CHARACTERISTICS OF DIABETIC PATIENTS RECEIVING CARE AT THE

MONTANA MIGRANT COUNCIL: A DESCRIPTIVE STUDY

by

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Jordan Bell Teller

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ABSTRACT

Problem/Aims: Although migrant workers face higher rates of chronic illnesses such as hypertension and diabetes, little is known about the specific health status characteristics of this vulnerable population. In Montana, outreach designed to address migrant worker health care access disparity includes community clinics that provide bilingual and culturally-sensitive, preventive care. The focus of this study was to (a) describe the characteristics of the diabetic migrant population who receive services at Montana Migrant Council clinics and (b) determine which information obtained during the patient visit is most often recorded. Methods: This non-experimental, descriptive, cross-sectional study applied secondary analysis to existing de-identified data from the Patient Electronic Care System (PECS) database managed by the Montana Migrant Council (MMC). Sample size ($n = 30$) was determined by the diabetes registry criteria established in the MMC Clinician's Manual. Results: Although 151 diabetic migrant patients were present in the state of Montana in 2008, only 30 were enrolled in the database and received primary care from MMC during the year. Characteristics such as age, gender, body mass index, blood pressure, and baseline laboratory testing were used to describe this population of patients. Of the 30 patients in the PECS database, 53% were female, 84% ranged in age from 30-64 years old, 60% were Hispanic, and 93% were uninsured. Ten percent of these patients had recorded blood pressures >140/90 and over half had co-existing hypertension and hyperlipidemia. Sixteen percent had neuropathy and/or nephropathy, 23% had microalbuminuria, and 7% had retinopathy. All 30 patients in the registry had a dental exam, nutrition education, a foot exam, substance abuse screening, a lipid panel, and a hemoglobin A1C drawn. Forty percent of PECS diabetes patients had an A1C less than 7.0. Fifty-six percent of patients had HDL cholesterol less than the desired 45mg/dL. Conclusion: Although results of this study agreed with findings in the literature, the MMC population possess unique characteristics including a high percentage of female registrants, a high number of Caucasian registrants, and a high number of annual visits (average of 10 within the PECS registry).

CHAPTER 1

INTRODUCTION TO THE STUDY

Introduction

The migrant farm worker population, comprised of a variety of cultural and ethnic

groups, lives a unique lifestyle that usually centers on agricultural work. During the

various harvest seasons an estimated three to five million farm workers and some of their

families move throughout the United States, providing labor and service to the

agricultural industry (Anthony, Williams, & Avery, 2008). Over three quarters of migrant

farm workers are of Hispanic decent, the majority being from Mexico (Anthony et al.,

2008). Spanish is the predominant language spoken by this population. In addition to the

language barrier, the laborers often reside in crowded, sub-standard living conditions,

face pesticide exposure and other occupational hazards daily, and lack even the most

basic access to healthcare. Chronic illnesses such as diabetes and hypertension affect

Hispanics more often than non-Hispanic whites (American Diabetes Association, 2009).

Health risks to migrant agricultural workers are greatly increased because of occupational

hazards, predisposed genetic disease risk, immense barriers to access of healthcare, and

lack of health education and prevention. The health care disparity is such that migrant

farmworkers face health problems experienced by those in Third World countries

(Bechtel, Davidhizar, & Spurlock, 2000).

Several types of interventions have been organized in an attempt to remedy the

identified healthcare disparity. Community outreach partnerships between an

interdisciplinary team of health care workers and translators have brought educational, financial and human resources into underserved communities (Connor, Rainer, Simcox, & Thomisee, 2007). Occasionally community health care providers partner with an academic group, such as a cohort of university students studying Spanish, in an effort to provide effective community outreach care (Sherrill, 2005). In this type of partnership, Spanish students report satisfaction from practicing their skills, public health team members gain experience with culturally competent care, and rural patients benefit from increased access to health care (Connor et al., 2007). A third type of outreach has been designed to specifically address migrant worker health care disparities. Some community clinics have been specifically designed to provide bilingual, culturally sensitive, preventive outreach care to migrant laborers.

Montana, an agriculturally-rooted state, has implemented the third type of outreach care in order to aid the migrant population. The Montana Migrant Council (MMC), a federally funded program, provides effective bilingual care to migrant agricultural workers and their families in an effort to remedy the vast health care disparity faced by this population. Both outreach and clinical assessments and treatments are a part of patient care, with appropriate referrals made to specialists. Demographic and health-related data is collected on patients in an attempt to provide continuity of care to a population defined by its migrant status.

Purpose

The purpose of this study is to describe the population of diabetic patients seeking care at the MMC. Currently, data on the population-of-interest are collected and entered into the Patient Electronic Care System (PECS) at the MMC. Annually, the data are sent to the appropriate government agency for review. However, the characteristics of the MMC patients have never been formally described.

As with most migrant research, much remains to be discovered about the migrant population and the way the population lives and accesses health care. Difficulty in patient care follow up and continuity of health care exists because of the inherent nature of migrant agricultural work. Even providing a description of day to day migrant worker life is complex because of the mistrust of unknown people and fear of Immigration and Naturalization Services (INS) (Doyle, Rager, & Bates, 2003). In addition, it is estimated that less than 20 percent of migrant agricultural workers seek care at an accessible clinic (National Center for Farmworker Health, n.d). These facts make tracking, studying, and describing the migrant lifestyle an enormous challenge. However, relevant research publications about this population do exist.

The purpose in examining the lifestyle, occupational risks, and barriers to care of this group is to help reduce the disparities that are most prevalent. The more that is known about health conditions and barriers to care in the Hispanic farm worker population, the more efforts can be made to overcome and reverse the apparent and covert problems. If the population can be identified and described, then perhaps health care providers can recognize the population and their needs, intercept those at high risk,

provide effective prevention and treatment, and do so in an accessible manner. If recognition, interception, treatment, and accessibility of care can be accomplished, then an increasing number of migrant workers can be prevented from getting the preventable and chronic health conditions which so plague their community.

Background and Significance of Study

Migrant Farmworker Status

Migratory lifestyle often leads to poor health outcomes within this population. Agriculture competes with mining and construction to win the title of the most dangerous occupation in the country. (Gaston, 1993) "Agricultural services accounted for 13% of all occupational deaths from 1994 to 1999, while only covering two percent of overall employment" (National Center for Farmworker Health, n.d, n.p.). Additionally, agricultural laborers have the highest percentage of skin disorders reported. The dawn to dusk, quick-paced effort that migrant laborers exert at least six days per week puts them at risk for conditions such as dehydration, heat exhaustion, and sun exposure (Connor et al., 2007).

The incidence of chronic illnesses such as asthma, diabetes, and heart disease are all increased in the Hispanic migrant population due to genetics and lifestyle (American Diabetes Association, 2009.) The incidence of diabetes in the Hispanic migrant worker is 300 times higher than it is in the general population. The Bureau of Primary Health Care conducted a study about disease patterns in the migrant population and found that their

disease patterns are similar to those found 60 years ago in the general population of the

United States (Gaston, 1993).

The migrant agricultural population is in desperate need of preventive care and

education. Providers must first recognize the barriers to access of care for the migrant

population, identify characteristics of the population at risk, and provide the necessary

education in an accessible location. In order to accomplish access to better care, the

population must be identified and described. Transportation to arrive at a medical facility,

language barrier, lack of knowledge about where to find health care, and high managerial

pressure not to leave work are all major barriers that need to be addressed in order to

improve access to care in the migrant population (Weathers, Minkovitz, O'Campo, &

Denier-West, 2004).

Society

Certainly the expenditure of medically treating chronic illness is costly. However

the costs associated with the lost productivity, morbidity, and mortality that accompany

chronic illness are exorbitant. An estimated 164 million workdays are lost in the United

States annually as a result of the chronic illnesses asthma, diabetes and hypertension

(American Hospital Association, 2007). This resulted in an estimated 30 billion dollar

loss in work productivity (American Hospital Association, 2007).

Unfortunately the prospect for improvement of chronic disease is dim. In 2005, 60

percent of the global deaths were attributed to chronic disease. By 2015 the World Health

Organization predicts that deaths due to chronic illness will increase by 17 percent. Over

80 percent of all cardiovascular disorders could be prevented through the use of nutrition,

physical activity, and tobacco cessation (World Health Organization, 2008). The United

States accounts for eight percent of the world's diabetes population but spends over 50

percent of the world's diabetes budget in an effort to treat, but not prevent, this

preventable disorder (International Diabetes Federation, 2006). Health care providers can

make a big impact on patient health through the simple implementation of patient

education.

The cost of lost productivity in the agricultural setting is equally detrimental to

society. Hypertension, asthma and diabetes are three chronic illnesses prevalent in the

migrant population. The multi-million dollar agricultural industry depends on the ability

of the migrant laborers to work effectively and efficiently in order to complete the

"complex cycle of agricultural production and distribution" (National Center for

Farmworker Health, n.d, n.p). However, occupational hazards and lifestyle-related risks

put these laborers in jeopardy daily. Health professionals must recognize the risks that are

encountered by the migrant population and identify those in need of care.

A strong link exists between health education and health outcomes (Sassi &

Hurst, 2008). Providers need to make bilingual treatment available and include

preventive education in order to best serve a population with sporadic access to health

care. If this population can be reached and educated, fewer days will be lost to lack of

productivity related to occupational injury and chronic disease. In turn, our agriculturally-

rooted society benefits from a productive, healthy workforce. In order for this chain of

events to occur, the population must be described and understood so that they can be

reached. Without an understanding of this population and their lifestyle, the healthcare

industry lacks the ability to recognize, intercept, and provide for the needs of migrant laborers.

Montana, specifically, is an agriculturally-rooted state dependent on the labor of migrant workers. While data about their demographic and medical characteristics exists, it has not yet formally been described. The formal description of migrant characteristics within the population seeking care at MMC could influence the way care is perceived within this population and the way care is delivered by health professionals in Montana.

Implications of Migrant Preventive Care

The patient and societal effects of chronic illness and of migrant health care disparities are immense. Health care personnel, however, have the opportunity and the influence to change the way care is delivered. By researching the characteristics possessed by the migrant population health care providers will have a better understanding of the barriers between their profession and the population that they seek to help.

Mistrust of health personnel and lack of cultural understanding are two documented reasons why migrant workers fail to reach out for health care (Doyle, 2003; Connor, 2007). Health care professionals have an obligation to provide excellent care to all persons. If health care providers could develop an understanding of characteristics of this population, as is the intent of this research, perhaps they could provide more culturally sensitive care. If providers can understand the challenges of daily migrant worker life and the occupational hazards to which they are regularly exposed, they could make client-centered care a top priority. Health care providers have the ability to

influence care delivery and client outcomes because of their role in preventive education. Kahn, Robertson, Smith and Eddy (2008) used a mathematical model to estimate that 221 million life-years could be added to the United States population over the next 30 years if preventive measures were implemented. They also projected that chronic illness costs over the next 30 years will total over nine trillion dollars. The authors project that with preventive measures, however, the United States could save about 900 billion dollars, or 10 percent, on health care costs.

Fortunately health care providers play a key role in patient education and prevention. The Hispanic migrant worker population, one especially vulnerable to hypertension and diabetes, could benefit from the preventive education provided by health care professionals. The first step in accessing migrant health disparities and providing preventive education is to understand the population in question and describe their patterns of living and their perceived needs. A descriptive study examining the migrant population who seeks care at MMC will set in motion the ability of health care providers to recognize the migrant worker characteristics, intercept those in need, and provide exceptional care to the migrant population. Anthony et al. (2008) stated that "most of the literature on health care needs of migrant and seasonal farmworkers is based on data obtained from health care providers" (para. 5).

Statement of Problem and Research Question

Migrant workers face incredible challenges in their daily lives. Occupational hazards are rampant, chronic disease is prevalent, and access to health care is limited by

language barriers, lack of transportation, and suspicion of the health care system. In order to remedy the disparities faced by migrant laborers in Montana, the population must first be identified and described. This study focuses on the descriptive analysis of diabetic migrant workers in Montana who receive services at the Montana Migrant Council clinics. Research question: (1) What are the characteristics of the diabetic migrant population who receive services at Montana Migrant Council clinics? (2) What information obtained during the visit is most commonly recorded?

Conceptual/Theoretical Framework

Hispanic migrant workers face challenges unique to their lifestyle. The migratory status, language barrier, specific health risks that accompany agricultural work, and the requirement of manual labor in a country that is not necessarily their country of origin make this population unique in their health needs. Madeline Leininger, a present day nursing theorist, developed the Theory of Cultural Care. The theory development was driven by her discovery that cultural factors influence patients' behavior. The purpose of the theory was to discover diversity and universality as they related to various cultures. With this knowledge, she hoped to find ways to "provide culturally congruent care to people of different or similar cultures in order to maintain or regain their well-being, health, or face death in a culturally appropriate way" (McFarland, 2006, p. 476). Transcultural care surpasses a mere knowledge of another culture and incorporates the use of culture to engage patients, develop continuity of care, and improve patient well-being (McFarland, 2006).

Three of Leininger's major assumptions used to support her Culture Care Theory of Diversity and Universality will be used to research and describe the characteristics of MMC patients. First, Leininger states that "culturally based care is the most comprehensive and holistic means to know, explain, interpret, and predict nursing care phenomena and to guide nursing decisions and actions" (McFarland, 2006, p. 481). A provider cannot prescribe a treatment and expect adherence if he or she does not know the migrant culture. As Leininger points out, understanding of a culture must guide nursing decisions. A second assumption is "transcultural nursing is a humanistic and scientific care discipline and profession with the central purpose to serve individuals, groups, communities, societies, and institutions" (McFarland, 2006, p. 481). Because service is a provider's central purpose, he or she must know and understand a culture in order to appropriately care for a patient. Third, Leininger assumes "beneficial, healthy, and satisfying culturally based care influences the health and well-being of individuals, families, groups, and communities within their environmental contexts" (McFarland, 2006, p. 481). Not only does the patient benefit from the culturally appropriate service of the provider, but the patient's community also benefits. As such, the provider has the responsibility to understand the culture in order to serve the cultural community. This pertains especially to the migrant population because of the close quarters in which they live and the close conditions under which they work. Providing preventive education to one patient may effectively educate a small community of people against chronic illness, pesticide exposure, injuries, or infectious disease.

The world grows ever more multicultural with each day that passes. Research, study, and practice of nursing are all influenced by cultural issues. Leininger's nursing theory brings to light the importance of not only knowing a culture, but *understanding* the culture in order to provide effective treatment. These "transcultural nursing tendencies will be imperative to guide all nursing decisions and actions for effective and successful outcomes." (Leininger, 2005, as cited in McFarland, 2006, p.476)

<u>Definitions</u>

- Migratory agricultural worker is " an individual whose principal employment is in agriculture on a seasonal basis, who has been employed within the past 24 months, and who establishes for the purposes of such employment a temporary abode" (Health Centers Consolidation Act, 110 stat 3635).

- Seasonal agricultural worker is defined as "an individual whose principal employment is in agriculture on a seasonal basis and who is not a migratory agricultural worker" (Health Centers Consolidation Act, 110 stat 3635).

- Agriculture is defined as "farming in all its branches, including (i) cultivation and tillage of the soil; (ii) the production, cultivation, growing, and harvesting of any commodity grown on, in, or as an adjunct to or part of a commodity grown in or on the land; (iii) and any practice (including preparation and processing for market and delivery to storage or to market or to carriers for transportation to market) performed by a farmer or on a farm incident to or in conjunction with an activity described in

clause (ii)" (Health Centers Consolidation Act, 110 stat 3635). Operationally these terms will be defined by eligibility for service at the Montana Migrant Council.

- Characteristic is defined as "a trait that distinguishes an individual or entity" (Mosby, 2002). Operationally, these characteristics will be collected, measured, and categorized as demographic data, medication and laboratory data, and health condition data.

- Receiving care is any encounter with health care personnel in which a patient obtains preventive, remedial, or therapeutic services. Operationally receiving care will be measured by documented visits to the MMC or their sponsored outreach clinics.

- Leininger's definition of culture care diversity plays a role in everyday migrant health care. "Culture care diversity refers to cultural variability or differences in care beliefs, meanings, patterns, values, symbols, and lifeways within and between cultures and human beings" (McFarland, 2006, p. 478). Operationally this is difficult to define, as it is inherently individualized to each person and may differ from one patient to the next.

- Leininger defines environmental context as: "the totality of an environment (physical, geographic, and sociocultural), situation, or event with related experiences that give interpretative meanings to guide human expressions and decisions with reference to a particular environment" (McFarland, 2006, p. 478). Again, this is operationally difficult to define as it is individualized to each patient.

- Montana Migrant Council is defined as a private non-profit, government grant-funded organization that seeks to provide health care and preventive education to migrant

workers and their families. Operationally this will be defined as the Billings,

Fairview, and Dillon clinic sites and their sponsored outreach clinics.

<center>Assumptions</center>

1. Hispanic migrant workers live and function in an environment that is fundamentally
   different than most health care providers and United States residents.

2. In order to provide adequate care and prevention, a provider must have some
   understanding of the hardships and challenges of daily migrant life.

3. If providers and health care personnel do their part to learn and understand the
   migrant population's specific cultural and health care needs, then the patients
   themselves must do their part to participate and adhere to the regimen or speak to the
   provider if the suggested solution will not meet their needs. This open communication
   creates a partnership in which both sides participate equally and share responsibility
   for the outcome.

4. Health care disparities exist between standard U.S. healthcare and the care received
   by the migrant population. These disparities, however, could be lessened or remedied
   by building a trust-based caregiver/patient relationship founded on culturally based
   care and prevention.

5. Preventive care, if properly implemented, could save the agricultural industry and its
   laborers millions of dollars in lost productivity and workplace injuries.

6. "Beneficial, healthy, and satisfying culturally based care influences the health and well-being of individuals, families, groups, and communities within their environmental context" (Leininger, as cited in McFarland, 2006, p. 481).

7. Researching and describing the population of diabetic migrant workers seeking care at MMC will help facilitate better recognition of patient needs, intervention, prevention and education, and treatment of disease.

Limitations

Due to the nature of migrant farm work finding a population that can be tracked will be challenging. In order to remedy this, data will be used from the existing Patient Electronic Care System (PECS) to study the characteristics of diabetic migrant workers within this population. The PECS system, however, comes with limitations of its own. The system contains coded patient data from the past five years. Thus, the descriptive study performed is non-generalizeable and will be limited to the data and patient characteristics contained within this system. If certain data are lacking it will somewhat limit the thorough description performed. If all new data were collected based upon the needs of this research, this limitation would not exist. Then, however, the problem of perpetual movement and migrant tendencies that accompany this type of farmwork would override the possibility of thorough, fair data collection.

Data in the PECS system are limited to patients who are treated at the MMC. For this research, the PECS diabetes data has been chosen. Therefore the patient description extracted from this data will describe only the diabetic patients who receive care at MMC

and their outreach clinics. It may not represent migrant worker characteristics in Montana

or the population in general. However, discovering common characteristics of the

diabetic MMC patient population may show patterns that apply to other migrant workers

receiving care at MMC, or other migrant workers in the state of Montana, thereby making

migrant health care needs more identifiable and treatable for those providing care.

Because the PECS system is used by three MMC sites statewide, different

providers are inputting data. Although categories and clinical care pathways exist to unify

continuity of care, providers may still have personal preferences about medication,

procedures, or general data and the way it is surveyed. As a result, data may be more

thorough from one site or more lacking from a certain site. Additionally, data from the

three sites may be summed into one descriptive study. If data from one site were to differ

in its results from another site, this distinction may be lost when the site totals are added

together. For example, if the Fairview provider prescribes more beta blockers for

hypertension than the Dillon provider, his/her site data may show lower incidence of

hypertension. This data, however, if mixed in with the other sites, may not be easily

distinguished. If the individual site data were examined separately this limitation would

not apply.

CHAPTER 2

REVIEW OF THE LITERATURE

<u>Introduction</u>

Although relatively little research exists on migrant worker health care in the

United States, and specifically in Montana, organization of the existing research to

produce a literature review is important. The review can help increase a researcher's

knowledge on the topic and can contribute to theory development and further nursing

practice (Shattell, Smith, Quinlan-Colwell, & Villabla, 2008; Whittemore &Knafl, 2005).

Search terms, databases used, and inclusion/exclusion criteria are delineated in this

discussion. A description of limitations applied to the search is described, as are the

inclusion and exclusion criteria for the search. Madeline Leininger's Theory of Culture

Care is included in search criteria and has guided the search terms used (McFarland,

2006).

Matrices were formed to logically compare and contrast the retrieved information.

"Matrices directly support a thematic analysis of information" (Polit & Beck, 2008, p.

119). Using them as a format, themes have been found within the literature and are

reported in the research findings. Several matrices have been included to show results

related to methodology, diabetes, Leininger's theory, community-based participatory

research, and prevalent non-research articles that have contributed greatly to the existing

literature. Matrices facilitate logical, organized analysis of the existing research on the

topic of migrant worker health care, its apparent shortfalls, and the description of those

migrant workers seeking care. Along with the matrices is a discussion of the information found within them. Similarities and differences of research findings are compared in the discussion section.

Finally, the gaps in the literature are discussed. As a result of the difficulty tracking and gathering data on this nomadic population, the published research in the area of migrant health is only in its infancy. While qualitative descriptive studies about migrant health are in existence, very few quantitative studies exist, and little research pertains to migrant health conditions. As suspected, very little research contains data about migrant and seasonal farm workers in the Rocky Mountain states.

<u>Search Limitations</u>

Although only a limited amount of research on migrant workers and their health conditions exists, inclusion and exclusion criteria will be delineated in an effort to focus the literature review. First, research pertaining to migrant workers outside of the United States has been excluded. Second, research discussing non-Latino minorities has been excluded. Third, unpublished manuscripts and doctoral dissertations have been excluded because of limited access to the full text versions of these documents. Articles pertaining to a very specific health condition, such as back strain or emotional stress levels, have been excluded because of their specific focus. Research articles discussing specific health interventions, such as tuberculosis or HIV prevention, have been excluded for the same reason. Research discussing prenatal care has been excluded because the topic pertains solely to female migrant workers; this study aims to address characteristics of both male

and female laborers in the agricultural field. Research in migrant dentition or dental care has been excluded in order to concentrate on more nursing-focused, preventable health problems.

Articles will be included in the literature synthesis if they specifically address health care disparities in the migrant worker population, delivery of health care in the migrant population, or a chronic illness such as diabetes or hypertension in the migrant population. Because the clinic involved in the research obtains patient data on diabetes and hypertension, theses chronic diseases will be used as part of the descriptive study that quantitatively describes the patients. Thus literature pertaining to diabetes and hypertension is relevant to the literature search for this study. All research is primary research with the exception of two non-research articles that were cited extensively throughout the literature and, therefore, contained relevant information that could not be ignored during a thorough review of literature on this topic. Research dating more than five years has been included only if more current data on the same topic is unavailable. Non-nursing-based research was necessary for use in the literature review because of the lack of nursing research on the topic of migrant health care. The relevant non-nursing research, however, is peer-reviewed and meets all other inclusion criteria. Both qualitative and quantitative data was included although much more qualitative data was found. The use of these inclusion criteria will allow for focused analysis of health problems faced by migrant workers and will be used to present a thorough literature synthesis.

Literature Searches and Findings

Using the databases Academic Search Premier and Cumulative Index of Nursing and Allied Health Literature (CINAHL), the search headings "migrant agricultural laborer or migrant laborer" and "transients and migrants" were used for the two respective databases. Applying limits of full-text, peer-reviewed, and a publishing date of the past five years, 445 and 108 articles were found in the respective searches. The words "health*" and "chronic" were search terms used initially for independent searches, then later to narrow relevant search results. Individually, these search terms produced results up to 422,785 articles, even with the aforementioned limits set. The search term "Leininger" was the final search term used and elicited 4 CINAHL results and 74 Academic Search Premier results when searched with limits.

In an effort to narrow the large results section found by the search headings "migrant agricultural laborer or migrant laborer" and "transients and migrants" in the respective data bases, the word "health*" was added to allow the search term headings to find any article containing the root word health. This narrowed the results to 58 in Academic Search Premier and 90 in CINAHL. Of the 58 in Academic Search Premier, four met the inclusion criteria and one of the 90 in CINAHL was included. Two of the four were community-based participatory research studies performed under the practice concept model in an effort to design effective collaborative care between health care professionals, Spanish language students, and the migrant workers in need of health care (Connor, Rainer, Simcox, & Thomisee, 2007; Rao, Arcury, & Quant, 2004). Both found

that the community partnership model is an effective way to provide care and reduce health care disparities in this population (Connor, et al., 2007; Rao, et al., 2004).

The third relevant article from Academic Search Premier and the single relevant CINAHL article were both qualitative descriptive studies. The first was performed to assess health needs and barriers to care in the migrant population (Goertz, Calderon, & Goodwin, 2007). Access to care, preconceived misconceptions, preventive care, payment for services, and communication barriers were themes identified from this research (Goertz, et al., 2007). The other qualitative descriptive study compared the health of a control group in Mexico to Latino migrant workers and found that the health of migrant workers was worse than the Mexican group (Ward, Tanner, & Cummings, 2008).

The fourth article found from searching for "health*" in combination with "migrant agricultural laborer" was a non-research article that was later found to have been cited extensively. Bechtel, Davidhizar, and Spurlock (2000) formulated a transcultural assessment tool, and are cited in many other pertinent articles such as Goertz et al. (2007), Kim-Godwin et al. (2006), and Doyle et al. (2006).

Next, the search headings pertaining to migrant workers were combined with the word "chronic" in the two data bases. Eight results appeared on the Academic Search Premier database and three of the articles were deemed relevant, because they met the aforementioned search inclusion/exclusion criteria. Bechtel et al. (2000) and Rao et al. (2004) were duplicate results of articles found in previous searches. The third relevant article was a qualitative descriptive study similar to Goertz et al. (2007) and described

migrant worker family composition, living conditions, and barriers to care (Anthony, et al., 2008).

The same search and limitations yielded three articles in the CINAHL database, one of which met the criteria. Heuer and Lausch (2006) performed and published a phenomenological qualitative study that discusses how care providers can tailor their health interventions to migrant workers living with diabetes.

The same search headings about migrant agricultural labor were combined with the name "Leininger" or "transcultural" in the two databases. Only one doctoral dissertation was found and did not meet inclusion criteria. Next the word "health*" was searched with the word "chronic" along with full-text, peer-reviewed, and the same five year date limitations. Academic Search Premier and CINAHL yielded 3433 and 15522 results, respectively. To narrow these searches the term "Leininger" was added. In Academic Search Premier, this limited the results to only one article discussing liver disease and was, therefore, not included. No results were found using these three search terms in CINAHL.

When the search term "health*" was combined with "Leininger" or "transcultural", four articles appeared in the CINAHL search and 206 in the Academic Search Premier search. None, unfortunately, pertained to the migrant agricultural population. The search term "chronic" was then combined with the terms "Leininger". This search yielded no results in CINAHL and one article about liver disease in Academic Search Premier. Since this article had already been excluded, no relevant results were obtained from these searches. Combining searches for "migrant agricultural

laborers," "health*", and "chronic" along with the previous limits resulted in 32 CINAHL articles and one Academic Search Premier article. The latter was excluded for its unilateral perspective from one researcher's experience. The former yielded the same Heuer and Lausch (2006) article from a previous search. Others in this search were excluded for their discussion of non-Latino migrant workers or for research in areas too specific for this study such as HIV intervention or pregnancy in Latina migrant workers.

The remaining searches exhausted all combinations of "migrant agricultural labor", "health*", "chronic", and "Leininger or transcultural." No results were found using either three or four of these terms in combination. This surprising lack of research signifies a gap in the literature that will be further discussed in the section entitled "Shortfalls in the Literature."

Two pertinent articles have been found via ancestry searching of the reference lists of several of the other articles. Doyle, Rager, Bates, and Cooper (2006) is a community-based participatory research article found cited in Anthony et al. (2008). It was found to add useful information to the existing matrix pertaining to community-based participatory research and was, therefore, included in the literature review. Narayan, Boyle, Geiss, Saaddine, and Thompson (2006) was found in an ancestry search of Clingerman (2008). It contains useful information about diabetes in the migrant population and was, therefore, included in this literature review.

Discussion of Search Results

Based upon results from the literature search it is evident that migrant health care is an area which lacks extensive formal research. Literature search results showed

surprisingly few articles relating to Leininger's theoretical frame work and also

relatively few quantitative articles. Perhaps research in the area of migrant health care is

in the identification stage and will, with time, move into the inquiry stage. After all,

qualitative research, or identification, typically precedes quantitative research, or

inquiry, in the same area (Polit & Beck, 2008). Seemingly, this area of research is

predominantly populated by qualitative studies. While most of the descriptive studies are

qualitative, one quantitative study explored prerequisites to providing culturally

competent care.

Qualitative Descriptive
Studies and Migrant Health Care

Table 2-1 shows the descriptive studies on the topic of migrant health care, all of

which are qualitative. Each author spends time enumerating the barriers to health care

that migrant workers must overcome in order to receive care. Anthony et al. (2008)

sought to describe family composition and living conditions and found that the language

barrier was the most often cited barrier to care. Goertz et al. (2007) found similar

barriers to care when they sought to assess migrant worker health needs and offer

solutions. Clingerman (2006) discovered the importance of spiritual health as a

culturally-based need within this population. Ward et al. (2008) compared Latino health

in the United States, Latino health in Mexico, and Latino migrant worker health and

found that farm worker health was worse than the comparison group in Mexico but

better than non-migrant U.S. Latino health. Anthony et al. (2008) and Goertz et al.

(2007) both enumerated the barriers to care experienced by migrant workers. Each cited

the language barrier as a priority concern, followed by cost, transportation, and lack of

preventive care. Clingerman (2006) took a feminist perspective in order to understand

conceptualizations of health in the migrant population. She too, acknowledged

significant health disparities in the Hispanic farm worker population (Clingerman,

2006). She also added that "nearly every participant described experiencing painful

types of discrimination, bias, or exploitation" (p. 52). Despite the different perspectives

taken in these qualitative descriptive studies, each agreed that a significant health

disparity exists and each offered individual solutions about how to remedy the disparity

(Anthony et al., 2008; Clingerman, 2006; Goertz et al., 2007; Ward et al. 2008).

Table 2-1. Migrant Health Qualitative Descriptive Studies.

Author/Year	Study Design and Purpose	Methods and Sample	Sample	General Findings
Williams, Avery/ 2008	Purpose was to gain fuller understanding of family composition, employment, migration patterns, health issues, and service needs of MSFW in three counties.	Cross-sectional, descriptive, qualitative.	n=369 heads of household representing 1314 family members.	Family composition, living conditions, educational levels were described. Pervceived barriers to care were researched with language barrier being the most commonly cited.
Goertz, Calderon, Goodwin/ 2007	Assess health needs and discuss barriers to health services for migrant workers, as well as suggest possible solutions.	Qualitative, phenomongolicial, descriptive, focus group methodology and narrative analysis.	n=6 focus groups with 5-7 participants each.	Access to care, preconceived misconceptions, preventive care, payment for services, and communication barriers were themes identified.
Clingerman, 2006	Describe conceptualization of health for Mexican and Mexican American women involved in migrant farmwork.	Qualitative, descriptive design, from feminist perspective.	n=21 women, age range 21-66 years.	Spiritual dimension of health identified as important. Health conceptualized as absence of disease, illness or symptoms.
Ward, Tanner, Cummings/ 2008	Purpose was to compare migrant farmworker health related quality of life with other populations suing a common health measure.	Qualitative, face to face interviews with migrant workers to gather data.	n=80 migrant workers	Farmworker health was worse than comparison group in Mexico but better than non-migrant US Latino health.

Literature Pertaining to
<u>Leininger's Work on Transcultural Nursing</u>

Table 2-2 shows articles that reference Madeline Leininger or her work in transcultural

nursing. Each of these articles recognized the disparity in the migrant worker population

and suggested that culturally competent care may be the solution to ending the inequality

in their health care. Bechtel et al (2000) acknowledged the third world health status

possessed by the migrant laborers. They used Giger and Davidhizar's transcultural

nursing assessment model to assess and provide comprehensive culturally-sensitive care

(as cited in Bechtel et al., 2000). Both Bechtel et al. (2000) and Kim-Godwin, Alexander,

Felton, Mackey, and Kasakoff (2006) cited appropriate culturally sensitive care as a

prerequisite for culturally competent care. Both suggested that the differences in the

nurse's culture from the patient's culture led to barriers to culturally-competent care

(Bechtel et al., 2000; Kim-Godwin et al., 2006). The authors of each of the three articles

contained in Table 2 recognized that culturally-competent care will lead to improved

health outcomes in the migrant population (Bechtel, et al., 2000; Goertz, et al., 2007;

Kim-Godwin, et al., 2006). Each suggested that increasing cultural knowledge helps

increase access to care and reduces barriers to care (Bechtel, et al., 2000; Goertz, et al.,

2007; Kim-Godwin, et al., 2006). Although each of these articles was written based upon

a different methodology, each came to the same conclusions. Leininger's theory of

transcultural nursing care is the common thread that binds these articles together and has

allowed for the common themes to emerge.

Table 2-2. Leininger's Theoretical Framework as a Guide.

Author/Year	Study Design/Purpose	Methods/Sample	General Findings
Kim-Godwin/ 2006	Identify prerequisites to culturally competent care to migrant workers.	Qualitative, delphi study. Nurse experts in migrant care. N=279	89 prerequisites to culturally competent care identified and subcategorized.
Goertz, Calderon, Goodwin/2007	Assess needs and discuss barriers to health services for migrant workers and suggest possible solutions	Qualitative, phenomonological, descriptive, focus on group methodology and narrative analysis. N=6 focus groups with 5-7 participants each.	Patients lack the understanding of health insurance and how to use it. Health education is also an area lacking in migrant health care.
Bechtel, Davidhizar, Spurlock/2000	Discuss essential culturally appropriate care for migrant workers in order to positively impact their health outcomes	Non-research, discussion of a model that is based upon Leininger's transcultural nursing theory.	Giger-Davidhizar Transcultural nursing assessment model provides a way to systematically assess migrant workers and a foundation for provision of culturally competent care.

Community-Based Participatory Research
Articles Pertaining to Migrant Health Care

A third theme that was present in the literature search was the relative abundance of community-based participatory research. While research in the area of migrant health in only in its infancy, the amount of research in the specific area of community-based participatory research and migrant health is more prevalent. Table 2-3 shows three recent research articles that used the collaboration of Spanish language students, health care personnel, and occasionally social workers to provide health care to migrant workers and their families. All studies reported increased delivery of care and satisfaction of the

participant team members (Connor, et al., 2007; Doyle, et al., 2006; Rao, et al., 2004).

Doyle et al. (2006) sought to assess community needs and the capacity to provide for

those perceived needs and found that communication and trust were the most important

aspects of working with a multi-disciplinary team. The success of the community-based

participatory style of delivery of care may eventually be a solution to the vast health care

disparity experienced by the migrant population.

Table 2-3. Community-Based Participatory Research.

Author/Year	Study Design and Purpose	Methods and Sample	General Findings
Connor, Rainer, Simcox, Thomisee/ 2007	Design collaborative effort between nursing students, faculty, and students studying the Spanish language to provide care for migrant workers.	Practice concept model. 90 students and faculty members providing care to migrant workers and families.	Increased delivery of care to migrant workers through collaborative efforts. Incorporation of decreasing health disparities into nursing practice.
Rao, Arcury, Quandt/2004	Collaborate students and health professionals to serve the migrant population. Offer observations regarding successful student integration in community -based participatory research.	Practice concept model. Observations from integration of community based participatory research. 90 students and faculty members providing care to migrant workers and families.	Students were engaged in health and environmental justice research. All students and educational levels can participate to make a difference as community advocates.
Doyle, Rager, Bates, Cooper/2006	Establish community-based partnerships for community-based participatory research and conduct a preliminary qualitative assessment of perceived health needs and capacities.	Qualitative group interviews. N=9 healthcare providers, 11 social service providers and 12 migrant and seasonal farmworkers.	Discovered the need to exert much effort in communication with all community-based research participants. Trust is essential when working with the migrant farmworker population. Finally, tailor the program to meet participant needs.

Diabetes Research in the Migrant Population

Although persons of Latino decent are at much greater risk of developing diabetes

and related complications, the research pertaining to diabetes in the migrant population is

relatively undeveloped (Clingerman, 2008). Table 2-4 reviews three prominent articles

pertaining to diabetes in the migrant population. Although the three articles pursued very

different approaches to the topic of diabetes in the migrant population, they all agreed it

is a significant health concern that needs to be addressed (Clingerman, 2008; Heuer, et

al., 2006; Narayan, et al. 2006). While Clingerman (2008) performed a retrospective

chart audit, Narayan et al. (2006) performed a projection to predict future diabetes rates

in this population. Heuer and Lausch (2006) performed a qualitative study that resulted in

the discovery of six themes that can be used to help providers adapt care specifically to

this population. They found that participants believe that diabetes is more than just a

biomedical disease (Heuer & Lausch, 2006). The authors found that participants often

associated diabetes with a folk belief or spiritual cause, necessitating this understanding

by health care providers to provide culturally competent care and education (Clingerman,

2008; Heuer & Lausch, 2006). While Heuer and Lausch (2006) captured the lived

experiences and perceptions of migrant and seasonal farm workers with diabetes,

Clingerman (2008) enumerated the challenges of the migrant lifestyle and living with

diabetes. Both emphasized the need for culturally competent care in the treatment of

diabetes (Clingerman, 2008; Heuer & Lausch, 2006).

Narayan et al. (2006) took a future perspective and performed a projection of

diabetes in the migrant population in the year 2050 (Narayan, et al., 2006). The authors

projected that diabetes will increase by 481% in the Hispanic population in the next 40

years (Narayan, et al., 2006). Despite the fact that Hispanics' risk of diabetes is much

higher than that of Caucasians, few articles exist that provide research information about

migrant workers and the incidence of diabetes (American Diabetes Association, 2009).

Table 2-4. Diabetes Research in the Migrant Population.

Author/Year	Study Design and Purpose	Methods and Sample	General Findings
Clingerman/2008	Evaluate diabetes and hypertension data for migrant worker clinics in an effort to improve self-management	Retrospective chart audit used to describe migrant and seasonal farmworker's diabetes and hypertension outcomes. n=136 migrant and seasonal farmworkers	Differences in outcomes for migrant farmworkers and seasonal farmworkers were found. Reduction of Hgb A1c levels lead to a measureable reduction in other health risk factors related to diabetes.
Narayan, Boyle, Geiss/2006	To estimate relative risk of mortality from diabetes in several cultures and ethnic groups	Incidence-based Markov model, discrete time, post-data used to project diabetes prevalence in 2050. N=5000 post data samples	Diabetes is projected to increase by 481% in the Hispanic individuals by the year 2050.
Heuer, Lausch/2006	Hispanic migrant workers and their perceptions of living with diabetes	Phenomonological design, qualitative study. N=12 Hispanic migrant workers from 2 local clinics.	6 themes emereged and can be used by providers to adapt their care specifically to this population.

Influential Non-Research Articles

Table 2-5 displays two non-research articles that have been influential in the

literature of migrant health care. Villarejo (2003) and Bechtel, Davidhizar, and Spurlock

(2000) must be included in the literature review because of their lasting influence on this

area of research. Bechtel et al. (2000) have used a transcultural assessment tool called the

Giger and Davidhizar's Transcultural Assessment Model. Their work is cited in many

other pertinent articles such as Goertz et al. (2007), Kim-Godwin et al. (2006), and Doyle

et al. (2006). Villarejo (2003) is an article that compiled and reviewed what was known

until 2003 in several areas pertaining to migrant health care. The author systematically

reviewed areas of migrant health care such as morbidity, mortality, access to care,

infectious disease, maternal child care, occupational health, violence, and chronic health

indicators. This work is cited in Clingerman (2006) and Clingerman (2008). Because of

their influence on the current literature, these two works are included in the literature

review of what is known about migrant health care.

Table 2-5. Significant Non-Research Works.

Author/Year	Purpose for Writing Non-Research Article	Significance of Written Work	Contribution to Current Literature
Bechtel, Davidhizar, Spurlock/2000	A culturally competent assessment will help providers positively impact health outcomes by using correct cultural practices.	Rooted in Leininger's transcultural nursing movement. Authors have developed own transcultural assessment model	Cited in many relevant works about migrant healthcare. Should therefore be included in literature synthesis
Villarejo/2003	To compile and synthesize what little is known about migrant farmworkers and their living situations.	This document reviews all that was known until this point about the health of U.S. hired farmworkers.	Cited in many relelvant works about migrant healthcare. Should therefore be mentionedin literature synthesis.

Shortfalls in the Literature

Most all articles found on the topic of migrant health care are qualitative articles. The literature search results showed surprisingly few quantitative articles. As mentioned, quantitative data and research will likely follow once adequate qualitative research has been studied. Seemingly, this area of research is predominantly populated by qualitative studies. The facts about migrant care are only in their infancy, and are, therefore, only being described at this point. For the same reason, studies performed on disease or chronic illness are lacking. Chronic illness is known to be high in this susceptible population, yet little research has been completed in this area (American Diabetes Association, 2008, as cited in Anthony, et al., 2008). As discussed, this lack of research is likely due to the fact that this population is difficult to track due to their inherent migrant nature and the fact that research in this area is only in its infancy. Another area of research that is lacking is the research discussing implementation of a solution to health care disparities. While community-based participatory research is prevalent and seemingly effective, other methods of health care delivery have not been researched and published. Once again, this is likely due to the fact that research in the area of migrant health care is only beginning to expand. Certainly, once the population has been described and studied, implementation of health care will be further researched. Although Madeline Leininger founded the concept of transcultural nursing and the migrant population has been demonstrated to benefit from culturally competent care, few articles exist that cite Leininger's work (Bechtel, et al., 2000; Goertz, et al., 2007; Kim-Godwin, et al., 2006). This lack of research information represents yet another shortfall in the

literature pertaining to migrant health. A final area of research that is lacking in the literature is discussion of migrant health care in Montana or the Rocky Mountain states. Most research that has been published discusses migrant health care needs in Michigan, Wisconsin, or other mid-west states. Montana, Wyoming, the Dakotas, Idaho and Colorado are very agriculturally-based states that employ seasonal farm workers. It is surprising that no research has been performed and published in this area of the country.

<u>Filling the Literature Gaps</u>

This research performed to describe migrant characteristics in Montana will begin to fill many of the aforementioned gaps in the literature. First, it will add depth to the methodology used to describe this population. Thus far, only qualitative descriptive studies have been performed. This descriptive study will implement a quantitative design to measure the characteristics possessed by the population receiving care at this particular rural clinic. Second, the study will fill part of the literature gap pertaining to chronic illness and implementation of interventions. The research performed will examine chronic illness in this population and examine the interventions currently being used. The data will show what interventions are most effective in improving the chronic illness indicators measured (hemoglobin A1c, blood pressure, etc.) Third, Leininger's theory will guide the research of this topic. Therefore, the gap in the literature that lacks information about Leininger and her theory of transcultural nursing will begin to be filled. Finally, this study describes characteristics of the population receiving care at three

Montana clinics. Therefore, the literature gap that lacks information about Rocky

Mountain states' migrants will begin to be filled.

Conclusion

Because little is known about the health of the migrant population, some areas of

literature are lacking (Villarejo, 2003). As more is discovered about this population, the

research in this area will likely expand. For now, qualitative descriptive studies exist, as

do a two qualitative articles discussing diabetes in the migrant population. Surprisingly

few articles credit Leininger or her theories on culturally competent care, despite the

known disparity somewhat attributable to culturally incompetent care (Bechtel, et al.,

2000). Nonetheless, all research in the area of migrant health care acknowledges the vast

health care disparity experienced by migrant workers (Anthony, et al., 2008). Much

research has begun to suggest solutions to remedying the problem. Solutions such as the

implementation of community-based participatory research, provision of culturally-

competent care, and increasing cultural awareness have all been suggested and are in the

stages of implementation (Doyle, et al., 2006; Kim-Godwin, et al., 2006; Clingerman,

2008).

As research in the area of migrant health care moves forward, gaps in the

literature will begin to fill. More qualitative and quantitative studies will be performed

and more studies assessing interventions will be published. This study may spark an

interest in research on the migrant population in the Rocky Mountain States and begin to

fill the gap in the literature in that area.

CHAPTER 3

METHODS

Introduction

This study was designed to describe the characteristics of the diabetic population

receiving care at the Montana Migrant Council (MMC). The MMC has collected health

data for submission to the Health Resources Services Administration (HRSA) since 2002.

While the data has been collected and submitted annually, the population has never been

formally described. A formal description of this vulnerable group would help identify

health practices and interventions that reap the most benefits for the patients. The intent

of this formal description of the collected data is to help providers measure their progress

in treating chronic patient conditions such as diabetes. Furthermore, a formal description

would allow the MMC clinic to increase their focus on prevention after seeing the

measureable differences described and documented in the system and hoped to increase

their grant writing ability in order to expand services to more underprivileged patients.

Study Design

This secondary analysis employed a non-experimental, descriptive, cross-

sectional design using existing information from a health center data base. The

methodology of this study was chosen based upon the reported needs of the clinic (C.

Townsend, personal communication, April 23, 2009). Secondary data analysis can

accurately and cost-efficiently allow a researcher to draw conclusions using existing data

(Nicoll & Beyea, 1999; Szabo & Strang, 1997). Although the data may have been collected for another purpose, secondary data analysis continues to be an effective method of research, especially for longitudinal studies looking for trends found over time. Nursing uses less of this research methodology than other professions (Nicoll & Beyea, 1999). In the interest of time, cost, and efficiency, secondary data analysis is an excellent research option when paired with the right research study.

Descriptive research was chosen because the intent of the study was to "observe, describe, and document aspects of a situation as it naturally occurs" (Polit & Beck, 2008, p. 274). Likewise, descriptive studies often serve as a starting point to generate theories (Polit & Beck, 2008). The quantitative design was chosen to numerically assess the previously collected data. Typically quantitative studies are chosen to assess "numeric information that results from some type of formal measurement and that is analyzed with statistical procedures" (Polit & Beck, 2008, p. 16). For this study, these two formats were used to quantify the information contained in the database and describe the measureable attributes of the diabetics receiving care at MMC.

Tool for Collecting Secondary Data

The Patient Electronic Care System (PECS) has been in place at the Montana Migrant Council (MMC) since 2002. Providers at each of MMCs three sites measure and enter specific information into the PECS system for quarterly submittal to the federal agency Health Resources Services Administration (HRSA). HRSA has provided a set of national standards which PECS system users abide by. The standards are similar to

clinical pathways, detailing which interventions are appropriate for which patients at which visit. For example, the standards say that a diabetic should have quarterly diabetic foot exams. The MMC PECS program documents how many PECS patients actually received a quarterly diabetic foot exam.

The MMC uses four subcategories to divide PECS patient records: diabetes, hypertension, asthma, and depression. Some patients fall into more than one category, depending on their concurrent disease states. For this analysis, the subpopulation of patients who experienced diabetes was used to formally describe the characteristics of patients with diabetes receiving care at MMC. Initially the data was collected by providers on the individual patients, entered into the computer database, PECS, and sent to a national organization for quarterly measurement and comparison. From there, the information was used to set goals in conjunction with national standards for health indicators such as hemoglobin A1C values and frequency of diabetic foot exams. Demographic data, visit information (including vital signs and medications prescribed), and lab data make up the three categories of information collected on each diabetic patient at each visit. For this research, the information was used to observe trends, quantitatively measure characteristics, and in the end, describe the population of diabetics receiving care at MMC.

<div align="center">Sample and Population</div>

People qualified to receive services at MMC were those who are involved in agriculture, including all branches of farming, tilling, packaging, or production of

agricultural products (see Chapter One-Definitions). No race, gender, ethnicity, or financial class was excluded. As long as the patient met the agricultural definition, he/she and his/her spouse and dependents were qualified to receive care at MMC. The patient must have been physically present at one of the three MMC sites or the seasonal satellite sites to qualify for care.

Those patients who meet the admission qualification are screened for entry into the PECS system in each of its four categories. The diabetes registry requires that the patient meet the definition of diabetes and fall into one of the diabetes classifications. The definition of diabetes as set for the by the MMC Clinician's Manual states that "this is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both" (MMC Clinician's Manual, 2008, p. J-6). The classifications are: Type I, idiopathic diabetes, type II, and diabetes associated with certain conditions such as insulin receptor disorders, genetic syndromes, drug or chemical-induced diabetes, or endocrinopathies (MMC Clinician's Manual, 2008). The subsets of diabetes are classified based upon clinical criteria and their ability to cause diabetec ketoacidosis. The Clinician's Manual (2008) specifies that if diabetes is suspected through symptoms of polydipsia, polyuria, or polyphagia, it must be confirmed with a serum blood glucose sample >200mg/dL, not a glucometer reading.

Once diabetes is diagnosed based upon these criteria, a patient qualifies for entry into the PECS program. They are then recommended/required to have an annual physical exam, annual laboratory blood work, and a referral to ophthalmology for an annual dilated eye exam, in addition to "as needed" services such as diabetes education or visits

to foot specialists. They must also have two visits to MMC per year in order to receive the necessary care to treat their condition and have follow up lab work. The information obtained in the annual exam and lab work was entered into the PECS for analysis and measurement.

<div align="center">Data Collection and Analysis</div>

The Patient Electronic Care System (PECS) that was used to collect data for analysis was made available to the researcher with de-identified data. The researcher used existing health information from the PECS program to perform a secondary data analysis.

First, the MMC protocols were researched to understand the clinical pathways that qualify a patient for entry into the PECS program. The protocols were also helpful in describing the required services made available to diabetic patients and the optional referral services used at the discretion of the provider.

Initial analysis of existing medical data including demographics, visit information, and lab data was performed to identify trends and outliers. The demographic data was described using frequency, mean, and mode for the traditional categories of age, race, and sex, in addition to the other demographic categories of number of visits to the clinic, type of health insurance, and type of diabetes. In addition, the demographic data was classified into special populations including migrant, homeless, and refugee.

Next the visit information was described using the frequency, mean, and mode for the blood pressure, medications used, specialty care received, and the health profile,

which quantifies concurrent disease states. Diabetic and lipid lab profiles were used to describe the test information via *n*, mean, and mode.

Finally the data sheet used to submit quarterly information to HRSA was reviewed and compared to the MMC results. Both the categories in which the MMC patients excelled and the categories in which they did not meet the national goals were compared and described.

<u>Human Subjects Considerations</u>

After submitting the study plan for this research, the Institutional Review Board (IRB) at Montana State University-Bozeman, the study was deemed exempt. They IRB determined that de-identified data in use for secondary analysis did not necessitate further review.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF THE DATA

Introduction

A cross-sectional, non-experimental study was designed to perform secondary analysis on an existing database that contained de-identified information. The study sought to describe the characteristics of the diabetic population receiving care at the Montana Migrant Council (MMC). Using the PECS database, demographic information, visit information, and lab data were analyzed in order to effectively describe the characteristics of diabetic patients within the PECS registry. Since very little information exists on heath of migrant workers in the Rocky Mountain states, this study was designed to begin the descriptive process necessary for further research.

Once Institutional Review Board (IRB) approval was obtained, the de-identified data set was retrieved from the MMC database. The Microsoft Excel file containing the PECS data was sent to the researcher. The calendar year data from 2008 was selected because it contained proper sample size ($n=30$) and was the most recent, complete calendar year available. Next, the data was examined for themes, outliers, and statistical trends using mean and sample size.

A descriptive analysis was performed using the Microsoft Excel system to research and explore the data. The presiding research question was "what are the characteristics of the migrant population with diabetes who receive care at the Montana Migrant Council?" The data presented in this chapter includes descriptive statistical

information that describes the demographics, information obtained from the patient visits

including blood pressure and current medications, specialty care received, and pertinent

lab data.

The research questions that guided this study were:

1. What are the demographic characteristics of diabetic migrant workers that receive

   care at MMC?

2. What information obtained during the visit is most commonly recorded?

Sample Characteristics

The PECS diabetes registry from January 1, 2008 to December 31, 2008 contains

de-identified data on 30 patients. Twenty six patients (86.7%) visited the clinic six or

more times during the 2008 calendar year. Three patients (10%) visited the clinic

between three and five times in 2008. One patient (3.3%) visited the clinic once or twice

that year. On average, the PECS diabetes patients visited the clinic 10 times in the 2008

calendar year. Table 4-1 shows this information.

Table 4-1. Number of Annual Patient Visits.

Patients		
	n	*%*
Pts w/ 0 visits	0	0.0%
Pts w/ 1-2 visits	1	3.3%
Pts w/ 3-5 visits	3	10.0%
Pts w/ 6+ visits	26	86.7%
	n	*Avg Visits*
Total registry & Avg	30	10.23

Demographic Information

Demographically, the 30 PECS patients are also categorized into gender, age race,

BMI, type of diabetes and insurance. Within the diabetes registry, over half of the

patients 53.3 percent ($n=16$) are female and 46.7 percent ($n=14$) are male. See Table 4-2.

The most densely populated age range is age 30-49 ($n=13$), followed closely by ages 50-

64 ($n=12$). There are no PECS diabetes registrants under age 14. There is one registrant

age 15-29 and four registrants ages 65-84. Table 4-3 displays this information.

Table 4-2. Gender of PECS Diabetes Registrants.

Gender		
	n	*%*
Female	16	53.3%
Male	14	46.7%

Table 4-3. Age of PECS Diabetes Registrants.

Age		
	n	*%*
0 - 14	0	0.0%
15 - 29	1	3.3%
30 - 49	13	43.3%

Diabetics of Hispanic descent make up the majority of the PECS diabetes registry.

Sixty percent ($n=18$) of registrants are of Hispanic origin, followed by 40 percent ($n=12$)

of Caucasian origin. No other races are represented in the PECS diabetes registry. See

Table 4-4.

Table 4-4. Race of PECS Diabetes Registrants

Race

	n	%
Caucasian	12	40.0%
African American	0	0.0%
American Indian	0	0.0%
Asian	0	0.0%
Hispanic	18	60.0%
Pacific Islander	0	0.0%
Other	0	0.0%

All 30 patients disclosed their insurance status to the clinician. The majority, 93.3%

($n=38$) are uninsured. One patient is covered by Medicare and one by Medicaid (3.3%).

Table 4-5 demonstrates this information.

Table 4-5. Insurance Status Among PECS Diabetes Registrants.

Insurance

	n	%
Insurance indicated	30	100.0%
Private Ins	0	0.0%
Medicaid	1	3.3%
Medicare	1	3.3%
Medicaid + Medicare	0	0.0%

Of the two types of diabetes, 100 percent ($n=30$) indicated that they have type II

diabetes. No one indicated that they have type I.

A final breakdown of the demographic data from the PECS diabetes registry

includes "special populations." Categories that make up special populations are migrant,

homeless, and refugee. Twenty-three patients from the PECS diabetes registry qualify as

a special population. Of the total number of PECS diabetes registrants, 76.6 percent are

migrant. No PECS diabetes registrants indicated that they are homeless or refugee. Table

4-6 shows this information.

Table 4-6. Special Populations Among PECS Diabetes Registrants.

Special Populations

	n	%
Migrant	23	76.6%
Homeless	0	0.0%
Refugee	0	0.0%

Visit Information

        The visit information contained in the PECS diabetes registry contains

information such as blood pressure, body mass index (BMI), medications being taken by

the patient, co-morbid conditions, and specialty care received. Although blood pressure

checks are not required for reporting of the quarterly data submission, all 30 patients in

the PECS diabetes registry showed blood pressure checks within the 2008 calendar year.

Of these patients, the average systolic and diastolic blood pressure was 124/75. Ten

percent of patients ($n=3$) had blood pressures greater than 140/90. Over half of patients

(56%, $n=17$) had blood pressures less than 130/80. Table 4-7 shows this information.

Table 4-7. Blood Pressure of PECS Diabetes Registrants.

Blood Pressure

	n	%
Patients w/bp checked	30	85.7%
Avg systolic & Avg diastolic	124	75
Patients BP >= 130/80	13	43.3%
Patients BP > = 140/90	3	10.0%
Patients BP < 130/80	17	56.7%

Body mass index (BMI) was calculated on all 30 registrants who had visits in 2008, a key measure that is not required by MMC quarterly reporting. Of those on whom a BMI was calculated, one patient (3.3%), had a BMI less than 25. Nine patients, or 30 percent, had a BMI between 25-29.9. Six patients, or 20 percent, had a BMI between 30-34.5. Six patients (20%) had a BMI between 35-39.9 and eight patients (26%) had a BMI greater than 40. Nearly two-thirds of PECS diabetes registrants whose BMI was calculated qualify as obese. See Table 4-8.

Table 4-8. Body Mass Index (BMI) of PECS Diabetes Registrants.

BMI		
	n	*%*
BMI calculated	30	85.7%
< 25	1	3.3%
25 - 29.9	9	30.0%
30 - 34.9	6	20.0%
35 - 39.9	6	20.0%
>= 40	8	26.7%

The PECS diabetes registry also tracks which medications patients are taking. The most common medications taken among patients in the diabetes registry are a biguanide (83.3%, *n=25*), ACE inhibitor or ARB (73.4%, *n=22*), and an antiplatelet (80.0%, *n=24*). Twenty percent (*n=6*) of PECS diabetes patients are taking a diuretic. Thirty seven percent (*n=11*) are taking a lipid-lowering agent. Table 4-9 shows this information.

Table 4-9. Medications Taken by PECS Patients.

Medications		
	n	*%*
Insulin	3	10.0%
Sulfonylurea	10	33.3%
Biguanide	25	83.3%
TZD/Glitazones	8	26.7%
ACE Inhibitors	17	56.7%
ARB	5	16.7%
ACE or ARB	21	70.0%
Statins	7	23.3%
Beta Blocker	3	10.0%
Diuretic	6	20.0%
Antiplatelet/Antithrombotic	24	80.0%
Lipid lowerer	11	36.7%
Other BP	1	3.3%

Patients in the PECS diabetes registry are also tracked by the concurrent disease states or co-morbid conditions. Of them, 60 percent (*n*=18) have hypertension, 57 percent (*n*=17) have dyslipidemia, and 17 percent (*n*=5) suffer from depression. Seventeen percent (*n*=5) have neuropathy and nephropathy. Table 4-10 shows this data.

Some PECS diabetes patients participate in activities that are documented on the health profile. About 97 percent self monitor their blood glucose (*n*=29). Eighty-nine percent (*n*=26) participate in physical activity three or more times per week and 100 percent of patients had a smoking status documented during their visits (*n*=30). Thirteen percent of patients are documented smokers (*n*=4), and each one of them received smoking cessation education.

Table 4-10. Health Profile Information.

Health Profile		
	n	*%*
Hypertension	28	60.0%
Dyslipidemia	17	56.7%
CerebroVDz	0	0.0%
PVD	0	0.0%
CAD	4	13.3%
Nephropathy	5	16.7%
Microalbuninuria	7	23.3%
Retinopathy	2	6.7%
Neuropathy	5	16.7%
Depression	5	16.7%
Self Monitor BG	29	96.7%
Physical Activity Doc'ed	29	96.7%
Physical Activity (>= 3/wk)	*26*	*89.7%*
Smoking Status Doc'ed	30	100.0%
Current Smoker	*4*	*13.3%*

Patients in the PECS diabetes registry have access to some specialty care through the voucher system offered at MMC. Every patient received diabetes education through a certified diabetic educator (*n*=30). The quarterly report sets a goal of >70 percent of patients setting a self-management goal within the past 12 months. However, the PECS diabetes patients exceeded that goal by nearly 27 percent. Twenty nine patients (96.7%) set a self management goal in 2008. In addition, as shown in Table 4-11, the quarterly report aims to document that >70 percent of PECS diabetes patients have had at least one dental examination in the past year. Of the registered patients, 100 percent (*n=30)* had dental exams in the past year. Like self-management goals and dental visits, the quarterly report aims to have >70 percent of patients have a dilated eye exam in the past year. Sixty percent of PECS diabetes patients (*n*=18) were recorded as having retinal exams. The

quarterly report asks that >90 percent of patients have a foot exam yearly, a test that is

performed in-office. All thirty patients were documented as having foot exams in 2008.

The PECS diabetes registry documented that all 30 patients seen during the 2008

calendar year (100%) were screened for substance abuse. Nearly sixty-seven percent

($n=20$) have had a pneumococcal vaccine and 70 percent ($n=21$) received an influenza

vaccine.

Table 4-11. Specialty Care Received Among PECS Diabetes Registrants.

Specialty Care Received

	n	*%*
DM Education (ever)	30	100.0%
Self-Mgt Goal Set	29	96.7%
Nutrition Edu. (ever)	30	100.0%
Dental Exam	30	100.0%
Smoke Cess (smokers)	4	100.0%
Retinal Exam	18	60.0%
Depression Screening	29	96.7%
Sub Abuse Screening	30	100.0%
Pneumonia Vacc. (ever)	20	66.7%
Flu Vaccination	21	70.0%
Foot Exam	30	100.0%
BMI > 25 Doc'ed	30	100.0%
Weight Reduction >= 10lb	5	16.7%

Test/Data Information

The standards for the quarterly report aim for >90 percent of patients to have two

hemoglobin A1C checks within the past year and for the A1C to be less than seven. The

PECS diabetes registry for the 2008 calendar year reports that all 30 patients had a

reported hemoglobin A1C in the past year and 80 percent ($n=24$) had two or more A1Cs

drawn that year. Of those patients, the average A1C was seven point four. Twelve

patients, 40 percent, achieved A1Cs less than seven. Eleven patients, 37 percent, achieved A1Cs from 7.0-7.9. Three patients (10%) had A1Cs from 8.0-8.9. Four patients (13%) had A1Cs greater than 10. Forty-eight percent of these patients (*n*=13) decreased their A1C from their baseline level. See Table 4-12.

Twenty seven patients (90%) had a baseline hemoglobin A1C drawn. Of those patients, 11 (40%) had a hemoglobin A1C of less than 7.0. Six patients had a baseline between 7.0-7.9. Five patients (18.5%) had a baseline between 8.0-8.9. Two patients (7%) had a baseline between 9.0-9.9. Three patients (11%) had an A1C baseline greater than 10.

Table 4-12. Hemoglobin A1C Baseline and Average.

HbA1c or Glycosylates Hb

	n	*%*
Patients with test	30	100.0%
< 7.0	12	40.0%
7.0 - 7.9	11	36.7%
8.0 - 8.9	3	10.0%
9.0 - 9.9	0	0.0%
>= 10	4	13.3%
2+ A1c 91 + days apart	24	68.6%
Avg HbA1c / n	7.4	30

HbA1c baseline

	n	*%*
Patients with baseline	27	90.0%
baseline< 7.0	11	40.7%
baseline 7.0 - 7.9	6	22.2%
baseline 8.0 - 8.9	5	18.5%
baseline 9.0 - 9.9	2	7.4%
baseline >= 10	3	11.1%

Twenty seven patients (90%) had microalbumin/creatinine ratios performed in 2008. Of those, 66 percent were normal (*n*=18), and 33 percent were abnormal (*n*=9). The standard for a reading of "normal" is less than or equal to 30, and abnormal is greater than 30.

Thirty PECS diabetes registry patients (100%) had a creatinine level drawn in 2008. Ninety percent (*n*=27) had creatinine levels less than 1.5 mg/dl at the time of the draw. The other three patients (10%) had creatinine levels between 1.6-2.5 mg/dl. No patients had creatinine levels over 2.5 mg/dl.

Thirty patients (85%) had liver function blood tests drawn. Those results were not included in the PECS diabetes registry.

All thirty PECS diabetes patients had cholesterol panels checked in 2008. The standard for the quarterly report is >80 percent. Of those 30 patients, the average total cholesterol was 178, the average triglyceride level was 203, the average HDL level was 44, and the average LDL level was 97.7. Thirty seven percent of patients (*n*=11) had triglycerides greater than 200 and 27 percent of patients (*n*=8) had total cholesterol levels greater than 200. Fifty six percent of patients (*n*=17) had an HDL level less than 45. Of the 29 patients with LDL levels drawn, 24 percent (*n*=7) had levels less than 70, which is the standard for a diabetic patients with other co-morbid conditions or family history of heart disease. Fifty-two percent of patients (*n*=15) had LDL levels less than 100, the standard for diabetic patients and the goal for the MMC quarterly reports. Thirty-four percent (*n*=10) had LDL levels between 100-129 and 11 percent (*n*=3) had LDL levels

between 130-160. One patient (three percent) had an LDL level >160. See Table 4-13 and

Figure 4-1.

Table 4-13. Lipid Panel on PECS Diabetes Registrants.

Cholesterol Test

	n	%
Patients with test	30	100.0%
Patients >= 200	8	26.7%

	n	Avg mg/dL
Average Cholesterol / n	30	177.9

Triglycerides Test

	n	%
Patients with test	30	100.0%
Patients >= 200	11	36.7%

	n	Avg mg/dL
Average Triglyceride / n	30	203.4

HDL Test

	n	%
Patients with test	30	100.0%
Patients < 45	17	56.7%

	n	Avg mg/dL
Average HDL / n	30	43.8

LDL Test

	n	%
Patients with test	29	96.7%
Patients < 70	7	*24.1%*
Patients < 100	15	51.7%
Patients 100 - 129	10	34.5%
Patients 130 - 160	3	10.3%
Patients > 160	1	3.3%

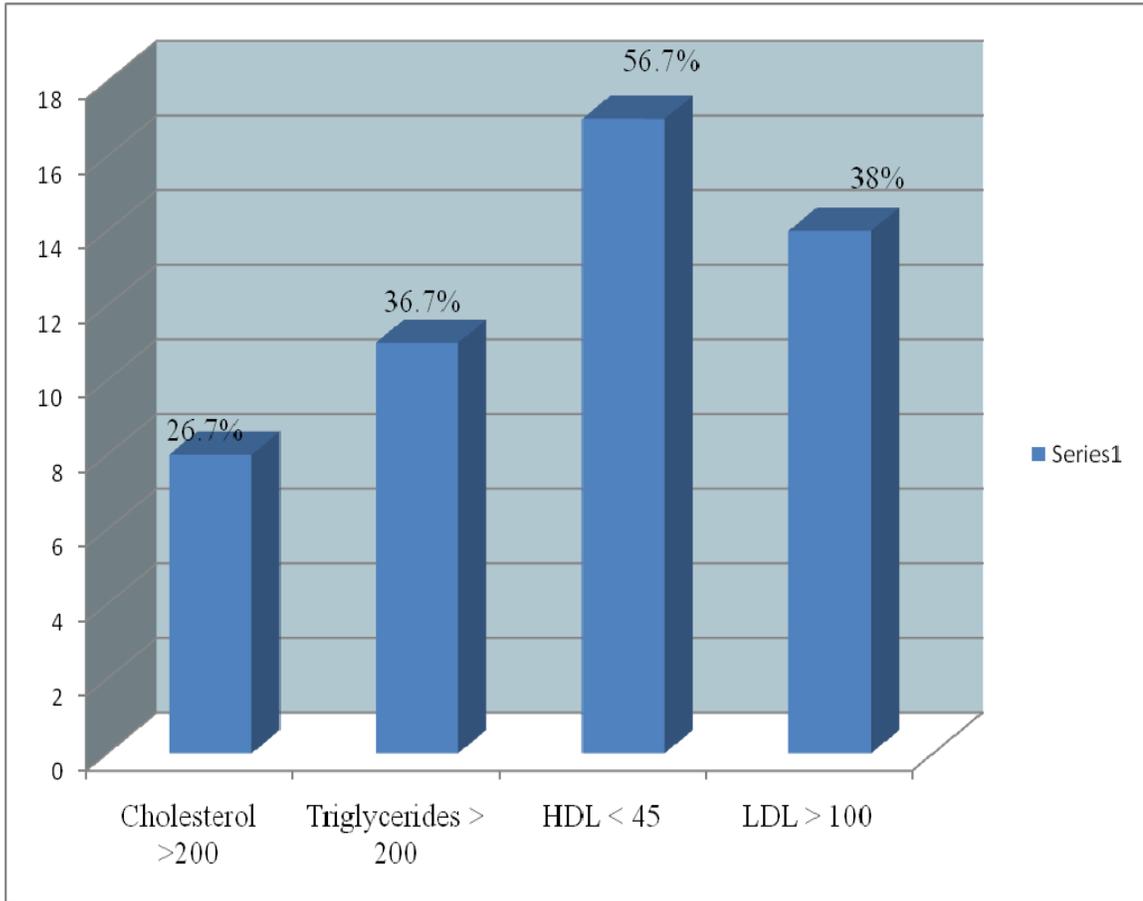|	n	Avg mg/dL
Average LDL / n	29	97.7

Figure 4-1. Percent of PECS Diabetes Registrants with Lipid
Panels Outside Desirable Range.

Additional Analyses

Although the MMC 2008 calendar year diabetic patient list for the state of

Montana shows 181 patients, the PECS system contains only 30. This information is

relevant to the research data because of the significant number of patients *not* included in

the PECS system. This section is intended to clarify the number of patients not included

in the PECS system data.

In order to be included in the 2008 PECS diabetes registry, patients must have declared in their health history that they are diabetic and must have two visits to a MMC clinic within the 2008 calendar year. Of the 181 known diabetic migrant workers in Montana, only 30 met these criteria. The remaining patients declared diabetes as a condition on their health history, but did not seek care for diabetes or had less that two visits. As the Executive Aide from MMC pointed out, some patients seek care for a cut or sore throat and fill out the health history form during their migrant season in Montana. During that visit, the provider treats them with the necessary care, but the patient continues to receive care for their diabetes outside of the state or in their home clinic. The 30 patients described in this PECS data set are those who have sought care more than one time at MMC for their known condition of diabetes.

The remaining 151 patients have worked in Montana and were seen at MMC for some type of care (be it vaccines, a health history, or an acute visit) but they did not receive comprehensive diabetic care at MMC. This point illustrates well the nomadic tendencies of this population that makes providing thorough, preventive health care a challenging task.

CHAPTER 5

DISCUSSION

Summary

Migrant workers face innumerable barriers when accessing health care in the United States. The top four barriers to care through the eyes of a migrant worker are: language barrier, cost of care, lack of transportation, and lack of preventive care (Anthony, et al., 2008; Goertz, et al., 2007). In addition to the fact that many do not speak English, 85% percent of agricultural workers have trouble reading *any* language (Clark, et al., 2009). The illiteracy rate makes dispersing health care information difficult. Word of mouth is sometimes the only way to make known the services provided for migrant workers. Most work dawn to dusk and lack personal transportation, making a visit to a health care clinic during regular business hours very difficult.

Furthermore, chronic disease such as diabetes and hypertension affect the Hispanic population at a higher rate than non-Hispanic whites (American Diabetes Association, 2009). Some reports have stated that the incidence of diabetes in the migrant population is 300 times higher than it is in the general population (Gaston, 1993).When combined with the fact that only about 40% of farmworkers who report a medical problem are actually seen for care, the preventive education need is startling (Ward, 2007). For these reasons, the need for preventive health care in this population is significant.

To date, no studies have been performed to describe the population of migrant workers with chronic disease in the Rocky Mountain states. This study aimed to describe the population of diabetic migrant workers receiving care at the Montana Migrant Council (MMC). This government-funded organization with three year-round clinics in Montana provides care to migrant workers and their families while tracking their care through the Patient Electronic Care System (PECS). A cross-sectional study was performed using secondary data analysis. The de-identified data from the PECS diabetes registry was used to describe the characteristics of 30 diabetic migrant patients who received care in Montana.

The PECS diabetes registry provided demographic data, visit information, and lab information. Using Microsoft Excel to analyze the data, trends, percentages, and means were used to help describe the population.

Conclusions

Demographics Analysis

The data analysis found that 30 diabetic patients in Montana were receiving care for their diabetes at MMC during the 2008 calendar year. On average, they visited the clinic 10 times per year, although some visited only two times in 2008. To qualify for entry into PECS system, a patient must have a known history of diabetes and be seen at least two times that year for diabetic care.

It is estimated that less than 20 percent of migrant agricultural workers seek care at an accessible clinic (National Center for Farmworker Health, n.d). Anthony et al. (2008)

stated that "most of the literature on health care needs of migrant and seasonal farmworkers is based on data obtained from health care providers" (para. 5). This is true of the PECS data, as well. The PECS data was collected and entered into the database by the clinician. The National Center for Farmworker Health statistic is notable because it leads one to believe that many other migrant workers are going undiagnosed, unseen, and uneducated regarding the disease process they may already have.

Demographically, there were more females than males receiving diabetic care. Anthony, et al., (2008) described the population of migrant workers as mostly male, while many family members remain home outside the country or in their home state. It is surprising that with such a high percentage of patients reporting migrant status in this database, that the number of women being seen at MMC for diabetes care is greater than that of men. One must remember that MMC treats dependents of any agricultural worker, but it is still unusual that the number of diabetic women in the database exceeds the number of men.

Perhaps the number of women exceeds the number of men in the database because women who are not employed in agriculture have the flexibility to be seen at a clinic during business hours, while men cannot leave work for a clinic appointment. In addition, in order to understand more thoroughly why the number of women exceeds the number of men in this database, research would need to be done to conclude if sugar beets and other local agricultural products draw both men and women for the harvest. During some harvests, men and women work side by side, while during other harvests men are employed more than women.

Over half of the registrants were of Hispanic origin while the other 40% was comprised of Caucasians. Based upon other reports, the percent of Caucasians in this registry was higher than expected. Anthony, et al., (2008) reported that over 75% of migrant workers are of Hispanic origin and that they are more prone to diabetes and chronic disease. Although this research shows that the diabetics of Hispanic origin out numbered the Caucasians in this database, it is surprising that they out numbered the Caucasians by only 20%. The unexpected number of Caucasians could be due to the employment of many local Montanans who are Causcasian at the sugar beet refinery. This population qualifies for care at MMC because of their relationship to agriculture via processing an agricultural product. This is one explanation for the increased percentage of Caucasians in the PECS database.

As expected, the majority of the diabetic PECS patients were uninsured. Finances are known to be a problem for this population, so it was not expected that any patient would hold private insurance.

Two-thirds of patients in the PECS diabetes registry were migrant, and none were refugee or homeless. Since this clinic was designed to track and serve the migrant agricultural population, it was expected that the number of migrant workers in the registry would be high.

The type of diabetes (type I vs. type II) showed that all 30 PECS registrants have type II diabetes. No juvenile-onset diabetes was found among this group of patients. It is presumed that lifestyle, poor living conditions, lack of nutrition education among this

population, and certainly genetics play a role in the development of diabetes in this

population.

Visit Information Analysis

The PECS diabetes registry showed that most registrants were overweight or

obese. Weight and type II diabetes are linked, so the elevated BMIs demonstrated by the

PECS patients were not unexpected.

Blood pressures were recorded on all thirty patients at some point during the 2008

calendar year. The average reading for the 30 patients was 124/75. Over half of patients

were recorded at less than 130/80, as a diabetic should be. Ten percent of patients were

recorded greater than 140/90, a concerning number for a patient with co-morbid

conditions, although not surprising because 18 patients had known hypertension. Several

sources have published the higher incidence of chronic disease in the migrant population.

Asthma, diabetes, and hypertension are known to be especially prevalent in this

population due to genetics and lifestyle (American Diabetes Association, 2009).

Many had co-morbid conditions resulting from poorly controlled diabetes, such as

neuropathy, nephropathy, retinopathy, and microalbuminuria. Others had cardiovascular

complications such as hypertension, hyperlipidemia, and coronary artery disease. Five of

the thirty patients suffered from depression. These co-morbid conditions were expected,

based upon the diabetic migrant population who is known to be prone to chronic disease

and its complications. The vascular complications frequently accompany diabetes and

were not unexpected in this data set. Gaston (1993) reported the incidence of diabetes to

be as much as 300 times higher in the Hispanic migrant population as it is in the general

population. The aforementioned complications resulting from poorly controlled diabetes can be related to genetics, lifestyle, and also a lack of preventive health education and primary care (Anthony, et al., 2008).

Upon review of the medications being taken by the PECS diabetes patients, it was found that most patients were taking at least one anti-diabetic medication, a blood pressure medication, and an antiplatelet. Each of these is recommended in the care of the diabetic patient. Metformin, the biguanide, was the most popular anti-diabetic medication, as it is typically the first-line treatment for type II diabetes. The majority of patients were on an ACE inhibitor or an ARB (angiotensin receptor blocker), as these drugs have renal-protective abilities in diabetic patients.

The quarterly report for MMC calls for certain patient education and outpatient referrals annually. The clinic exceeded the quarterly report standard of 70% of patients receiving dental exam, nutrition counseling, and help setting self-management goals. The only measure on which the clinic fell short was the annual retinal screening. They aim to have a dilated eye exam on >70% of patients annually but only achieved 60% in 2008. Nearly all patients received or participated in the specialty care services offered.

The services which had the fewest participants were influenza and pneumococcal vaccinations. Patients who have co-morbidities such as diabetes and hypertension are recommended to have both vaccines. In this PECS database, only about two-thirds of patients received either vaccine. That is concerning based upon the fact that this is an underserved population with co-morbid conditions.

Laboratory Information Analysis

Hemoglobin A1C tests and lipid panels were a large focus of the lab work performed on the PECS diabetes patients. A1C management is imperative to assess the blood glucose control of a patient who can usually afford to check a BG only two or three times per week. Lipid panels help the provider control lipid levels that, if severely elevated, further the vascular complications associated with diabetes.

An estimated 164 million workdays are lost in the United States annually as a result of the chronic illnesses asthma, diabetes and hypertension (American Hospital Association, 2007). If a patient receives proper health education and manages their chronic illness through medication and lab work, perhaps lost work days due to chronic illness could be reduced. Furthermore, lab work such as that performed for the PECS diabetes patients at MMC may be considered a preventive measure to reduce further complications of diabetes and promote the health education provided to these patients. Kahn, Robertson, Smith and Eddy (2008) used a mathematical model to estimate that 221 million life-years could be added to the United States population over the next 30 years if preventive measures were implemented. The authors project that with preventive measures, however, the United States could save about 900 billion dollars, or 10 percent, on health care costs.

Only about half of patients were within the desirable ranges for HDL and LDL cholesterol (56% and 51%, respectively). Because of the known disparities in health education in addition to the genetic factors that predispose this population to chronic disease, the cholesterol findings are not surprising. Total cholesterol and triglycerides

were areas in which the PECS diabetes patients had better results. Only 26% of patients

had total cholesterol levels greater than 200 and 36% had triglyceride levels greater than

200. This could be due to cultural diet preferences or genetics.

Summary of Health Care Status

Overall, the PECS patients met the goals set forth by the quarterly report. They

used the specialty services including nutrition consultation, dilated eye exams, dental

exams, and foot exams. The thirty patients in the PECS system for the 2008 calendar year

were followed with laboratory A1C checks and lipid panels, among other services and

testing provided. Although only two-thirds received influenza and pneumococcal

vaccines, this is likely higher than the 150 known diabetic migrant workers in Montana

who are not enrolled in the PECS system. While some of these patients may be receiving

episodic care in other states, it is safe to assume that many are not being followed by a

primary care provider. This faction of patients is lacking annual physicals, preventive

health education, and chronic disease management.

Although many of these patients may receive care for necessary injuries or

episodic treatments, the care is unlikely to be cohesive. The many providers in various

locations are unable to get a "total picture" of the patient who is seen once for a single

complaint before moving to a new harvest location.

For this reason, the importance of patient tracking in a migrant population such as

this, is imperative. If providers could look at previous records and lab data, they could get

a better picture of the patients needs and be more able to meet those needs. In addition,

barriers to care such as transportation, daytime clinic hours, and language barriers could

be addressed in patients with chronic disease. Patient tracking is one step in the

continuum of providing continuous care to diabetic migrant patients in need.

Limitations

As with any secondary data analysis, this study was able to use only the data

contained within this data set. The researcher was not able to tailor the research questions

in any way.

First, the literature researched on migrant health care did not contain any

information about typical migrant worker BMI, blood pressure, services received, or

specific diabetic lab work. Thus the research done here was unable to be compared to

previous research in an effort to either support or refute existing literature.

Second, the PECS diabetes database for the 2008 calendar year contained 30

patients. In order to make more conclusive interpretations of the migrant worker

population in Montana, a larger dataset would need to be obtained. It would be beneficial

to use more than a single calendar year to compare trends in population size and health.

Third, since the PECS data was obtained in Microsoft Excel format, the

researcher was unable to follow specific patients' courses of action throughout the 2008

calendar year. It would have been beneficial to this research to determine if, for example,

the same patient who has multiple co-morbid conditions is the same patient in the

database with an A1C greater than 10. That is to say, the database in its present format

limits the conclusions that can be made because it is not possible to track individual

patient outcomes or outliers through the present system.

Furthermore, the PECS database is set up so that the clinician enters information

into a data range. For example, did the patient have 1-2 visits/year or 5-6 visits. It would

be more helpful and more accurate if research could make conclusions based upon

specific numbers or ages rather than a range of numbers or ages.

Finally, the PECS data does not contain any information about culturally sensitive

interventions performed by the health care providers. Because of Madeline Leininger's

Theory of Cultural Care, it is known that cultural factors influence patients' behavior.

She posited that providing culturally competent care to people of different cultures helps

the patient maintain their well-being, health, and face disease in an appropriate way

(McFarland, 2006). Since the PECS data does not provide any information on the

providers or their cultural knowledge or background, the research is limited.

Recommendations for Future Research

Future research could focus on the cultural knowledge and background of the

MMC providers to determine if an increased knowledge improves patient outcomes. Per

Leininger's Cultural Care Theory, increased cultural sensitivity and knowledge of a

culture should help a patient maintain their health through culturally-sensitive care.

Another avenue of future research to be pursued is the outcomes of the other 151

diabetic patients known to be working in Montana who did not receive care at MMC.

Future research could determine where these patients are receiving care and why they choose not to be seen for their diabetes at the MMC reduced-fee clinics.

Future research could focus on the number of work days lost to chronic illness such as diabetes. Many projections have been offered and calculated, but no solid research has been done that tracks lost productivity to chronic illness in this population.

As mentioned in the review of literature, much research acknowledges a health care disparity in the migrant population, but little research exists that focuses on specific reasons for the disparity. Several authors cited in chapter 2 of this work, agree that diabetes in the migrant population is a concern that needs to be addressed. However, literature pertaining to diabetes in the migrant population is lacking. This work describes the diabetics receiving care at MMC, but certainly more quantitative studies could stem from this research in the future.

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