She was pleased that lack of documentation as a legal resident was not a consideration to participate in this study and that no mention of that was made on the disk. She is also now in the process of trying to get that status changed through assistance from the Catholic Community Center’s immigration and citizenship division.

Case III

Elvira T. is a 39 year old, married , Spanish speaking mother of three children, ages, 10, 13 and 15. She has lived in the United States for the past ten years, and has worked packing apples in Willcox for many of those. Neither she, nor her husband are documented. The husband is unemployed and has been ill with residual effects from tuberculosis, as well as high blood pressure. Staff at the Migrant Outreach office at the Willcox High School were especially anxious to involve Elvira in this project in an attempt to have her receive medical attention and treatment. Telephone contact was made through the Outreach office and a visit made to the small but comfortable brick home she rents in the middle of town with the help of a local charity. The purpose of the project, and use of the computer disk were explained to Elvira, and she signed the Oral Consent. A new disk, labeled with her name and birth-date was inserted into the A:drive and the "Portable History and Physical of the Migrant Farmworker" easily assessed on my laptop. Questioning began, following the prompt of the template format, and information was easily entered onto the disk. That initial hour of interview and computer input revealed that Elvira was indeed in need of medical attention.

In May 2000, Elvira had been hospitalized at St. Mary's Hospital in Tucson with acute paralysis of her right side resulting from a stroke. Following her release from that facility, she had not been seen by a health care provider. Although follow-up treatment and monitoring must have been recommended upon her hospital discharge, her financial situation, lack of transportation and husband's illness prevented this. She currently is experiencing headaches, blurry vision, right sided weakness and occasional hematuria.

She has been taking her husband's Atenolol, for high blood pressure, on and off since that hospitalization.

A physical exam was conducted, revealing a blood pressure of 160/102. Her neurological assessment was intact. She had some edema of hands and feet. This information was entered under the "Clinic Visit Summary" with the follow-up plan to obtain a permanent health care provider as soon as possible to monitor her condition and medication. As an undocumented alien, her options, as were Maria's in Case II, were limited. She could not risk going to the Chiricahua Clinic in Elfrida due to the Border Patrol's checkpoint. An eligibility appointment was also made at St. Elizabeth's of Hungary in Tucson. She and Maria were seen to determine eligibility and sliding-scale status the same day, and subsequent appointments made to see the health care provider concurred as well. I recommended that Elvira sign a consent for her St. Mary's medical records to be sent to this clinic as well, which would also support findings found on her disk. The disk was presented to the same receptionist as in Case II, and her completed "Portable History of the Migrant Farmworker" retrieved from the A:drive, and a hard copy made. This was given to the nurse practitioner, who made it a part of the permanent record. Medication was prescribed and lab work ordered. Although, as with Case II, time constraints did not allow the nurse practitioner to add to the disk, a computer to do so was available. The nurse practitioner's comments were positive about the content of the disk and she stated that the information on the disk helped guide her exam. She stated as earlier that she felt the form to be "very thorough."

Elvira stated she liked having the disk. She felt that it might help her in an

emergency situation. If she were not able to communicate her past problems, the disk might help the emergency room staff know what's wrong with her.

Case IV

Mrs. L. is a 55 year old divorced native of Mexico, born in Ciudad Juarez. She is the mother of an 11 year old boy born in the United States , and 2 daughters, one of whom died of leukemia 2 years ago. She is undocumented, although her son, Angel, was born in the United States and she has lived here over 20 years. Mrs. L. lives across the street from the Willcox High School and is a frequent visitor to the Migrant Outreach Office who helped her find her present apartment. She was willing to participate in this study at its onset, however, she was the most difficult to find, since she has no telephone and is rarely home. Accompanied by Dolores from the high school, who arranged the visit, Mrs. L. was read the Oral Consent in Spanish, which she then signed. Her apartment was dark, with few furnishings but her son's bike in the living room. A well worn hoe was leaning near the front door.

Having set up the laptop computer on the case containing supplies for the physical exam, the newly labeled disk was inserted into the A:drive and the blank "History and Physical of the Migrant Farmworker" was brought up. The next two hours were spent filling in the blanks as well as between the lines, as Mrs. L. related her extensive work history in the fields from California, and New Mexico to Colorado over the past 20 years, including where she had worked, her job responsibilities as picker, packer and cleaner, and known exposures to pesticides. She became excited when talking about Colorado and the beautiful San Joaquin Valley in California. This information was carefully typed into the areas provided on the "Portable History" (Appendix E) but unfortunately there was not enough space to document her work history. It was found by moving the cursor between the main categories and blocks, that additional information could be added,

which was done. Her "Problem List" was extensive. She reported a history of colon cancer for which she was operated on at University Medical Center in 1998. She also has an arthritic condition and the "moon face" of one who has been on steroids. However, she has not been seen by a health care provider since that hospitalization. She had taken Prednisone in the past, but her prescription ran out and she could not renew it without a medical evaluation. She was managing her severe arthritis with occasional aspirin and ibuprofen. The first portion of the Portable History took over 2 hours to collect, so it was agreed that I would return to perform the physical exam portion the next day. There were a few distractions when her 11 year old son came home from school. In the process of saving the information on the computer that had just been collected, I inadvertently pressed the wrong key and deleted it. All that could be brought back to the screen was a blank Portable History. I took Mrs. L's disk home and filled in as much as could be recalled, prior to the next visit. Mrs. L was very understanding and patient, as I asked her again about her work history. She seemed to enjoy recounting those experiences and the places she had worked. The "Portable History and Physical" was completed during this visit, in about 1½ hours. Mrs. L. agreed that it was time to be seen by a health care provider again, especially since she had related to me that there was blood in her stool. Transportation and lack of finances were the main reasons she never returned for follow-up care. In 1998, her care was provided under "emergency" ACCCHS, which is good for a month. Mrs. L. liked the University Medical Center (UMC) staff and wanted to return there for care. She even had the home phone number of a doctor who cared for her two years ago. She said that he would see her if she called him. She was encouraged to do

so. Mrs. L made her appointment to be seen by the physician that operated on her two years earlier and whom she liked and trusted. In the past, Mrs. L. had taken the Greyhound bus the 80 miles from Willcox to Tucson costing \$26.00 round trip. . She has always brought her son to medical appointments in the past so as not to worry about his whereabouts after school and to translate for her. Private transportation was arranged to the surgical clinic at the UMC to see Dr. R. Following a two hour trip, Mrs. L. arrived at the clinic to find out her appointment **was for the following day**. We were frustrated, but Mrs. L observed, "Better the day before the appointment than the day after." I asked her what she would have done if she had taken bus today. She related a similar experience in the past when the clinic needed labs drawn the next morning. She and her son spent the day touring the hospital and sleeping in the waiting room until the next morning when blood could be drawn. Because of that, she lost her return ticket which had been paid for in advance and had to buy another for she and her son to return home.

The two hour trip was repeated the next morning, but half way to Tucson Mrs. L. realized she had left her purse at home which contained the disk with her portable history. She did remember to bring a bag of food, with tamales, left over pizza and sodas. I assured her that this project would still benefit from her participation and that I could at least test the system by using a disk with a blank "History and Physical of the Migrant Farmworker." I reminded her that Dr. R. already knew her history and had records already available in his office. I felt if a hard copy of the template could be made, then the doctor could comment on its contents. When Mrs. L. checked in, the receptionist told her she would have to pay for this visit, and they would bill her. The receptionist

presented her with an “Application for Premium Sharing” which are used by those without insurance. However this can’t be used by undocumented persons. Mrs. L. just smiled. I then briefly explained my project and presented the disk to the receptionist. She was agreeable to making a hard copy for the doctor, but had to change computers. After inserting the disk into the A:drive only the “Directions for Use of the Disk” appeared in the dialog box which she readily printed. I advised her there was another file and that she needed to change the “FILE TYPE” to “All files” from “Word Document.” Once she did this, the “History and Physical of the Migrant Farmworker” readily appeared in the dialog box as well and a hard copy was made.

Dr. R. hugged Mrs. L. on their encounter, and commented on her son’s new glasses. It was obvious they were old friends. I introduced myself and the reason for my being with Mrs. L. He was pleased that finally she had some follow-up care. He was fully aware of her situation as an undocumented, uninsured patient with multiple health problems. We talked outside the room about Mrs. L’s healthcare options. He had “slipped” her through the system before with emergency ACCCHS, but this was not an emergency. She had been living with the arthritis pain for a long while. I mentioned St. Elizabeth’s as another option and we agreed she should try and be seen there. Then, at least, she could have her prednisone and pain medicine monitored, and if additional surgery was required, they could then refer her to him. He explained this to Mrs. L. very gently, and she understood. He did tell her that if she failed to receive treatment at the clinic, she could still call him. He commented in Spanish, “If we can’t go through the front door, we’ll go through the back.” Dr. R. also commented on the blank “History and

Physical.” He pointed out that as a surgeon and specialist, the extensive history would not be as valuable to him as one in primary care. He felt the contents of the disk would be very helpful if the provider did not speak Spanish. After receiving samples of Vioxx, Mrs. L was on her way. Dr. R. wants to hear about her follow-up at St. Elizabeth’s Clinic since he was unaware that she might receive treatment there. An eligibility appointment at St. Elizabeth’s was made, and information from Catholic Community Services obtained to begin the process of becoming a “legal resident”. After all, she has been living and working in the states for over 20 years. Her eligibility has been assessed, and she will not have to pay anything for her care at the clinic. She has an appointment with the Rheumatologist at the end of the month there.

Mrs. L. stated she liked having the disk with all her medical history and “everything about her life’s work.” She noted that even though the hospital has a large medical file on her, it does not contain all the information about past accidents and work history. She stated that no one had ever asked her many of the questions that were on the “Portable History” form before. She stated she will always keep it in a safe place. I encouraged her to keep it in her purse, and present it at the front desk whenever she has a clinic appointment or medical emergency.

Case V

Mrs. G. is a divorced, 37 year old mother of three children ages 16, 14 and 10. She recently moved to the area to work picking chili peppers and her children began school in September. Dolores explained this study, and Mrs. G. was anxious to become involved. An appointment to visit her at home following work, was set up. When I arrived alone to her small trailer, it became clear that Mrs. G desired medical attention for her 16 year old daughter who had problems with lower leg swelling for some time. I explained that this thesis project was limited to those over 18 and that I had intended to collect her medical history and perform a brief physical. She stated she was in perfect health, although had not been seen by a health care person for several years. She was adamant that my visit focus on her daughter's condition, not her. She did not seem to understand how the portable medical history would benefit her for future use, an apparent limitation in this study with some cultural significance. What is important is the here and now. No intake was to be done on this visit, if not for the daughter. She and her family were also undocumented and uninsured. I assisted in helping her set up an eligibility appointment the following day, to begin to receive health care through the front door.

Migrant Outreach Worker Experience

Dolores, the migrant outreach worker for the Willcox School District has used computers in the past to collect and transmit data on migrant farmworker children including educational data and history of vaccinations. A laptop computer and modem is supplied for the purpose, and the computer program "CoStar" is utilized to electronically transmit information through e-mail to a central "Migrant Terminal" in Tolleson, Arizona. She stated that over \$6,000,000 through Title I state funds finances this program, along with her salary as well as other home outreach persons, and workshops and training sessions. She has not been able to use this system for the past couple of months, because of a computer malfunction.

When she approached prospective volunteers about this project, all were receptive. They were "happy and surprised that someone was going to be caring for the parents as well as the children."

Dolores felt the main barrier to healthcare for this population is lack of transportation and documentation status which prevents use of all available clinics. She did not feel that the migrants were afraid of using this new technology and that most of the migrants she knew had already been exposed to computers at least through television.

She felt one of the main benefits was already having the information available regarding past health status when arriving at a new clinic, and not having to repeat the same information over again. She was disappointed that the providers could not add information to the disks due to time constraints.

Table 1: Summary of Responses to the Portable Health History by Stakeholder

Migrant	Clinic Staff	Health-care Provider	Outreach Worker
<p>Liked the disk</p> <p>Took up less space than paper and easy to care for</p> <p>Would help them when they sought medical care in an emergency</p> <p>Never had been asked some of the questions</p> <p>Not threatened because no documentation required</p> <p>Never carried medical record previously</p>	<p>Easy to use</p> <p>Took "a couple of minutes" to access info</p> <p>Would use again if client presented it</p> <p>Liked the idea</p> <p>Helpful, reduced need to send for records</p> <p>Computer accessibility not a problem</p>	<p>Guided care</p> <p>Felt content was thorough</p> <p>Would add additional data if time permitted and computer available</p> <p>Would like more info about symptoms</p> <p>Would like to know where screening tests performed</p>	<p>Has used electronic records for children in the past</p> <p>The idea was well received by the migrant families- happy and surprised to have service for adults</p> <p>Felt it reduced repetition of information</p> <p>Felt barrier to its use would be transportation to a clinic and undocumented status</p> <p>Noted problem that new information not added by subsequent providers</p>

EVALUATION

It was found that using a 3 ½ inch floppy disk in a simple word processing program to collect and transport the medical history and physical of a migrant farmworker is feasible, easily implemented, and readily accepted (Table 1). The actual template made to record the information collected for the histories was created using the Microsoft WORD 97 word processing program. It was discovered that the information on the disk was readily accessible in the variety of clinics which provided healthcare services and a hard copy containing its contents also could be printed without difficulty by the receptionists. They did require some coaching to access the file. However, it was also noted that no one accessed the “Directions for Use of the Disk” (Appendix E) which was clearly available.

The template created in WORD 97 seemed to be fulfill the requirements necessary to document a thorough history in a systematic way that could be easily replicated and saved to multiple disks, ready for use. Most entries to the template, were made in individual off sections that “grew” to accommodate whatever information it must contain. The boxes helped to visually organize the information. As the person who performed the interviews and inputted the information, I felt the content of the template flowed smoothly and was appropriate for collecting pertinent information. Inputting of the information was rapid and only dependent on my typing speed and accuracy. The receptionist at the Health Department added the date and results of the TB skin test to the disk with ease, taking only a few minutes. The physician that did take the time to add to the disk under “Clinic Visit Summary” did so also with ease once the

template was brought up on the screen.

Information lacking from the disk, that was commonly requested by the clinics included address, phone number, insurance status, and who would be responsible for the bill.

The problems encountered with the disk included SAVING the information correctly. After one interview was almost completed and ready to be SAVED under the participants surname, the information was inadvertently lost due to operator error. The interview had to be redone and again typed in. The information was saved to the floppy disk as well as to the C:drive on the laptop. Although the disk carried by the participant could be updated by subsequent providers, there was no means of having that information centralized in this study. This could easily be accomplished and is important for replacing lost disks. One receptionist could not find the "The Portable History" on the A:drive. This resulted because "ALL FILES" was not appearing under "File Type" on the dialog box. It was necessary that I explain the use of the disk to all "systems" personnel, since this was the first time they had a client present with medial information in this manner. All staff, however, were familiar with how the floppy disk worked in their respective computers.

The migrant farmworker family members were receptive to this technology which could be brought to them. The information gathering time was done at their convenience, and they had something in hand when the interview completed. The disk was given to each participant and in their control.

Summary

Chapter Four presented the results as case studies in four separate instances. These case studies documented the experience of using the disk in the home settings of selected migrant farmworker family members to collect the medical history and document physical findings. The use of the completed disk, labeled with the migrant's name, was then followed in subsequent clinic visits. Table 1 summarizes the verbal comments by the participants following informal interviews after using the disk. Evaluations gleaned from direct observation were also incorporated within each case presentation, as well as the migrant outreach worker's experiences with this study.

CHAPTER FIVE

CONCLUSION AND IMPLICATIONS

Chapter Five evaluates the use and effectiveness of using a portable medical history and physical on computer disk for improving inter-clinic communication. The results presented in Chapter Four will be discussed within the conceptual framework developed for this study. The relationship of the results to the conceptual model are also discussed. Benefits of using the disk and portable history and its implications for nursing are presented. Finally, the limitations of this feasibility study are identified along with recommendations for further research.

Relationship of Results to the Conceptual Orientation

The conceptual orientation for this study was a synthesis of systems theory and change theory with the contributing components of the change agent concept and culture. The following table presents the advantages and disadvantage discovered when utilizing the disk containing the “Portable History and Physical of the Migrant Farmworker” as they relate to elements of the conceptual model.

Table 2: Relationship of the Advantages and Disadvantages of the Disk as a Portable Medical Record to Elements of the Conceptual Orientation

ELEMENT OF CONCEPTUAL ORIENTATION	ADVANTAGES OF DISK	DISADVANTAGES OF DISK
Client system	<ol style="list-style-type: none"> 1. Helps remove barriers to continuity of care - keeping all health information together 2. Confidentiality - client is in control of the disk and its contents 3. Helps remove language barriers 4. Helps remove transportation barriers when data collected in client home 5. Helps remove financial barriers when data collected at client's convenience 6. Small, easy to take care of and carry 	<ol style="list-style-type: none"> 1. May be lost, misplaced, forgotten or easily destroyed 2. Provider may be unable to access information 3. Requires extra time to make access info on computer 3. Provider may not take time to add information 4. Information may be inaccurate 5. Not easily replaced since no central storage bank
Health-care system	<ol style="list-style-type: none"> 1. Ensures communication between health-care providers is consistent 2. Saves time <ul style="list-style-type: none"> - staff does not need to repeat interview for information already collected - treatment priorities more readily made with history available - no need to send for old records - information does not need to be collected during clinic hours 3. Saves money <ul style="list-style-type: none"> - prevents duplication of services (ie. diagnostic tests) - disk is inexpensive - no new computer software needs to be installed to access information on the disk 4. Easy to use 5. Adaptable/flexible tool <ul style="list-style-type: none"> - information can be gathered in any setting if laptop available 6. Confidentiality maintained because disk in client's control 7. May help to increase use of system by eliminating barriers to care 	<ol style="list-style-type: none"> 1. Information can be lost due to computer malfunctions 2. Compatible computer system may be unavailable 3. Viruses spread via disk 4. Requires additional staff time to access and input data 5. Staff not familiar with use of as storage device for medical record 6. No means to centrally store data so potential loss of all information 7. No control over who enters or deletes data on the disk 8. Information may be inaccurate
Culture	<ol style="list-style-type: none"> 1. Empowers client to be in control of an aspect of health-care 2. Eliminates language barriers 3. No threat of deportation due to lack of documentation 4. Small, easy to care for and store 	<ol style="list-style-type: none"> 1. Not future oriented - survival needs must be met first 2. Small, easily lost or forgotten -not a priority when moving

Relationship to the Change Implemented

The computer disk containing the Portable History and Physical of the Migrant Farmworker fulfilled the requirements described by Rogers (1983) necessary for diffusion of an innovation (see Table 3).

Change or innovation, when introduced into a system, is more likely to be adopted by individuals in that system, when the change is perceived as an advantage, that is, when it is perceived as better than what they were previously doing. This innovation, the computer disk with Portable History and Physical of the Migrant Farmworker, proved to be well received not only by the migrants but also by the clinics or health care systems where it was introduced. The migrant farmworker family members who participated in this study were anxious to become involved with this change in a system (the health care system) that they had difficulty accessing because of distance and transportation, undocumented status, low income and lack of money.

The computerized health history offered these individuals the means to access a distant health care system. The health history on disk replaced no health record and no care at all. The health history on a disk came to the individual migrant. The migrant families did not need transportation to access this extension of the health care system. They did not have to take a day from work, as was the case with Mrs. C. who continued to "babysit" while her medical history was being compiled. For the health care system, the health history on a disk replaced a lack of previous knowledge about the patient and saved time for both the provider and the migrant. The information gathered on disk did

not have to be rediscovered, only clarified by the health care provider. The information collected on the disk was compiled over a two-hour period. The usual amount of time allotted the health care provider in today's clinic is approximately 15 minutes a visit.

All participants were familiar with computer technology. All, except the migrants, used computers on a daily basis. The migrants had been exposed to computers via television and through their children at school. They observed closely observed while I entered their health information into the laptop computer. They voiced understanding of how they would use the disk when they sought health care. All participants expressed positive feedback after using the disk revealing compatibility with existing values.

The lack of complexity of the technology was evident in its ease of use and accessibility in a variety of clinical settings including the local County Health Department, the St. Elizabeth of Hungary's southside clinic, a University Medical Center specialty clinic and a private doctor's office. The health history template was developed in a common word processing program that did not require additional software installation in computers to be utilized.

Although this qualitative study provided only an initial limited test of the innovation, participants quickly recognized its benefits for improving inter-clinic communication. A large quantity of information is stored and portable, and carried by the migrant worker. This reduces the problem of ensuring the confidentiality of the information because it is only in the client's possession to use as he/she sees fit. Additional advantages to the use and implementation of the disk discovered in this study were identified earlier (Table 2).

Table 3. Comparison of Characteristics of an Innovation Necessary for Diffusion with Results of Study

Characteristics Necessary for Diffusion	Study Findings
<ol style="list-style-type: none"> 1. Relative advantage over that which it replaces 2. Compatibility with existing values 3. Lack of complexity 4. Ability to test on a limited basis 5. Communicability 	<ol style="list-style-type: none"> 1. Replaced no health record at all and lack of knowledge of previous health history 2. All participants were familiar with computers and accepting of this technology and "liked the disk" 3. The information on the disk was easily inputted and accessible and clearly organized in a familiar word processing program. 4. Exemplified with this study 5. The information on the disk was easily accessible in a variety of clinical settings. The benefits of its utilization were readily understood by all participants.

Relationship to the Change Agent

The change agents included the staff of the Migrant Outreach Office and myself. Dolores and Ruth, both Hispanics, were trusted links between undocumented farmworker families and other social systems, including the education and health care systems. Together we fulfilled the seven identified roles of the change agent according to Rogers (1983), identified in Table 4, which helped to successfully link the client system with the healthcare system and allow implementation of the innovation. The change agent role was vital to the realization of this study because of the cultural differences between the systems and technology to be linked. The change agents ensured the interactions took place between the migrant farmworkers and the health care system, and that the disk was utilized. Upon termination of the study, the individual migrants were informed of how

and where they could continue to receive health care, not only for emergency conditions. Phone numbers of organizations were dispersed which could help arrange legal documents for those interested.

Table 4. Comparison of the Seven Roles of the Change Agent with Study Results

Seven Roles of Change Agent	Study Findings
1. Identifying/developing the need for change	1. Development of a tool to improve inter-clinic communication
2. Developing rapport and trustworthiness	2. Previously established through migrant outreach office/staff
3. Viewing the situation from the client's perspective	3. We went to our clients homes and accompanied them to clinic and eligibility appointments
4. Motivating an interest in the innovation	4. Migrants were eager to participate when discovered they could receive medical attention when they used the disk
5. Translating intent into action by activating peer networks	5. Telephone contact and home visits were conducted
6. Stabilizing adoption and preventing discontinuation	6. Migrants kept clinic appointments to establish eligibility for healthcare and documentation. Participants intend to keep disk and use when they seek healthcare
7. Achieving a terminal relationship by developing self renewing behaviors and self reliance	7. Follow-up appointments at St. Elizabeth's clinic were made and subsequently kept but transportation remains a problem. Phone numbers of available resources were made available to the migrants.

Relationship to the Client System

The barriers to healthcare for the migrant farmworker enumerated in the literature reviewed were commonly encountered in the case studies reported. Those barriers

included poverty and low income, language differences, lack of continuity of care and information, rural isolation and unreliable access to transportation, and economic uncertainty. The migrant population of this study was less mobile, and their family members were employed generally as seasonal workers. Mrs. L. and Maria G. had earlier migratory farmworker backgrounds. Mrs. C and Elvira were married to men who followed the streams. Of those who participated in the study, only one had a legal visa and social security number. Lack of legal documentation was found to also be a major concern and obstacle when seeking health care. The Primary Care Clinics that provide care for the undocumented and uninsured were found to be distant and posed a threat of deportation. Transportation barriers and threats of deportation were eliminated with the use of the disk in the home of the migrant. Financial barriers which limit access to health care due to missed work time were also reduced with use of the disk since the information could be collected at the convenience of the farmworker without loss work time. Reducing these barriers resulted in increased utilization of services.

Major health problems encountered with the study's participants were also consistent with the review of literature. Uncertainties with past diagnosis and diagnostic procedures were evident in each case study. Mrs. L. had the most extensive farmworker background. She also had the longest "Problem List." She acknowledged known exposure to powders on fruits she had harvested and resulting skin rashes. She relates a history of colon cancer and had a daughter die of leukemia whom she had raised while working in the fields. Her present arthritis and kyphotic spine are also probably linked to her life style as well as constant irritation on the soles of her feet. She experienced three

miscarriages. Maria G. not only suffers from back pain and leg numbness due to circulatory problems but depression as well, and has fertility problems. Elvira's health problems and resulting stroke might have been prevented with early detection of her high blood pressure and reduction of risk factors through life style changes within her control. Mrs. C. has a chronic cough. Respiratory problems are common in this population as well as tuberculosis. Up until their use of the disk, these problems had not been totally addressed nor adequately documented. The "hard copies" of these histories are now a part of their permanent records in at least three different clinical settings.

It seems feasible to expand use of the computerized health history to a variety of settings. In addition, medical histories could be collected in migrant's homes, medical clinics or community centers, which would accommodate and service the maximum numbers of migrant farmworkers in places they could access easily. It would be helpful to arrange times for recording the health history around the migrant's work schedules as well, for example, with evening intake sessions. Trained bilingual lay persons with laptop computers could collect and input the medical history. It would be necessary for licensed professionals to perform the physical exams, which would become part of the ongoing "Clinic Visit Summary". This could be accomplished by either nurse practitioner or medical students as well as seasoned practitioners. Follow-up care could then be arranged for those needing additional treatments or diagnostic procedures, as well as referrals to other resources available to assist the migrant workers.

Relationship to the Health Care System

It was pointed out in the review of literature that less than 20% of migrant farmworkers utilize the services available for their health care or other assistance. In this study, one participant had utilized emergency services once in the past year, and another a year earlier. It had been over two years since the other participants had received any medical attention. Only one had reported ever having a TB skin test performed. There was a lack of knowledge about the services provided by the local health department. The lengthy application process to receive social services was experienced when I followed Mrs. C to her ACCCHS eligibility appointment. Completion of a five page questionnaire was required prior to even getting an eligibility appointment to receive ACCCHS. Once the appointment was made, there were again transportation problems, work conflicts, and language barriers. Mrs. C. was required to bring her own translator. A clinic appointment was canceled after arrangements had been made for transportation to the facility 40 miles away and alternative care found for her three small grandchildren. Someone at the clinic discovered Mrs. C had not been seen for over a year and her "eligibility" had expired. This could have been noted at the time her visit was scheduled, two weeks earlier. This happened twice to the same client, Mrs. C, at the same clinic. In another instance, Mrs. L. traveled two hours to find out her appointment was for the following day. Both Elvira and Maria had erroneously been given appointments on the wrong date and were notified that an error had been made by the receptionist who had scheduled them for the wrong day. They were then told they needed to reschedule in two weeks. This is not an inconvenience for the clinics, but is very difficult for the migrant

who has arranged transportation to the distant clinic and many times loses work time as well. No wonder there is low utilization of services by migrant farmworkers when these type of interactions with the health care system occur and are apparently common.

The lack of continuity of care even for a non-mobile group of farmworkers, was also apparent in the case studies. Only one of the study's participants had been to the same clinic more than once, two years earlier. No participant had any type of prior health record in their possession. However, both Elvira and Maria G. had follow-up appointments at St. Elizabeth's when this study was concluded. When the individuals who participated in this study do seek treatment in other clinics they can present their disk to the health care providers with confidence that past medical issues and treatment regimes will be known. As earlier mentioned, the hard copies of "The Portable History and Physical of the Migrant Farmworker" are now part of permanent records in some clinics. The use of the disk also resulted in increase utilization of services by these migrants.

Relationship to the Culture of the Migrant Farmworker

The results of this study revealed that the disk and the information it contained were readily and eagerly accepted by the participants in this study. Common characteristics of this population include powerlessness due to low socio-economic status and lack of legal documentation, uncertainty about the future, present orientation due to survival needs, and the need for dignity, and pride in their work and work-ethic. The disk, and the information it contained, did not seem to conflict with existing values and

beliefs. Primarily, there was no cost to the migrant to participate in this study and use the disk. All had financial difficulties. The disk did not discriminate on the basis of legal documentation nor language which might have contributed to its acceptance as well. This population is generally not future-oriented, with immediate survival needs the priority. However, the disk did help the participants receive immediate health care in the form of a physical performed by the researcher, which was documented on the portable history along with any symptoms and other health problems encountered. A condition of this study was that if further health care was needed, they would be assisted in finding that care.

This disk provided a source of security and a sense of pride as evidenced in the case studies. The sense of security it provided was apparent in Elvira's comments about using it if she ever needed to go to the emergency room again. It was a source of pride for Mrs. L, who commented that she felt it was better than her medical records at the hospital because it documented where she has worked in the past. Because this was considered important information to be collected and documented on the disk, her pride in a strong work ethic, dignity and self-esteem were reinforced.

Maria, who has been powerless, liked the disk because it didn't identify her as an undocumented person. She had lived in fear of deportation. Because no mention was made of her status in the United States, she was helped in finding medical care and becoming a legal citizen.

Table 5. Perceived Cultural Implications of Disk Apparent in Case Studies

Case Study	Cultural Implications
I Mrs. C	Acceptance, did not discriminate, no cost, reduced language barrier
II Maria	Reduced feelings of powerlessness due to lack of legal documentation, sense of control
III Elvira	Provided source of security
IV Mrs. L.	Self esteem enhanced, dignity, pride, work-ethic reinforced

Benefits and Implications for Nursing

The benefits of using a computer disk containing the “History and Physical of the Migrant Farmworker” demonstrated with this study included savings in time, costs, and uncertainty for both the patient and health care providers. The use of a simple computer disk is an extremely inexpensive means of accomplishing the large task of improving inter-clinic communication between health care providers. The cost of a disk along with hard plastic cover is less than \$1.00. There would be no cost, except in time, to transfer the data from one computer to the next, if the Windows program is available on the computer. The time spent collecting the data, would save time later, when the patient sought care, eliminating the need to send for old record if at all possible, or perform unnecessary tests. With information the disk contained, the health care provider would be directed to the most pertinent health concerns of the patient.

There is no need to have special computer programs installed in the user’s computer to use the disk. It was demonstrated in this study, that the disk and its contents are readily useable and its contents accessible in variety of health care settings, including

a health department, a private physicians's office, and a primary care clinic. However, the disk can be easily forgotten, as happened with Mrs. L, even though she knew it was important. Problems accessing the information can also occur for unknown reasons, as was encountered in Dr. H's office.

It was discovered with this small sampling of people that diagnostic tests have been done, but the client is unaware of what the test was done for, or the results. The Portable Medical History eliminates the need to have records sent for from other facilities, which is time consuming for both clinics and staff members. Confidentiality is ensured when the patient is in possession of their own record. When past health records are available there is more probability for continuity of treatment and this eliminates the need for duplication of services, such as testing. If the client is unclear about diagnostic studies done in the past or the results of those studies, the contents of the disk would clarify that, without the need to repeat tests, (eg. a TB skin test that was recently done because documentation was unavailable).

The time involved to collect the information on the disk, approximately two hours, was at the clients' convenience, in their homes. This eliminated the need to make transportation arrangements and accommodated a busy work schedule. It would be unrealistic to expect a health care provider in a busy clinic to collect this much information at one visit, especially if the care were for some urgent condition. Having this information already available would be an alternative, and the disk provides this.

All of the clients in this study were Spanish speaking only. Communication barriers were encountered at the private physician's office and health department, with

few Spanish speaking personnel available when these visits took place. This study demonstrated the benefits of having a Spanish speaking client's history already translated into English when language is a barrier.

Nursing staff and nurse practitioners can and did use the information available on the disk to guide health promotion and disease prevention activities. The district nurse at the health department became aware of the void in the client's screening for tuberculosis after viewing the disk's contents and administered the patient's first TB skin test. Those results were then added to the disk by the secretarial staff. The nurse practitioner at another clinic stated her treatment of the client was guided by the information contained on the disk as well. The disk revealed what the client's past blood pressure readings were and the medications she had taken in the past. The "Problem List" on the first page was completed and the nurse practitioner could prioritize her care, subsequent treatment and patient teaching more readily without a time consuming interview to discover the problems already documented.

It became clear, with this study, that home visits by the provider who comes to the client is one means of improving access to care for this population, by eliminating barriers to care including transportation and financial and also risks of deportation. In combination with the disk, which helps to remove the problem with continuity of care and language barriers, nursing services might be guided in directions that promote access to care for this vulnerable population. Bringing health care services to the client has been shown in this study to increase utilization of existing services.

Limitations of the Study

Although demonstrating the feasibility of the innovation, the small number of volunteers and health care facilities that utilized the disk might make generalizability difficult. Because the disk and its contents were unfamiliar to the clinics where it was introduced and language barriers existed between the migrant and clinic staff, it was necessary for the researcher to be present and to verbally explain and guide its use. In a larger study, this would not be possible. This obstacle might be overcome with a letter to clinics and healthcare providers explaining the study and asking for their participation prior to the migrant coming to the clinic.

This researcher or another health care provider, while having collected histories and performed physical exams in the past in the course of her studies and nursing, may overlook important information, or not completely fill in the required information accurately as a result of human error.

For this study, the innovation was not only the computerized health history, but also the researcher who recorded the history and performed the physical. It was difficult to separate the effect of one from the other, as one could not function without the other. The disk does not speak, nor collect the data on its own. Any use of the disk will require one to input the information. The person to determine what information is entered should be a professional health-care provider. Ideally, that person would eliminate the middle man and input the information themselves which would also save time and repetition. This innovation is dependent on others to succeed.

Recommendations for Further Research

While this study confirmed that the use of a computer disk containing the history and physical of a person is feasible for communicating important health information in a variety of settings, its impact on the healthcare of the migrant farmworker has not been proven. Additional qualitative studies on a much larger scale, as well as surveys, would be needed to determine if using computer disks makes a significant difference in helping to remove barriers to care for the migrant farmworker and increase utilization of healthcare facilities. To get the best results may require a combination of disk and home visits by the health care providers. The impact, benefits and limitations of home visits to this population should be studied as a realistic means of reducing barriers to care.

The content and format of the information contained on the disk may need to be revised to become more relevant to a variety of health care providers. This could be accomplished by soliciting the input and recommendations of a larger number of health care providers as to content. The present disk lacks space for “psychosocial history” which might reveal past experiences with violence or drug abuse which are significant health problems in the migrant population. This content area should be added to the present template.

This researcher has limited computer experience and is unaware of all technological advances available today. This study utilized a simple means of creating a form on a disk. There most likely are better ways to do this. For this project, the data collection methods were sufficient and inexpensive and did not require additional computer software. On a larger scale more advanced technology might be utilized.

Summary

This chapter described the relationship of the findings of this study to the conceptual model which was developed out of a synthesis of systems and change theory and the concepts of change agent and culture. The benefits and limitations of using a computer disk to improve continuity of care and inter-clinic communication were identified. Additional advantages to the use of a computer disk in eliminating other barriers to health care for the migrant farmworker population were also shown, including those posed by transportation problems, language, and lack of finances. Bringing the disk to farmworkers, at their convenience, eliminated the need to arrange transportation and miss work. Having the information translated into English for the those speaking only Spanish helps reduce language barriers. This study identified the need to bring services to vulnerable clients, to help overcome the multitude of barriers to receiving health care. When only 20% of a population utilizes services that were intended for 100%, something is not working. While not an intention of this study, the benefits of bringing the health care provider to the client has also been proven feasible as a means of increasing utilization of services. The feasibility of using a computer disk and a common word processing program to improve the continuity of care for the migrant farmworker was shown in this study.

APPENDIX A:

PORTABLE HISTORY AND PHYSICAL OF THE MIGRANT FARMWORKER

TEMPLATE

PORTABLE HISTORY and PHYSICAL of the MIGRANT FARMWORKER

IDENTIFYING DATA		FAMILY MEMBERS			Total #
Name:		Name:	Age	Health Status	Living with client?
DOB:					
Place of Birth:					
Marital Status:					
Date of Interview:					
Language: Religion:					

WORK HISTORY

DATES:				
Occupation				
Location				
Job responsibilities				
Protection				
Known exposures				
Injuries				
Living conditions				

PROBLEM LIST		ALLERGIES	Reaction
Date	Description		

MEDICATIONS -VACCINATIONS-FOLK RX	
Date	Name

Smoking pk/day	
ETOH/day	
Diet	

SCREENING TESTS

Test:	Mo/Yr & Results	Mo/Yr & Results	Test:	Mo/Yr & Results	Mo/Yr & Results
Tuberculosis			BP		
PAP			Cholesterol		
Breast			Glucose		
Mammogram			EKG		
Rectal (hemocult)			Other:		
PSA					

PAST HEALTH STATUS

Childhood Illnesses:	Menarche:
Hospitalizations:	LMP:
Accidents:	Pregnancies:
Operations:	Outcomes:
Other:	Birth control:

FAMILY HISTORY

	Who?	Comments	Problem	Who?	Comments
Tubercluosis			Diabetes		
Asthma			CAD		
HTN			Epilepsy		
Arthritis			Cancer/type		
Birth defects			Retardation		
Other:					

CLINIC VISIT SUMMARY

DATE	Place	Provider's name
BP: Temp: Pulse: Resp:		ABD:
Ht: Wt:		GI/GU:
ROS: Skin: HEENT: Lymph:		Neuro/Msk:
Breasts: Lungs: CV:		Psych:
Subjective/Objective Findings	Assessment	Plan

CLINIC VISIT SUMMARY

DATE	Place	Provider's name
BP: Temp: Pulse: Resp:		ABD:
Ht: Wt:		GI/GU:
ROS: Skin: HEENT: Lymph:		Neuro/Msk:
Breasts: Lungs: CV:		Psych:
Subjective/Objective Findings	Assessment	Plan

APPENDIX B:
ORAL CONSENT - ENGLISH

APPROVED BY UNIVERSITY OF AZ IRB
THIS STAMP MUST APPEAR ON ALL
DOCUMENTS USED TO CONSENT SUBJECTS.
DATE: 7-3-00 EXPIRATION: 7-3-01

CONTINUITY OF CARE FOR THE MIGRANT FARMWORKER UTILIZING COMPUTER DISKS

Oral Summary and Subject's Consent Form

The following oral summary will be read to the participant in their native tongue which they will be asked to sign and date:

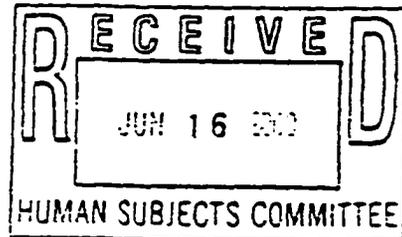
If I agree to participate, I will be asked to provide personal information about my past health and work sites to the investigator, who will record what I say on a laptop computer. The investigator, a Family Nurse Practitioner student, will be allowed to perform a physical exam on me and has thoroughly covered what organ systems will be examined and other data to be collected. I may opt out of any aspect of the exam that I desire. A summary of pertinent physical findings will also be recorded on the computer disk. I will be given a copy of the information she collects, on a computer disk with a cover and directions for its use, as well as a hard copy of its contents. I will be asked to take care of the disk and present it to the clinic at my next appointment. This study will take about two hours of my time. The information gathering and physical examination will take place in a private area outside of the clinic, and possibly in my home. I may decide to discontinue participating at any time without any penalty. I was chosen to participate because I am a migrant farmworker or family member, over 18 years old, and have a chronic health problem. I will be one of five participants in this study. Only the clinic where I receive care and the primary investigator will have access to this information or know my name. My name will not be used in any reporting of the results of this research. I will permit the information and findings to be used for whatever purposes found appropriate, without use of my name. I do not expect to receive any money for participation in this research. There are no expected physical discomforts or other risks associated with participation in this study, and the benefits have been explained. If a health problem is identified, the researcher will assist me in finding appropriate treatment.

Subject's Signature

Date

Witness

Date



INVESTIGATOR'S AFFIDAVIT:

I have carefully explained to the subject the nature of the above project. I hereby certify that to the best of my knowledge the person who is signing this consent form understands clearly the nature, demands, benefits, and risks involved in his/her participation and his/her signature is legally valid. A medical problem or language or educational barrier has not precluded this understanding.

Signature of Investigator

Date

APPENDIX C:
ORAL CONSENT-SPANISH

**CONTINUIDAD DEL CUIDADO PARA TRABAJADORES MIGRATORIOS
DE GRANJA
UTILIZANDO DISQUETTE DE COMPUTADORA**

Resumen oral y Forma de Consentimiento del Sujeto

El siguiente resumen oral se leerá al participante en su lengua materna que después se debe firmar incluyendo la fecha:

Si yo acuerdo participar, la investigadora me pedirá información personal respecto a mi salud y lugares de trabajo en el pasado, ella en cambio la escribirá en una computadora portátil. El investigador, un estudiante del programa de Enfermera Médica de Familia habrá el permiso para examinarme físicamente y me han explicado detalladamente cuales órganos y sistemas se examinarán y cualquier otra información que se pida. Tengo la opción de no participar en cualquier parte o aspecto del examen que yo desee. Un resumen de los resultados físicos importantes se incluirá en el disquette de la computadora. Me entregarán una copia de la información obtenida, en un disquette de computadora con una portada y instrucciones para su uso, igual que una copia escrita del contenido. Me pedirán de cuidar muy bien este disquette y de entregarlo en la clínica en mi próxima cita. Este estudio dura aproximadamente 2 horas. La etapa de obtener la información y el examen físico se llevará a cabo en un lugar particular fuera de la clínica y posiblemente en mi propio hogar. Puedo decidir de discontinuar mi participación en cualquier momento que yo desee sin ninguna sanción. Me han seleccionado para participar porque soy un trabajador migratorio de granja o miembro de familia de uno, soy mayor de edad y tengo un problema crónico de salud. Seré uno de cinco participantes en este estudio. Solamente la clínica que me atiende y el investigador principal habrá acceso a esta información y a mi nombre. Mi nombre no se usará en ningún reporte de los resultados de este estudio. Doy permiso a utilizar la información y los resultados en cualquier uso que se determine ser apropiado, sin usar el nombre mio. No espero recibir dinero para participar en este estudio investigativo. No se pronostican inconveniencias físicas u otros riesgos asociados con la participación en este estudio y me han explicado los beneficios. El investigador me ayudará en encontrar un tratamiento apropiado para cualquier problema de salud que se identifique.

Firma del Sujeto

Fecha

Testigo

Fecha

Declaración jurada del investigador:

Le he explicado al sujeto detalladamente la indole del proyecto mas arriba descrito. Por medio de la presente certifico que, a mi mejor saber, la persona firmando esta forma de consentimiento entiende claramente la indole, los requisitos, beneficios y riesgos involucrados en su participación y que su firma tiene validez legal. No hay ningun problema ni de tipo médico ni de idioma ni de educación que le haya impedido entenderlo.

Firma del Investigador

Fecha

APPENDIX D:
HUMAN SUBJECTS APPROVAL FOR STUDY

THE UNIVERSITY OF
ARIZONA
HEALTH SCIENCES CENTER

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Human Subjects Committee
3 July 2000

1622 E. Mabel Street
P.O. Box 245137
Tucson, AZ 85724-5137
(520) 626-6721

Shirley Bayham-Hicks, R.N.
Advisor: Judith Effken, Ph.D.
College of Nursing
PO BOX 210203

RE: HSC A00.91 CONTINUITY OF CARE FOR MIGRANT FARM WORKERS UTILIZING
COMPUTER DISKS

Dear Ms. Bayham-Hicks:

We received your above-cited research proposal. The procedures to be followed in this study pose no more than minimal risk to participating subjects. Regulations issued by the U.S. Department of Health and Human Services [45 CFR Part 46.110(b)] authorize approval of this type project through the expedited review procedures, with the condition(s) that subjects' anonymity be maintained. Although full Committee review is not required, a brief summary of the project procedures is submitted to the Committee for their endorsement and/or comment, if any, after administrative approval is granted. This project is approved effective 3 July 2000 for a period of one year.

The Human Subjects Committee (Institutional Review Board) of the University of Arizona has a current assurance of compliance, number M-1233, which is on file with the Department of Health and Human Services and covers this activity.

Approval is granted with the understanding that no further changes or additions will be made either to the procedures followed or to the consent form(s) used (copies of which we have on file) without the knowledge and approval of the Human Subjects Committee and your College or Departmental Review Committee. Any research related physical or psychological harm to any subject must also be reported to each committee.

A university policy requires that all signed subject consent forms be kept in a permanent file in an area designated for that purpose by the Department Head or comparable authority. This will assure their accessibility in the event that university officials require the information and the principal investigator is unavailable for some reason.

Sincerely yours,



David G. Johnson, M.D.
Chairman
Human Subjects Committee

DGJ:rs

copy: Departmental/College Review Committee

APPENDIX E:
DIRECTIONS FOR USE OF DISK

DIRECTIONS FOR USE OF DISK:

This disk contains the health history and physical findings of the person presenting at your clinic. It was designed on in the Windows "Word" program as a template. It has been compiled as part of a thesis project through the U of A College of Nursing to determine the feasibility of using such disks to improve the continuity of health care for migrant peoples. Please follow the directions for use. You will be contacted regarding it usefulness. Thank you very much.

Shirley Bayham-Hicks RN/ FNP student

- 1. Insert disk in drive**
- 2. Open Windows "Word" program if available**
- 3. Open document: "Portable History and Physical of the Migrant Farm Worker" in a: drive and print hard copy for records if desired**
- 4. To make additions to the disk, place mouse/cursor on first area to begin input (typing) of information (i.e. place cursor next to shaded box)**
- 5. Make sure cursor is at least one space from shaded box and input the requested information**
- 6. Use mouse/cursor OR directional arrows to move to next area/line to input requested information. Continue until all current information is typed in. If possible, please record the providers findings under the "CLINIC VISIT SUMMARY" which follows the History.**
- 7. Be sure to save to the disk the document once you have typed in all pertinent information.**

THANK YOU.

APPENDIX F:
EVALUATION QUESTIONS

Evaluation Interview Questions Following Disk Utilization

Migrant Farmworker Interview Questions

1. Have you ever had a medical history taken in the past? If so when, where, under what circumstances?
2. Have you ever had a complete physical exam done? If so...
3. Have you ever carried any health record with you before? If so...
4. When was the last time you went to the doctor or clinic and for what reason?
5. Do you feel it may a difference in the care you received?
Has the use of the disk improved the quality of care that you were provided?
6. Would you continue to use it in the future?
7. Would you choose a clinic or provider because they would use your disk?
8. What did you like about using it?
9. What didn't you like about it?

Clinic Staff Interview Questions

1. Have you ever used any type of health history form or storage device before for the migrant farmworkers? If so, how does this compare?
2. Were you able to use the disk in your computer?
3. How difficult was it for you to access the information on it?
4. How much time did you spend using it?
5. What did you do with the information on the disk?
6. Would you use it again?
7. Did you perceive any benefits from using the disk?
8. Did you encounter any problems using the disk?
9. Do you have any suggestions to improve the disk?

Outreach Worker Interview Questions

1. Have you ever used any kind of a health history storage form or computer before with your clients? If yes, how does this compare?
2. What were the reactions you received when approaching perspective volunteer about this project?
3. What do you feel are the barriers to the use of the disk in this population?
4. How do you feel those barriers could be overcome?

Healthcare Provider Interview Questions

1. What percentage of your practice are migrant farmworkers? How have you obtained health histories on migrant farmworkers in the past? How are they recorded?
2. Did any information on the disk influence the care or treatment you provided to the migrant farmworker?
3. Did you make the information on the disk a part of your medical record?
4. How much time was involved in using the disk for you?
5. Was the disk difficult to use?
6. Did having the information on the disk save you time?
7. Did you encounter any problems using the disk?
8. Do you have any suggestions to improve the disk?

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