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Foreword

The Annual Review of Nursing Research (ARNR) series was launched in 1983, more than a quarter of a century ago. Since the initial volume, throughout the years, I have participated as an editor with a number of distinguished nurse colleagues. I am indebted to them for their commitment to and vision for the ARNR series. Through the collective volumes, although we have charted the history of nursing science (including aspects of theory development), we have primarily focused on nursing research. Students of the developing discipline will be forever indebted to the nurse scientists and editors who contributed to the series.

In the ARNR series, two particular chapters are noteworthy because they include summaries of the first 20 years of content published in the series. In Volume 10, Joanne Stevenson analyzed the first decade of ARNR for content themes, identifying the changes in how the disciplinary content was organized and presented, and the areas in which there were significant scientific developments. In Volume 21, Fitzpatrick and Stevenson used the same framework for analysis of the second decade of nursing research content published in the ARNR series. In the analysis of the second decade of ARNR publication, attention also was paid to the societal forces, for example, the rapid expansion of research-oriented doctoral programs in nursing and the establishment of the National Institute of Nursing Research at the National Institutes of Health, and their effect on the development of the discipline.

Starting with Volume 20, emphasis was placed on theme issues of the series. Volume 20 included geriatric nursing research; Volume 21 included research on child health and development; Volume 22 included research on health disparities among minority populations; Volume 23 included research on substance use, misuse, and abuse; Volume 24 included research on patient safety; Volume 25 included research on vulnerable populations; and this Volume, 26, is focused on research on rural health. Each of these theme-related volumes was edited by distinguished colleagues in the content area.

Volume 26 is the final one in which I will participate. I am immensely proud of the contributions that have been made through the years. I am especially indebted to the founding editor of the ARNR series, Harriet Werley, for all that
she contributed to the series through her vision and dedication to the rigor of scientific publishing. She taught me much of what I have subsequently applied throughout my career, including not to compromise quality and rigor in our science, to encourage others to maintain the vision, and to confront the challenges inherent in a developing discipline and redefine them as opportunities. I know that the ARNR series will be in able hands with the new series editor, Christine Kasper, and I welcome her enthusiastically.

It is important for me to reiterate the outstanding contributions that have been made by my colleagues throughout the years, including those serving as chapter authors, reviewers, advisory board members, and coeditors. I am indebted to all of you for making this historical ARNR series a reality, and for your significant contributions to the discipline of nursing.

Joyce J. Fitzpatrick, PhD, RN, FAAN
Series Editor
Preface

All nursing research and all rural health research contribute to the knowledge base of rural nursing research. Knowledge developed from nursing research in urban areas often informs the development of rural nursing studies. Understandings of clinical problems, systems problems, and rural culture and communities developed from general rural health care research inform the development of specific nursing studies. Of equal note is the role that nurse scientists serve, often as research leaders within the field of rural health. The integration of rural nursing research into the general nursing research and rural health literature makes identifying this research difficult. This constraint is magnified by the lack of consistent definitions of rural and the complete lack of consistency among authors in communicating how they decided to describe a particular setting or study as rural. Additionally, the paucity of rural nursing research makes it difficult to synthesize research findings on specific topics. Such are the challenges facing the nurse scientists who have contributed to this volume, challenges they have attempted to overcome by identifying and synthesizing the literature on important rural health problems and issues within the context of a comprehensive identification of relevant research, including contributions by nurse researchers from nonrural areas relevant to the problems and issues at hand.

As such, contributing authors of each chapter in this volume have developed a creative and effective strategy to identify relevant research, synthesize the literature, and present it within the context of the rural delivery system and what we know about the problem from the relevant research or policy literature. This enables the reader to situate available nursing knowledge within the broader context of knowledge about the problem or issue as a whole. In most chapters, the authors also have discussed the problems and issues they deal with within the context of recent rural and general health policy reports. We expect that readers will benefit from using such content as a basis for new research agendas within rural nursing research.

Certainly, rural nursing researchers have made important contributions toward meeting the health care needs of rural populations as well as toward improving the health care system within which care is delivered. Nonetheless, in chapters related to needs of particular population groups, we consistently note
either limited intervention studies or the small sample sizes of such studies. The chapter “Diabetes Care Among Rural Americans,” for example, presents mainly descriptive studies with only three intervention studies for this too prevalent health condition. In the chapter “Matters of the Heart: Cardiovascular Disease and Rural Nursing,” contributing authors also report many descriptive studies while pointing out the small sample sizes of intervention studies. The chapter “Intimate Partner Violence in Rural Environments” identifies the major contributions of nursing researchers to the general field but also the lack of contributions to the specific area of rural nursing. In response, the authors provide an example of an approach that rural nursing researchers can use in developing a research program that builds on the general nursing and broader literature.

In Part II, contributors seek to improve the rural health care delivery system itself. Two particular components of the rural delivery system discussed are emergency and mental health care. In the chapter “Hospital-Based Emergency Nursing in Rural Settings,” the author identifies some studies that fail to build on each other toward an evolving knowledge base. In contradistinction, the author uses the existing literature to propose an impressive research agenda to move the field forward and to contribute to solving some of the problems identified by a recent Institute of Medicine report that calls for improvements in emergency care. In one of the more developed areas of rural nursing research, mental health, the author of the chapter “Building the Rural Mental Health System: From De Facto System to Quality Care” presents results obtained by the successful implementation of research programs by a small group of researchers sustained for more than a decade. The chapter “Improving the Quality of Rural Nursing Care” describes studies that have been conducted in most areas of the health care setting with the aim of improving at least some aspect of quality of care. These studies provide discussions of workforce development and improving student experiences through innovative learning. The different dependent variables and outcomes that can come together under the broad concept of quality challenge the field to better conceptualize quality and to determine how it is operationalized in different settings. The recent Institute of Medicine focus on improving patient safety has stimulated rural nursing research in this regard, as reflected in the chapter “Nursing Patient Safety Research in Rural Health Care Settings.” The author of this chapter calls for increasing interdisciplinary collaboration, as well as for collaborative research across the nation and the world. An important recommendation concerns the necessity for nurse researchers to sample rural hospitals in larger studies of patient safety. If this one recommendation were to be adopted as a funding criterion for large studies in general, then rural nursing research studies would expand dramatically, with a further result: the enlarging of the pool of nurse researchers conducting rural research also would prompt experienced researchers who work mainly in urban settings to assist in developing solutions to the more difficult methodological issues of recruitment, small samples,
lack of resources and capacity of rural organizations to support research, and the role played by travel time and geographic distance to services in rural nursing research. These issues are discussed in some of the chapters in this volume and also throughout the rural health literature.

Part III focuses on the importance of cultural relevance in rural research and methodological issues facing the design and implementation of rural research. The issue of how rural is defined is one that limits the field of rural health research as a whole. The interaction between rural as a cultural concept and rural as a geographic measure thus prompts some reflection in the chapter “Conducting Culturally Competent Rural Nursing Research.” A unique aspect of rural research is that researchers must understand the cultural values at work in a rural community in order to design a study that can be implemented successfully and contribute knowledge relevant to the unique needs of specific types of rural communities. Although rural is also considered a geographic concept, the availability of a variety of definitions of rural based on different aspects of geography, distance to urban areas, and so on, also serves as a methodological challenge for rural studies. This chapter thus provides an overview of cultural aspects of rural nursing research as well as methodological challenges common to rural research. Readers will witness how authors (both chapter authors and published studies being reviewed) consider the lack of consistency in the definition of rural, the common methodological challenges faced in recruitment, and the availability of small samples, as seen throughout this volume. The challenge to researchers, and to the capacity of researchers to generalize rural nursing research, is clear. As such, increasing the involvement of community leaders and members as collaborators in rural research is a subject that is clarified in “Establishing the Public’s Trust Through Community-Based Participatory Research,” which offers a case example of collaboration with an ethnic community. The potential of this approach to develop culturally meaningful rural studies is evident, as is the limited use of this approach within the rural nursing literature.

Clearly, the cultural aspects of rural nursing research are reflected in many of the chapters in this volume. The concluding special chapter, “Rural Health Nursing Research Review: Global Perspectives,” provides an expanded view of the importance of cultures and characteristics of different countries with published rural nursing research. Here, the authors creatively presented the United Nations Human Development Programme’s rating of development to contrast the countries represented by the nursing research studies reviewed in this chapter. This chapter differs from other chapters in the volume. The topic evolved from the identification of a large number of international studies identified in a review of the literature on quality of care, which provided the motivation to create a separate chapter with an international focus. Also at work here was a growing realization of the importance of contributions from international studies in several of the other chapters in this volume. The topics selected for focus in this
volume were chosen and considered largely from the perspective of the United States. The major differences in types of rural communities within the United States pose challenges to the development of a relevant rural nursing knowledge base. The chapter on global perspectives, along with other chapters in the volume that incorporate international studies, points to analogous problems and issues that rural nursing research raises across countries, with the availability of resources being an important issue.

Many challenges face the nursing research community in its efforts to expand the empirical knowledge base to inform rural nursing practice. The approaches used in this volume of identifying an important problem or issue and identifying and critiquing the existing literature to determine what is known from research about the problem, what nursing research studies have been conducted, and what types of methods were used while identifying the strengths and limitations of the state of the science for a specific problem or issue offer direction for prioritizing the need for research and for formulating a research agenda or program of research that will contribute to solving the problem or addressing the issue. The general field of nursing research is asked to consider the recommendation of the author of the chapter on patient safety to include rural samples in general research studies. Nursing research journals should also solicit articles specifically on rural populations and include reviewers with backgrounds in conducting rural research on their review panels. In effect, to make informed decisions about contributions to the rural nursing research knowledge base, review panel members must understand the reason for small sample sizes and the methodological challenges of rural research. Similarly, funding agencies should do the same. With an increased focus on rural nursing research and with increased collaboration with the general nursing research community, the research questions and agendas proposed by authors of the chapters in this volume can improve the state of the science of rural nursing. This would allow nursing research to play a greater role in improving the health of rural populations as well as the effectiveness of the rural health care delivery system.

Elizabeth Merwin, PhD, RN, FAAN
Volume Editor
Acknowledgment

Thank you to the individuals who served as peer reviewers, for your thoughtful suggestions and contributions to the quality of this volume.
PART I

Nursing Research to Meet Health Care Needs of Rural Populations
Chapter 1
Diabetes Care Among Rural Americans
Sharon Williams Utz

ABSTRACT

The prevalence of diabetes in the United States is higher among those living in rural/nonmetropolitan statistical areas than in urban centers. Managing this complex chronic illness is complicated by factors such as limited access to care, low socioeconomic status, aging, and membership in a racial or ethnic minority group. A review of the literature was conducted focusing on research about rural Americans with diabetes by searching databases of CINAHL, PubMed, and MEDLINE, and selecting articles in English that were published between 2000 and 2007. Search terms included: nursing, research, rural, rural nursing, rural health services/programs, and diabetes care. Additional search strategies included journal hand searching and networking. Twenty-six research reports were found and included qualitative and quantitative methods and program evaluations. All regions of the United States were represented except the Northwest. The vast majority of research reports were of descriptive studies (n = 16), with program evaluation reports (n = 7) and studies testing an intervention (n = 3) also represented. The quality of each study is examined and summarized.

Keywords: diabetes care; rural; nursing; research
INTRODUCTION

Diabetes mellitus (diabetes) is the sixth leading cause of death in the United States and is significantly underreported (Centers for Disease Control [CDC], 2005). Diabetes has become one of the major health concerns in the United States, often considered a public health crisis with a current incidence of 1.5 million new cases per year among people age 20 and older. The prevalence of diabetes is 20.8 million people, or 7% of the overall U.S. population. Highest rates are among older adults, with a rate of 20.9% among those ages 60 or older. Members of racial and ethnic minorities typically have rates that are two times those of non-Hispanic Whites. According to the CDC (2005), rates of diabetes are at epidemic levels, owing to factors such as longer life span, rising rates of obesity, inactivity, and possibly other factors. In addition to those already diagnosed with diabetes, estimates indicate that as many as 6.2 million people have a condition called impaired glucose tolerance or prediabetes, and are at significant risk for developing Type 2 diabetes mellitus (T2DM) (CDC, 2005). Among those living in rural areas, rates are higher than the national average. In their report, Rural Healthy People 2010, Gamm, Hutchinson, Dabney, and Dorsey (2003) note that the prevalence of diabetes is higher in nonmetropolitan statistical areas (non-MSAs) than in central cities. The authors indicate that the self-reported prevalence of diabetes in non-MSAs was 17% higher than in MSAs (Gamm et al., 2003). Of particular note is that diabetes is more common in the Southeast and the Southwest regions of the United States and, “Typically diabetes is a more serious problem in rural areas as they adopt a more ‘developed’ or urban lifestyle” (p. 110). The authors of Rural Healthy People 2010 conclude that the higher prevalence of diabetes among rural residents is likely because of a complex set of factors such as low socioeconomic status among many rural residents, a high proportion of racial or ethnic minorities, and aging populations that are predominant in rural areas. The authors also note that the aspects that contribute to these health disparities are most pronounced among African Americans (Gamm et al., 2003, p. 110).

People living in rural areas also have many barriers to health care that complicate management of a complex illness such as diabetes. Barriers to care include cultural beliefs about seeking care, costs of care, distance and transportation, and few available specialists such as diabetologists and certified diabetes educators (typically nurses and dieticians). Therefore, with high rates of diabetes among rural populations and significant barriers to health care, it is important to review the nursing research literature to systematically examine studies that have been conducted among rural populations with diabetes and to identify results that inform nurses and other health care providers about offering high-quality health care to rural residents to manage the disease, prevent complications, and deal with the many implications of the illness.
Purpose

The purpose of this literature review was to systematically examine published research reports related to the nursing care of rural people with diabetes. It is recognized that there are numerous definitions of the term rural that may be chosen by researchers and policy makers (Stern, Merwin, Hauenstein, Hinton, Rovnyak, et al., in process). In the context of this review, published research reports were accepted if they used the term rural to describe the sample and/or population of the study as being derived from a rural area.

Methodology

Nursing and health care literature was examined by using the following search terms: research, nursing, diabetes, rural health, rural health centers/services, rural areas, rural health nursing, and diabetes mellitus (nursing). Databases that were searched were MEDLINE, PubMed, and CINAHL, via the National Library of Medicine. The search was limited to articles in English and to the years 2000 through 2007. In addition to searching national databases, additional strategies used to find relevant publications were networking and journal hand searching (particularly journals such as Rural Health Care, and journals focused on diabetes care such as The Diabetes Educator and Diabetes Spectrum). All published research reports were selected based on the previous parameters if they involved research relevant to nursing and people with diabetes living in rural areas in the United States. Although diabetes is increasingly being identified as a global epidemic by the World Health Organization (Ruder, 2007), the current review is limited to studies published about rural people residing in the United States.

LITERATURE REVIEW

Defining Rural Nursing

In the textbook about rural nursing, Long and Weinert (1998) define the term as, “the provision of health care by professional nurses to persons living in sparsely populated areas” (p. 4). In the first chapter of the text, Long and Weinert identify key concepts relevant to rural nursing such as, “work beliefs and health beliefs, isolation and distance, self-reliance, lack of anonymity, outsider/insider, and old timer/newcomer” (p. 9). These authors note the importance of the nurse recognizing the unique elements of rural life, and that perspectives of rural people often differ from people living in urban areas. Such perspectives must therefore be part of the understandings of nurses who offer health care to rural people. As previously noted, there are numerous ways to define rural; characteristics about rural
communities are also numerous. Rural areas may be found within 50 miles of large urban centers, such as those near Atlanta, Georgia, or rural areas may be vast, frontier areas located hundreds of miles from urban areas such as in New Mexico. Rural Pennsylvania could be considered part of the Northeast, but some sections are part of Appalachian regions in terms of geography and culture. Rural Maine is very different from rural Virginia—and many more examples could be identified. Suffice it to say, a review about nursing research focusing on rural populations provides information that is varied in numerous ways. Of the 26 research reports examined in this review, the regions of the United States from which the samples were drawn are as follows: Appalachia (n = 2); Great Plains (n = 6); Northeast (n = 1); Midwest (n = 2); Southeast (n = 12); and Southwest (n = 2). There were no research reports of studies with rural samples of people with diabetes from the Northwest, nor from Alaska or Hawaii. Of the 12 research reports from the Southeast region, five studies were based in North Carolina, three in Virginia, and one from South Carolina. The predominance of studies from these regions most likely reflects the high rates of diabetes in the Southeast rural region of the United States (Gamm et al., 2003). There is a surprising paucity of studies from the other rural region with the highest reported rates of diabetes—the Southwest.

Use of Theory and Conceptual Frameworks

Review of nursing research about care of rural people with diabetes could be expected to reflect a variety of theories such as those of Orem and colleagues (2001) and Roy (1999), and midrange theories such as Health Behavior Model, Social Cognitive Theory, and Stages of Change Model. However, these theories or conceptual frameworks were rarely described in the articles selected for this review. Examples of studies that did report using a framework are: Morris (2007), who used Orem's Theory; Skelly and colleagues (2007), who used Kleinman's Explanatory Model of Illness; and Nagelkerk, Reick, and Meengs (2006), who used the Theory of Integration. The study by Tessaro, Smith, and Rye (2005) was reported by the authors to be based on a combination of theories—the Explanatory Model of Illness, Social Learning Theory, the Health Belief Model, and Social Support Theory (p. 3). Two of the three intervention studies were based on the Wagner Chronic Care Model, a framework for health care delivery to those with chronic illness (Bray, Roupe, Young, Harrell, Cummings, et al., 2005; Siminerio, Piatt, & Zgibor, 2005). Some research reports included elements that appeared to implicitly incorporate specific theories or frameworks such as the research of Utz and colleagues (2006), where elements of Orem's Theory of Self-Care Deficit Nursing and Bandura's Social Cognitive Theory implicitly underlie the exploration of barriers and facilitators to self-care, and examination of self-efficacy of rural African Americans with T2DM.
Research Designs

Of the 26 research reports analyzed in this review, the vast majority reported the use of quantitative research designs (n = 17) such as questionnaires, structured phone surveys, medical record reviews, cost-benefit analyses, and testing interventions using quasiexperimental designs. A total of eight studies reported predominately qualitative research designs. Seven research reports described the use of qualitative methods such as phenomenology (Struthers, Hodge, DeCora, & Geishirt-Cantrell, 2003), mapping and ethnographic survey combined with interviewing (Gesler, Hayes, Arcury, Skelly, Nash, et al., 2004), and focus group exploratory studies (Jones et al., 2006; Nagelkerk, Reick, & Meengs, 2006; Utz et al., 2006; Wenzel, Utz, Steeves, Hinton, & Jones, 2006). One researcher used a mix of both qualitative and quantitative methods, including a combination of open interviews with semistructured questionnaires (Heuer, Hess, & Batson, 2006).

Summary of Results of the Studies

Descriptive Studies

Studies examined for this review focused on the health problem of diabetes or aspects of caring for people with diabetes in rural areas. Search terms included nursing, and the research reports are highly relevant to nurses interested in the health problem of diabetes and the care of those living in rural areas. The majority of the research reports were authored by nurses (22 out of 26); however, most were published in journals intended for a variety of health professionals (e.g., Family & Community Health, Journal of Rural Health, The Diabetes Educator), while a smaller number were published in nursing journals (e.g., Holistic Nursing Practice, Research in Nursing & Health, Western Journal of Nursing Research). The majority of studies selected for this review—16 (n = 16) of the 26 studies (61.5%)—were descriptive in their design. Studies in this category are summarized and analyzed in detail in Table 1.1. In most cases, the purpose of these studies was to describe the experiences, perspectives, health care needs, health care practices, facilitators and barriers to care, impact of technology, and quality of care for individuals and groups with diabetes living in rural areas. Nearly all were cross-sectional, collecting data at only one point in time, with only a few reporting data collection over a long period of time or returning to collect additional data more than one time. Methods used for several studies were focus groups, but other approaches included surveys, interviews, medical record reviews, and mapping sites for potential diabetes care in a community using global positioning satellite (GPS) technology. The samples ranged in size from 23 to more than 1,420, with many having samples in the hundreds. Most were samples of convenience,
reflecting the bias of self-selected samples. All except one study examined samples of people with diabetes or those at risk for developing diabetes. One study was of a sample of health care providers who used telehealth interventions for people with diabetes (Tudiver et al., 2007). Most of the studies reported diverse samples of African Americans, American Indians, Hispanics, and European Americans. None included samples of Asians or Pacific Islanders. A few studies did not describe racial and ethnic composition of the sample—presumably because the majority of people in the region are White. Only a few researchers described the population from which their sample was drawn—an important factor in determining how representative the sample was of those living in the area. In a few cases, researchers not only described the population in the region, but also gave geographic information to enhance the readers’ understanding of the rural character of the area.

Program Evaluation Studies

The second most frequent research design characterizing studies in this review was program evaluation (n = 8, 30.8%). Program evaluation studies are analyzed in detail in Table 1.2. Each of these studies by definition included the testing of a programmatic approach to meeting the health care needs of adults with diabetes, or needs of providers. These studies are in some ways similar to an approach recently emphasized by the National Institutes of Health as translational research. However, most of these program evaluation studies do not reflect rigorous designs and controls that typically characterize translational research, but are intended to test feasibility and acceptability of programs to address needs of patients living in rural areas with diabetes. The samples from the program evaluation studies reflect efforts to meet the needs of several different racial or ethnic groups for diabetes care. Only one study focused on a program to increase the number of certified diabetes educators in order to meet the needs of the rural population. Many of these studies collected data from medical records or electronic databases from the health care delivery sites. Evaluation data most often consisted of descriptive information about services provided to patients (e.g., number of patient encounters, percent seen by case manager, etc.), information from medical records to document outcomes (e.g., blood glucose levels, self-care goals met, etc.), and changes in processes of care (e.g., proportion of providers meeting the standards set by the American Diabetes Association, etc.). To their credit, many of the researchers reported the year(s) that data were collected. The most frequent limitation of this set of studies is the lack of a comparison group. Although it is recognized that these are program evaluation studies, rather than more highly controlled designs, researchers could enhance the strength of their findings by using comparisons to other groups in the community or the region, data that can often be drawn from state health department statistics or large data
TABLE 1.1 Analysis of Descriptive Studies (n = 16)

<table>
<thead>
<tr>
<th>Source</th>
<th>Purpose</th>
<th>Design and Method</th>
<th>Rural Location</th>
<th>Sample Size, Demographics</th>
<th>Findings</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neil (2002)</td>
<td>To report findings on self-care practices related to foot care of 61 rural people with diabetes mellitus.</td>
<td>Descriptive, using questionnaire (Siriraj Foot-Care Score Questionnaire) to compare self-care by those with and without foot ulcers. Administered verbally by researchers, 4 subscales: Inspection, cleaning, nail cutting, going barefoot.</td>
<td>Southeast Region of the United States.</td>
<td>Convenience sample of 61 patients from treatment facility of Academic Medical Center serving 26 counties. Referred by MDs. n = 24 with foot ulcers, N = 37 without; 30 men, 31 women; 48 White, 14 African American, 2 Hispanic. Average age = 46 (range 18–81) Type 1 or T2DM.</td>
<td>Overall scores no difference between groups. No statistical differences on three subscales. Significant difference in “going barefoot” (p ≤ .004): those without ulcers more likely to go barefoot inside. Many could not see feet; most common reason for no foot care: can’t reach feet.</td>
<td>Data collected in MD office: may have told researchers the “right answer”: no information on representativeness of sample based on demographics of region. Instrument validated in Thailand and tests knowledge versus behavior.</td>
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<tr>
<td>Source</td>
<td>Purpose</td>
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<td>Study</td>
<td>Purpose</td>
<td>Data采集和方法</td>
<td>Results</td>
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<td>Gesler et al. (2004)</td>
<td>To show how maps of location of daily activities can be used by health care providers to plan a diabetes prevention program.</td>
<td>Description of all activity locations of patients without diabetes using global positioning system (GPS) and geographic information system (GIS); interviews about where participants went; locations identified by GPS. Also interviewed providers to identify potential sites for diabetes medication.</td>
<td>Southeast Region of the United States. Ethnographic sampling from a rural southern town population 7,000 in year 2000. n = 121 working adults (not diagnosed with diabetes). 20 Latino men, 20 Latino women, 20 African American men, 22 African American women, 20 White men, 19 White women. Important differences found in standard deviational ellipses (SDEs) by ethnicity and gender; resulting maps of spatial patterns of people's movements have a strong visual impact and enable planners to see at a glance how intervention strategy would look on the ground.</td>
<td>No information about how questions were asked. Need to elicit and compare reports of where participants would like to get health education to care providers' ideas.</td>
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<td>Anderson-Loftin et al. (2005)</td>
<td>To summarize literature and describe lessons learned by researchers regarding recruitment and retention of</td>
<td>Descriptive study: summary of literature and report of researchers' experience.</td>
<td>Southeastern Region of the United States. MEDLINE search of research and clinical literature. Report of researchers' studies with African Americans. Successful strategies reported: collaboration with community leaders, get donations from local businesses, involve local health care.</td>
<td>No description of how reviewed literature was selected from MEDLINE search.</td>
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<td>Source</td>
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<td>Sample Size, Demographics</td>
<td>Findings</td>
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<td>rural African American research participants.</td>
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<td>(1) feasibility study of food habits and physical measures; convenience sample of 23 with retention 70%. (2) Pilot intervention with 97 adults from primary care sites.</td>
<td>providers, obtain funds to cover nurse care manager. Primary importance of cultural competence, caring, trust, incentives, and follow-up over time.</td>
<td>Doesn’t make clear distinctions between own results versus others from literature reviewed.</td>
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<tr>
<td>Skelly et al. (2005)</td>
<td>To describe self-monitoring blood glucose (SMBG) practice of older adults with T2 DM; identify characteristics differentiating testers from nontesters; to identify personal and support-related predictors of monitoring frequency.</td>
<td>Population-based cross-sectional survey with in-home interviews. Used claim records from CMS of randomly selected patients. Conducted 11 two-hour interviews about diabetes self-care practices.</td>
<td>Southeastern Region of the United States.</td>
<td>Medicare recipients with diabetes. Men and women. Response rate 89%</td>
<td>77% practiced SMBG previous week; 40% tested daily; no ethnic differences in SMBG. Significant predictors of SMBG were medication regimen, provider recommendation, duration of diabetes, receiving help with testing.</td>
<td>Researchers noted reliance on self-report as limited. Sample from only two rural counties in one region.</td>
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<td>Study</td>
<td>Objective</td>
<td>Methodology</td>
<td>Data Collection</td>
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<tr>
<td>Zulkowski &amp; Coon (2005)</td>
<td>Descriptive study to examine congruence between rural patient self-reported and provider-documented information on American Diabetes Association (ADA) recommended guidelines.</td>
<td>From larger study to improve provider adherence to ADA guidelines. Questionnaire sent to patients. Data collected from records to compare to ADA recommendations.</td>
<td>Great Plains Region of the United States. Rural Montana</td>
<td>Patients n = 149 adults ages 45 or above diagnosed with diabetes (provider documented); 86 women. 65% response rate to questionnaire. Four rural health care providers.</td>
<td>Multiple barriers to care: lack of certified diabetes educators; gaps in patients’ knowledge; lack of communication between provider and patient. Adherence to ADA guidelines suboptimal. Noted no ethnic, educational, or socioeconomic information in records. Participants younger and had lower A1c levels compared to nonresponders.</td>
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<tr>
<td>Tessaro et al. (2005)</td>
<td>To gain culturally informed understanding of diabetes in an Appalachian region by determining cultural knowledge, beliefs, and attitudes about</td>
<td>Design: Focus groups. Qualitative analysis methods. Transcription of tapes and use of NUD*IST software.</td>
<td>Appalachian Region of the United States. West Virginia</td>
<td>13 focus groups over 5 months from 16 counties. 7 groups with diabetes, n = 61; 6 groups without diabetes, n = 40; 73 women, 28 men.</td>
<td>Broad themes: Cultural beliefs and perceived susceptibility; Barriers to early detection; Knowledge about diabetes; Social relationships. No description of racial/ethnic characteristic of sample. Data analysis would be better described as content analysis of previously...</td>
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<tr>
<td>Alverson &amp; Kessler (2005)</td>
<td>To examine health concerns by individuals for themselves, families, and community.</td>
<td>Self-report instrument developed by researchers and clinic staff at health care center.</td>
<td>Midwest Region of the United States.</td>
<td>90 adults invited on random days at clinic to complete questionnaire. Total n = 82 Ages 19–64 80% women; 88% White; 7% Hispanic; 1% African American; 4% other.</td>
<td>Numerous health concerns listed—(1) for self, only three listed diabetes; most listed chronic conditions; (2) for community, health concerns varied from “general” to HIV/AIDS, addiction, etc.</td>
<td>Subjects tend to underreport concerns (i.e., diabetes prevalence in community is high); Subjects unable to explain nature of concern; limited participation. Self-selected sample.</td>
</tr>
</tbody>
</table>
Nagelkerk et al. (2006) To describe the perceived barriers to self-management of adults with T2DM in a rural setting and to identify effective strategies in self-management to highlight infrastructure needs or changes in clinical practice.

Framework Theory of Integration

Analysis

Data collected in 2002.

Midwest Region of the United States.

Three focus groups, 24 adults (>21) with T2DM recruited from rural primary care practice. Purposive sampling of fourth person on a list of 160 eligible. Age 26–78. Half women, men. All White. Approximately equal numbers with high school education, less than or more than.

Michigan

Most frequent barriers: lack of knowledge, actions to take; feeling helpless/frustrated; lack of resources; poor quality DSME; daily struggles. Effective strategies: collaboration with provider, positive attitude, support, routines, group DSME. Recommend more individual tailoring.

One practice setting, all White, small sample.

Not clear if participants could be anonymous from providers.

Utz et al. (2006) Aims were to describe experience of self-managing Type 2 diabetes among rural dwelling

Framework Focus groups.

Southeast region of the United States.

10 Focus groups, 3 rural communities, n = 73 African American adults, 42 women, 31 men

Many diagnosed late in disease process. Individuals varied greatly in knowledge and skills for

Small sample from one region of the United States.

Volunteer participants.
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<tr>
<td>African Americans, to identify facilitators and barriers to self-management, to describe the use of prescribed and alternative therapies and elicit recommendations for programs of diabetes care.</td>
<td>Content analysis, group centered Analysis Folio Views software</td>
<td>Data collected 2003–2004</td>
<td>Sample Size, Demographics</td>
<td>Findings</td>
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<tr>
<td>Wenzel et al. (2006)</td>
<td>To examine experience of being diagnosed with diabetes as described by rural Blacks.</td>
<td>Descriptive exploratory study of focus groups. Part of a larger study (see Utz et al., 2006).</td>
<td>Mid Atlantic Region: Central Virginia</td>
<td>n = 73 African Americans from three rural communities (see Utz et al., 2006).</td>
<td>One quarter diagnosed by routine screen; most acutely ill (64%); many hospitalized.</td>
<td>Problem in accurate report, that is, many years with diagnosis (11.6 yrs).</td>
</tr>
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</table>
Methods:
10 focus groups
Separate men and women.

Transcriptions of taped sessions and analysis using Folio Views software.

31 women
42 men.
Average years with diabetes = 11.6.

Vivid memories of diagnoses, classic symptoms of DM.
Many “expected” diagnosis (family history, high rates in community); a few “shocked”; many report difficult acceptance; illness rarely discussed with family/friends; men emphasize treatments; most use figurative, symbolic language; common use of religious, spiritual language. Focus groups facilitate rich descriptions.

Focus groups may limit disclosure of more personal nature.
Only those comfortable with groups participate (self-select sample).

Jones et al. (2006)
To explore use of complementary and alternative modalities
Exploratory focus group method.
Southeast Region of the United States.
Two rural communities
Eight focus groups

Most common remedies: prayer, diet-based, that

Small sample one region

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<tr>
<td>(CAM) therapies, and the role of religion and spirituality in dealing with diabetes among adult African Americans with Type 2 diabetes.</td>
<td>Part of larger study (see Utz et al., 2006).</td>
<td>Central Virginia</td>
<td>n = 68 African American adults with T2DM, 39 men, 29 women. Demographics: 20% 8th grade or less, 38% high school education. Most had health insurance. One quarter paid for health care “out of pocket.”</td>
<td>is, teas from root, leaves, lemon juice, vinegar, “Natural” products and herbal dietary supplements. Some findings differ from other literature and others consistent. Women spoke more openly about CAM use. Some skeptical. Many took remedies for arthritis, hypertension. Confidence in own providers.</td>
<td>Group participation may limit disclosure though opposite appears to be true.</td>
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</table>
Tudiver et al. (2007)

Purpose: to determine acceptability and perceived impact on primary care practices of a randomized clinical trial using telemedicine to deliver diabetes services to elderly Medicare patients (endocrinologist, nurses, dieticians).

Longitudinal phone survey. Part of larger project using telemedicine for diabetes education.

Survey: 36 items using 5-point Likert scale with 3 foci: impact, acceptability, and communication. Six open-ended items for qualitative evaluation, content analysis. Two interviews identified key words, phrases, concepts, and list of themes. Conducted 2002–2004.

Analysis: descriptive statistics, paired t-tests between year 1 and Northeast Region of the United States.

Primary care providers serving patients with diabetes in rural areas and small towns “medically underserved.”

n = 116 of 137 eligible potential participants, 65 completed both year 1 and year 2 surveys. Mean age 48.84 women, 32 men. Family practice and internal medicine MDs, nurse practitioners, physician assistants with at least 1 year experience.

Providers saw an average of three telemedicine patients per year (SD = 2.9).

Multiple regression showed only one variable predictive of acceptability with impact, number of patients enrolled showed an inverse relationship. Means and standard deviations. For year 1 and 2 surveys showed slight improvement in acceptability over time. Qualitative: Three themes: what worked best for patients and providers; what did not work; suggestions for improving diabetes education and telemedicine.

Survey tool developed by investigators (tested for content and face validity three iterations). Factors analysis, reliability, Cronbach’s ok 0.88, etc. No verbatim transcripts. Analysis limited to 65 who did year 1 and 2 surveys. Modifications year 1 and 2 may affect validity of measures.

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<tr>
<td>Moore et al. (2006)</td>
<td>To compare quality of diabetes care provided to American Indian, Alaskan Natives (AI/AN) by urban and rural Indian Health Service (IHS) Programs</td>
<td><strong>Design</strong>: cross-sectional study</td>
<td>Researcher from Great Plains Region of the United States.</td>
<td>20,102 individuals from 242 facilities from all 12 IHS service areas.</td>
<td>Average age rural, 55; urban, 51. Few differences among groups.</td>
<td>Not clear why year 2002 chosen for analysis. Decisions about selection of larger number of rural patients not explained. Not all IHS Programs participated thus may overestimate quality of care. Note: Last 6 years New</td>
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| Moore et al. (2006) | To compare quality of diabetes care provided to American Indian, Alaskan Natives (AI/AN) by urban and rural Indian Health Service (IHS) Programs | **Medical records review, Audit in 2002 by Indian Health Service. Source of data 70 demographic and quality of care variables collected in 2002 from those with complete data for covariants.** | New Mexico. | From urban area n = 841 patient records selected, all urban and random sample of rural. Final sample = 710 urban, 1,420 rural. | Providers spent about 33 minutes/month on project-related tasks. One of first to do longitudinal analysis of tele-medicine. | Overall: PCPs show increased quality of care but reported too time consuming, too much paperwork. |
Data analysis
Descriptives, Logistic regression to compare odds of dichotomous outcomes of rural versus urban patients. Linear regression.

Complete explanation regarding analysis, that is, complex selection of variables, creation of intermediate outcomes, and so on.

likely to receive eye and dental exams. Rates of adherence to national guidelines same or higher than national norms for care providers overall.

“Special Diabetes Program for Indians” from Congress, making future comparisons difficult.

Heuer et al. (2006)

To describe Hispanic migrant farmer workers’ perceptions of services provided at 37 multidisciplinary “Cluster Clinics” designed to serve rural populations with diabetes.

Questionnaire and interviews of clinic clients.

Methods
Descriptive statistics and individual interview of clinic clients (contact evaluation), 15-item English-Spanish eliciting perceptions of clinic services. Bilingual health outreach workers administer questionnaire and interviews.

Midwest Region of the United States.

Convenience samples from 37 clinics over 447 linear miles:
- n = 566 survey
- n = 12 in-depth interviews
- 91% had T2DM
- Age 23–77
- Mean age = 51
- 14% = 55 or > 53% men.

High percent rated service at clinics as “excellent” (75%–88%); 21%–25% rated “good.” Over 85% preferred “no changes.”

Content analysis—clients perceive quality service, six characteristics contributing to successful delivery and four challenges to be tackled.

No outcomes measured. Quality to uninformed may mean “nice, friendly providers.” Data skewed by social desirability, fear of criticizing providers. Researcher developed instrument—provides no information on validity or reliability. Interview from only two clinics.

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<tr>
<td>Skelly et al.</td>
<td>To elicit views of African Americans and identify differences by gender and age about diabetes and its prevention; to design/plan a community-based intervention for prevention; to derive</td>
<td>Interview about benefits, barriers, and suggestions for improvement of clinic services (Clinics established between 1998 and 2003).</td>
<td>Stratified for equal number of men (n = 20), women (n = 22); equal distribution of younger (18–30) and older (31–50) adults.</td>
<td>Findings similar to Utz et al. (2006), “Diabetes is your own personal business” (p. 22) (often not discussed). Respondents did not share a well-developed explanatory model for disease.</td>
<td>Small nonrepresentative sample. Nonrandom sample from one community.</td>
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<td>(2007)</td>
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<td>Descriptive guided by Kleinman’s Ethnographic interviewing—5 domains to develop interview guide.</td>
<td>Rural North Carolina</td>
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<td>1. etiology</td>
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<td>2. time with mode for symptom onset</td>
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<td>3. pathophysiology</td>
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an explanatory model of diabetes from this population.

Framework

Analysis
Transcribed analysis using Ethnograph software.

4. course of illness
5. treatment.

Added an item on prevention of diabetes.

24 open-ended questions and probes. 45 minutes to 2 hours in homes or place of choice.

Thorough in-depth interview and analysis.

Site-based sampling in community (stores, churches, agencies) working poor at risk for diabetes (not diagnosed).

More ideas about etiology than other domains of explanatory model. Some consistent themes within domains.

Recommendations: focus on family involvement, build on belief about "taking care of oneself," recognize age and gender differences to develop programs to prevent diabetes.
sets from studies by the federal government. Of particular note is an unusual study that is an in-depth cost-benefit analysis of a proposed case management program intended for low-income, high-risk people living in a rural county of Alabama (Crow, Lakes, & Carter, 2006). The latter study involved a detailed examination of the financial elements of a proposed program prior to testing. Such an approach is unique in the literature selected for this review and results may be important in future decisions about the kinds of programs that are effective and sustainable in rural areas.

**Intervention Studies**

The smallest percentage of study designs identified for this review was experimental or interventional—a design found in only three studies (11.5%). All three studies were quasiexperimental designs, and are analyzed in detail in Table 1.3. Samples for these studies reflect special populations—that is, African Americans in the rural South and women in the Great Plains. All deal with testing interventions that include one or more group approaches. All include outcomes that measured effective diabetes self-management, such as glycosylated hemoglobin (HbA1c) level (a measure of long-term glycemic control), blood pressure, body weight, and use of health care resources. Some included more subjective data such as patients’ preferences or satisfaction with the approach. One included use of computers to deliver the intervention. While it is disappointing that such a small number of studies were conducted to test an intervention, this finding reflects the difficulties of conducting research in rural areas. Barriers to conducting such studies are consistent with the factors described previously by Long and Weinert (1998), in their description of major concepts associated with rural nursing. Categories of research barriers include logistical factors for both researchers and participants—such as distance, transportation difficulties, cost, communication barriers, and limited facilities. Cultural factors can also complicate research because of differences between rural residents and researchers as described by Long and Weinert (1998): “outsider/insider, old timer/newcomer” factors (p. 9). Researchers who lack an understanding of cultural differences between rural groups are unlikely to be successful in studies about rural people. Another factor that may be a barrier to research in rural areas is the lack of available health professionals and researchers in the region. While most nursing research is conducted by nurses in academic medical centers, such centers are rarely located in rural areas. All of these barriers to nursing research affect studies of every type (descriptive program evaluations and experimental interventions); however, they impact researchers most profoundly when they attempt to test an intervention and follow results over time—a type of study that is most needed to inform health care providers about diabetes care.
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<tr>
<td>Heuer et al. (2004)</td>
<td>To describe migrant Health Services, Inc. (MHSI) Diabetes Program conceptual model and four types of outcomes achieved over three years.</td>
<td>Descriptive analysis of program records and documents.</td>
<td>Great Plains Region of the United States.</td>
<td>Systematic sample of 451 Hispanic farm workers with every third patient served at each of nine health centers from 447 linear miles. Nurse-managed health centers. Comparisons of two annual subsamples: Year 2000: 165; Year 2002: 140; and preliminary data from 2003. Those with T2DM are 91% of sample. 9%: T1DM. Age range 23–77. Average age 51. Women = 53%.</td>
<td>Multicomponent program addressing barriers offering continuum of health services and education to meet ADA recommendations. <strong>Outcomes</strong> 1. 78% seen two times/year or more 2. screenings offered at cluster clinics 3. specific medical care given statistically significant increase, by 2002 all but 6% had A1c measure: screened for complications. Extensive patient/participant education with positive evaluations. Conducting research and educating providers. Conclusion: major increase from 2000 to 2002 in services provided.</td>
<td>Program evaluation with no comparison of those served elsewhere in this community or similar one elsewhere or to national norms.</td>
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<td>Bray, Roupe, et al. (2005)</td>
<td>To assess feasibility and potential for cost effectiveness of restructuring care in rural fee-for-service practices for predominately minority patients with diabetes for over one year.</td>
<td>Business plan developed to examine costs and revenue for tailored intervention for 12 months with advanced practice nurse case manager (CM)—weekly visits and four group sessions with MD and CM. Electronic registry with reminders, “Circuit rider case manager” nurse. Care based on established overall goals following ADA guidelines; CM set individual goals with patients.</td>
<td>Southeast Region of the United States. North Eastern North Carolina</td>
<td>n = 314 patients with T2DM from five clinics serving 3,700 people with DB.</td>
<td>Increase in percentage of patients achieving diabetes care goals. Increase productivity and billable encounters. Increase average daily encounter rate. Significant improvement with both patient care and processes of care. Program continues to expand in five clinics.</td>
<td>Didn’t measure total use of health care system (e.g., emergency room or hospital visits). Lack of comparisons with control clinics. Can’t separate effects of three different aspects of intervention. May not generalize to other settings.</td>
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Siminerio et al. (2005) conducted a pilot study to determine the impact of implementing elements of the Chronic Care Model (CCM) on provider's diabetes care practices and patient outcomes in a rural practice setting.

**Methods:**
- Chart reviews and interviews to describe practices and outcomes.
- Methods: reviewed charts previous years; interviewed providers; repeated chart review.
- Intervention by CDE based on ADA guidelines.
- DSME at office site: held group sessions, series of five per group. For 12 months dieticians CDE came two times/month; phone call follow-up.

**Analysis**
- McNemar's test, paired t-tests

**Results:**
- Appalachian Region of the United States.
  - Pennsylvania, South Central bordering Appalachia
  - County has 172 people diagnosed with diabetes;
  - Sample eligible n = 104
  - adult patients with T2DM; n = 29
  - received intervention,
  - n = 17 completed entire program.
  - 99% White,
  - Low formal education.
  - Average age 65.4.
  - Primary care practice with four MDs and a PA and NP.
  - Provider adherence to ADA standards increased significantly across all process measures.
  - Patients increase knowledge, empowerment.
  - Changes in clinical values nonsignificant except A1c<7; HDL cholesterol improved.

**Conclusion**
Implementing systems to support decisions and DSME has influence on practices and patient outcomes in rural areas.

Practice site received ADA certification after patient study.

Small number completed entire program.
Hawthorne effect.
Small power to detect differences.

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<tr>
<td>Balamurugan et al. (2006)</td>
<td>To describe barriers to diabetes self-management education (DSME) programs in medically underserved rural areas of Arkansas and describe lessons learned.</td>
<td>Chronic Care Model: A coalition of groups developed a plan, recruited 12 sites to set up DSME programs of care; hired three certified diabetes educators (CDEs) to train staff of clinics and prepare them as CDEs; each clinic got resources/materials. Each patient got 10 hours DSME and three hours nutrition assistance—tailored to individual.</td>
<td>Southeastern Region of the United States.</td>
<td>Enrolled 734 between February 2003 to March 2004. Total n = 734 93% T2DM 25% age 45 or less 69% White 30% African American 50% High school education or less Only 20% completed the 13 hours DSME (n = 65). Total data on 43.</td>
<td>Clinical changes not statistically significant except increased foot exam rates. HbAlc decreased 0.5. Barriers to implement program at patient level and program level. Only significant change at six months = increased foot exam rates ($p = 0.03$). Conclusions • Met goal of establishing 12 sites for DSME. Increased number of CDEs by three • Doubled number received DSME over one year • Key problem—attrition. Lack of effort for retention of patients • Problems with reimbursement • Didn’t have systematic evaluation early. • Planning six more sites of evaluation.</td>
<td>Barriers well summarized in table form. Recognition of lack of evaluation plan. No use of Planning model such as PRECEDE-PROCEED</td>
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Butcher et al. (2006) To increase access to quality diabetes self-management education (DSME) in rural Montana via a mentoring program with three levels (basic, intermediate, advanced).

Mentoring and technical assistance offered through state-wide initiative. Assessed each profile, learning needs, outlined course of self-study and matched with mentor. Most mentoring conducted via phone and email with occasional site visits. Lending library of materials on DB care/education. Program with ADA recognition held meeting and offered information documents, etc. HIS involved.

Great Plains Region of the United States. Rural Montana

90 nurses (76%) and dieticians (21%) participated.

30 facilities received technical assistance to achieve ADA certification.

Average number participating each of six years = 37.

27 completed structured education and 13 achieved CDE. Satisfaction with program n = 23 “high.” 25 of 30 facilities received ADA recognition. Number CDEs in state increased from 52 to 76 over five years. Number ADA recognized programs increased from 2 to 22. Strong network of diabetes educators developed across state. Minimal costs. Materials, lending library, Montana Diabetes control program DCP developed. Successful partnership between Montana DCP and Association of Diabetes Educators.

Small number evaluated program (self-selected). No comparison to other states or national norms. “Technical Assistance” not well explained. No cost figures provided.

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<tr>
<td>Morris (2007)</td>
<td>To address the social support and education needs of rural residents with diabetes by implementing an adult support group.</td>
<td>Telephone needs assessment.</td>
<td>Southwest Region of the United States.</td>
<td>Needs assessment survey conducted in five counties. Participants selected via telephone interview (no number given). Sample population: 87% White, 4.16% Black, 8.3% Hispanic (not proportional, too few Black and Hispanic). First group meeting, n = 32. Phone survey completed by 12 participants two weeks after meeting. Good discussion of evidence about importance of social support.</td>
<td>Services wanted: monthly meetings, speakers, talk with others with similar needs, and telephone resource list. 75% found information beneficial at first meeting. 40% stated information with meeting others beneficial.</td>
<td>Cites Healthy People 2000 (vs. 2010) for objective for diabetes care. State data based on 1990 census. Hospital admission data from 1996. Goal of 20 people is too big for group process. Evaluation of one group session is very limited.</td>
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### COST-BENEFIT ANALYSIS

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<tr>
<td>Crow et al. (2006)</td>
<td>Describes cost-benefit analysis. Proposed nursing case management (CM) program that provides care for low-income, high-risk diabetic population in a rural county.</td>
<td>Cost-benefit analysis based on case manager's caseload of 20 low-income, high-risk clients with diabetes.</td>
<td>Southern Region of the United States.</td>
<td>Calculations based on sample of 941 patients with diabetes from total patients of 5,354 seen over four years by RHMMMA.</td>
<td>Baseline Analysis: RHMMMA projected to save local and community hospital (ER and hospital) $3.5 million over four years: - Program able to “break even” with costs and revenues at $808,307 in 2004 Analysis by adding CM: - Net benefit of $149,544 savings per year - Benefit-cost ratio 2:9 (a ratio of &gt;1 generates more benefits than costs) - Assume other intangible benefits such as client and staff satisfaction, overtime, decrease complications.</td>
<td>Strengths: thorough literature review of CM and needs of rural people. Provides detailed description of CM job and organizational arrangement. Projected cost-benefit analysis not actual savings. Outcome evaluation planned after one year.</td>
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<td>Part of Rural Health Mobile Medical Unit (RHMMMA).</td>
<td>Alabama</td>
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<td>Analysis of one year.</td>
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<td>Cost savings are estimates based on national averages established by Healthcare Costs and Utilization Project (AHRQ).</td>
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<td>Source</td>
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<td>Design and Method</td>
<td>Rural Location</td>
<td>Sample</td>
<td>Findings</td>
<td>Critique</td>
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<td>South Carolina (Columbia)</td>
<td>Convenience sample from one family practice office in rural medically underserved county.</td>
<td>High-risk individuals with indicators modifiable by diet.</td>
<td>Outcomes of FBS not very useful.</td>
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<td>Comprehensive description of community from which the sample was drawn.</td>
<td>Some questions developed by researchers, e.g., health services utilization and costs of care (well-established instruments are available).</td>
<td>Pilot study with small sample from one setting.</td>
</tr>
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</table>
Bray, Thompson, et al. (2005) To explore efficiency of combining care management and interdisciplinary group visits for rural African Americans with diabetes.

Quasiexperimental intervention study comparing usual care to multidisciplinary group sessions.

Southeast Region of the United States.

Rural African Americans with diabetes. Convenience sample from two adjacent counties. Targeted those with high risk or poor management intervention, n = 112; control n = 48; Total 160

90% African American

Comprehensive description of population of counties used.

Adjusted not significantly different at baseline but significantly changed at 12 months. Decreased A1c in intervention group, increase in control group (median). No change in body weight or blood pressure in either group. Cost Analysis: increased number of visits due to guidelines in 10 randomly selected subjects reviewed, thus increased costs of intervention and increased patient volume. ≥ 60% of those in intervention group had decreased A1c. However, those achieving 7% increased from 32% to 45%.

Limited information on use of health care services/cost analysis.

Use of modified case management approach can be successful with rural African American circuit rider concept.

Findings similar to those with managed care system in urban areas.

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<th>Source</th>
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<th>Critique</th>
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<td>Smith &amp; Weinert</td>
<td>To test the use of telecommunication technology to deliver diabetes education and social support to rural women with diabetes.</td>
<td>Quasiexperimental study with usual care compared to support group offered via computer over five-month period. Provided computers and software. Data collected from telephone interviews, mail questionnaires, and computer-use information. Measures collected at 2.5 months, 5 months, 7.5 months, and 10 months: Personal Resource Questionnaire, Quality of Life Index, Social Readjustment Rating Scale, and Psychosocial Adaptation to Illness Scale. Researcher developed score for utilization of computer. Information from software: number of times used and length.</td>
<td>Great Plains Region of the United States. Montana (South Central)</td>
<td>30 women randomized to computer and noncomputer groups. Recruited through health care providers and Montana Diabetes Association. Average age = 46.7 80% married 60% employed</td>
<td>Improving health and higher education attainment positively influenced social support scores and quality of life scores. Married women or those who reported greater support had higher Personal Resource Questionnaire scores. Employment may have significant effect on illness. Those in both groups tended to feel better adjusted to disease over time. Only five subjects had information about their A1c levels. Subjects spent more time using computer first month (average 129 minutes) vs. month 5 (average 37 minutes). Most positive evaluations were of “health chat” and “conversation” segments.</td>
<td>Not conceptually clear—“health” vs. “Quality of Life” measures? Length of time with diabetes not reported. Why women only? Multicollinearity of measures, with varied/overlapping measures of social support and adaptation to illness.</td>
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CONCLUSIONS

A critique of the research literature about nursing care of rural people with diabetes was conducted focusing on research published between 2000 and 2007 among rural populations of the United States. A total of 26 research reports were found that met the established criteria. The vast majority of research reports (22 of 26) were authored by nurses and published in journals intended for an audience of various health professionals. Results of this review are therefore informative for developing knowledge for nurses and other health professionals who care for those with diabetes, particularly those living in rural areas. Of the 26 studies examined, 16 were descriptive studies, 7 were program evaluations, and only 3 were intervention studies.

Findings indicate that with a few exceptions, researchers typically did not define rural, and rarely mentioned a conceptual framework. The studies reflected nearly every region of the continental United States with the exception of the Northwest; the majority were conducted in the Southeast. No studies were found from Alaska or Hawaii. The most significant methodological limitations include a lack of detailed information about recruitment of samples and/or populations from which they were drawn, a predominance of nonprobability sampling, and low statistical power that was the result of small sample size and/or too many variables. Additional methodological limitations identified in this review are the lack of longitudinal studies and the lack of adequate comparison groups in most studies. Thus, studies that use better research designs and that offer both valid and reliable results are needed. Because only three intervention studies were found, it is evident that there is a need for more experiments to test approaches to diabetes care among rural people, particularly because of the high rates of diabetes and high burden of disease in this population. Surprisingly, only a few of the studies used computers, telehealth, or other technological approaches to reach out to rural residents with diabetes.

Research Agenda for Rural Diabetes Care

It has been established for some time that good glucose control can reduce morbidity and mortality from diabetes—what remains to be determined for rural people in the United States is what kinds of strategies work in various settings with particular population groups. The research agenda for rural diabetes care should also include testing interventions that have already shown positive outcomes in urban populations. For example, studies have shown the importance of social, emotional, and informational support over the long term while individuals learn diabetes self-management (Funnell, Tang, & Anderson, 2007). More studies are needed to test ways of providing similar support to rural people for
whom attending regular support group meetings may be difficult. Of those studies reviewed here, only one tested a support group in a rural area (Morris, 2007), and no outcomes such as glycemic control were measured. Studies are therefore needed to determine what kind of support is feasible to sustain diabetes management and whether such support is associated with key outcomes such as optimal glycemic control and improved quality of life.

As noted in a report by the Health and Human Services Task Force on Community Preventive Services, approaches such as case management and community-based self-management education programs need to be tested in rural populations (Evans & Kantrowitz, 2001). Studies that use such care processes to deal with barriers for rural people are particularly needed. For example, to overcome the barrier of distances and transportation, approaches should be tested that make use of technology such as computers, cell phones, and telehealth. Another barrier is the lack of multidisciplinary teams to offer comprehensive diabetes self-management education. Intervention studies need to be conducted that test creative ways to overcome insufficient numbers and types of health professionals. Examples might be the use of trained community health workers or other nonprofessional health care extenders. Only one study was found for this review that tested an approach to increasing the number of certified diabetes educators in a rural state (Butcher et al., 2006). Studies that implement new ways to train existing health care providers and to increase their ability to offer diabetes education are needed to test new approaches to rural diabetes care.

Financial barriers in the current health care system are another significant barrier to rural diabetes care. Limited reimbursement for diabetes self-management education by nurses and dieticians contributes to small numbers of health professionals in rural areas and throughout the United States (Siminerio, 2007). Studies are needed to test approaches that are financially viable in rural areas, such as the study reviewed here by Bray, Thompson, and colleagues (2005), which found 75% of the costs of a rural-based nurse case manager were offset by improvement in billable encounters and improved processes of care. Similarly, the study by Crow, Lakes, and Carter (2006) projected that a program will be able to break even with costs and revenues by using a nurse case manager. Follow-up studies are needed to determine actual cost-benefit analyses and the outcomes of diabetes care. Similarly, the circuit rider diabetes educator nurse who travels to several primary care sites is another approach that has promise in rural areas but has had minimal testing (Bray, Thompson, et al., 2005) as regards outcomes and cost-effectiveness. Studies are therefore needed to measure long-term savings that may be realized from case management diabetes care, circuit rider diabetes educators, and other kinds of care processes to determine if such approaches result in better clinical outcomes and fewer emergency room and hospital visits among those living in rural areas.
In summary, there is a great need for research to test many areas of diabetes care among rural people. Given the high rates of diabetes and the importance of improving the health of rural people with diabetes, there is an urgent need for nurses and other health care professionals to tackle the health disparities that currently plague this population.

REFERENCES


Office of Rural Health Policy, Health Resources and Services Administration, United States Department of Health and Human Services.


