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PREVALENCE OF TYPE 2 DIABETES
AMONG MINORITY GROUPS

A Project

Presented to the

Faculty of

California State University,

San Bernardino

In Partial Fulfillment

of the Requirements for the Degree

Master of Social Work

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by

Patricia Elizabeth Sanchez

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ABSTRACT

Type 2 diabetes is an endemic public health concern that affects social work practice because of its impact on minority mortality and morbidity rates. A study to examine Loma Linda University Medical Center's Diabetes Treatment Center's effectiveness in treating high risk populations for Type 2 diabetes was conducted in an effort to reduce health disparities among racial and ethnic minority groups. Quantitative research was conducted on site using secondary analysis by extracting data from 68 patient medical records to explore associations between sociodemographic traits and patient health status. Although the data from the study did not produce statistically significant results, the study did reveal that Hispanics in San Bernardino County are developing the disease at least ten years earlier than previously reported.

ACKNOWLEDGMENTS

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I would like to thank Dr. Rosemary McCaslin for her support and guidance in the writing and editing of this work. Special thanks to Dr. Scott Lee for his good will and for allowing me the opportunity to perform this study at the Diabetes Treatment Center (DTC) in Loma Linda, California. I also wish to thank Debbie Clausen, Nurse Manager at the DTC, for her assistance in sorting and accessing data from the ACCESS database. Heartfelt thanks to Dr. Ray Liles and Dr. Tom Davis for inspiring me to turn toward challenges instead of away from them.

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CHAPTER ONE

INTRODUCTION

Despite strides toward racial equality in this country, disparities continue to exist. Disparities in areas of socioeconomic status, political and legal representation, and access to healthcare are but a few. Yet the growing trend appears to have its greatest impact on the health needs of racial and ethnic minorities. This first chapter will provide an overview of the impact of diabetes mellitus on minority morbidity and mortality rates. Contextual social and economic factors contributing to disparities in health services utilization will be examined, and health outcomes attributed to access and quality of care will be explored. Finally, a study for prevention intervention to reduce mortality risks among high risk minority group populations will be presented.

Problem Statement

Scope and Impact of Diabetes

Diabetes mellitus is a metabolic disease characterized by hyperglycemia, which "is caused by the body's inability to produce or effectively utilize" insulin, a hormone that converts food into glucose (Black, 2002, p. 543). When the body is unable to produce sufficient insulin to break down food, sugar levels rise leading to a condition of diabetes. Diabetes mellitus has four categories: Type 1, which is often diagnosed in childhood or early adulthood and requires insulin injections; Type 2, which is usually diagnosed in middle to later adulthood is presently controlled by a combination of diet and medication; gestational, which occurs in pregnancy; and other types, which result from genetic defects, substance use, or co-morbid illnesses (Black, 2002).

Of the present 18 million diabetics, over 90% have Type 2 diabetes of which five million will remain undiagnosed (Strategic Plan, 2004). This represents a 49% increase just within the last decade ("Health Gap," 2003). Future projections estimate a growing trend of cases reaching 22 million people affected with diabetes by the year 2025 (Black, 2002). Consequently, diabetes mellitus has become an endemic public health concern.

According to the Centers for Disease Control, diabetes is the sixth leading cause of annual deaths in the United States yet diabetes mellitus is the fifth leading cause of death among Hispanics and African-Americans ("Health Gap," 2003). Minorities, which include women and the elderly, are the most affected by diabetes ("Health Gap," 2003; Ashton et al., 2003; Johnson & Smith, 2002). Ethnic women are 2-4 times more likely to develop non-insulin dependent diabetes than white women (American Diabetes, 2005). In general, American Indians, Hispanics and African-Americans are twice as likely to develop diabetes as their white counterparts (Liburd & Vinicor, 2003). According to national figures from the National Institute of Diabetes and Digestive and Kidney Diseases, the prevalence of diabetes cases reported among people aged 20 and over is highest among Southern Arizona and Southeastern American Indians at 27.8%, followed by African-Americans at 11.4%, and Alaskan Natives and Hispanics at 8.2% ("National Diabetes," 2002). The American Diabetes Association (2005) reports that 25% of diagnosed cases occur among African-Americans aged 65-74 and 25% of diagnosed cases among females in this group occur at age 55 while 50% of recorded cases among Hispanics are between the ages of 45 and 74. Epidemiological studies continue to investigate the reasons for these racial and ethnic group differences. At present, contributing factors for risk of developing the disease are attributed to behavioral factors influenced by lifestyle, culture, family, diet, stress, and socioeconomic status (Strategic Plan, 2004). The implication here is that there appears to be a prevalence of cases of Type 2 diabetes among minority groups that merits consideration, attention and action.

Following former President Bill Clinton's Initiative on Race in 1997 to reduce the disparity in health status among minority groups by the year 2010, the Department of Health and Human Services, the National Diabetes Education Program, and other public and private agencies launched national campaigns to promote diabetes education and prevention strategies in response to the need for remedy of past and present inequities within this nation's healthcare system. Health disparities are identified as limitations to "accessibility, utilization, quality of care, or benefits derived from medical care" that maintain inequities in health status (Carter-Pokras & Woo, 1999, p. 117). Although discriminatory practices in health care services are not new, their effects have had a lasting psychological and societal impact on patient attitudes and behaviors affecting mortality risks and rates.

Minority Health Disparities

Historically, minority groups have endured limited access to or denial of services and substandard quality of patient health care services following, or in response to, desegregation laws (Washington, et al., 2002). Social movements to enact civil liberties for racial and ethnic minorities set the stage for subsequent legal protections and entitlements. Title VI of the Civil Rights Act of 1964 was established to ensure fair and equitable health practices (Washington et al., 2002). The Medicare/Medicaid Act of 1965 facilitated the entry of minorities into U.S. medical facilities (Ibrahim et al., 2003). Yet despite civil rights efforts and federally subsidized health programs, the disparities gap continues to broaden.

Underutilization of Services

In addition to differences in socioeconomic status and educational opportunities, generational experiences, socio-cultural and economic barriers have prevented many minorities from seeking and utilizing medical services.

For African-Americans, the historical and subjective experiences of having been used as involuntary medical subjects for research during the era of slavery and in the Tuskegee syphilis project and sterilization practices of the early twentieth century have served to promulgate mistrust toward the health care system (Johnson & Smith, 2002).

For Latinos, the experience of prejudice and discrimination, while manifest in different ways, has occurred with similar results. Language and cultural barriers have resulted in misdiagnoses of somatic complaints that were, as a result, treated either inappropriately or ineffectively (Ruiz, 2002). Economic factors such as the lack of steady employment and access to healthcare coverage contribute to the underutilization of clinical services, especially among uneducated and/or undocumented Hispanics (Brown et al., 2003; Ruiz, 2002). Consequently, such factors would seem to contribute to poor health outcomes.

As the preceding suggests, historical and socioeconomic factors would also appear to foster further dependence on this nation's public health system (Ashton et al., 2003). The present economic burden to public health exceeds an annual $100 billion prompting the aforementioned initiatives to reduce health risks among minority groups (Black, 2002). Therefore, when one considers the national population growth of 58% among Latinos and 16% among African-Americans just within the last decade, reducing the barriers to adequate health services, as well as the economic burden to local, state and federal agencies, becomes an increasingly important matter (U.S. Census Bureau, 2000).

Purpose of the Study

The purpose of this study was twofold. First, the study evaluated Loma Linda University Medical Center's (LLUMC) Diabetes Treatment Center's (DTC) effectiveness in providing diabetes education and services to high risk minority populations. Second, the results of the study helped the DTC determine the need for expanding its present efforts in the form of community health prevention services to San Bernardino County residents. Further research efforts following this preliminary study could address associations between sociodemographic traits and patients' underutilization of services and health outcomes.

The benefits of this study to the host agency were also twofold. First, the preliminary study had an immediate impact by adding to the institution's body of information. Second, the findings supported the institution's need for additional funding to address minority patients' self-care management of Type 2 diabetes. Furthermore, the findings could prove instrumental in supporting studies such as the quelled S.T.O.P. (Screening, Treatment, Outreach, and Prevention) study so that future planning and development of a community outreach program, including a mobile-type, could be designed to prevent or delay the onset of Type 2 diabetes cases among minority groups in San Bernardino County, which would, in turn, serve to reduce the annual public health expenditures of the state of California and its local health agencies.

In order to perform an agency needs assessment for minority prevention services, a preliminary profile of sociodemographic (community composition) data were collected and compiled from DTC patient files in an attempt to answer the following research question: "What population of outpatients attending LLUMC's Diabetes

Treatment Center has a higher prevalence of Type 2 diabetes?"

Diabetes Prevention Program

At present, the DTC provides diabetes support, education and treatment to individuals through its facility. The agency's commitment to ameliorate the effects of health disparities at the local level, prompted the DTC to embark on a mission to delay the onset of Type 2 diabetes among high risk population groups through its S.T.O.P. study, which like its predecessor, the Diabetes Prevention Program (DPP), purposed to understand, treat and prevent diabetes.

The objective of DPP, a landmark study, was to conduct a comprehensive program where diet, exercise and changes to lifestyle could positively impact people's lives by delaying the onset of Type 2 diabetes as well as reducing the burden of health care costs ("Diet," 2004). The experimental study was performed in "a major clinical trial [of] 3,234 people with impaired glucose tolerance, a condition that often precedes diabetes" ("Diet," 2004, Par. 5). A comparison study of four groups of participants with ages ranging from 25 - 85 was performed as follows: 1) lifestyle changes of diet and exercise in conjunction with drug treatment of Metformin, 2) one control group given a placebo and information regarding diet and exercise, and 3) two standard groups that solely received education on diet and exercise. The results of this experimental study after a three year follow-up period yielded a development of diabetes in 14% among the first group, 22% among the second and 29% among the third and fourth groups ("Diet," 2004, Par. 12). The results of the comparison suggest that diet and exercise can significantly delay the onset of diabetes even when no drug therapy is used. The DPP is cautiously optimistic that containment of the disease is possible, but longitudinal studies will have to be performed in order to review the effectiveness of these interventions ("Diet," 2004, Par. 13).

Despite efforts by the DTC to bridge the gap in the health disparities race, the S.T.O.P. study at the DTC was terminated in the summer of 2004 due to state and institutional cutbacks. As a result, an opportunity, and challenge to social workers, has been created to develop and implement a cost-effective educational program for minorities that could prevent or delay the onset of type 2 diabetes cases in San Bernardino County.

Considering that more than half of the nearly 1.8 million residents in San Bernardino County are ethnic minorities (U.S. Census Bureau, 2000), conducting research and designing programs aimed at promoting community prevention through lifestyle interventions like the DPP are a commendable effort. Consequently, a preliminary study exploring the sociodemographic traits of high risk diabetic populations was drafted and pursued as a necessary first step toward meeting the DTC's outreach objectives.

Significance of the Project For Social Work

Community outreach greatly impacts medical social work practice. At the micro level, medical social work practitioners are culturally competent and sensitive, possess the skills to work with individuals, groups and families and can provide counseling, health education and behavior modification, which are useful tools in assisting patients to manage their illness. Practitioners also have the ability to assess different groups' needs. At the mezzo level, medical social workers act as intermediaries to communicate patient needs to medical staff, outside agencies, care providers, family members, and the community. From a macro perspective, the ability of social workers to effect agency policies concerning treatment modalities, program design and implementation, minority research, and legislative proposals would widen the scope of medical social work interventions.

Social work practitioners have an essential role to play in the fruition of such developments. Presently, however, social work involvement in the area of diabetes appears limited. Although there are undoubtedly social workers treating client populations with diabetes and researching the disease, social worker involvement remains largely inconspicuous (DeCoster, 2001). The field has few educated and trained social workers, and even fewer medical social workers with training in assisting patients with chronic illnesses (DeCoster, 2001).

From a generalist model perspective, an evaluation of current assessment and planning interventions is needed to improve the health status of minorities. Medical social workers need to possess knowledge about diseases and conditions that impact patients if they are to be effective in their endeavors. Social workers must understand and recognize the fundamental challenges inherent in cultural attitudes that affect patient coping and management of their illness. Implementation of these skills must be encouraged through education, training and practice if the profession hopes to positively impact the effects of these diseases at the micro, mezzo and macro levels.

CHAPTER TWO

LITERATURE REVIEW

Introduction

Despite macro policy initiatives to reduce the gap in health disparities, it is evident from a survey of the literature that the need for redress of the health care system is long overdue (Black, 2002). Presently, there is an ongoing debate as to which methods yield the greatest results for understanding the relation between patient health behavior and disease management. In this chapter, health outcomes affected by racial biases will be addressed. Theories guiding current research practices on health disparities will be examined and evaluated. These theories include health needs, socioeconomic status, community-based participation, communication, and demographic indicators. Last, the biopsychosocial theory that guides this research study will be discussed in its relation to diabetes management.

Research Biases Affect Outcomes

Research studies must, at the local/community level, assess for racial and ethnic differences in access to care and health status and address the barriers that maintain a substandard system of patient care and treatment in this country. For too long, the medical community has been reactive instead of proactive in treating patients' health (Bertera, 2003). Twentieth century views still pervade our society today creating attitudes and biases that promulgate the erroneous belief that poor health outcomes are largely the result of poverty, poor education, and poor hygiene. In essence, the poor are blamed for their infirmities and inequities (Wallerstein, 2002).

Such culturally biased assumptions have directed, if not dictated, the course of modern research, which has, in turn, limited understanding concerning health disparities and mortality rates (Johnson & Smith, 2002). According to Johnson & Smith (2002), results from past and contemporary clinical studies have involved mostly white subjects "yet subsequent diagnostic tests and procedures have been used across racial and ethnic groups" (p. 30). This is neither adequate nor appropriate for assessing the needs of minorities (Washington et al., 2002). As a result, elevating the standards of the medical community to move beyond its static acute care approach of treating symptoms toward a holistic one has become a national priority (Ibrahim et al., p. 2003).

Health Needs Approach to Research

A health needs assessment (HNA) macro approach considers the influences from multiple aspects of an individual or group's experience (socioeconomic, cultural, provider, biopsychosocial, environmental, health system, and lifestyle factors), to explain the disparity and interactions between health outcomes and health care planning and delivery (Horne & Costello, 2003; Johnson & Smith, 2002). The objective of such a holistic approach is to address and understand the cultural beliefs and preferences among individuals and sub-populations that may contribute to disparate health outcomes (Johnson & Smith, 2002). Yet, while present empirical research would tend to support HNA in that it attempts to interpret data from multiple aspects of patient experiences as they relate to health, such an undertaking would require time, money, and community participation. Although HNA may be the most effective approach, it expends the most human resources. Thus, was measured by work conditions affecting morbidity and mortality, income by household wealth (i.e., earnings and savings accumulated), which is representative of permanent income resources, social class, and lifestyle factors through obesity, exercise, and alcohol and tobacco use (Hayward et al., 2000). The findings are important because they bring to the fore health trends and challenges affecting this nation's baby boom generation entering their retirement years at the turn of the twenty-first century (Hayward et al., 2000). Racial disparities between blacks and whites are also reinforced by these studies and the link between health and race supported.

Contemporary research studies commonly assume that SES remains the same for subjects from the time of measurement until the time of death, overlooking the fluctuations in SES across the life span (Hayward et al., 2000). Results, therefore, indicate a higher prevalence of health problems for middle-aged African-Americans due to the cumulative process of socioeconomic disadvantages over individual life span cycles or stages. However, changes to a person's life cycle can positively affect health outcomes in a person's later years, providing a more comprehensive look at different ways life events and/or circumstances of one race can positively or negatively influence health.

Yet the problem with using a socioeconomic approach in research is that results convey a need for structural reforms at societal and economic levels that require a radical and drastic redress of current policies and societal structures. Thus, it presents a major challenge for researchers and institutional bodies when lobbying lawmakers for changes. Societal and institutional changes are slow, which is the reason socioeconomic conditions remain in their present, stagnant state. As Hayward et al. (2000) point out, "race is ... a socially constructed concept created by institutional and ideological forces" that define and maintain the status quo of racial superiority in society (p. 912).

Community-Based Participatory Research

Evidence suggests that community support strengthens and empowers individuals as well as communities because of the focus on addressing local problems and issues, providing education to its membership, and enhancing social well-being (Israel et al., 2001; Caldwell, Zimmerman & Isichei, 2001). Collaborative research partnerships or community-based participatory research (CBPR) as referred to in contemporary literature is an action-oriented approach that seeks to advance community capacity through community-empowerment (Minkler et al., 2003; Wallerstein, 2002). CBPR is defined by Minkler et al. (2003) as "a collaborative process that equitably involves all partners in the research process and recognizes the unique strengths" of all partners or participants (p. 1210).

CBPR begins with a presentation to the community about a research topic of some significance with the objective of improving community capacity for social change, thereby reducing existing health disparities (Minkler et al., 2003). Community capacity refers to a community's assets in terms of leadership, active participation, decision-making, use of skills and resources, value system, and access to power (Wallerstein, 2002; Israel et al., 2001). Community empowerment is the end result of a community's capacity to organize and exercise its social and political power, "a social action process by which individuals, communities and organizations gain mastery over their lives" in effecting changes that bring about equity and an expansion of benefits that elevate their status (Wallerstein, 2002, p. 73).

By contrast, the theoretical approach of communication toward improving health care delivery seeks to analyze and explain how cultural and linguistic barriers affect quality of patient care, behaviors and overall health.

Communication Barriers Impede Progress

Empirically researched and established theoretical communication models seek to explain how race and ethnicity influence doctor-patient interactions (Ashton et al., 2003). The argument for continuing research and implementing programs that support changes in communication patterns between patients and their physicians stems from evidence that nearly half of all studies performed have excluded data from non-English speaking patients (Taira, 1999). This is important. If the health care system is to improve the quality of its care and service, the methods by which research is conducted must change to include all segments of the population. Not doing so results in a generalization of cultural norms and expectations toward minority populations, which raises confusion between the efficacy of a treatment modality and the effectiveness of treatment follow-up by patients (Taira, 1999). Furthermore, racial biases of medical practitioners toward patients and those that stem from patient values and preferences for treatment have also been factored into the communication equation that keeps disparity of minority health statuses alive (Ashton et al., 2003).

Demographic Perspectives of Mortality

Rogers et al. explain that using a conventional demographic perspective proposes a hypothesis of association between population mortality and indicators of age, gender and cause of death (1996). Yet most demographic studies, like those compiled by the National Center for Health Statistics, rely heavily on data obtained from the U.S. Census Bureau, National Death Index (NDI) and the National Health Interview Survey (NHIS) to present a nationally representative comparative analyses of cross-sectional data on mortality rates. Measurement techniques differ among agencies. The Census Bureau relies on self-reporting surveys from household members while the NDI is based on death registry information (Rogers et al., 1996). The NHIS derives its information "from a household multistage sampling" of U.S. non-institutionalized civilian population, yet the NHIS tends to over-sample sub-population groups like Mexican-Americans and African-Americans, which produce more "standard errors and ... more conservative statistical tests" between groups (Rogers et al., 1996, p. 1426).

Despite differences in how these agencies obtain data, the reliability of results for mortality rates have remained relatively constant over the decades (Hummer et al., 1998). According to demographic figures derived from the above studies, Caucasians are more likely to die from cancer, cardiovascular disease and suicide, Mexican-Americans are more likely to die from diabetes, homicide and HIV, Native Americans are likely to acquire and succumb to diabetes and infectious diseases such as tuberculosis, and African-Americans will die at significantly higher rates in all areas including HIV and homicide than all others (Rogers et al., 1996). The implication here is that ethnic mortality risks reflect more social and economic disadvantages than those affecting the white majority of the population.

Limitations to Demographic Research

While demographic studies add to the field's information regarding racial and ethnic health disparities, the data fail to provide an explanation for the underlying forces that generate excess mortality rates among some groups but not others. There is no conceptual framework involved other than reporting statistical figures. Understanding how variables contribute to morbidity rates is left for readers to ponder and explore further. There are also problems inherent with the reliability of these data since definitions of ethnicity and race differ between information gathered in census surveys and the coding performed on death records which still list persons as either Caucasian or Black (Rogers et al., 1996). Furthermore, causes of deaths are often condensed into general categories. Social differences in mortality and morbidity rates are not reflected in death certificates, thereby, reducing the accuracy of causal associations to mortality. Yet, despite these limitations for assessing social and psychological factors, demographic research and data prove useful when surveying for population trends, mortality and morbidity rates, and generating estimates of future trends.

Regardless of the approach, it is evident that quantitative macro studies that encourage minority participation are vitally important to the elimination of health disparities and the achievement of federal, private and public agencies' health objectives for 2010. If this nation is to meet its objective to decrease the prevalence and incidence of diabetes among its minority citizenry, then research into the subject of diabetes, specifically, among minority populations, must take priority. Only then can the development and implementation of initiatives to combat these disparities be put into place to promote and improve patient equity in health care settings. Therefore, research conducted at Loma Linda University Medical Center's Diabetes Treatment Center would seek to support efforts toward development of preventive strategies aimed at lowering the prevalence of Type 2 diabetes among minority populations.

Theory Guiding Conceptualization: Biopsychosocial Model

Western medicine has traditionally been based on the biomedical/disease model for treatment while the social work field has adhered to psychosocial practice models for assessing patients' health and understanding the meaning of behaviors within the context of a person's or group's perspective. The biomedical perspective supports traditional doctor-patient relationships that give power to doctors to direct the course of treatment for their patients, thereby, placing patients in deferential positions (Larivaara, Kiuttu & Taanila, 2001). With the exception of life threatening emergencies, doctors tend to make "decisions about what information and knowledge is necessary and important" (Larivaara, Kiuttu & Taanila, 2001, p. 8).

Psychosocial theory is at the core of social work practice. It is a widely accepted and used tool for assessing and diagnosing clients' health and mental health status (Johnson & Atkins, 1990). By themselves, the models are self-limiting in the results they yield. Together, however, they comprise a comprehensive, holistic approach in understanding and meeting the individual "needs of patients within a concentric system of family, community and the environment" which is the goal of the biopsychosocial approach as promoted by George Engel (Chin, Monroe & Fiscella, 2000, p. 321).

Although the concept of biopsychosocial theory is widely accepted by both the medical and social work professions, it is often neglected in practice (Johnson & Atkins, 1990). Social workers view biological factors as a medical domain and medical practitioners perceive psychosocial factors as an endeavor best served by mental health practice. Yet, both perspectives are relevant to both fields when working and advocating for patient health, especially for social work practitioners (Johnson & Atkins, 1990).

Social workers screen, counsel, make referrals for treatment, and monitor client cases in a variety of clinical settings, yet practitioners lack the biological knowledge needed to effectively assess, treat, refer and advocate for clients (Johnson & Atkins, 1990). Social workers must be able to assess and recognize the signs and symptoms of major diseases and be knowledgeable about the effects that certain medications have on intellectual, physical and emotional functioning to reduce the incidence of misdiagnosis or neglect of conditions that would require further medical exploration and evaluation (Johnson & Atkins, 1990). Policies at the macro, mezzo and microsystems level must be emphasized and encouraged in order for social workers to effectively impact the lives of their clients.

Summary

Health care reform to reduce the incidence and prevalence of morbidity and mortality rates among minority groups is commendable in theory but difficult to enact without proactive participation from the medical and scientific communities. Elevating the standards of research and healthcare requires attention to the needs of all population groups. Without reform, lobbying for legislative policy changes that advocate for and improve patient care becomes moot. Consequently, until such fundamental changes occur, the status quo will remain in effect, the quality of patient care will continue to be ineffective and health disparities will continue to rise.

CHAPTER THREE

METHODS

Introduction

The focal point of analysis was to determine whether Loma Linda University Medical Center's (LLUMC) Diabetes Treatment Center (DTC) was effectively reaching at risk groups most in need of diabetes services. Sociodemographic data were collected, reviewed and evaluated to measure the institution's effectiveness using a secondary analysis of data from an initial sampling pool of one hundred thirty-two DTC non-insulin dependent diabetes mellitus (NIDDM) outpatients receiving Type 2 diabetes education for self-management skills and glucose monitoring. Data collection, procedures and how data analysis were conducted are discussed in this chapter.

Study Design

Patient data for a secondary analysis were obtained onsite from the DTC from an existing database called ACCESS on December 09, 2004. Sociodemographic information retrieved from ACCESS was extracted from patient medical charts for the purpose of obtaining the following: race/ethnicity, age, gender, method of payment for services, and zip code in order to explore the similarities and differences between population groups considered to have a higher prevalence for the disease.

The principle benefit of performing secondary analysis was convenience. A quantitative study using secondary analysis eliminated the need for conducting interviews, circulating self-report surveys and questionnaires, and the allocation of financial resources to collect data. Second, the method was cost effective. Furthermore, the method was unobtrusive to patients.

Sampling

Convenience, non-probability sampling of DTC patients was conducted on a representative sample of physician referred and insurance approved new NIDDM cases enrolled between August 01, 2004, and October 31, 2004. It was determined by the data provided by ACCESS that 132 NIDDM patients attended the DTC during this specified time period. However, after careful review of the data retrieved from ACCESS, discrepancies in data entry procedures and human errors were observed which prevented the use of data from all 132 subjects. Seventeen outpatients were initially excluded due to incomplete or inaccurate transfer of information from patient medical charts to ACCESS. Forty-seven additional outpatients were excluded from final analysis due to residency outside San Bernardino County (Riverside County) and/or incomplete payment method information reported as other. As a result of these factors, a final sample of 68 subjects with complete sociodemographic chart histories were found to meet the criteria specified for the performance of this study.

The sampling frame was based on DTC outpatients meeting all of the following criteria: 1) must be a newly diagnosed non-insulin dependent diabetes mellitus patient, 2) must be a San Bernardino County resident, 3) must be at least eighteen years of age and no more than seventy-five on his/her most recent birthday, and 4) must have completed at least one follow-up visit to the DTC for glucose monitoring following enrollment between August 01, 2004 and October 31, 2004 preceding survey collection. A minimum sample size of one hundred DTC type 2 diabetic patients was initially sought by documenting the number of enrollments during the month of September 2004. However, according to ACCESS reports, less than fifty enrollments of new NIDDM cases were reported for the month of September. Therefore, in order to obtain the minimum sample of 100 participants and document the prevalence of new NIDDM cases, it was necessary to expand the data collection time frame from one month to three. Every race and ethnicity were eligible for study inclusion. In the end, however, data from only 68 outpatients meeting the above criteria were eligible for review and analysis.

Permission for performing this study was obtained from the DTC and Institutional Review Board (IRB) at LLUMC respectively. Project supervision was provided onsite by Dr. Scott W. Lee, Medical Director of LLUMC DTC, in accordance with the requirements of the IRB at both Loma Linda University Medical Center and California State University, San Bernardino, and in compliance with privacy guidelines specified by the Health Insurance Portability and Accountability Act (HIPAA) of 1996.

Data Collection and Instrument

A data extraction instrument was used to record information taken from outpatient medical chart records using the ACCESS database. (See Appendix A.) The instrument specifically included independent variables needed to obtain a reliable composite of high risk Type 2 diabetic populations within the specified geographic location of San Bernardino County for this study. Age was recorded as an interval measure. Nominal measures were used for gender, race and ethnicity, payment method, and zip code. The research question, "What population of outpatients attending LLUMC's Diabetes Treatment Center has a higher prevalence of Type 2 diabetes?" guided this comparative study in examining the associations between sociodemographic traits and health status.

Procedures

Data on patients enrolled between August 01, 2004 and October 31, 2004 was extracted onsite by Debbie Clausen, Nurse Manager, using the ACCESS database. All information was obtained and recorded during regular business hours with the expressed permission of Director Scott W. Lee and written approval from the Institutional Review Board at LLUMC. Review and evaluation of data were performed solely by the researcher during the academic year 2004-2005. At no time did medical files or chart records leave the DTC premises. Patient information obtained from the generated ACCESS database report was limited to patient number, name, age, race, gender, payment method and zip code. This information was recorded onto a blank report form that was kept onsite and used for internal reference by authorized DTC personnel. A second report form omitting patient identifiers such as name and patient chart number was cross-referenced with the pre-fix 2004- followed by a three digit subject number assigned by the researcher according to the order in which patient sociodemographic information was transcribed onto the second form. Patient identifiers such as name and patient chart number were omitted from data extraction forms to reduce the possibility of subject identification. Assigned subject cross-reference numbers were recorded onto data extraction forms to reduce the possibility of duplicating research information. All other sociodemographic information pertinent to this study was kept confidential and in possession of the researcher. Once all data were collected, data were entered into a statistical database using SPSS 11.0. Data were then analyzed anonymously and reported in aggregate. Once research was concluded and the findings had been accepted for thesis publication, all collected patient information was shredded.

Protection of Human Subjects

Patient information was protected in accordance with HIPAA Privacy Rules. "Individually identifiable health information" such as patient name and chart number were not disclosed ("Rules and Regulations," 2002). Only this researcher, Project supervisor, Dr. Scott W. Lee, and Nurse Manager Debbie Clausen were privy to identifying patient information during the collection process. Dr. Rosemary McCaslin, Faculty Project Supervisor, had access to aggregate data without patient identifiers expressly for purposes of project consultation and statistical analysis. Strict adherence to ethical standards and rules governing human subject practices prevented confidentiality and anonymity from being compromised or sacrificed for the sake of research.

Data Analysis

Quantitative procedures were used to answer the research question: "What population of outpatients attending LLUMC Diabetes Treatment Center has a higher prevalence of Type 2 diabetes?" A variety of methods were used to perform this analysis. Data were entered into a statistical database, SPSS 11.0, that did not contain names or patient medical record numbers. Data were then analyzed anonymously and reported in aggregate.

A summary of dependent and independent variable characteristics using frequencies were used to examine the sociodemographic traits of groups. Sociodemographic composition of participants in the study were grouped and categorized by age, gender, race/ethnicity, payment method, and zip code. Comparisons between observed and expected outcomes of DTC outpatients were measured using cross-tabulations. Finally, chi squared values were run between nominal pairs using cross-tabulations to determine the significance of relationships between variables where the p value was defined as statistically significant when $\leq .05$.

Summary

In order to measure the effectiveness of LLUMC's Diabetes Treatment Center in treating at risk minority groups for Type 2 diabetes, a secondary analysis of patient data was performed. Data were extracted from patient files using an ACCESS database in compliance with HIPAA guidelines. A representative sample of DTC outpatients was drawn using a sampling frame, resulting in sixty-eight newly diagnosed cases. The purpose of the study was to examine the associations between sociodemographic traits and patient population groups. A variety of methods of analysis were pursued to ascertain specific group differences. It was hoped that the findings would justify further research in this area to diminish the health disparities that exist presently between Caucasians and other racial and ethnic minority groups in the county of San Bernardino.

CHAPTER FOUR

RESULTS

Introduction

This chapter will present findings related to the incidence of new, non-insulin dependent diabetes mellitus (NIDDM) cases in San Bernardino County being treated at the Diabetes Treatment Center (DTC) in Loma Linda, California. The sociodemographic characteristics age, gender, race/ethnicity, payment method, and zip code will be examined and compared for similarities and differences between non-minority and minority groups. The findings are intended to improve agency practices concerning the needs of its minority outpatients. It is hoped improvements in community outreach and marketing will help promote the center's services and reputation, which will increase patient enrollments and agency revenues, and help meet national objectives to reduce the prevalence of the disease among high risk groups by educating communities on the propensity for disease.

Presentation of the Findings

Table 1 summarizes the sociodemographic traits of the study sample using frequency statistics. Zip code frequencies were omitted here in the interest of space but are reported in aggregate nonetheless. (See Appendix B, Table 2.) The study sample (N=68) reveals the incidence of new cases being treated at the DTC between August 01, 2004 and October 31, 2004, in terms of race and ethnicity.

Table 1. Sociodemographic Traits of Patients

Race/Ethnicity	Frequency	Percentage
Caucasian	26	38.2
African-American	8	11.8
Hispanic	26	38.2
Asian/Pac. Islander	8	11.8
Total (N)	68	100.0
Age Groups		
19-34	6	8.8
34-44	16	23.5
45-54	18	26.5
55-64	14	20.6
65-74	14	20.6
Gender		
Male	25	36.8
Female	43	63.2
Payment Method		
LLUMC	16	23.5
Medi-Cal/IEHP	19	27.9
Medicare	15	22.1
HMO	11	16.2
PPO	7	10.3

The incidence of new cases at the DTC was 68 among adults aged 18 and older. The ages of the entire sample ranged from 19 to 74 years of age where the mean age was 51.8 years. Both Caucasians and Hispanics had 26 patients each (38.2%) followed in enrollment by eight African-Americans and eight Asian/Pacific Islanders (11.8%). The age group with 19-34 year olds had the least amount of new cases reported and treated at the DTC (n=6). The highest number of new cases reported was among 45-54 year olds with a total of eighteen. DTC figures were similar to national figures reported in the literature that purport the incidence of new cases among minorities primarily after the age of 45.

Other notable differences are revealed when racial and ethnic groups are combined into non-minority and minority categories. Minorities represent 61.8% (n=42) of DTC patients receiving services. DTC patients are predominantly female (63%). Additionally, the largest group of patients(27.9%) access Medi-Cal/IEHP benefits to pay for center services. Furthermore, the most frequently represented patient geographic locations are Redlands (13) and San Bernardino (11). When combined, the data also showed that 35% of all DTC patients originated from these two cities.

Once frequencies were reviewed, a statistical analysis was performed to assess for associations between variables: race/ethnicity, age groups, gender, payment method, and zip code. Age group and payment method categories were collapsed in order to allow for testing. The 19-34 age group was combined with 35-44 year olds while the categories under payment method were combined into three health insurance groups: LLUMC Risk Management, government and private. As a result, Medi-Cal/IEHP and Medicare were grouped under government and HMO and PPO were grouped to form private.

Pairs of nominal variables were tested against race/ethnicity data using cross tabulations and Chi Square analysis. Among age groups, cross-tabulation figures suggest that the incidence of new cases differs by race/ethnicity, however, cell sizes were too small to conduct a chi square analysis. (See Appendix C, Table 1 for Cross-Tabulation.) In order to further compare possible differences and variances between outcomes, a cross-tabulation was conducted between race/ethnicity and gender. (See Appendix C, Table 2 for Cross-Tabulation.) A chi square analysis of these two variables proved not statistically significant (Chi square = 1.163, p = .762). Cross-tabulation statistics were run for race/ethnicity and payment method. (See Appendix C, Table 3 for Cross-Tabulation.) Chi square testing initially indicated a statistically significant relationship between these two pairs (Chi square = 15.870, p = .014). However, upon further analysis, chi square results revealed that the data was rendered invalid when six cells (50%) had an expected count of less than five. Therefore, had the sample been larger, further analysis would have been possible for inclusion here. A zip code cross-tabulation was excluded from inclusion in this chapter (but included in the appendix section) due to considerations of relevance: geographic codes are meaningless data unless collapsed into groups or regions. (See Appendix C, Table 4 for Cross-Tabulation.)

Summary

While relationships between nominal variables were not proven to be statistically significant, the results do yield important information concerning the prevalence of different groups being served at the DTC. Hispanics and Caucasians comprise the majority of DTC patients.

When groups are classified as either non-minority or minority, the agency meets its target objective of serving minority residents, which is also consistent with the objectives of national health campaigns to reduce the disparities gap between population groups by 2010. Both minorities and women account for nearly two-thirds of those receiving treatment and/or educational services. However, when racial and ethnic groups are individually compared, the agency equally serves Caucasians and Hispanics and the ratio of non-minority to minority cases among ethnic women are below nationally reported figures, which places the risk at 2-4 times greater than Caucasians. Consequently, the data, when viewed from this perspective, suggest a need for improved outreach measures that will elicit both minority and ethnic female enrollment.

CHAPTER FIVE

DISCUSSION

Introduction

Current national projections anticipate that the impact of undiagnosed and untreated diabetes mellitus cases in the United States will reach 22 million by the year 2025. Social workers and health organizations will face the challenge of having to find remedy to the long-term, adverse impact on individuals, minority groups, and state and local economies. At the mezzo level, the DTC has the potential to effect positive changes locally in San Bernardino County by promoting early intervention and prevention educational health services. At the macro level, social work practitioners must address the legacy of complacency that the healthcare system has perpetuated to the detriment of minorities by excluding them from inclusion in research study practices. As such, macro policy changes must reflect a new order of healthcare initiatives that support a redress of racial and ethnic health disparities if minority mortality and morbidity rates are to be reduced.

Discussion

The findings presented in chapter four indicate that in San Bernardino County Caucasians and Hispanics share the highest incidence of new NIDDM cases being treated at the DTC with 26 patients each (N=68). When compared within their own racial and ethnic groups, Caucasians and Hispanics differ in age of diagnosis of onset and treatment. These age and racial/ethnic group differences may indicate that symptoms are appearing and being diagnosed in San Bernardino County at earlier stages than those being reported nationally. Furthermore, it appears that Hispanics in San Bernardino County are developing type 2 diabetes at a higher rate and ten years earlier than national figures for other racial and ethnic populations. The implication here suggests that education and earlier testing is needed to reduce the incidence of diabetes at earlier ages among non-minority and minority populations.

Despite the apparent lack of association between nominal variables, the data do yield important results that indicate a need for further research and exploration. The fact that patients are equally Caucasian and Hispanic and female indicates a need for improving present minority outreach efforts. Therefore, when evaluating the agency's effectiveness in addressing these disparities, present efforts fall short of reaching minority target populations.

Recommendations for Social Work Practice, Policy and Research

As the results from this study indicate, Hispanics in San Bernardino County are being diagnosed with diabetes mellitus as early as age 35. Research and prevention strategies are thus needed to circumvent the prevalence of this chronic disease. Minority participation in research is essential to ascertain the chronological time frames between the actual onset and diagnosis of type 2 diabetes. Therefore, if attempts to reduce health disparities among minority groups are to be successful, an assertive and strategic plan to ameliorate the incidence of cases must take place at the mezzo and macro levels.

Enacting mezzo policy initiatives, while daunting, can be achieved by expanding present organizational efforts. At the mezzo level, the DTC can engage in marketing strategies that promote service access and cultural competency, support community-based participatory research, seek implementation of a mobile service to expand present outreach efforts, and initiate efforts to strengthen community partnerships.

In order to reduce the incidence of cases reported in San Bernardino County, diabetes education and glucose testing need to be performed routinely among Hispanics and other racial and ethnic minority groups. The first step is developing a marketing strategy that supports cultural competency and addresses the needs of minority groups. As such, the agency would benefit from adopting a "promotora" style of marketing to educate and inform the public on the risks of diabetes mellitus. The "promotora," or promotion, style is typically conducted among Hispanic populations by a representative or ethnic member of the community. The "promotora" goes door-to-door marketing the services of the business or organization he or she represents and collects qualitative information and feedback from community members as to the kinds of health services that are available and accessible and those that are needed. The data are then collected and used to assess community needs. The primary benefit of the promotora model is that it circumvents the inherent barriers encountered in minority research and outreach contacts: identification and/or sensitivity to cultural beliefs, norms and/or linguistic needs of minority populations.

Second, in order to improve patient service delivery, logistical strategies must be addressed. The use of a mobile health clinic unit or team would help reach at-risk populations in remote or outlying areas of the county. The unit or team could be supervised by a public health nurse and assisted by bilingual medical assistants and volunteers. The mobile team would serve as a supplementary resource for promotora social services by referring at-risk residents for diabetes mellitus for glucose testing. A mobile unit could also serve to assess the needs of impoverished communities and address the barriers to health services such as access, transportation and lack of health insurance.

Third, it is also recommended that the agency strengthen its community partnerships through a multi-disciplinary collaborative effort with community-based organizations, local school districts and other interested stakeholders. These community-based partnerships should be viewed as vehicles for promoting diabetes awareness among the community and for enlisting support for legislative initiatives, policies and changes to present health care practices in San Bernardino County.

The benefit of a collaborative is that local health and public agencies could support and supplement diabetes education, prevention and outreach efforts. In the wake of county and statewide budget cutbacks that stifle diabetes education and prevention initiatives such as the closure of the S.T.O.P. project, assembling and instituting a collaborative community-based partnership makes sense for many reasons. First, it reduces the probability of service duplication between agencies that expend valuable funding resources. Second, it has the potential to fill gaps in much needed services such as outreach to outlying areas where poverty is high and healthcare accessibility is low or non-existent. Third, it is a cost-effective tool that can be accessed between agencies for the delivery of human services. Finally, collaborations help promote issues that can facilitate dialogues between agencies and communities and legislative bodies.

Community involvement such as sponsoring local events would increase the agency's visibility and improve its image among other community agencies and minority neighborhoods. Some examples of civic sponsorship could be community health fairs that target ethnic minority women and their families. Informative and educationally-based lectures on diabetes mellitus could be presented at school assemblies and college campus fairs throughout the year. By targeting school and college-aged groups, older, at-risk family members are thus reached and receive the educational materials and resource information they may need to seek or access health services in their communities. Exposing children and young adults to the propensity for disease is a long-term benefit to be gained as it increases the probability that they will seek routine glucose testing across their life span. It is hoped that the ensuing results will produce a butterfly-effect that will promote prevention skills that incorporate a modified diet, exercise program and routine monitoring for the delay of onset or prevention of the disease among high risk groups.

Conclusion

In the final analysis, individuals, social workers, agencies, communities and political parties must take a stand and make a commitment to seek remedy for institutional inequities in this nation's healthcare system if intervention services are to be successful. Otherwise, diabetes mellitus will continue its spiral trend toward pandemic proportions of chronic, debilitating disease among our nation's most vulnerable populations.

APPENDIX A

DATA EXTRACTION PROTOCOL

Data Extraction Protocol

1. Currently receiving treatment for Type 2 diabetes at the DTC? ____ Yes ____ No

2. Patient age? ____

3. Patient gender? ____ Male ____Female

4. Race or ethnicity?
   ____ Caucasian
   ____ African-American/Black
   ____ Hispanic Specify: ________
   ____ Asian Specify: ________
   ____ American Indian
   Tribal affiliation ____________

5. Method of payment for DTC services to treat diabetes?
   LLUMC Risk Management ____
   Government Health Insurance:
   ____ Medi-Cal ___IEHP
   ____ Medicare

   ____ Private Health Insurance:
   Please specify type of private insurance:
   ____ HMO ____ PPO

6. Zip code? ______

APPENDIX B

TABLE 2

Table 2. Patient Geographic Locations

Zip Code

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	91701	1	1.5	1.5	1.5
	91730	1	1.5	1.5	2.9
	91764	1	1.5	1.5	4.4
	91784	1	1.5	1.5	5.9
	92307	1	1.5	1.5	7.4
	92311	1	1.5	1.5	8.8
	92313	2	2.9	2.9	11.8
	92316	1	1.5	1.5	13.2
	92324	6	8.8	8.8	22.1
	92335	2	2.9	2.9	25.0
	92337	2	2.9	2.9	27.9
	92346	5	7.4	7.4	35.3
	92354	7	10.3	10.3	45.6
	92359	2	2.9	2.9	48.5
	92365	1	1.5	1.5	50.0
	92373	6	8.8	8.8	58.8
	92374	7	10.3	10.3	69.1
	92376	3	4.4	4.4	73.5
	92382	1	1.5	1.5	75.0
	92392	1	1.5	1.5	76.5
	92394	1	1.5	1.5	77.9
	92399	4	5.9	5.9	83.8
	92401	1	1.5	1.5	85.3
	92402	1	1.5	1.5	86.8
	92404	3	4.4	4.4	91.2
	92405	1	1.5	1.5	92.6
	92408	2	2.9	2.9	95.6
	92410	1	1.5	1.5	97.1
	92411	1	1.5	1.5	98.5
	92423	1	1.5	1.5	100.0
	Total	68	100.0	100.0	

APPENDIX C

CROSS-TABULATIONS

Cross-Tabulation 1. Incidence of New Cases Among Age and Racial/Ethnic Groups

			Age Groups				
			19-44	45-54	55-64	65-74	Total
Race/Ethnicity	Caucasian	Count	8	9	7	2	26
		Expected Count	8.4	6.9	5.4	5.4	26.0
		% of Total	11.8%	13.2%	10.3%	2.9%	38.2%
	African-American	Count	2	2	2	2	8
		Expected Count	2.6	2.1	1.6	1.6	8.0
		% of Total	2.9%	2.9%	2.9%	2.9%	11.8%
	Hispanic/Latino	Count	11	4	4	7	26
		Expected Count	8.4	6.9	5.4	5.4	26.0
		% of Total	16.2%	5.9%	5.9%	10.3%	38.2%
	Asian/Fil/Pacls	Count	1	3	1	3	8
		Expected Count	2.6	2.1	1.6	1.6	8.0
		% of Total	1.5%	4.4%	1.5%	4.4%	11.8%
Total		Count	22	18	14	14	68
		Expected Count	22.0	18.0	14.0	14.0	68.0
		% of Total	32.4%	26.5%	20.6%	20.6%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.130[a]	9	.425
Continuity Correction			
Likelihood Ratio	9.910	9	.358
Linear-by-Linear Association	1.237	1	.266
N of Valid Cases	68		

a. 8 cells (50.0%) have expected count less than 5. The minimum expected count is 1.65.

Cross-Tabulation 2. Patient Race and Gender

			Gender		
			Male	Female	Total
Race/Ethnicity	Caucasian	Count	10	16	26
		Expected Count	9.6	16.4	26.0
		% of Total	14.7%	23.5%	38.2%
	African-American	Count	2	6	8
		Expected Count	2.9	5.1	8.0
		% of Total	2.9%	8.8%	11.8%
	Hispanic/Latino	Count	9	17	26
		Expected Count	9.6	16.4	26.0
		% of Total	13.2%	25.0%	38.2%
	Asian/Fil/Pacls	Count	4	4	8
		Expected Count	2.9	5.1	8.0
		% of Total	5.9%	5.9%	11.8%
Total		Count	25	43	68
		Expected Count	25.0	43.0	68.0
		% of Total	36.8%	63.2%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.163[a]	3	.762
Continuity Correction			
Likelihood Ratio	1.170	3	.760
Linear-by-Linear Association	.066	1	.797
N of Valid Cases	68		

a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is 2.94.

Cross-Tabulation 3. Patient Race and Payment Method

			Payment Method			
			LLUMC	GOVT HEALTH INS	PRVT HEALTH INS	Total
Race/Ethnicity	Caucasian	Count	10	9	7	26
		Expected Coun	6.1	13.0	6.9	26.0
		% of Total	14.7%	13.2%	10.3%	38.2%
	African-Americar	Count	3	4	1	8
		Expected Coun	1.9	4.0	2.1	8.0
		% of Total	4.4%	5.9%	1.5%	11.8%
	Hispanic/Latino	Count	0	19	7	26
		Expected Coun	6.1	13.0	6.9	26.0
		% of Total	.0%	27.9%	10.3%	38.2%
	Asian/Fil/Pacls	Count	3	2	3	8
		Expected Coun	1.9	4.0	2.1	8.0
		% of Total	4.4%	2.9%	4.4%	11.8%
Total		Count	16	34	18	68
		Expected Coun	16.0	34.0	18.0	68.0
		% of Total	23.5%	50.0%	26.5%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.870[a]	6	.014
Continuity Correction			
Likelihood Ratio	21.514	6	.001
Linear-by-Linear Association	2.234	1	.135
N of Valid Cases	68		

a. 6 cells (50.0%) have expected count less than 5. The minimum expected count is 1.88.

Cross-Tabulation 4. Patient Race and Zip Code

Count

		Race/Ethnicity				
		Caucasian	African-American	Hispanic/Latino	Asian/Fil/PacIs	Total
Zip Code	91701			1		1
	91730		1			1
	91764			1		1
	91784	1				1
	92307	1				1
	92311				1	1
	92313	1	1			2
	92316	1				1
	92324	1	1	3	1	6
	92335	1			1	2
	92337			2		2
	92346	2	1	1	1	5
	92354		2	2	3	7
	92359	1		1		2
	92365	1				1
	92373	4	1	1		6
	92374	4		2	1	7
	92376	1	1	1		3
	92382	1				1
	92392	1				1
	92394			1		1
	92399	3		1		4
	92401			1		1
	92402			1		1
	92404	1		2		3
	92405			1		1
	92408			2		2
	92410			1		1
	92411			1		1
	92423	1				1
Total		26	8	26	8	68

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	75.899[a]	87	.796
Continuity Correction			
Likelihood Ratio	78.114	87	.741
Linear-by-Linear Association	.033	1	.856
N of Valid Cases	68		

[a] 120 cells (100.0%) have expected count less than 5. The minimum expected count is .12.

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