NURSE PRACTITIONERS' IMPACT ON PRIMARY HEALTH CARE OUTCOMES IN RURAL CLIENTS

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DEDICATION

I would like to dedicate this work to my wonderful family. First to my mother, Jacqueline Norwood Green, and to my father, Earl Green, Jr., who taught me to believe I could do anything. Just as important, to my husband, Alan, who gave me strength and inspiration. And to my children and grandchild, Jeremy, Amber, Morgan, and Micah, whose sacrifices have not gone unnoticed. Thank you one and all.

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ABSTRACT

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The purpose of this descriptive cross-sectional study was to determine if a significant difference exists in perceived primary health care outcomes of rural clients treated by nurse practitioners and those treated by physicians or physician assistants. Primary health care outcomes were defined as (a) perceived satisfaction with care, (b) compliance with antibiotic medications, and (c) perceived health.

Three hypotheses were tested:

1. There is a significant difference in satisfaction with care among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant.

2. There is a significant difference in compliance with antibiotic medications among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant.

3. There is a significant difference in perceived health among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant.

Descriptive statistics were used to describe the sample demographics. ANOVA and t-tests were used to test for significant group mean differences for each of the three hypotheses. The sample of 151 subjects (a) were age 18 or older, (b) could read and understand English, and (c) lived in a pre-defined rural county. The majority of subjects were female, white, and married.

There was no significant difference found in satisfaction with care or compliance with antibiotic medications among rural clients treated by a nurse practitioner and those treated by a physician or physician assistant. Clients of nurse practitioners had higher levels of perceived health, general health, and physical health than clients of physicians or physician assistants.

Rural clients in this study were more satisfied with nurse practitioners in relation to general satisfaction, interpersonal manner, time spent with health care provider, and accessibility and convenience. Financially, rural clients in this study were more satisfied when treated by physicians and nurse practitioners when compared to physician assistants.

Nurse practitioners are independent practitioners of primary health care. This study supports nurse practitioners as valuable providers of primary health care in rural environments.

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CHAPTER I

INTRODUCTION

Providing health care services in rural areas of the United States has become increasingly difficult in recent years. During the 1970s, rural communities thrived with economic expansion and unprecedented population growth. At that time, rural primary health providers represented viable institutions offering an array of services to their communities (Perryman, 2000). By the early 1980s, however, thousands of communities were confronted with downturns in agriculture, mining, timber, and manufacturing--bringing a near halt to population growth and eroding health care services as well. A new profile of rural clients has emerged: one with a greater number of unemployed and underemployed residents, a greater number of residents with little or no health insurance, and a higher proportion of both young and old residents (Perryman, 2000). Slifkin, Goldsmith, and Ricketts (2000) stated,

> The gap in health status and reduced access to a full range of health care services that exists for minorities nationwide may be exacerbated by a variety of factors in rural areas, such as poverty, transportation problems, and limited provider availability. In addition, the recent migration of new ethnic and minority groups into rural areas may be creating the need for a more diverse provider base to overcome cultural and language differences. (p. 16)

There is a higher rate of infant mortality, suicide, low birth weight babies, auto accidents, and inadequate prenatal care in rural areas (Center for Rural Health Initiatives, 1997). The collapse of health care services in many areas has accelerated this transformation. Nurse practitioners and physician assistants have willingly attempted to fill this primary health care void.

Problem of Study

In today's changing health care environment, the worth of nurse practitioners and physician assistants in primary care compared to physicians is controversial. Nurse practitioners have a long history of delivering health care to underserved persons in rural areas (Mezey & McGiver, 1993; Mundinger, 1999). Differences in the type of primary care provided by nurse practitioners and that provided by physicians or physician assistants may have a far-reaching impact on the health of their rural clients. However, nurse practitioners are scrutinized for their ability to deliver safe, effective, and satisfactory care (Mundinger, 1999). With health care being provided by a variety of professionals, what is the impact of this care on rural clients?

The problem of this study was to determine: Is there a difference in primary health care outcomes of rural clients treated by a nurse practitioner, and primary health care outcomes of rural clients treated by a physician or physician assistant? Primary health care outcomes include perceived satisfaction with care, compliance with antibiotic medications, and perceived health.

Rationale for the Study

One of the most serious challenges that rural communities across the country face today is a shortage of primary health care providers. In many rural areas, a lack of professional medical personnel, such as physicians, nurse practitioners, or physician assistants, keeps people from getting the care needed (Baer et al., 1999; Earle-Richardson & Earle-Richardson, 1998; Strickland, Strickland, & Garretson, 1998). Nurse practitioners and physician assistants provide primary health care for many rural clients, who otherwise would not have access to services. According to Mundinger (1999), there is not a consistent structure for delivery of primary health care to rural clients. Therefore, it is important to determine the impact of primary health care in the rural environment.

The measurement of outcomes has become an important component of evaluating health care. In the current competitive health care market, outcomes of care are used to compare and evaluate the impact of health care treatments, procedures, and providers (Kleinpell-Nowell & Weiner, 1999). Assessment of outcomes is an expectation of all types of primary health care providers (Sparacino, 1998).

Conceptual Framework

The conceptual framework for this study was derived from Donabedian's (1966) paradigm for evaluation of quality: structure, process, and outcome. Structure is defined by Donabedian (1992) as the physical and organizational properties of the

settings in which care is provided. Process is defined as what is done for the patient, while outcome is defined as what is accomplished for the patient (Donabedian, 1992). Outcomes have the important advantage of being "integrative," and reflect the contributions of all those who provide care, including the contributions of patients to their own care. Outcomes also reflect skill in execution as well as appropriateness of the care provided. For the purpose of this study, structure is defined as the type of primary health care provider (nurse practitioner, physician, or physician assistant). The process of providing primary health care is similar regardless of the type of primary health care provider. This process includes assessing, diagnosing, testing, prescribing, referring, communicating, and educating. In this study, primary health care outcomes include satisfaction with care, compliance with antibiotic medications, and perceived health as identified by the client (see Figure 1).

Assumptions

The following assumptions were made:

1. Nurse practitioners, physicians, and physician assistants provide primary health care to individuals in rural areas.

2. Nurse practitioners, physicians, and physician assistants assess, diagnose, and treat health problems.

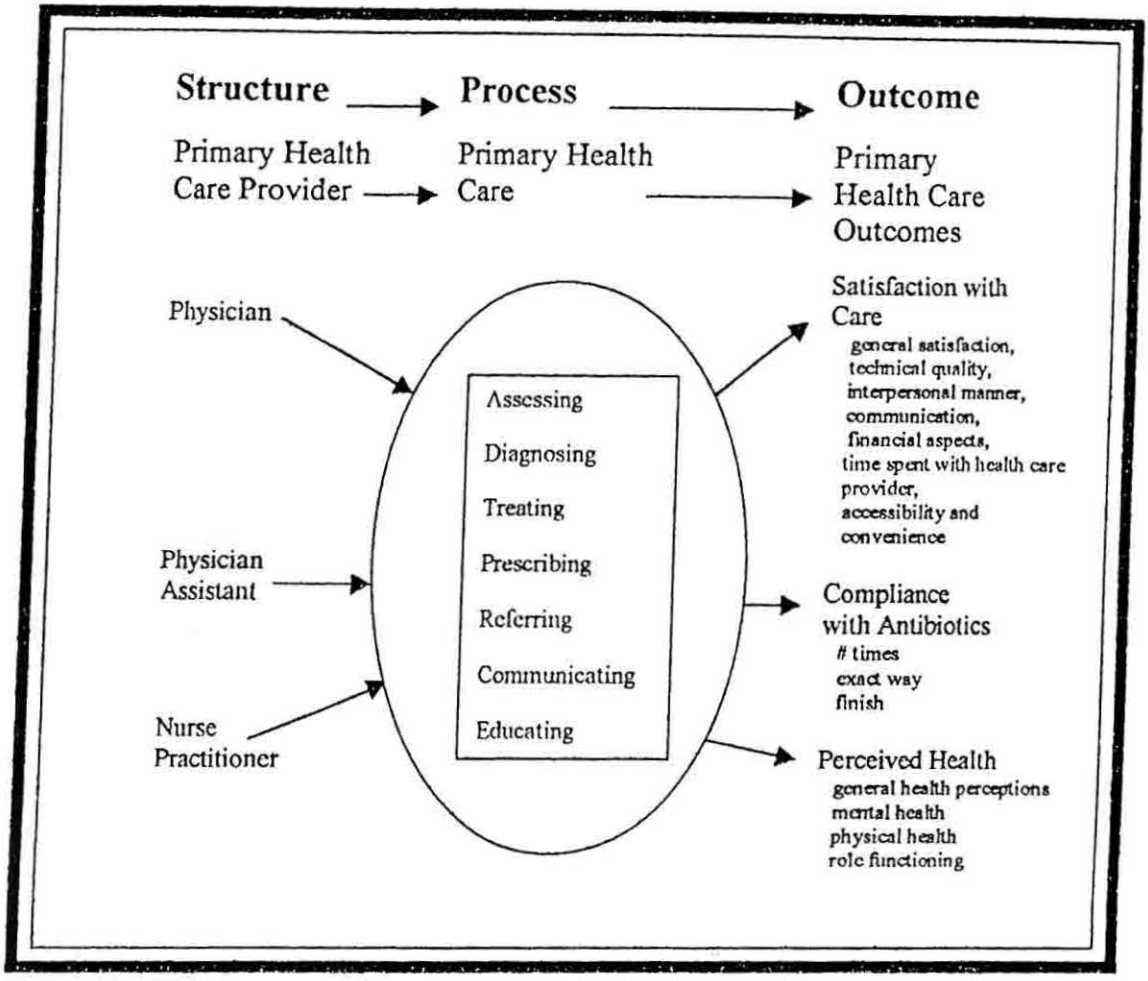

Figure 1. Taylor's Primary Health Care Outcomes Model

3. Positive health care outcomes result from primary health care provided by nurse practitioners, physicians, and physician assistants.

4. Clients expect quality care from each type of provider.

5. Patient satisfaction, compliance with antibiotic medications, and perceived health can be measured.

6. The responses on each questionnaire will reflect one individual's recent primary health care experience.

Hypotheses

The following research hypotheses were tested:

1. There is a significant difference in satisfaction with care among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant.

2. There is a significant difference in compliance with antibiotic medications among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant.

3. There is a significant difference in perceived health among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant.

Definition of Terms

The following are the theoretical and operational definitions for the terms used in this study.

1. Rural is defined theoretically as an area not classified as a metropolitan statistical area (Center for Rural Health Initiatives, 1997). The area or county is further identified by the State as a Health Professional Shortage Area (HPSA) and/or Medically Underserved Area (MUA). Rural is defined operationally as a county that is designated as either a HPSA or a MUA, or both.

2. Rural client is defined theoretically as a person living in and receiving health care in a rural county. Rural client is defined operationally as a person 18 years of age or older living in and receiving health care in a rural county.

3. Physician is defined theoretically as a licensed practitioner of medicine, able to assess, diagnose, and treat clients. Physician is defined operationally as a licensed Doctor of Medicine or a Doctor of Osteopathic Medicine providing primary health care in a rural health clinic as identified by the client.

4. Physician assistant is defined theoretically as a licensed practitioner, able to assess, diagnose, and treat clients under the supervision of a physician. Physician assistant is defined operationally as a licensed physician assistant providing primary health care in a rural health clinic as identified by the client.

5. Nurse practitioner is defined theoretically as a licensed registered nurse with advanced education and clinical skills able to assess, diagnose, and treat clients. Nurse practitioner is defined operationally as a licensed advanced practice nurse providing primary health care in a rural health clinic as identified by the client.

6. Satisfaction with care is defined theoretically as the clients' perceptions of the health care they receive in general. Satisfaction with care is defined operationally by seven dimensions: (a) general satisfaction, (b) technical quality, (c) interpersonal manner, (d) communication, (e) financial aspects, (f) time spent with health care provider, and (g) accessibility and convenience, as measured on the Patient Satisfaction Questionnaire (PSQ-18) (Marshall & Hays, 1994).

7. Compliance with antibiotic medications is defined theoretically as the degree to which a client follows the health care provider's prescribed medication regimen (Sackett & Haynes, 1976). Compliance with antibiotic medications is defined operationally as the summed score on the researcher-developed compliance with antibiotics questionnaire.

8. Perceived health is defined theoretically as the clients' perceptions of (a) general health, (b) mental health, (c) physical functioning, and (d) role functioning. Perceived health is defined operationally as the score on an instrument derived from the Medical Outcomes Study (MOS) SF-36, and SF-12 health surveys (Tarlov et al., 1989).

Limitations

The following limitations were identified for this study:

1. A mailed survey was the only method of data collection.

2. Self-report measures were limited to what clients know about their attitudes and willingly report (Nunnally, 1978).

3. The sample was comprised of voluntarily returned questionnaires and may not be representative of the total population of rural clients.

4. The type of health care provider was identified by the client, and assumed to be correct.

5. There was no way to know if collaboration took place within a household while completing the questionnaire.

Delimitations

The following delimitations were identified for this study:

1. Rural counties were utilized.

2. The sample was comprised of rural clients with US Postal service access with either a post office box or rural delivery.

3. Participants were 18 years of age or older.

4. Participants were able to read and understand English.

5. Participants were rural clients receiving health care in a rural county.

Summary

The provision of primary care to underserved clients in rural areas of the United States has become an issue of increasing concern in recent years. The shift from the offering of a full array of services to rural communities to the decrease in primary health services came about with a drastic change in the economy in the early 1980s. Today, a shortage of primary health care providers is one of the most serious challenges that rural communities face. Nurse practitioners and physician assistants have willingly attempted to fill this primary health care void, with nurse practitioners having a long history of providing care to underserved patients in rural areas.

According to Mundinger (1999), there is no consistent structure of delivery of primary health care to rural clients. Therefore, it is important to determine the impact of primary health care in the rural environment. Differences in the type of primary care provided by nurse practitioners and the type provided by physicians and physician assistants may have a far-reaching impact on the health of their rural clients.

The measurement of outcomes has become an important component of evaluating health care. "Outcomes of care are used to compare and evaluate the impact of health care treatments, procedures, and providers" (Kleinpell-Nowell & Weiner, 1999, p. 93), thus the purpose of this study was to examine the differences in primary health care outcomes for rural clients of physicians, physician assistants, and nurse practitioners.

The conceptual framework developed by the researcher was discussed. Donabedian's (1992) paradigm for evaluation of quality that includes structure, process, and outcome provided the basis for the framework. Three hypotheses were presented:

1. There is a significant difference in satisfaction with care among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant.

2. There is a significant difference in compliance with antibiotic medications among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant.

3. There is a significant difference in perceived health among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant.

Theoretical and operational definitions of study terms were presented. Assumptions, limitations, and delimitations of this study were identified.

CHAPTER II

REVIEW OF LITERATURE

This chapter presents a review of the literature related to primary health care providers and the concepts of satisfaction with care, compliance with antibiotic medication, and perceived health. The review is presented under the headings of primary health care providers, primary care, and primary health care outcomes with the subheadings of (a) satisfaction with care, (b) compliance with antibiotic medication, and (c) perceived health.

Primary Health Care Providers

The review of literature is focused on three primary health care providers: (a) physicians, (b) physician assistants, and (c) nurse practitioners. Physicians, physician assistants, and nurse practitioners are not the same type of health care provider, even though there is a large area of overlap in each profession's practice of primary health care.

Physicians are practitioners of medicine, performing examinations of patients, diagnosing illness, and treating disease and injury. Many years are devoted to learning the art and science of their profession. Physicians spend their entire careers continuing to learn about care for their patients as new technologies, equipment, techniques, and

medications are introduced. Two types of physicians, the Doctor of Medicine and the Doctor of Osteopathic Medicine, may practice general medicine or concentrate on a medical specialty. Physicians work as leaders and coordinators of the health care team, referring patients to appropriate resources for care and services and overseeing the practice of other health care providers (Center for Rural Health Initiatives, 1997). Physicians have more in-depth knowledge about disease processes and complex medical management. This greater medical knowledge has been the focus of comparisons between physicians and nurse practitioners in the past, but there are also competencies that belong uniquely to the nurse practitioner (Mundinger, 1999).

Physician assistants are trained to provide medical care specifically under the direction and supervision of a physician (Sox, Ginsburg, & Scott, 1994). Physician assistants were introduced into the health care arena in the early 1960s. The physician assistant program was developed to provide an opportunity for military personnel, who received extensive medical training during the Vietnam War, to use their skills in a civilian setting. Physician assistant programs have since expanded to include nonmilitary personnel. The program consists of 2 years of general education and 2 years of clinical education with the focus on treatment and cure of illness and general health needs (Marion, 1996). Physician assistants currently help provide primary health care in a variety of settings such as hospitals, clinics, and physician offices (Center for Rural Health Initiatives, 1997; Rudy et al., 1998; Sox et al., 1994).

The purpose of a study by Larson, Hart, Goodwin, Geller, and Andrilla (1999) was to examine the recruitment and retention of physician assistants in rural practice. Physician assistants who began their careers in a rural location were more likely to leave them during the first 4 years of practice than urban physician assistants. Female rural physician assistants were slightly more likely to leave than the male physician assistants. Physician assistants who started in rural practice had a high attrition to urban areas (41%); however, 10% of those who started practice in urban settings left for rural settings. Twenty-one percent of the earliest graduates of physician assistant training programs had exclusively rural careers; only 9% with 4 to 7 years of experience had worked exclusively in rural settings. Generalist physician assistants were significantly more likely to leave states with unfavorable practice environments in terms of prescriptive authority, reimbursement, and insurance (Larson et al., 1999).

McCulloch (1999) suggested a change in the physician assistant law to allow physician assistants some provision for independent practice in rural settings. Without the legal ability of physician assistants to practice in rural settings on a competitive basis with nurse practitioners, the entire rural clinic job market would be dominated by nurse practitioners (McCulloch, 1999).

A nurse practitioner is a licensed registered nurse with advanced education and clinical skills and can practice independently. According to Mundinger (1994),

> Nurse practitioners work in a wide variety of structures, from settings in which they are supervised employees of physicians, to collaborative practices with other practitioners, to solo practices. In each of these

> structures the nurse practitioner sees a patient, elicits data, reaches diagnostic conclusions, and decides about treatment. It is with regard to this professional process that nurse practitioners and physicians are being compared. (p. 211)

Nurse practitioners have broader skills (a) in developing preventive regimens; (b) engaging clients in their own health care decision making; (c) providing health education, counseling, and community resource coordination; and (d) home care (Mundinger, 1999).

Evaluation of the practice of nurse practitioners has been ongoing since the development of the role in 1965 (Mundinger, 1994). Thirty years of research, most conducted by physicians, have shown that nurse practitioners have diagnostic certainty and management effectiveness similar to physicians (Congress of the United States, 1986; Feldman, Ventura, & Crosby, 1987; Rudy et al., 1998; Sox, 1979; Spitzer et al., 1974). These studies also demonstrated that nurse practitioners provide 90% of the services primary care physicians provide. Feldman et al. (1987) analyzed 248 articles related to nurse practitioner effectiveness. An information synthesis demonstrated that positive results were obtained about nurse practitioner utilization, delivery of care, and health care outcomes (Feldman et al., 1987).

Marion (1996) noted that nurse practitioners are community oriented and focus on prevention and self-care. They provide a majority of primary health care which includes (a) obtaining medical histories, (b) performing physical examinations, (c) monitoring patients with chronic diseases, (d) assessing and tracking acute and chronic

illnesses, (e) ordering and interpreting laboratory tests and x-rays as needed, (f) providing health education and disease prevention information to children and adults, and (g) discussing disease prevention strategies with the public (Marion, 1996).

Pike, Bowden, and Peeples (1998) wrote that nurse practitioners were committed to a practice that focused on self-care, promoting healthy lifestyles, and encouraging individuals to take responsibility for their own well-being. Nurse practitioners are taught to provide wellness care in addition to medical care. Although trained to provide primary care, many nurse practitioners obtain additional training for specialized practice in family practice, geriatrics, pediatrics, school health, or mental health (Sox et al., 1994).

The nurse practitioner collaborates with physicians and other health care professionals when the client's needs are beyond the scope of practice and/or individual expertise of the nurse practitioner. Nurse practitioners are also educators and researchers (Center for Rural Health Initiatives, 1997) and have a long history of delivering health care to underserved persons in rural areas (Mezey & McGiver, 1993; Mundinger, 1999).

Studies comparing various types of primary health care providers were found in the literature. Some researchers found that the care given by nurse practitioners was equal to, and in some instances superior to the care given by physicians (Koch, Palzaki, & Campbell, 1992; Murray & Paxton, 1993; Nelson, VanCleve, Swartz, Keesen, & McCarthy, 1991; Prescott, 1994). Murphy and Ericson (1995) concluded

that some communities preferred nurse practitioners because of their holistic approach to patient care. Kane et al. (1991) investigated nurse practitioners' and physician assistants' impact on cost and quality of care provided to nursing home clients. Using multivariate analysis (N = 564), they found that nurse practitioners provided more appropriate care (as evaluated by physicians) while also decreasing the cost when compared with physicians.

Sullivan-Marx and Maislin (2000) conducted a pilot study, using an exploratory survey, to examine the feasibility of using data for nurse practitioners for specifying relative work values (RWV) in the Medicare Fee Schedule for three office visit codes. Nurse practitioner data were obtained from structured questionnaires completed by 43 nurse practitioners. Data from a computerized database for the American Academy of Family Physicians were used for physician data (N = 46). Sullivan-Marx and Maislin found no significant differences in the three office visit codes for RWV and intensity between nurse practitioners and family physicians. Further research with larger data sets and additional codes was suggested. Decisions about Medicare payment and public policy could be based on these studies (Sullivan-Marx & Maislin, 2000).

Anderson and Hampton (1999) examined the role of payment sources in the utilization of nurse practitioners and physician assistants. Rural versus urban results were compared using data from the National Hospital Ambulatory Medical Care Survey conducted by the National Center for Health Statistics, U. S. Centers for Disease Control and Prevention in 1994. Significant rural-urban differences were found

to exist in the relationships between payment sources and the utilization of nurse practitioners and physician assistants. Prepaid and health maintenance organizations' types of reimbursements were shown to have no relationship with nurse practitioner and physician assistant utilization in both rural and urban patient visits. The study showed that physicians, nurse practitioners, and physician assistants were each as likely as the other to be present at a rural managed care visit. Physicians, however, were much more likely to be present at an urban managed care visit than nurse practitioners and physician assistants.

Mills, McSweeney, and Lavin (1998) explored the characteristics of outpatient department visits using cases for which nurse practitioners or physician assistants were care providers. Data from the 1992 National Hospital Ambulatory Medical Care Survey were used for the study. Results of multivariate logistic regression suggested that nurse practitioners were the most likely providers for outpatients receiving more health promotion and therapeutic counseling services and for those needing women and children services. Physician assistants were the most likely providers to see outpatients needing hearing and vision tests. Outpatients treated by physician assistants were more likely seen by registered nurses during the same visit. Outpatients treated by nurse practitioners were more likely seen by licensed vocational nurses or nursing assistants during the outpatient visit. Mills et al., recommended future research into (a) referral patterns of non-physician providers, (b) referral patterns of physicians to non-physician providers, and (c) practices and behaviors of patients seeking non-physician providers.

Venning, Durie, Roland, Roberts, and Leese (2000) compared the cost effectiveness of general practitioners and nurse practitioners as first point of contact in primary care. Data were analyzed on 651 general practitioner consultations and 641 nurse practitioner consultations. Nurse practitioner consultations were significantly longer than those of the general practitioners. Also, the nurse practitioners requested more tests and advised patients to return more often. There was no significant difference in prescribing patterns or health status outcomes for the two groups. Patients were more satisfied with nurse practitioner consultations. There was no significant difference in health service costs for the providers. Venning et al. concluded that nurse practitioners could be more cost effective than general practitioners if they reduced their return request rate or shortened their consultation time.

Cooper, Henderson, and Dietrich (1998) examined the practice prerogatives of disciplines, which included nurse practitioners and physician assistants, who were, collectively, considered to be the major non-physician contributors to the delivery of medical and surgical services. Cooper et al. reported marked differences in the practice prerogatives granted non-physicians in various disciplines. The magnitude of the prerogatives for most disciplines correlated with the number of non-physician clinicians practicing in each state. State practice prerogatives, at their maximum levels, authorized a high degree of autonomy and a broad range of authority to provide discrete levels of uncomplicated primary and specialty care. Cooper et al. suggested that while the recent increase in state practice prerogatives provided new opportunities,

a pluralism was being created with the potential to further fragment the health care system. Regulatory integration and professional collaboration were recommended by Cooper et al. so that the health care workforce could be assured of providing a coherent set of patient care services.

Focus groups were used by Baldwin et al. (1998) to explore community acceptance of nurse practitioners and physician assistants in rural medically under-served areas. Baldwin et al. concluded that participants would accept nurse practitioners and physician assistants who (a) work in collaboration with physicians in the existing system, (b) serve as coordinators of care, (c) are readily accessible, (d) keep information confidential, and (e) are active in the community. Other system factors considered critical for acceptance were (a) cost, (b) geographic proximity, and (c) availability (Marshall, Hays, Sherbourne, & Wells (1993). Participants felt that cost of physician assistant and nurse practitioner services should be less than that of services provided by a physician. Public education on the qualifications and roles of these two types of providers was a need identified by participants. Replication of the study country-wide, as well as further studies to examine communities' understanding of the differences in nurse practitioners and physician assistants and the effects of understanding the differences on acceptance were suggested (Baldwin et al., 1998).

The role of nurse practitioners and physician assistants in women's health care was examined by Coulter, Jacobson, and Parker (2000) as part of a larger study that assessed the use of the two providers as primary care practitioners. Providers and

administrators at nine managed care organizations and multi-specialty clinics were interviewed. The shortage of women health care providers was identified as an important contributing factor to the institution beginning to hire nurse practitioners and physician assistants. Nurse practitioners and physician assistants were more interested in preventive care than physicians. There was no indication that the importance of the two providers was declining with the increase in the number of female physicians. The expectation is that primary care will be provided by women physicians in teams with nurse practitioners and physician assistants (Coulter et al., 2000).

The objective of a study by Kinnersley et al. (2000) was to ascertain any differences between care provided by nurse practitioners and general practitioners for 1,368 patients seeking same-day consultations in 10 primary care practices. Generally, patients consulting nurse practitioners were significantly more satisfied with their care, although this difference was not observed in all 10 general practices for adults. Resolution of symptoms and concerns did not differ between the two groups. The two groups were similar in the number of prescriptions issued, tests ordered, referrals to secondary care, and revisits. Patients reported receiving significantly more information about their illnesses when cared for by nurse practitioners. In all but one practice, patient consultations were significantly longer. The study supports the wider acceptance of the role of nurse practitioners in providing care to patients asking for same-day consultations (Kinnersley et al., 2000).

According to Alpert (1994), primary health care is the foundation of the contract between the medical profession and society. Primary health care is concerned with the (a) interface between the patient and the provider and the patient's outreach, follow-up, and compliance; (b) coordinated and longitudinal responsibility for a patient with or without disease; (c) integration of services; and (d) the delivery of services (Alpert, 1994). Alper (1994) suggested that too few physicians had chosen careers in primary care. More money, better training, and role models were identified as ways to increase the number of primary care physicians.

The Institute of Medicine (1996) redefined primary care as the provision of integrated, accessible health care services by clinicians accountable for (a) addressing a large majority of personal health care needs, (b) developing a sustained partnership with patients, and (c) practicing in the context of family and community. Mundinger (1999) contended that this new broad scope of care requires far more than the practice of medicine and includes several requirements distinctive to nursing.

Mundinger (1999) stated that there is not a consistent structure for delivery of primary health care to rural clients. In many rural areas, a lack of professional medical personnel, whether physicians, nurse practitioners, or physician assistants, keeps people from getting the care they need (Baer et al., 1999; Earle-Richardson & Earle-Richardson, 1998; Slifkin et al., 2000; Strickland et al., 1998). Nurse practitioners and physician assistants provide primary health care for many rural clients, who otherwise

would not have access to services (Baer et al., 1999; Earle-Richardson & Earle-Richardson, 1998).

Mundinger (1994) noted that nurses have been attracted to primary care while physicians were more interested in specialty and subspecialty medicine. Mundinger stated that, "a practice focused on health is profoundly different from a practice focused on disease" (p. 213). Nurses are more likely to talk with patients and adapt medical regimens to a patient's preferences, family situation, and environment. They are also more likely to provide disease-prevention counseling, health education, and health-promotion activities to maintain the patient's health (Mundinger, 1994).

Murray and Paxton (1993) conducted a study to assess the preferred provider and the overall perceptions of the service of 200 consecutive female patients of an inner city practice. Patients' perceptions of which provider, the doctor or nurse practitioner, was most appropriate to handle their family planning requirements were also explored. Those patients who were cared for by a nurse practitioner claimed to be up-to-date with their cervical smear and to have had their blood pressure checked. Murray and Paxton reported that of the patients seeing the physician, 88% were satisfied, while 95% of the patients seeing the nurse practitioner reported being satisfied. Patients felt (a) it was easier to get an appointment with the nurse practitioner, (b) they spent less time waiting, and (c) the nurse practitioner spent more time with them. Some patients stated they were less embarrassed with the nurse practitioner, but felt equally confident with both providers.

Fitzpatrick (1998) contended that nurse practitioners delivered lower cost, high quality care. Although comparison of the roles of physicians and nurse practitioners have shown them to be similar, the value of the nurse practitioner role is that disease prevention and patient education are provided in addition to medical intervention. The nurse practitioner provides health care during illness, as well as during health, in order to promote and maintain a healthy state. Nurse practitioners, through effective interaction and education, have excelled in making illness change or behavior change understandable (Fitzpatrick, 1998).

Hill, Bird, Harmer, Wright, and Lawton (1994) conducted a single blind, parallel group study in which 70 patients with rheumatoid arthritis were randomly assigned to either a nurse practitioner or physician. Effectiveness and safety were assessed by bio-chemical, clinical, psychological, and functional variables. Questionnaires were used to measure patient knowledge and satisfaction. Physical symptoms, psychological status, patient knowledge, and satisfaction improved significantly in patients managed by the nurse practitioner. Patients of the nurse practitioner (a) suffered from lower levels of pain, (b) had acquired greater levels of knowledge, and (c) were significantly more satisfied with their care than patients of the physician (Hill et al., 1994).

Jones and Bunner (1998) compared the approaches to detection, diagnosis, and initial management of urinary incontinence in older adults seen in rural primary care practices of three family physicians, three physician assistants, and three nurse

practitioners. Three simulated patients saw the three providers for a total of 27 visits during which they posed as new patients seeking primary care. Jones and Bunner concluded that asking about incontinence was uncommon and providers omitted potentially important questions about precipitants and associated symptoms. Infrequently, the three providers examined areas potentially relating to incontinence and recommended supplementary assessments and specialized testing. Often they made diagnoses and offered therapy at the end of an initial visit even though there was minimal history taking and examinations and lack of any additional assessment or testing. Jones and Bunner suggested further study to determine how to enhance the interaction between primary care providers and patients with urinary incontinence, thus giving both the opportunity to take advantage of effective diagnostic tools and therapeutic options.

Although there is no consensus on which type of provider is best, the findings clearly show that nursing has a unique contribution to make to the practice of primary care (Mundinger, 1999). The differences in the types of primary care provided by nurse practitioners and care provided by physicians or physician assistants may have far-reaching impacts on the health of their clients. However, it is the practice of the nurse practitioners, in the delivery of safe, effective, and satisfactory care, that is more closely scrutinized (Mundinger, 1999).

The purpose of a study by Chang et al. (1999) was to investigate whether nurse practitioners were able to provide a level of primary health service applicable to

remote/isolated settings in wound management and treatment of blunt limb trauma. Using a randomized trial design, data were collected from 232 patients using quantitative and qualitative methods. Chang et al. found no significant differences between the patients of the medical officers and the patients of the nurse practitioners in patient satisfaction. Overall, there were no significant differences in all areas of care or in waiting time between the two groups. There was strong support for the role of the nurse practitioner in the rural emergency setting by medical staff and the study participants (Chang et al., 1999).

Murray and Paxton (1993) examined care provided to clients in a British inner city family planning practice to determine which type of provider, physician or nurse practitioner, the client preferred. The results indicated that 87% of the clients preferred to see the nurse practitioner for initial and return visits.

Primary Health Care Outcomes

Sparacino (1998) stated that "an outcome is the consequence of an intervention to attain a goal" (p. 176). Kleinpell-Nowell and Weiner (1999) suggested that the measurement of outcomes has become an important component of evaluating health care. In the current competitive health care market, outcomes of care are used to compare and evaluate the impact of health care treatments, procedures, and providers. Fitzpatrick (1998) noted that documentation of the nurse practitioner's impact on quality, outcomes, and cost effectiveness is critical. The importance of measuring

outcomes to establish the effectiveness of advanced practice nurses is clear; however, which outcome measures to use and how to conduct an effective outcomes assessment is still unclear (Kleinpell-Nowell & Weiner, 1999).

Byers and Brunell (1998) wrote that advanced practice nurses are challenged to assess the value of their roles and the impact of their practices. Value, as defined by Byers and Brunell, is quality divided by cost. Therefore, to evaluate comprehensively the impact of the advanced practice nurse, both quality and cost must be considered. Advanced practice nurses are considered effective, high-quality caregivers and must demonstrate excellent outcomes at a competitive or decreased cost. Byers and Brunell contended that the measurement of structure (characteristics of the nurse and practice setting), process (care delivered), and outcome (result of structure and process factors) was key to the assessment of the quality of care and the impact of the role.

Safriet (1992) reviewed studies on advanced practice nurse effectiveness. Findings repeatedly demonstrated that advanced practice nurses provided cost-effective, high-quality primary health care. Safriet suggested more outcome studies to document advanced practice nurse effectiveness.

In 1995, Brown and Grimes conducted a meta-analysis evaluating patient outcomes of nurse practitioners compared with physicians in primary care. Fifty-three nurse practitioner and nurse midwife studies were reviewed. Findings showed that (a) patient compliance, patient satisfaction, and resolution of pathological conditions were greater in the patients cared for by nurse practitioners; (b) nurse practitioners

ordered more laboratory tests than physicians; and (c) in the care of obstetrical patients, nurse midwives used less technology and analgesia than physicians. Brown and Grimes recommended comparative outcome studies of primary care including nurses, physicians, and other providers.

Thirty-three advanced practice nurses participated in a study by Hamric, Lindebak, Worley, and Jaubert (1998) to evaluate the safety and effectiveness of advanced practice nurse prescriptive authority. Data from 1,707 patients seen during a 2-month period were analyzed. Three different measures were used: (a) advanced practice nurse assessment of patient outcome, (b) patient assessment of outcome, and (c) assessment of the advanced practice nurse practice by physicians. Evaluation of patient outcome by advanced practice nurses and physicians indicated that the patient's condition stabilized or improved in 76% of the cases. Patients' assessments of their outcomes were positive. Physicians evaluated prescriptive authority as beneficial to their patients and beneficial and complementary to their medical practice (Hamric et al., 1998).

Rudy et al. (1998) compared the care activities performed by 11 acute care nurse practitioners and 4 physician assistants and the outcomes of their patients with the care activities and patients' outcomes of 54 resident physicians. Resident physicians (a) cared for more patients, (b) cared for patients who were older and sicker, (c) worked more hours, (d) took a more active role in patient rounds, and (e) spent more time in lectures and conferences compared with the nurse practitioners and

physician assistants. In comparison, the nurse practitioners and physician assistants (a) were more accessible, (b) spent more time on their units, and (c) interacted more frequently with staff, patients, and patients' families. Patient outcomes for all care providers were remarkably similar (Rudy et al., 1998).

The objective of a study by Mundinger et al. (2000) was to compare outcomes for patients randomly assigned to physicians (n = 510) or nurse practitioners (n = 896) for primary care follow-up and ongoing care after an emergency department or urgent care visit. Both were primary care providers in the same environment and had the same authority. No significant differences were found in patients' health status at 6 months (p = .92), in physiological tests for patients with diabetes (p = .82), or asthma (p = .77). At 6 months, satisfaction ratings differed for only one of the four dimensions measured, with physicians rated slightly higher (4.2 versus 4.1, with 5 = excellent, p = .05). Mundinger et al. concluded that patient outcomes were comparable in settings where conditions were the same for nurse practitioners and physicians.

According to Sox (2000), the external validity in the study by Mundinger et al. (2000) study was weak and suggested the results not be applied to long-term primary care. The short study period limited the study's ability to test a provider's full spectrum of competence. Sox (2000) contended that,

> It would have been useful to know how well the physicians and nurse practitioners compared in performing activities that are hallmark of independent primary care practice: providing preventive care, making an accurate diagnosis, evaluating emergency patients for possible

admission, managing sick inpatients, and caring for complex patients with multiple problems. (p. 107)

Satisfaction with Care

Client satisfaction with care has emerged as a critical outcome of health care (Applegate, 1997), whether provided by a nurse practitioner, physician, or physician assistant (Kleinpell-Nowell & Weiner, 1999; Marsh, 1999; Mundinger et al., 2000). Marshall et al. (1993) utilized data from 2,226 clients in the Medical Outcomes Survey to determine the dimensions of satisfaction with medical care. Seven dimensions of satisfaction were identified using structural equation modeling: (a) general satisfaction, (b) technical quality, (c) interpersonal manner, (d) communication skills, (e) financial aspects, (f) time with provider, and (g) accessibility/convenience.

The Congress of the United States Office of Technology Assessment (1986) presented a policy analysis of nurse practitioners, physician assistants, and certified nurse-midwives. The case study reviewed research that compared the practices of mid-level providers (nurse practitioners, physician assistants, and nurse-midwives) with the practices of physicians. Mid-level providers were found to provide care equivalent in quality to the care provided by physicians for similar health care problems. Considerable evidence was presented that nurse practitioners and nurse midwives were more adept than many physicians at communicating effectively with clients and managing clients who required long-term and continuous care. The analysis revealed that there was less evidence concerning physician assistants' supportive-care and

health-promotion activities. It was observed that patient satisfaction with mid-level providers care is affected by factors external to the actual care provided. The analysis pointed out that satisfaction is also based on the physician conveying a sense of approval of the mid-level provider, and that physicians apparently have a higher level of appreciation for physician assistants when compared to nurse practitioners and nurse mid-wives (Congress of the United States, 1986).

Mundinger et al. (2000) found that when using the traditional medical model of primary health care, patient outcomes for nurse practitioner and physician delivery of primary care do not differ in the urban environment. In a study by Oliver, Conboy, Donahue, Daniels, and McKelvey (1986), client satisfaction with physician assistant care was shown to be high in a rural environment. However, physician assistants tended to function primarily as substitutes for physicians, generally providing only services that physicians provided. Nurse practitioners were likely to provide both services usually provided by physicians as well as services generally provided by nurses (Congress of the United States, 1986).

Murphy and Ericson (1995) randomly selected 34 elderly clients, age 65 or older, in a rural area, to determine the level of satisfaction with the family nurse practitioner. In the study, nurse practitioner services were compared with the fire department emergency medical service, the pharmacy, hospital and physician services. Murphy and Ericson concluded that some communities preferred nurse practitioners because of their holistic approach to patient care.

Medication Compliance

Bebbington (1995) defined compliance as adherence to an appropriate and prescribed treatment, not necessarily pharmacological. Bebbington referred to non-compliance as a critical topic. At an individual level, non-compliance undermines the possibility of effective treatment; at a research level, there is interference with the demonstration of treatment efficacy; and at a service level, the benefits accruing from the deployment of scarce resources are reduced (Bebbington, 1995).

Burke and Dunbar-Jacob (1995) noted that in the management of illness, nurse practitioners, physicians, and physician assistants routinely prescribe medications and other treatment regimens. Of particular importance, however, is whether clients actually follow these prescribed treatment regimens. Burke and Dunbar-Jacob contended that in addition to the potentially serious health consequences of noncompliance, the economic impact on society is significant. Over half of the nearly two billion prescriptions written annually are taken incorrectly (Burke & Dunbar-Jacob, 1995).

Buckalew and Buckalew (1995) conducted a study to obtain information on the nature and incidence of noncompliance. Using a convenience sample and a quota method to fill age brackets, 148 adults were surveyed. Only 99 of the participants reported always obtaining the medication prescribed, 55 participants took all the prescription, and 58 took the medication exactly as prescribed. According to Buckalew and Buckalew, noncompliance, or poor compliance with prescribed medication

regimens, is possibly the most common reason for failed therapy and a great waste of resources. Consequences of noncompliance include (a) poor client health, (b) added discomfort and inconvenience for the client, (c) repetition of expensive diagnostic testing, and (d) increased cost to both the client and the health care system. When dealing with antibiotic therapy, the issue of drug resistant organisms is a major consideration for present and future generations (Buckalew & Buckalew, 1995).

Simons (1992) suggested that a distressingly wide gap exists between the regimen recommended by the health care provider and the regimen actually followed by the client. Typically, clients who receive recommendations have come in search of them and have invested considerable time, money, and energy. These clients have withstood detailed questioning and sometimes lengthy and invasive physical examinations in the process of seeking help. Their primary health care providers have, in turn, maneuvered through elaborate and sometimes complicated differential diagnosis. At the conclusion of the visit a specific treatment recommendation is usually formulated, collaboratively between the client and primary health care provider. Despite the considerable investment from both parties and the serious health consequences that might result from noncompliance, the chances are high that the client will fail to follow the treatment plan (Simons, 1992).

Cargill (1992) and Blackwell (1992) cited the frequent reasons for not taking medication as prescribed included (a) feeling well after 1 or 2 days of therapy, (b) carelessness, (c) insufficient money, (d) refusal, and (e) misunderstanding. Cargill

(1992) found that inconvenience of taking medication and the complicated regimens were also deterrents to compliance.

DiMatteo et al. (1993) examined to what degree physicians' own personal characteristics and the characteristics of their practice affected patient adherence. This was a 2-year longitudinal study of 186 physicians and their patients with diabetes, hypertension, and heart disease. Patients' average general adherence improved significantly over the 2 years of the study. Exercise adherence did not change, while medication and diet adherence declined significantly over 2 years. There were no significant effects of personal characteristics (age, gender, and ethnic group) on patient adherence. Cardiologists' patients achieved better medication adherence; endocrinologists' patients achieved better dietary and overall specific adherence. Practice characteristics and practice style affected patient adherence. Physicians who saw more patients per week had better patient medication compliance. Physicians' global job satisfaction had a positive effect on patients' general adherence (DiMatteo et al., 1993).

Ashida, Sugiyama, Okuno, Ebihara, and Fujii (2000) examined the relationship of home blood pressure measurement to medication compliance and name recognition of antihypertensive drugs in outpatients with hypertension. A total of 1,452 consecutive clients seeking care at a cardiovascular outpatient clinic participated in the study. Ashida et al. concluded that physicians should recommend home blood pressure measurement to patients being treated with antihypertensive drugs, because of the

possibility that home blood pressure measurement might improve medication compliance.

Cameron (1996) pointed out that the medical regimen was only part of the life regimen the client must manage. A person will follow instructions only when they (a) understand the instructions, (b) are mentally and physically able to comply, and (c) believe that the medical regimen is compatible with personal interests and consistent with the purpose of the overall system (Cameron, 1996).

Trinkaus (1991) used a convenience sample of 799 students at a large business school to develop an understanding of patients' reluctance to question physicians about medications as reported by The National Council on Patient Information and Education. Ninety-six percent of patients reported not asking about their medications, while 72% reported wanting more information. In the study by Trinkaus, 97% of the students reported they asked questions of their physicians about prescribed medications. Most of the students wanted more information than they were receiving. The results supported the proposition that patients do not feel well informed by physicians about their prescription drugs. Patients are hesitant to ask, even though they would like to know more, according to Trinkaus (1991).

Thompson, Kulkarni, and Sergejew (2000) stated that medication compliance is one of the foremost problems affecting neuroleptic efficacy in psychiatric patients. A comparison of medication continuation and regimen compliance with clozapine and haloperidol was done by Rosenheck et al. (2000). In a randomized clinical trial ($\underline{N}$ =

423) among patients on haloperidol treatment, poorer continuation was associated with being older and greater continuation with receiving public support. Among patients assigned to clozapine, continuation was poorer among African American patients and greater among patients who showed a reduction in clinical symptoms and akathisia. Continuation with clozapine remained greater even after adjusting for these factors. Rosenheck et al. concluded that continuation with medications was greater with clozapine than haloperidol. This was attributed partly to greater symptom improvement and reduced side effects. There were no differences in regimen compliance (Rosenheck et al., 2000).

Perceived Health

Aiken et al. (1993), Hill et al. (1994), Holmes, Bix, and Shea (1996), and Kane et al. (1991) reported that patients cared for by nurse practitioners fared better in performance of physical function than patients cared for by physicians. Hill et al. (1994) found a significant improvement in pain for the patients being cared for by the nurse practitioner as opposed to those being cared for by the physician. However, Aiken et al. (1993) contended that there was no significant difference related to pain between providers.

Pinkerton (1998) found that in an urban managed care setting, there was no significant difference in perceived patient satisfaction or perceived health outcomes between nurse practitioners and physicians. Marsh (1999) stated that patient

satisfaction is often "conceptualized as the congruence between the patients' expectations of providers and their perceptions of the actual care they receive" (p. 47). According to Marsh, patient satisfaction is more closely related to health service economics than to quality. Dissatisfied patients may be non-compliant with treatment regimens and follow-up care and may discourage others from seeking care. Therefore, dissatisfied patients' behaviors potentially affect both the outcomes of quality care for themselves and the provider and the costs of providing care. Marsh stated that it is appropriate to include quality and cost perspectives of patient satisfaction in outcome studies.

Cleary and McNeil (1988) defined patient satisfaction as a cognitive and emotional reaction, and described it as a measure of attitudes. Other authors defined patient satisfaction in terms of the degree to which patient expectations were fulfilled (Greeneich, 1993; Williams, 1994). Hill (1997) defined patient satisfaction as the degree to which patients perceive their needs are met. The more patients perceive that their expectations have been realized and their needs are met, the greater the perceived satisfaction (Fitzpatrick, 1998; Hsieh & Kagle, 1991). Donabedian (1988) pointed out that although patient satisfaction is the subjective perception from the patient's point of view, the health care provider must view it as reality.

The Medical Outcomes Study emphasized the perspective of patients about health outcomes and satisfaction with their care (Tarlov et al., 1989). The Medical Outcomes Study, a 4-year observational study, was designed to help understand how

specific components of the health care system affect the outcomes of care. The study was designed to ensure meaningful comparisons between medical care processes and outcomes as these concepts are affected by (a) system of care and clinician specialty, and (b) patients' diagnoses and levels of illness severity. The secondary objective was to advance the methods for monitoring patients' perspectives in medical practice (Tarlov et al., 1989).

Hall, Feldstein, Fretwell, Rowe, and Epstein (1990) suggested a positive relationship between satisfaction with care and health outcomes. Marshall, Hays, and Mazel (1996) suggested that satisfaction with care might be both a consequence and a determinant of health status. Dissatisfaction with care has been linked to nonadherence to medical recommendations, according to Sherbourne, Hays, Ordway, DiMatteo, and Kravitz (1992), which may, in turn, lead to poorer health status (Hays, Kravitz et al., 1994). Conversely, poor health status may contribute to dissatisfaction with care. Roberts, Pasco, and Attkison (1983) found evidence suggesting that dissatisfaction with health care may be a manifestation of dissatisfaction with other aspects of life. Physical and mental health co-vary to a significant degree according to Hays and Stewart (1990) and Hays, Marshall, Wang, and Sherbourne (1994). That is, individuals who experience good physical health also tend to report good mental health.

Health care has typically been assumed to be medical care, with very little attention to prevention, education, health promotion and consumer directed self-care (Mundinger, 1999). With the rapidly changing managed care environment, increasing

emphasis is being placed on health care outcomes regardless of which type of provider is being utilized or the setting in which care is taking place. In the rural areas of this nation, health care is difficult to obtain. Mid-level providers (nurse practitioners and physician assistants) fill this void in many areas.

Summary

While the focus of studies differed, there was general consensus that nurse practitioners are an important contributor to the provision of primary health care in rural areas. The major concepts discussed were (a) health care providers, (b) primary health care, and (c) primary health outcomes, such as satisfaction with care, medication compliance, and perceived health.

The practices of physicians, physician assistants, and nurse practitioners have been the focus of many studies since the development of the nurse practitioner role (Congress of the United States, 1986; Feldman et al., 1987; Mundinger, 1994; Rudy et al., 1998; Sox, 1979; Spitzer et al., 1974). Mundinger (1994) stated that nurse practitioners see patients, elicit data, reach diagnostic conclusions, and decide about treatment, and it is with regard to this professional process that nurse practitioners and physicians are compared.

Anderson and Hampton (1999) found that physicians, nurse practitioners, and physician assistants were as likely as the other to be present at a rural managed care visit. Cooper et al. (1998) and McCulloch (1999) reported marked differences in

practice prerogatives granted non-physicians, such as nurse practitioners and physician assistants. Baldwin et al. (1998) concluded that community acceptance of nurse practitioners and physician assistants, in rural medically underserved areas, was positive. Murphy and Ericson (1995) reported that some communities preferred nurse practitioners because of their holistic approach to patient care, while Oliver et al. (1986) found patients to be highly satisfied with physician assistant services. There is general consensus that in many rural areas, a lack of physicians, physician assistants, or nurse practitioners keep people from getting the care they need (Baer et al., 1999; Earle- Richardson & Earle-Richardson, 1998; Mundinger, 1999; Slifkin et al., 2000; Strickland et al., 1998).

Primary health care is concerned with the (a) interface between the patient and the provider and the patients' outreach, follow-up, and compliance; (b) coordinated and longitudinal responsibility for a patient with or without disease; (c) integration of services, and (d) the delivery of services (Alpert, 1994). Alpert referred to primary care as the foundation of the contract between the medical profession and society. Mundinger (1999) suggested that there is not a consistent structure for delivery of primary care to rural clients.

The Institute of Medicine (U.S.), Division of Health Care Services (1996) redefined primary care as the provision of integrated, accessible health care services by clinicians accountable for (a) addressing a large majority of personal health needs, (b) developing a sustained partnership, and (c) practicing in the context of family and

community. Mundinger (1999) pointed out that the new definition includes several requirements distinctive to nursing.

Coulter et al. (2000), Mills et al. (1998), and Mundinger (1994) noted that nurses are more likely to talk with patients, provide disease prevention counseling, health education, and health promotion activities. Fitzpatrick (1998) stated that the value of the nurse practitioner role is that disease prevention and patient education are provided in addition to medical intervention.

Kinnersley et al. (2000) found that patients cared for by nurse practitioners reported receiving significantly more information about their illnesses. Kane et al. (1991) found that nurse practitioners provided more appropriate care while also decreasing cost when compared to physicians. Costs were identified as a critical system factor, by Baldwin et al. (1998), for community acceptance of physician assistants and nurse practitioners. According to study participants, cost of physician assistants and nurse practitioners should be less than that of similar services provided by physicians. Fitzpatrick (1998) contended that nurse practitioners delivered lower cost, high quality care.

Venning et al. (2000) found that patients were more satisfied with nurse practitioner consultations as compared to general practitioners. Hill et al. (1994) and Kinnersley et al. (2000) found that patients consulting nurse practitioners were significantly more satisfied with their care. Chang et al. (1999) found no significant differences in patient satisfaction between the patients of medical officers and those of

nurse practitioners. Oliver et al. (1986) determined that patient satisfaction with physician assistant care was high in a rural environment. Applegate (1997), Kleinpell-Nowell and Weiner (1999), Marsh (1999), and Mundinger et al. (2000) discussed client satisfaction as a critical outcome of health care.

Bebbington (1995) referred to compliance as adherence to an appropriate and prescribed treatment. Simons (1992) suggested that a wide gap existed between the recommended regimen of the health care provider and the regimen the client actually follows. Burke and Dunbar-Jacob (1995) contended that over half of the nearly two billion prescriptions written annually are taken incorrectly. According to Buckalew and Buckalew (1995), noncompliance, or poor compliance, with prescribed medication regimens is possibly the most common reason for failed therapy and a great waste of resources.

Hamric et al. (1998) reported that safety and effectiveness of advanced practice nurses were positively evaluated by patients, physicians, and advanced practice nurses. According to Feldman et al. (1987), advanced practice nurses have diagnostic certainty and management effectiveness similar to physicians. Hill et al (1994) found effectiveness and safety of nurse practitioners to be greater than that of physicians. Mundinger (1999) stated that the delivery of safe, effective, and satisfactory care is more closely scrutinized for nurse practitioners.

Safriet (1992) reviewed studies on advanced practice nurse effectiveness and findings repeatedly showed that advanced practice nurses provided cost-effective, high

quality primary health care. Byers and Brunell (1998) also found nurse practitioners to be considered effective high-quality caregivers. Kane et al. (1991) reported that patients cared for by nurse practitioners fared better in performance of physical function than patients cared for by physicians. Participants in a study by Murray and Paxton (1993) reported that nurse practitioners spent more time with them.

The Congress of the United States Office of Technology Assessment (1986) presented a policy analysis of nurse practitioners, physician assistants, and certified nurse-midwives. Results showed that care provided by the mid-level providers was equivalent in quality to the care provided by physicians for similar health care problems. Mundinger et al. (2000) reported patient outcomes for nurse practitioner and physician delivery of primary care do not differ in the urban environment.

Brown and Grimes (1995) found that nurse practitioners' patient compliance, patient satisfaction, and resolution of pathological conditions were greater. Koch et al. (1992), Murray and Paxton (1993), Nelson et al. (1991), and Prescott (1994) found that care given by nurse practitioners was equal to or superior to care by physicians.

Kleinpell-Nowell and Weiner (1999) stated that outcomes of care are used to compare and evaluate the impact of health care treatments, procedures, and providers. Byers and Brunell (1998) commented that advanced practice nurses were challenged to assess the value of their role and the impact of their practice. Measurement of structure, process, and outcome are key to the assessment of the quality of care and the impact of the role of nurse practitioners (Byers & Brunell, 1998).

In the rural environment physicians, physician assistants, and nurse practitioners provide primary health care. Therefore, it is imperative that the impact of that care be measured. There is a lack of research regarding health care outcomes in rural patients. This study will contribute to the knowledge about health care outcomes of patients in rural areas cared for by physicians, physician assistants, and nurse practitioners.

CHAPTER III

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

The purpose of this descriptive cross-sectional study was to determine if a significant difference exists in perceived primary health care outcomes of rural clients treated by nurse practitioners and those treated by physicians or physician assistants. This chapter presents the procedures for collection and treatment of the data for this study.

Setting

The setting for this study was rural counties that utilize nurse practitioners, physicians, and physician assistants as primary health care providers. The "rural" designation is assigned by the U.S. Bureau of the Census. The State also classifies rural counties as a Health Professional Shortage Area (HPSA) and/or a Medically Underserved Area (MUA).

Population and Sample

The participants for this study were selected from the rural population of adults, age 18 and over, who read and understood English. Participants had to reside in (and

receive mail in) a rural county. A bulk mailing list (adhesive labels) was purchased from a bulk mailer that included every postal address in the rural counties. The participants were selected randomly from the list by using a table of random numbers. The first number was selected by randomly touching the table with a felt tip pen. The number closest to the mark was the starting point. The numbers were then selected by going down the columns of numbers until 1,500 labels were chosen. The questionnaires were mailed to the participants.

Protection of Human Subjects

Permission to conduct this study was obtained from the Texas Woman's University Human Subjects Review Committee (see Appendix A). The participants' rights were protected by (a) providing information in the cover letter regarding the purpose of the study, (b) voluntary participation, and (c) maintaining anonymity and confidentiality. Direct personal risks and/or benefits of participating in the study were minimal. Potential risks of participating in this study were identified as (a) anger, sadness, or some other feeling of discomfort if the participant starts thinking about how they have been treated by health care providers in the past; (b) feelings of inferiority if the participant did not know the answers to some of the questions; and (c) feelings of embarrassment because of past behaviors in a health care setting. There were no direct personal benefits to the participants. However, the information may increase the understanding of thoughts and feelings of rural clients.

Instruments

There were four instruments used to collect data for this study: (a) the Patient Satisfaction Questionnaire (PSQ-18), (b) a researcher-developed medication compliance questionnaire, (c) a perceived health questionnaire, and (d) a demographic data sheet. Each of the instruments is described in the following paragraphs.

Patient Satisfaction Questionnaire (PSQ-18)

Recognizing the importance of patient satisfaction in assessing quality of medical care, Ware, Snyder, Wright, and Davies (1983) developed the Patient Satisfaction Questionnaire (PSQ). The initial measure consisted of 80 items and was intended to be applicable in general population studies and to be useful for planning, administration, and evaluation of health services delivery programs (Ware et al., 1983). In subsequent years, revisions of the instrument were fielded in the (a) RAND Health Insurance Experiment (Davies, Ware, Brook, Peterson & Newhouse, 1986), (b) RAND Medical Outcomes Study (Marshall et al., 1993), and (c) various national surveys (Aday, Fleming, & Anderson, 1984).

Items were selected for inclusion in the short-form version on the basis of their association with long-form scale scores. Each subscale was desired to have equal number of positively and negatively worded items. Internal consistency reliabilities and correlations between PSQ-III and PSQ-18 were all above .90, except interpersonal manner, which was .83. The PSQ-18 contains 18 items measuring each of the seven

dimensions of satisfaction with medical care: (a) general satisfaction, (b) technical quality, (c) interpersonal manner, (d) communication, (e) financial aspects, (f) time spent with health care provider, and (g) accessibility and convenience.

The scores were calculated by averaging the scale and subscales individually. The scores on the overall scale and each of the subscales range from 1-5. The higher the score, the higher the level of satisfaction with care.

A pilot study of the present study revealed an alpha reliability of .92; however, in order to facilitate the comparison between types of providers for this study, the PSQ-18 wording was changed with the permission of the authors (see Appendix B). The word "doctor" was replaced with "health care provider." A brief explanation at the beginning of the questionnaire defines "health care provider" as a physician, physician assistant, or nurse practitioner. A second pilot study, with the revisions, revealed an alpha reliability of .95 with reliability coefficients for each subscale ranging from .62 to .87. In this study the overall satisfaction reliability coefficient was .93. As shown in Table 1, the subscales alpha reliabilities ranged from .64 to .82.

Table 1

Cronbach's Alpha Coefficients for the PSQ-18 and Subscales

Scale and Subscale	Reliability Coefficients
PSQ – 18	.93
General Satisfaction subscale	.82
Technical Quality subscale	.79
Interpersonal Manner subscale	.72
Communication subscale	.64
Financial Aspects subscale	.69
Time Spent with Health Care Provider subscale	.82
Accessibility and Convenience subscale	.75

Compliance with Antibiotics Questionnaire

A researcher-developed questionnaire was used to measure compliance with antibiotics. Only seven compliance questions were included as the intent was to develop a short questionnaire that could be administered to large groups. To answer the questions, the participant was asked to recall his or her last episode of antibiotic therapy. The first question asked if the client had ever received a prescription for an antibiotic in the past. If so, the client answered questions related to (a) the purchase of the antibiotic, (b) expense of the antibiotic, (c) the number of times each day the antibiotic was taken, (d) how the antibiotic was taken, (e) finishing the antibiotic, (f) saving a few antibiotics for later, and (g) identifying any side effects. The compliance

score was computed by averaging the responses on (a) the number of times the medication was taken, (b) the exact way the medication was taken, and (c) finishing the medication to provide one score from 1-5. The higher the score, the greater level of compliance with antibiotic medication.

The first pilot study on the instrument revealed an alpha reliability of .70 ($\underline{n}$ = 62), which met Nunnally's (1978) recommended level for a beginning research instrument. The second pilot study on the instrument yielded an alpha reliability of .82 ($\underline{n}$ = 58). To increase validity and reliability, minor revisions were made to the questionnaire. The questions were reworded to emphasize "the last time" an antibiotic was prescribed. Further content validity was determined by a panel of five experts based on percentage agreement. The final form of the compliance with antibiotics scale received 100% agreement. In this study, the reliability coefficent was .88.

Perceived Health Questionnaire

The perceived health questionnaire evolved from the General Health Survey used in the Medical Outcomes Study (MOS). The initial MOS was a 2-year observational study used to gather data on client health care outcomes (Stewart, Hays & Ware, 1988). After years of assessing and evaluating data, the MOS SF-36 identified the variables (a) physical functioning, (b) social functioning, (c) role functioning, (d) mental health, (e) pain, and (f) general health perceptions.

Reliability coefficients range from .70 and most exceeded .80 on the SF-36 (Ware et al., 1983). Stewart et al. (1988) asserted that all the items had 30 to 40 years of testing in other instruments before coming together in their final form in the MOS.

For this study, the original SF-36 and SF-12 Health Survey were modified to enhance the overall flow of the total questionnaire. It more closely matched the SF-20 Health Survey which was derived from the same source. Questions were reworded to be more congruent with the wording in the remainder of the questionnaire. Twenty questions were used in the final form of the scale. Four subscales were identified: (a) general health perceptions, (b) mental health, (c) physical health, and (d) role functioning.

To calculate the scores, the scale and each subscale were averaged. The overall scale and each subscale had scores ranging from 1-6. The higher the number, the higher degree of perceived health.

A pilot study on the final form of the revised questionnaire revealed an alpha reliability of .81 ($\underline{n}$ = 58) for the overall scale. Reliability coefficients for each subscale ranged from .83 to .92. In this study, the reliability coefficient was .91 for the overall scale and from .77 to .92 for the subscales as shown in Table 2.

Table 2

Cronbach's Alpha Coefficient for the Perceived Health Survey and Subscales

Scale and Subscale	Reliability coefficients
Perceived Health Questionnaire	.91
General Health Perceptions subscale	.77
Mental Health subscale	.92
Physical Health subscale	.89
Role Functioning subscale	.80

Demographic Data Sheet

A demographic data sheet was used to collect data about (a) age, (b) gender, (c) race/ethnicity, (d) marital status, (e) income, (f) insurance information, (g) distance to health care facility, (h) type of health care provider, and (i) education. Also, one question asked the client to identify any chronic illness, such as high blood pressure, diabetes, congestive heart failure, cancer, depression, heart disease, and lung disease. Demographic data were used to describe the sample and to compare the sample with the population.

Data Collection

Data collection was accomplished by collating all the questionnaires into one packet (see Appendix C). The total questionnaire packet consisted of (a) a cover letter, (b) the PSQ-18, (c) the Compliance with Antibiotics questionnaire, (d) the Perceived Health questionnaire, and (e) the Demographic Data sheet. The questionnaire packet included a prepaid, preaddressed envelope for the voluntary return of the completed questionnaire. Fifteen hundred questionnaire packets were mailed.

Treatment of Data

Data were entered and analyzed using the SPSS 6.1 program for Windows. Exploratory data analysis of the demographic data was used to describe the sample. The PSQ-18 was scored according to the instructions by Marshall and Hays (1994). A total compliance with antibiotic medications score was calculated using the average of three items on the compliance with antibiotics questionnaire. The perceived health questionnaire was scored by averaging all the questions to provide an overall score for perceived health. Each subscale was averaged. The possible scores ranged from 1-6. The higher the score, the higher the degree of perceived health. Reliability estimates were calculated for the PSQ-18, compliance with antibiotics questionnaire, and the perceived health questionnaire.

Three hypotheses were studied. Hypothesis 1 stated there is a significant difference in satisfaction with care among rural clients treated by a nurse practitioner

and those treated by a physician or a physician assistant. Hypothesis 2 stated there is a significant difference in compliance with antibiotic medications among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant. Hypothesis 3 stated there is a significant difference in perceived health among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant.

A priori comparisons was used to explore the data. The advantage of planned comparisons is that they increase the power and precision of the data analysis (Polit, 1996). The hypotheses were stated specifically in search of differences between clients treated by nurse practitioners and clients treated by physicians or physician assistants. Therefore, t-tests were used to test for significant differences between each of the three groups. The comparison between clients treated by physicians and clients treated by physician assistants is presented for information only and does not influence the evaluation of the hypotheses. Levine (1981) pointed out that if the plan is to conduct more than one significance test, the researcher is obliged to shrink the alpha value according to the number of tests. By shrinking the alpha from .05 to a smaller value, the 5% probability of rejecting a true null hypothesis will be overall maintained. The formula used to determine the alpha is α Shrunken = $(1-(1-\alpha)^T)/T$. For this analysis, an alpha of .048 was used in each t-test as the significance level in order to compensate for the number of tests (3) performed. The ANOVA was used to test for significant group mean differences and analysis of each of the three hypotheses.

Summary

The procedures for collection and treatment of the data used in this study were presented in this chapter. The purpose of this descriptive cross-sectional study was to determine if there was a significant difference in perceived primary health care outcomes of rural clients treated by nurse practitioners and those treated by physicians or physician assistants.

The setting for this study was rural counties which utilized nurse practitioners, physicians, and physician assistants as primary health care providers. The designation of rural was assigned by the U.S. Bureau of the Census and the State. The study participants were selected randomly from a bulk mailing list. Participants were adults, age 18 and over, who read and understand English. The questionnaires were mailed to the participants after approval was obtained from the Texas Woman's University Human Subjects Review Committee (see Appendix A).

A cover letter and four instruments (a) the PSQ-18, (b) a researcher-developed Compliance with Antibiotics questionnaire, (c) a Perceived Health questionnaire, and (d) the Demographic Data sheet were collated to form one questionnaire packet (see Appendix C). The questionnaire packet also included a prepaid, preaddressed envelope for the voluntary return of the completed questionnaire.

Exploratory data analysis of the demographic data was described, as well as the scoring method of each instrument. Instrument reliability data were presented. Plans for the analysis of each of the hypotheses was presented.

CHAPTER IV

ANALYSIS OF DATA

A descriptive cross-sectional study was done to determine if there was a significant difference in perceived primary health care outcomes of rural clients treated by nurse practitioners and those treated by physicians or physician assistants. Questionnaires were utilized to address primary health care outcomes that included perceived satisfaction with care, compliance with antibiotic medications, and perceived health. The basic premise of this study was to explore the different types of primary health care providers and the impact these providers have on primary health care outcomes in rural clients. A description of the sample and the findings (by hypothesis) is addressed in this chapter. The SPSS 6.1 program, a comprehensive data management tool, was used for presentation and data analysis. Exploratory data analysis was used for the demographic information.

Each hypothesis was analyzed using t-tests and ANOVA. Hypothesis 1 stated that there is a significant difference in satisfaction with care among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant. Hypothesis 2 stated that there is a significant difference in compliance with antibiotic medications among rural clients treated by a nurse practitioner and those treated by a

physician or a physician assistant. Hypothesis 3 stated that there is a significant difference in perceived health among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant.

Description of the Sample

Descriptive statistics were used to explore and analyze age, gender, race/ethnicity, marital status, income, insurance status, distance to the nearest health care facility, type of primary health care provider, health conditions, and educational level. The sample consisted of 151 subjects who met the study criteria. Subjects were (a) age 18 and over, (b) read and understood English, and (c) lived in a pre-defined rural county. The "rural" designation was assigned in accordance with the U.S. Bureau of the Census, as well as the State's classification of rural counties as HPSA (health professional shortage areas) and/or MUA (medically underserved areas). When possible the sample data were compared to population data. Graphic and descriptive explanations of this analysis are presented in Chapter IV.

Age

Figure 2 presents a bar graph of the frequency distribution of age for the sample (n = 151). The mean age for the total sample was 52.5 years (SD = 18.48), range 20-93 years. The mean age for clients treated by physicians was 54.6 (SD = 19.79), and the mean age for clients treated by physician assistants was 47.7 (SD = 9.71). The mean age for clients treated by nurse practitioners was 46.6 (SD = 14.43).

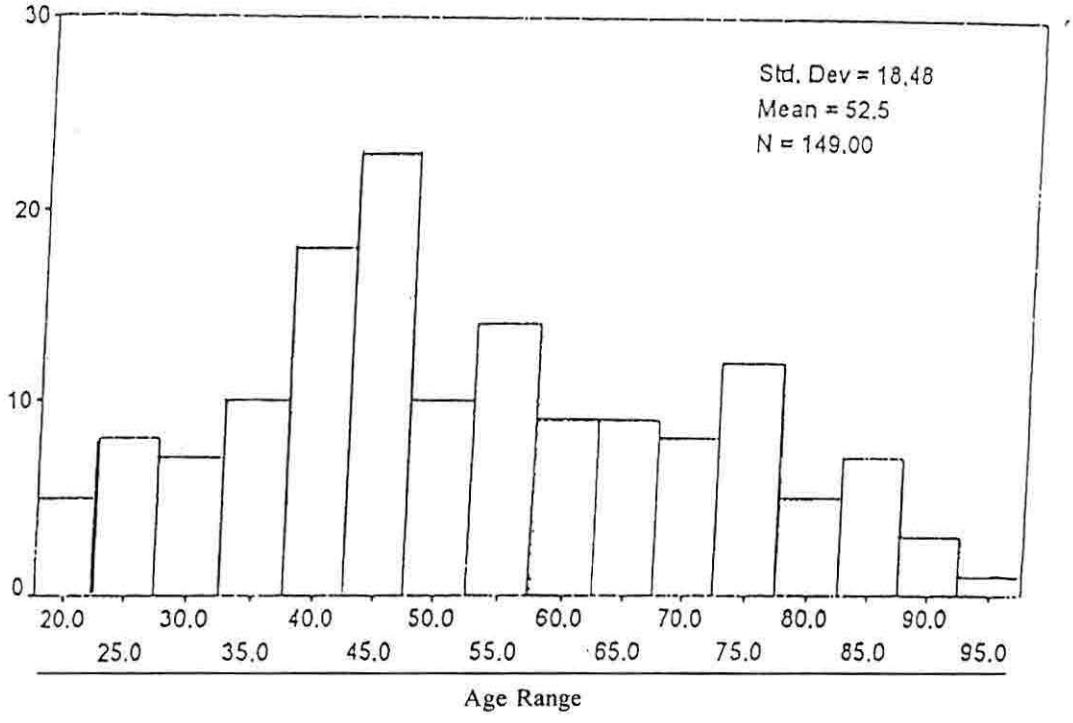

Figure 2. Bar graph of age distribution of sample.

The t-test revealed a significant difference ($t = 2.44$, $p = .018$, $r_{pb} = .20$) between clients treated by physicians and clients treated by nurse practitioners. The clients of physicians were older. There were no significant differences between clients treated by physician assistants and clients treated by nurse practitioners, or between clients treated by physicians and clients treated by physician assistants (see Table 3).

Table 3

Independent Sample t-test for Age According to Provider

Provider	n	M	SD	SE	t	df	p	r_{pb}
Physician	108	54.63	19.79	1.9		107		
					2.44		.02	.20
Nurse Practitioner	29	46.62	14.43	14.4		28		
Physician Assistant	10	47.70	9.71	3.1		9		
					0.26		.79	
Nurse Practitioner	29	46.62	14.43	14.4		28		
Physician	108	54.63	19.79	1.9		107		
					1.92		.07	
Physician Assistant	10	47.70	9.71	3.1		9		

Note. Missing = 4.

Gender

The majority of the subjects were female (n = 131, 86.8 %). Table 4 provides the gender frequencies and distributions.

Table 4

Gender Frequencies by Type of Health Care Provider

Type	Frequency		Total
	Male	Female	
Physician	13	99	112
Physician Assistant	1	7	8
Nurse Practitioner	2	24	26
Totals	16	130	146

Note. Missing = 5.

Race/ethnicity

The majority of the subjects in this study were White (n = 127, 85.8%). In this study 6 were Black (4.0 %), 10 were Hispanic (6.6 %), 1 was Asian (0.7 %), and 4 were American Indians (2.6 %). Table 5 compares the sample frequencies with the State frequencies from the 1990 census data.

Table 5

Frequencies of Race/ethnicity of Sample and State

Variable	Sample No.	Sample %	State No.	State %
White	127	85.8%	12,787,521	75.0%
Black	6	4.0%	2,018,543	11.9%
Hispanics	10	6.8%	1,795,502	10.6%
Asian	1	0.7%	315,072	1.9%
American Indian	4	2.7%	69,872	0.5%
Totals	148	100.0%	16,986,510	99.9%

Note. Missing = 3.

Marital Status

The majority of the subjects in this study were married (n = 91, 61.1%), followed by widowed (n = 23, 15.4%). There were 22 (14.8%) subjects who were divorced, 10 (6.7%) were single, and 3 were separated (2.05%). Table 6 shows the frequencies of marital status for this sample.

Table 6

Frequency of Marital Status of Sample

Variable	Frequency	Percent	Cumulative Percent
Single	10	6.7%	6.7%
Married	91	61.1%	67.8%
Divorced	22	14.8%	82.6%
Widowed	23	15.4%	98.0%
Separated	3	2.0%	100.0%
Total	149		

Note. Missing = 2.

Income

Income was reported by the following categories: (a) $0-$10,000, (b) $10,001-$25,000, (c) $25,001-$50,000, (d) $50,001-$75,000, (e) $75,001-$100,000, and (f) above $100,000. Most subjects reported their yearly household income between $25,001 and $50,000 (n = 38, 27.9%). Almost as many subjects reported their income between $10,001 and $25,000 (n = 36, 26.5%). Figure 3 presents a bar graph of the frequency distribution of income in this sample. The household income of this sample was compared to the State population household income in Table 7.

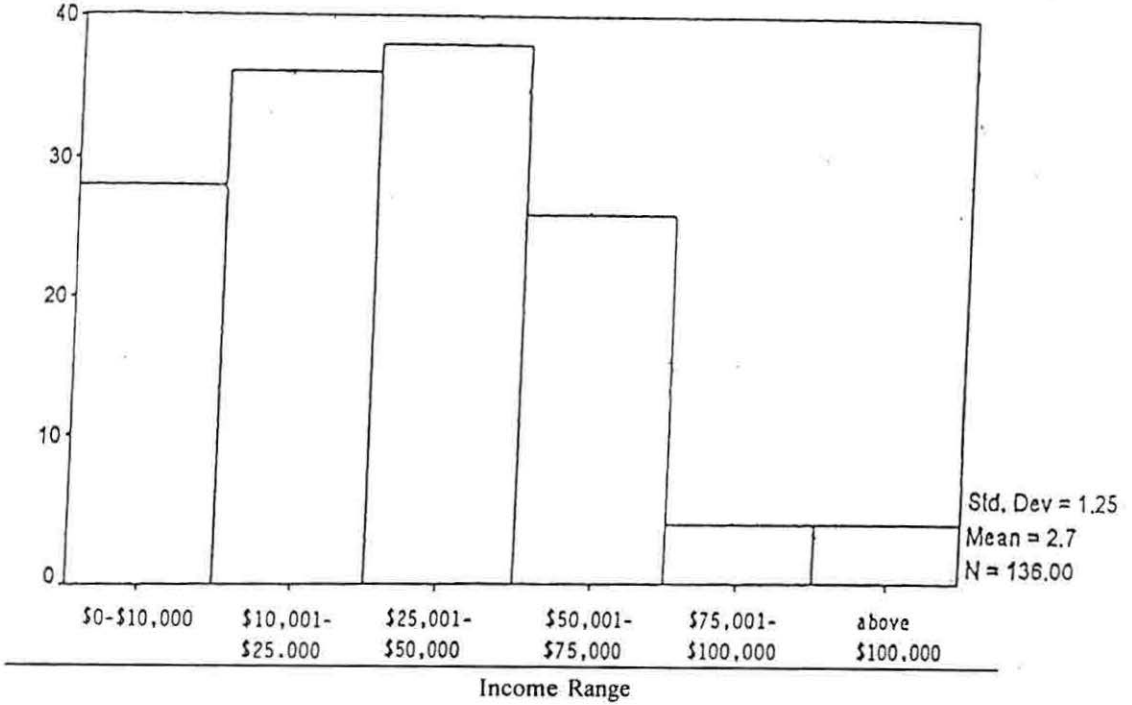

Figure 3. Bar graph of income distribution of sample.

Table 7

Frequencies of Household Income of Sample and State

Variable	Sample No.	Sample %	State No.	State %
$0-$10,000	28	20.7%	1,078,268	17.7%
$10,001-$25,000	36	26.5%	1,737,618	28.6%
$25,001-$50,000	38	27.9%	1,964,318	32.3%
$50,001-$75,000	26	19.1%	811,086	13.3%
$75,001-$100,000	4	2.9%	262,522	4.3%
> $100,000	4	2.9%	225,529	3.7%
Totals	136	99.9%	6,079,341	99.9%

Note. Missing = 15.

Distance to Health Care Facility

The mean distance to the nearest health care facility in this study was 13.1 miles, with a range of between 1/8th of a mile to 90 miles. Seventy-nine percent of subjects reported 15 miles or less to the nearest health care facility. Figure 4 presents a bar graph of the distance to the nearest health care facility for this study. The t-test revealed a significant difference ($t = 3.02$, $p = .003$, $r_{pb} = .26$) between clients treated by physicians and clients treated by nurse practitioners and ($t = 2.68$, $p = .01$, $r_{pb} = .41$) between clients treated by physician assistants and clients treated by nurse practitioners (see Table 8). The clients reported traveling twice as far to see a physician or physician assistant than a nurse practitioner.

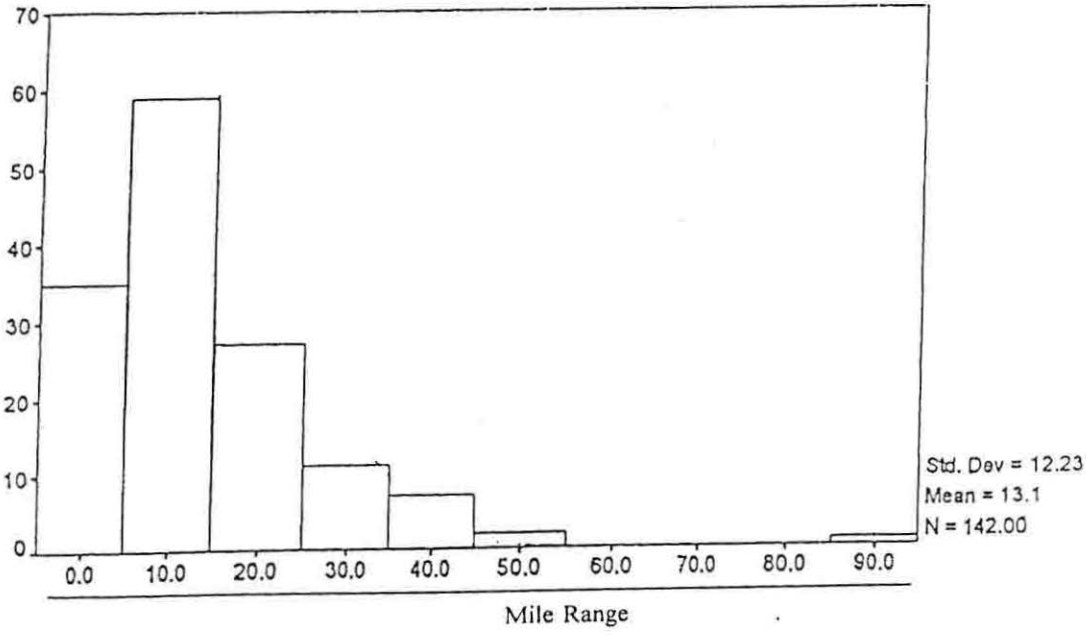

Figure 4. Bar graph of distance to health care facility.

Table 8

Independent Sample t-test for Distance to Health Care Facility According to Provider

Provider	n	M	SD	SE	t	df	p	r_{pb}
Physician	105	14.37	12.77	1.2		104		
					3.02		.003	.26
Nurse Practitioner	27	6.68	6.70	1.3		26		
Physician Assistant	9	15.22	12.08	4.0		8		
					2.68		.01	.41
Nurse Practitioner	27	6.68	6.70			26		
				1.3				
Physician	105	14.37	12.77			104		
				1.2				
					0.19		.85	
Physician Assistant	9	15.22	12.08			8		
				4.0				

Note. Missing = 10.

Insurance Status

Several questions in this study addressed insurance status. Thirty-six of the subjects (24%) reported receiving Medicare, while only 8 reported receiving Medicaid (5.3%). Seven of the subjects reported having both Medicare and Medicaid (5%), and 98 reported having neither Medicare nor Medicaid (64.9%). One hundred (66%) of the subjects in this study reported having health insurance; 92 (60.9%) reported insurance paid for part or all of their medications.

Education Level

Subjects reported the highest grade completed in school. Thirty-one of the subjects (21%) reported completing high school or its equivalent. Thirty-one (21%) of the subjects reported completing below the high school level, and 86 (56.9%) reported completing above the high school level. In Table 9 the sample data are compared to the State population data. The t-tests revealed no significant differences in educational level between the clients treated by physicians, physician assistants, and nurse practitioners (see Table 10).

Table 9

Frequencies of Educational Level of Sample and State

Variable	Sample No.	Sample %	State No.	State %
< 9th grade	4	2.7%	1,492,112	12.3%
9th-11th grade	27	18.2%	1,924,831	15.8%
12th grade	31	20.9%	3,153,187	25.9%
Technical School	17	11.5%	No data	No data
Some college	34	23.0%	2,777,973	22.9%
Associate Degree	10	6.8%	598,956	4.9%
Bachelor's Degree	18	12.2%	1,530,849	12.6%
Graduate Degree	7	4.7%	673,250	5.5%
Totals	148	100.0%	12,151,158	99.9%

Note. Missing = 3.

Table 10

Independent Sample t-test of Educational Level According to Provider

Provider	n	M	SD	SE	t	df	p
Physician	109	10.68	2.56	.25		108	
					-1.76		.08
Nurse Practitioner	29	11.41	1.82	.34		28	
Physician Assistant	10	11.30	3.40	1.08		9	
					0.10		.92
Nurse Practitioner	29	11.41	1.82	.34		28	
Physician	109	10.68	2.56	.25		108	
					0.71		.48
Physician Assistant	10	11.30	3.40	1.08		9	

Note. Missing = 3.

Chronic Conditions

The frequency of high blood pressure, diabetes, congestive heart failure, cancer, depression, heart disease, and lung disease reported by the subjects was determined (see Table 11). Forty-five (29.8%) of the subjects reported having no current health conditions.

Table 11

Frequencies of Chronic Conditions According to Provider

Condition	Physician	Physician Assistant	Nurse Practitioner	Total
Hypertension	34	3	5	42
Diabetes	10	2	3	15
CHF	6	1	0	7
Cancer	2	0	0	2
Depression	21	2	3	26
Heart Disease	13	0	0	13
Lung Disease	4	0	1	5
Total				110

Findings

The purpose of this descriptive cross-sectional study was to determine if there was a significant difference in perceived primary health care outcomes of rural clients treated by nurse practitioners and those treated by physicians or physician assistants. Primary health care outcomes were defined as (a) perceived satisfaction with care, (b) compliance with antibiotic medications, and (c) perceived health.

Hypothesis 1

Hypothesis 1 stated there is a significant difference in satisfaction with care among rural clients treated by a nurse practitioner and those treated by a physician or a

physician assistant. Hypothesis 1 was analyzed using t-tests (3) and ANOVA to test for significant group mean differences. The t-tests indicated (a) no significant difference in level of satisfaction with care between clients of physicians and clients of nurse practitioners, (b) no significant difference in the level of satisfaction with care between clients of physician assistants and clients of nurse practitioners, and (c) no significant difference in the level of satisfaction with care between clients of physicians and clients of physician assistants (see Table 12). Using ANOVA, no significant differences were found in the level of satisfaction with care between the clients of the three types of providers (see Table 13). Thus, Hypothesis 1 was rejected.

Table 12

Independent Sample t-test for Perceived Satisfaction with Care According to Provider

Provider	n	M	SD	SE	t	df	p
Physician	101	3.32	.78	.08		100	
					-1.77		.08
Nurse Practitioner	25	3.63	.76	.15		24	
Physician Assistant	9	3.11	.75	.25		8	
					1.76		.09
Nurse Practitioner	25	3.63	.76	.15		24	
Physician	101	3.32	.78	.08		100	
					0.79		.43
Physician Assistant	9	3.11	.75	.25		8	

Note. Missing = 16.

Table 13

ANOVA for Perceived Satisfaction with Care

Variation	Sum of Squares	df	Mean Square	F	Sig. of F
Main Effects	1.204	4	.301	.477	.752
Satisfaction	1.204	4	.301	.477	.752
Explained	1.204	4	.301	.477	.752
Residual	82.010	130	.631		
Total	83.215	134	.621		

Note. Missing = 16.

It is important to note that, within the overall satisfaction scale, seven subscales exist: (a) general satisfaction, (b) technical quality, (c) interpersonal manner, (d) communication, (e) financial aspects, (f) time spent with health care provider, and (g) accessibility and convenience. Analysis showed significant differences ($t = -2.06$, $p = .041$, $r_{pb} = .17$) in general satisfaction between the clients of physicians and the clients of nurse practitioners (see Table 14). The clients of nurse practitioners were more satisfied. There were no significant differences in technical quality (see Table 15) and communication (see Table 16); however, there was a significant difference in interpersonal manner (see Table 17) between the clients of physicians and the clients

of nurse practitioners (t = -2.06, p = .044, r_{pb} = .17). The clients of nurse practitioners were more satisfied.

Table 14

Independent Sample t-test for General Satisfaction According to Provider

Provider	n	M	SD	SE	t	df	p	r_{pb}
Physician	104	3.25	1.02	.10		103		
					-2.06		.041	.17
Nurse Practitioner	28	3.70	0.99	.19		27		
Physician Assistant	10	3.10	0.99	.31		9		
					1.64		.11	
Nurse Practitioner	28	3.70	0.99	.19		27		
Physician	104	3.25	1.02	.10		103		
					0.44		.66	
Physician Assistant	10	3.10	0.99	.35		9		

Note. Missing = 9.

Table 15

Independent Sample t-test for Technical Quality According to Provider

Provider	n	M	SD	SE	t	df	p
Physician	107	3.29	0.85	.08		106	
					-0.75		.45
Nurse Practitioner	28	3.43	0.91	.17		27	
Physician Assistant	9	3.11	0.77	.26		8	
					0.94		.35
Nurse Practitioner	28	3.43	0.91	.17		27	
Physician	107	3.29	0.85	.08		106	
					0.61		.55
Physician Assistant	9	3.11	0.77	.26		8	

Note. Missing = 7.

Table 16

Independent Sample t-test for Communication According to Provider

Provider	n	M	SD	SE	t	df	p
Physician	108	3.53	0.88	.09		107	
					-0.92		.36
Nurse Practitioner	26	3.71	0.95	.19		25	
Physician Assistant	10	3.45	1.19	.38		9	
					0.69		.50
Nurse Practitioner	26	3.71	0.95	.19		25	
Physician	108	3.53	0.88	.09		107	
					0.27		.78
Physician Assistant	10	3.45	1.19	.38		9	

Note. Missing = 7.

Table 17

Independent Sample t-test for Interpersonal Manner According to Provider

Provider	n	M	SD	SE	t	df	p	r_{pb}
Physician	108	3.78	0.94	.09		107		
					-2.06		.044	.17
Nurse Practitioner	29	4.10	0.70	.13		28		
Physician Assistant	10	3.95	0.55	.17		9		
					0.63		.53	
Nurse Practitioner	29	4.10	0.70	.13		28		
Physician	108	3.78	0.94	.09		107		
					0.88		.40	
Physician Assistant	10	3.95	0.55	.17		9		

Note. Missing = 4.

Significant differences were found in financial aspects (see Table 18) between the clients of physicians and the clients of physician assistants ($t = 2.08$, $p = .04$, $r_{pb} = .20$) and between the clients of physician assistants and the clients of nurse practitioners ($t = -2.39$, $p = .02$, $r_{pb} = .36$). In relation to financial aspects, clients of physicians and clients of nurse practitioners were more satisfied. The difference in time spent with health care provider (see Table 19) was significant between the clients of physicians and the clients of nurse practitioners ($t = -2.72$, $p = .01$, $r_{pb} = .20$) with

the clients of nurse practitioners being more satisfied. Significant differences were found in accessibility and convenience (see Table 20) between the clients of physicians and the clients of nurse practitioners (t = -2.64, p = .01, r_{pb} = .22), and between the clients of physician assistants and the clients of nurse practitioners (t = -3.21, p = .003, r_{pb} = .47). Clients of nurse practitioners were more satisfied.

Table 18

Independent Sample t-test for Financial Aspects According to Provider

Provider	n	M	SD	SE	t	df	p	r_{pb}
Physician	108	3.05	1.09	.10		107		
					-1.27		.21	
Nurse Practitioner	29	3.34	1.20	.22		28		
Physician Assistant	10	2.30	1.18	.37		9		
					-2.39		.02	.36
Nurse Practitioner	29	3.34	1.20	.22		28		
Physician	108	3.05	1.09	.10		107		
					2.08		.40	.20
Physician Assistant	10	2.30	1.18	.37		9		

Note. Missing = 4.

Table 19

Independent Sample t-test for Time Spent with Health Care Provider According to Provider

Provider	n	M	SD	SE	t	df	p	r_{pb}
Physician	108	3.32	1.07	.10		107		
					-2.72		.01	.20
Nurse Practitioner	29	3.88	0.95	.18		28		
Physician Assistant	10	3.40	0.88	.27		9		
					1.40		.17	
Nurse Practitioner	29	3.88	0.95	.18		28		
Physician	108	3.32	1.07	.10		107		
					0.22		.83	
Physician Assistant	10	3.40	0.88	.27		9		

Note. Missing = 4.

Table 20

Independent Sample t-test for Accessibility and Convenience According to Provider

Provider	n	M	SD	SE	t	df	p	r_{pb}
Physician	104	3.14	0.92	.09		103		
					-2.64		.01	.22
Nurse Practitioner	29	3.64	0.81	.15		28		
Physician Assistant	10	2.63	1.00	.32		9		
					-3.21		.003	.47
Nurse Practitioner	29	3.64	0.81	.15		28		
Physician	104	3.14	0.92	.09		103		
					1.69		.09	
Physician Assistant	10	2.63	1.09	.32		9		

Note. Missing = 7.

Hypothesis 2

Hypothesis 2 stated there is a significant difference in compliance with antibiotic medications among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant. Hypothesis 2 was analyzed using t-tests (3) (see Table 21) and ANOVA to test for significant group mean differences (see Table 22). There were no significant differences between types of primary health care providers; therefore, Hypothesis 2 was rejected.

Table 21

Independent Sample t-test for Compliance with Antibiotic Medications According to Provider

Provider	n	M	SD	SE	t	df	p
Physician	93	4.35	0.78	.08		92	
					.59		.56
Nurse Practitioner	27	4.25	0.92	.18		26	
Physician Assistant	9	4.19	0.67	.22		8	
					-.18		.85
Nurse Practitioner	27	4.25	0.92	.18		26	
Physician	93	4.35	0.78	.08		92	
					0.62		.54
Physician Assistant	9	4.19	0.67	.22		8	

Note. Missing = 22.

Hypothesis 3

Hypothesis 3 stated there is a significant difference in perceived health among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant. Hypothesis 3 was analyzed using t-tests (3) and ANOVA to test for significant group mean differences. Using ANOVA, no significant differences were found in perceived health between clients of the three types of providers (see Table 23).

Table 22

ANOVA for Compliance with Antibiotic Medications

Variation	Sum of Squares	df	Mean Square	F	Sig. of F
Main Effects	.862	4	.215	.313	.869
Satisfaction	.862	4	.215	.313	.869
Explained	.862	4	.215	.313	.869
Residual	85.371	124	.688		
Total	86.233	128	.674		

Note. Missing = 22.

Table 23

ANOVA for Perceived Health between Types of Provider

Variation	Sum of Squares	df	Mean Square	F	Sig. of F
Main Effects	2.876	3	.959	1.461	.228
Satisfaction	2.876	3	.959	1.461	.228
Explained	2.876	3	.959	1.461	.228
Residual	84.002	128	.656		
Total	86.879	131	.663		

Note. Missing = 19.

The t-tests showed a significant difference in perceived health between the clients of physicians and the clients of nurse practitioners ($t = -2.68$, $p = .01$, $r_{pb} = .24$), and a significant difference in perceived health between the clients of physician assistants and the clients of nurse practitioners ($t = -2.11$, $p = .043$, $r_{pb} = .35$). Clients of nurse practitioners had higher levels of perceived health. No significant difference was found in perceived health between the clients of physicians and the clients of physician assistants (see Table 24). The statistical data supported Hypothesis 3 and, therefore, it was accepted.

Table 24

Independent Sample t-test for Perceived Health According to Provider

Provider	n	M	SD	SE	t	df	p	r_{pb}
Physician	97	3.28	0.82	.08		96		
					-2.68		.01	.24
Nurse Practitioner	27	3.65	0.58	.11		26		
Physician Assistant	9	3.12	0.78	.28		8		
					-2.11		.043	.35
Nurse Practitioner	27	3.65	0.58	.11		26		
Physician	97	3.28	0.82	.08		96		
					0.54		.59	
Physician Assistant	8	3.12	0.78	.28		7		

Note. Missing = 19.

Within the Perceived Health scale, there are four subscales: (a) general health perceptions, (b) mental health, (c) physical health, and d) role functioning. Significant differences were found in general health perceptions between the clients of physicians and the clients of nurse practitioners ($t = -2.33$, $p = .02$, $r_{pb} = .20$), and between the clients of physician assistants and the clients of nurse practitioners ($t = -2.08$, $p = .045$, $r_{pb} = .33$) (see Table 25). Clients of nurse practitioners had higher levels of general health. There were no significant differences in mental health (see Table 26) or role functioning (see Table 27) between the clients of the three types of primary health care providers. Physical health was significantly different ($t = -3.88$, $p = .000$, $r_{pb} = .33$) between the clients of physicians and the clients of nurse practitioners, and between the clients of physician assistants and the clients of nurse practitioners ($t = -2.73$, $p = .01$, $r_{pb} = .42$) (see Table 28). Clients of nurse practitioners had higher levels of physical health.

Table 25

Independent Sample t-test for General Health Perceptions According to Provider

Provider	n	M	SD	SE	t	df	p	r_{pb}
Physician	107	3.08	1.01	.10		106		
					-2.33		.02	.20
Nurse Practitioner	28	3.57	0.88	.17		27		
Physician Assistant	9	2.89	0.78	.26		8		
					-2.08		.045	.33
Nurse Practitioner	28	3.57	0.88	.17		27		
Physician	107	3.08	1.01	.10		106		
					0.56		.57	
Physician Assistant	9	2.89	0.78	.26		8		

Note. Missing = 7.

Table 26

Independent Sample t-test for Mental Health According to Provider

Provider	n	M	SD	SE	t	df	p
Physician	104	4.45	1.25	.12		103	
					-0.51		.61
Nurse Practitioner	28	4.59	1.12	.21		27	
Physician Assistant	10	3.94	1.04	.33		9	
					-1.59		.12
Nurse Practitioner	28	4.59	1.12	.21		26	
Physician	104	4.45	1.25	.12		103	
					1.26		.21
Physician Assistant	10	3.94	1.04	.33		9	

Note. Missing = 9.

Table 27

Independent Sample t-test for Role Functioning According to Provider

Provider	n	M	SD	SE	t	df	p
Physician	106	3.25	0.95	.09		105	
					-1.76		.08
Nurse Practitioner	28	3.55	0.73	.14		27	
Physician Assistant	10	3.33	0.65	.21		9	
					-0.82		.42
Nurse Practitioner	28	3.55	0.73	.14		27	
Physician	106	3.25	0.95	.09		105	
					-0.26		.80
Physician Assistant	10	3.30	0.65	.21		9	

Note. Missing = 7.

Table 28

Independent Sample t-test for Physical Health According to Provider

Provider	n	M	SD	SE	t	df	p	r_{pb}
Physician	103	2.39	0.69	.07		102		
					-3.88		.000	.33
Nurse Practitioner	27	2.80	0.43	.08		26		
Physician Assistant	9	2.31	0.57	.19		8		
					-2.73		.01	.42
Nurse Practitioner	27	2.80	0.43	.08		26		
Physician	103	2.39	0.69	.07		102		
					0.32		.75	
Physician Assistant	9	2.31	0.57	.19		8		

Note. Missing = 12.

Summary of Findings

In this chapter the sample and the results of the data analyses were described. Descriptive statistics were used to describe the demographics of the sample. The ANOVA and t-tests were used to test for differences in group means for each of the three hypotheses.

The subjects in this study were from 20 to 93 years of age with a mean of 52.5 years (SD = 18.48). There was a significant difference in age ($t = 2.44$, $p = .02$, $r_{pb} = .20$) between the clients of physicians ($\bar{x} = 54.6$, SD = 19.79) and the clients of nurse practitioners ($\bar{x} = 46.6$, SD = 14.43). The majority of the subjects were female (n = 131, 86.8%), White (n = 127, 85.8%), and married (n = 91, 61.1%). The sample's income and educational levels were compared to the state population to assess for representativeness.

Subjects reported traveling twice as far to see a physician or physician assistant as they did to see a nurse practitioner. Most of the subjects (n = 100, 66%) reported having health insurance; 92 (60.9%) reported insurance paid for part or all of their medications. Thirty-six (24%) of the subjects received Medicare and 8 (5.3%) received Medicaid. Chronic conditions were reported by frequency and sorted by type of primary health care provider.

Hypothesis 1 stated there is a significant difference in satisfaction with care among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant. Hypothesis 1 was analyzed using t-tests (3) and ANOVA to test for significant group mean differences. Hypothesis 1 was rejected.

Hypothesis 2 stated there is a significant difference in compliance with antibiotic medications among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant. Hypothesis 2 was analyzed using t-tests

(3) and ANOVA to test for significant group mean differences. Hypothesis 2 was rejected.

Hypothesis 3 stated there is a significant difference in perceived health among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant. Hypothesis 3 was analyzed using t-tests (3) and ANOVA to test for significant group mean differences. Hypothesis 3 was accepted.

CHAPTER V

SUMMARY OF THE STUDY

A summary of the study is included in this final chapter. Following the summary is the discussion of the findings. Conclusions, implications for nursing, and recommendations for further studies complete the chapter.

Summary

The purpose of this descriptive cross-sectional study was to determine if a significant difference exists in perceived primary health care outcomes of rural clients treated by nurse practitioners and those treated by physicians or physician assistants. Primary health care outcomes were defined as (a) perceived satisfaction with care, (b) compliance with antibiotic medications, and (c) perceived health.

Taylor's Primary Health Care Outcomes Model (based on Donabedian's evaluation of quality) was used as the conceptual framework for this study. All data were based on subject report received by survey method. The SPSS 6.1 program was used for data analysis. Descriptive statistics were used to explore and analyze (a) age, (b) gender, (c) race/ethnicity, (d) marital status, (e) income, (f) insurance status, (g) distance to the nearest health care facility, (h) type of primary health care provider, (i) health conditions, and (j) educational level. When possible, the sample data were

compared to population data to show representation of the population. The demographic data were compared between type of health care providers to assess for differences.

The sample consisted of 151 subjects who (a) were age 18 or older, (b) could read and understand English, and (c) lived in a pre-defined rural county. The mean age was (a) 52.5 years for the total sample, (b) 54.6 years for the clients of physicians, (c) 47.7 years for the clients of physician assistants, and (d) 46.6 years for the clients of nurse practitioners. The majority of the subjects were female ($\underline{n}$ = 131, 86.8 %). The race/ethnicity of the group was (a) White (85.8%), (b) Black (4%), (c) Hispanic (6.8%), (d) Asian (0.7%), and (e) American Indian (2.7%). State frequency data from the 1990 census shows race/ethnicity as (a) 75% White, (b) 11.9% Black, (c) 10.6% Hispanic, (d) 1.9% Asian, and (e) 0.5% American Indian. Of the 151 subjects, 91 were married, 23 widowed, 22 divorced, 10 single, and 3 separated. Thirty-eight (27.9%) subjects reported yearly household income between $25,001 and $50,000, with 36 (26.5%) reporting income between $10,001 and $25,000. Compared to the state population household incomes, 32.3% had incomes between $25,001 and $50,000 and 28.6% had incomes between $10,001 and $25,000.

The mean distance to the nearest health care facility in this study was 13.1 miles, with a range of between 1/8th of a mile to 90 miles. Seventy-nine percent of subjects reported 15 miles or less to the nearest health care facility. The clients

reported traveling twice as far to see a physician or physician assistant compared to a nurse practitioner.

Thirty-six of the subjects (24%) reported receiving Medicare, while only 8 reported receiving Medicaid (5.3%). Seven of the subjects reported having both Medicare and Medicaid (5%) and 98 reported having neither Medicare nor Medicaid (64.9%). One hundred (66%) of the subjects in this study reported having health insurance, and 92 (60%) reported insurance paid for part or all of their medications.

Thirty-one of the subjects (21%) reported completing high school or its equivalent, with an equal number completing below the high school level and 86 (56.9%) completing above the high school level. Forty-five (29.8%) of the subjects reported no current health problems.

Three hypotheses were tested in this study:

Hypothesis 1 stated there is a significant difference in satisfaction with care among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant. Findings did not support hypothesis 1, therefore it was rejected.

Hypothesis 2 stated there is a significant difference in compliance with antibiotic medications among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant. No significant difference was found, therefore the hypothesis was rejected.

Hypothesis 3 stated there is a significant difference in perceived health among rural clients treated by a nurse practitioner and those treated by a physician or a

physician assistant. The t-tests showed a significant difference in perceived health of clients treated by physicians and clients treated by nurse practitioners (t = -2.68, p = .01, r_{pb} = .24), and a significant difference in perceived health between clients treated by physician assistants and clients treated by nurse practitioners (t = -2.11, p = .043, r_{pb} = .35). Clients of nurse practitioners had higher levels of perceived health. No significant difference was found in perceived health between the clients of physicians and the clients of physician assistants. Using ANOVA, no significant differences were found in perceived health between the clients of the three types of providers. The statistical data support Hypothesis 3, therefore, it was accepted.

There were no significant differences in mental health or role functioning between the clients of the three types of primary health care providers. Significant differences were found in general health between the clients of physicians and the clients of nurse practitioners (t = -2.33, p = .02, r_{pb} = .20), and between the clients of physician assistants and the clients of nurse practitioners (t = -2.08, p = .045, r_{pb} = .33), and in physical health (t = -3.88, p = .000, r_{pb} = .33) between the clients of physicians and the clients of nurse practitioners and between the clients of physician assistants and the clients of nurse practitioners (t = -2.73, p = .01, r_{pb} = .42). Clients of nurse practitioners had higher levels of physical health and general health.

Discussion of the Findings

Findings related to each of the three hypotheses are presented as follows:

Hypothesis 1

Hypothesis 1 predicted there is a significant difference in satisfaction with care among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant. Findings did not support Hypothesis 1, so it was rejected. The t-test analysis of the overall perceived satisfaction with care showed no significant differences between the clients of the three types of primary health care providers. This is inconsistent with findings of the pilot studies completed in 1998 and 1999, in which significant differences were found. The findings of this study are consistent with Mundinger et al. (2000) and Chang et al. (1999) who found there was no difference in the level of satisfaction with care between the clients of physicians and the clients of nurse practitioners in the urban environment. Oliver et al. (1986) found patient satisfaction with physician assistant care to be high in a rural environment. The level of general satisfaction with care was significant ($t = -2.06$, $p = .041$, $r_{pb} = .17$) between the clients of physicians and the clients of nurse practitioners in this study. These findings are consistent with Venning et al. (2000), Kinnersley et al. (2000), and Hill et al. (1994) who found patients to be more satisfied with nurse practitioner consultations as compared to general practitioners. Murphy and Ericson (1995) reported that some communities preferred nurse practitioners because of their holistic approach to patient

care. Applegate (1997), Kleinpell-Nowell and Weiner (1999), Marsh (1999), and Mundinger et al. (2000) discussed client satisfaction as a critical outcome of health care.

There were no significant differences in the level of satisfaction with technical quality and communication. Contrary to the findings in this study of no difference in technical quality, Hill et al. (1994) found effectiveness and safety of nurse practitioners to be greater than that of physicians. This study does support the findings of Feldman et al. (1987), who determined that advanced practice nurses have diagnostic certainty and management effectiveness similar to physicians. Jones and Bunner (1998) found no differences in the approaches used by physicians, physician assistants, and nurse practitioners in diagnosing urinary incontinence. Hamric et al. (1998) reported that safety and effectiveness of advanced practice nurses were positively evaluated by physicians, patients, and advanced practice nurses themselves. Koch et al. (1992), Murray and Paxton (1993), Nelson et al. (1991), and Prescott (1994) found that the care of nurse practitioners was equal to or superior to that of physicians. Rudy et al. (1998) found outcomes of care were similar for resident physicians, physician assistants, and nurse practitioners.

In this study, a significant difference was found in the level of satisfaction with interpersonal manner between the clients of physicians and the clients of nurse practitioners ($t = -2.06$, $p = .044$, $r_{pb} = .17$). While no studies were found that focused on interpersonal manner, DiMatteo et al. (1993) examined to what degree physicians'

own personal characteristics and the characteristic of their practice affected patient adherence. No significant effects of personal characteristics were found but practice characteristics had a significant effect.

The level of satisfaction with time spent with health care providers was significantly greater for clients of nurse practitioners than for clients of physicians ($t = -2.72$, $p = .01$, $r_{pb} = .20$). Kinnersley et al. (2000) and Murray and Paxton (1993) found nurse practitioners spent more time with their patients. In keeping with these findings, rural clients in this study had a higher degree of general satisfaction ($t = -2.06$, $p = .041$, $r_{pb} = .17$) with care, and reported spending more time ($t = -2.72$, $p = .01$, $r_{pb} = .20$) with nurse practitioners compared to physicians. These findings lend credence to Mundinger's (1999) contention that nursing has a unique contribution to make to the practice of primary care. The findings of this study are consistent with other studies that found nurse practitioners provided more than just medical interventions, thus spending more time with patients. Mundinger (1994) noted that nurses are more likely to talk with patients, provide disease prevention counseling, health education, and health promotion activities. Fitzpatrick (1998) stated that the value of the nurse practitioner role is that disease prevention and patient education are provided in addition to medical interventions. Kinnersley et al. (2000) found that nurse practitioners provided significantly more information to patients about their illnesses. Marion (1996) and Pike et al. (1998) reported that nurse practitioners focused on self-care, promotion of healthy lifestyles, and encouraged patients to take responsibility

for their own well-being. Coulter et al. (2000) identified the shortage of women health service providers as an important contributing factor to hiring nurse practitioners and physician assistants. Mills et al. (1998) reported that nurse practitioners were the most likely provider for the outpatients needing women's health services.

Significant differences were found in financial aspects between the clients of physicians and the clients of physician assistants ($t = -2.08$, $p = .04$, $r_{pb} = .20$) and the clients of physician assistants and the clients of nurse practitioners ($t = -2.39$, $p = .02$, $r_{pb} = .36$). Financially, rural clients in this study were more satisfied with physicians and nurse practitioners when compared to physician assistants. This study supports the findings of Venning et al. (2000), who also found no significant differences in health service costs for nurse practitioners and general practitioners. Baldwin et al. (1998) identified cost as a critical system factor for community acceptance of physician assistants and nurse practitioners. Patients felt that the cost of physician assistant and nurse practitioner services should be less than that of similar services provided by physicians (Baldwin et al., 1998). Anderson and Hampton (1999) examined the role of payment sources for physician assistants and nurse practitioners and found that significant differences exist in the relationships between payment sources and the utilization of the two providers. Prepaid and health maintenance organization types of reimbursements had no relationship with physician and nurse practitioner utilization.

Marsh (1999) reported that patient satisfaction is more closely related to health service economics than to quality. Byers and Brunnell (1998) indicated that nurse

practitioners must demonstrate excellent outcomes at competitive costs. Fitzpatrick (1998), Kane et al. (1991), and Safriet (1992) agreed that nurse practitioners provided high quality care, while also decreasing cost.

Provision of integrated, accessible health care services is part of the new definition for primary care published by the Institute of Medicine (1986). In this study, rural clients found nurse practitioners more accessible and convenient when compared to physicians ($t = -2.64$, $p = .01$, $r_{pb} = .22$) and physician assistants ($t = -3.21$, $p = .003$, $r_{pb} = .22$). Geographic proximity and being readily accessible were identified by Baldwin et al. (1998) as a critical factor for community acceptance of nurse practitioners and physician assistants in rural, medically under-served areas. Marshall et al. (1993) considered provider availability as an important factor on which to evaluate patient satisfaction.

The significant findings from Hypothesis 1 are shown in Figure 5. The magnitude of each significance is also identified.

Hypothesis 2

Hypothesis 2 predicted there is a significant difference in compliance with antibiotic medications among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant. Hypothesis 2 was rejected. There were no significant differences between types of primary health care providers and patients' compliance with antibiotic medications. This finding supports the findings of Buckalew

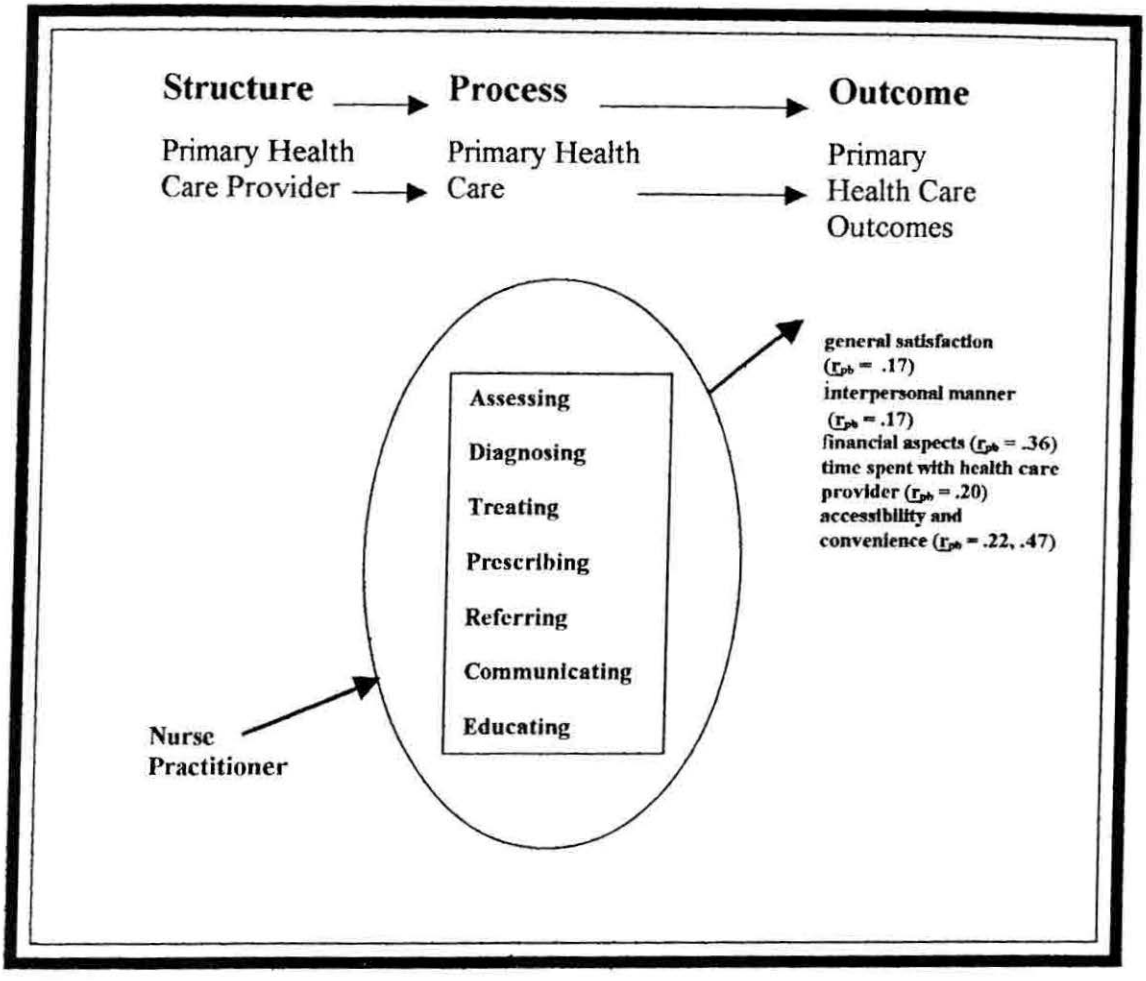

Figure 5. Taylor's Primary Health Care Outcomes Model with significant findings from Hypothesis 1.

and Buckalew (1995), Blackwell (1992), and Cargill (1992), who found multiple reasons for noncompliance with medication regimens. Simons (1992) identified a distressingly wide gap between the medication regimen recommended by the health care provider and the medication regimen actually followed by the client. The findings

of this study did not support the findings of Sherbourne et al. (1992), who reported a positive correlation between client satisfaction with their health care provider and client compliance. DiMatteo et al. (1993), and Tarlov et al. (1989) found that the health care provider attributes and practice styles influence the client's compliance with treatments. Burke and Dunbar-Jacob (1995) contended that over half of the nearly two billion prescriptions written annually are taken incorrectly. Trinkaus (1991) examined the reluctance of patients to ask questions about medications.

Hypothesis 3

Hypothesis 3 predicted there is a significant difference in perceived health among rural clients treated by a nurse practitioner and those treated by a physician or a physician assistant. Hypothesis 3 was accepted. The t-tests showed a significant difference in perceived health between clients of physicians and clients of nurse practitioners ($t = -2.68$, $p = .01$, $r_{pb} = .24$), and a significant difference in perceived health between clients of physician assistants and clients of nurse practitioners ($t = -2.11$, $p = .043$, $r_{pb} = .35$). Clients of nurse practitioners had higher levels of perceived health. No significant difference was found in perceived health between the clients of physicians and the clients of physician assistants. Using ANOVA, no significant differences were found in the clients' perceived health between the three types of providers. Hall et al. (1990) found a positive relationship between client satisfaction with care and health outcomes, while Pinkerton (1998) found no significant difference

in perceived patient satisfaction or perceived health outcomes between nurse practitioners and physicians. Mundinger et al. (2000) found patient outcomes for nurse practitioners and physicians do not differ. The Congress of the United States Office of Technology Assessment (1986) reported that the care provided by nurse practitioners and physician assistants was equal in quality to care provided by physicians. Marshall et al. (1996) suggested that satisfaction with care might be both a consequence and a determinant of health status. Dissatisfaction with health care may be a manifestation of dissatisfaction with other aspects of life (Roberts et al., 1983).

No significant differences in mental health or role functioning were found between the clients of physicians, physician assistants, and nurse practitioners. Hays et al. (1994) and Hays and Stewart (1990) suggested that individuals who experience good physical health also tend to report good mental health. The clients of nurse practitioners in this study reported higher levels of overall health, general health, and physical health than the clients of physicians or physician assistants. Kane et al. (1991) and Hill (1997) found that clients cared for by the nurse practitioner had a higher level of physical functioning than clients being seen by physicians. Aiken et al. (1993) contended there was no significant difference related to pain between providers. Brown and Grimes (1995) found that nurse practitioners' patient compliance, patient satisfaction, and resolution of pathological conditions were greater than those of physicians.

The significant findings from Hypothesis 3 are shown in Figure 6. The magnitude of each significance is also identified.

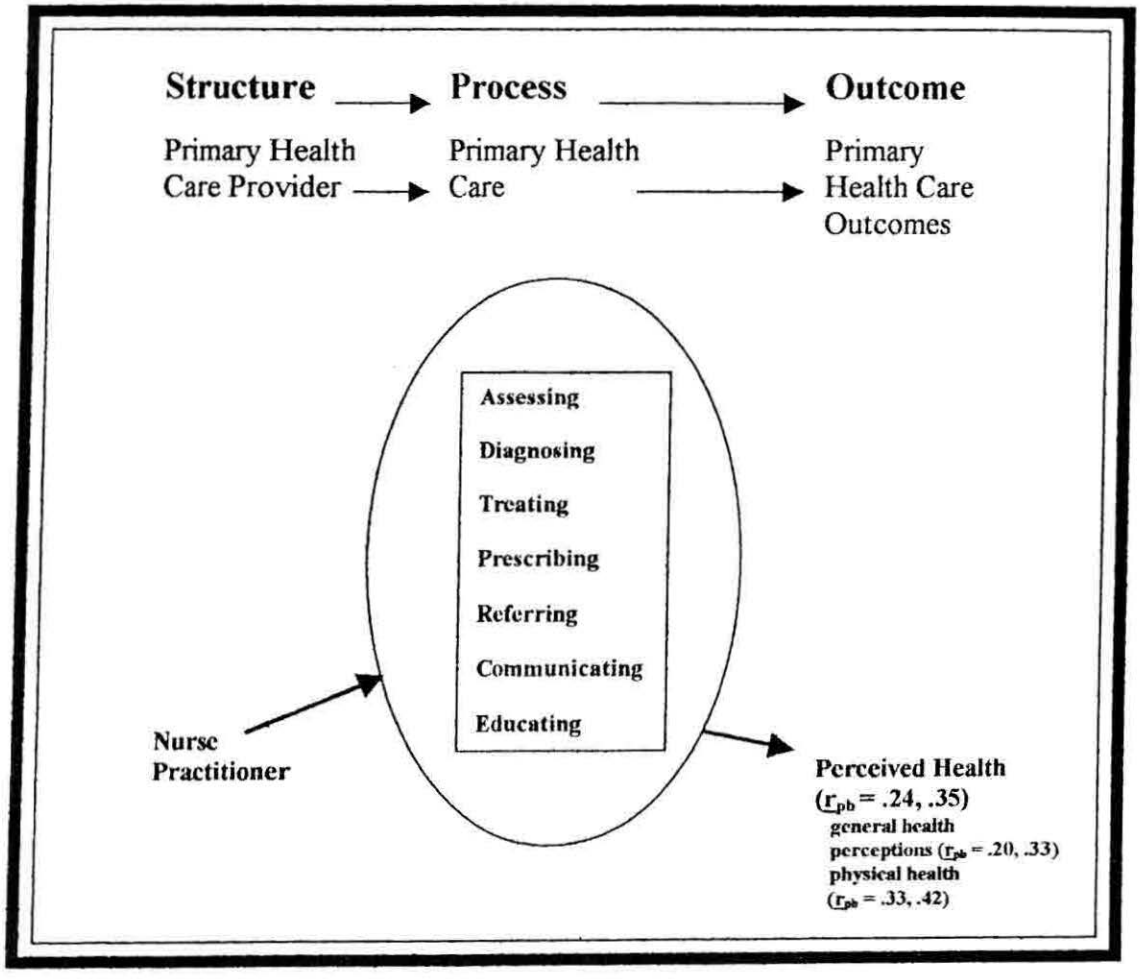

Figure 6. Taylor's Primary Health Care Outcomes Model with significant findings from Hypothesis 3.

Conclusions

This research study examined primary health care outcomes in rural clients in relation to the type of primary health care provider. Primary health care outcomes were (a) satisfaction with care, (b) compliance with antibiotic medication, and (c) perceived health. The conclusions are presented as follows:

1. Clients are as satisfied with the care provided by nurse practitioners as with the care provided by physicians and physician assistants.

2. Clients' compliance with antibiotic medication regimens does not differ whether treated by physicians, physician assistants, or nurse practitioners.

3. Perceived health is greater for rural clients cared for by nurse practitioners.

4. Nurse practitioners are independent practitioners of primary health care.

5. Nurse practitioners are valuable providers of primary health care in rural environments.

Implications

Implications of the study are:

1. This outcome study demonstrates the value of the nurse practitioner role in rural areas. Results of this outcome study must be communicated in order to educate policy makers and the public about the role of the nurse practitioner and the value of that role as an independent primary health care provider to rural areas.

2. Nurse practitioners must become actively involved in lobbying for independent practice and reimbursement comparable to services provided. With adequate reimbursement for services and independent practice, the potential for increasing the number of primary health care providers in rural areas will be enhanced.

3. The findings of this study support the Taylor Primary Health Care Outcomes Model derived from Donabedian's paradigm (structure, process, and outcome) by demonstrating that nurse practitioners are at least equivalent to physicians and physician assistants in the provision of primary health care in rural environments.

Recommendations for Future Studies

There is a need for further research to examine the:

1. Cost effectiveness of the nurse practitioner role compared to other primary health care providers.

2. Differences in clients by gender and age and their levels of satisfaction with care based on their primary care provider.

3. Provider preference of rural clients.

4. Primary health care outcomes across settings.

5. Impact of patient education and health promotion on community health.

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APPENDIX A

Human Subjects Review Committee Permission to Conduct Study
and
Graduate School Permission to Conduct Study

TEXAS WOMAN'S
UNIVERSITY
DENTON / DALLAS / HOUSTON

HUMAN SUBJECTS
REVIEW COMMITTEE
P.O. Box 425619
Denton, TX 76204-5619
Phone: 940/898-3377
Fax: 940/898-3416

January 24, 2000

Ms. Lisa Taylor
135 N. Falling Leaves
Waxahachie, TX 75167

[redacted]

Dear Ms. Taylor:

Re: Nurse Practitioner Impact on Health Care Outcomes in Rural Clients

The above referenced study has been reviewed by a committee of the Human Subjects Review Committee and appears to meet our requirements in regard to protection of individuals' rights.

Be reminded that both the University and the Department of Health and Human Services (HHS) regulations typically require that agency approval letters and signatures indicating informed consent be obtained from all human subjects in your study. As applicable to your study, these consent forms and agency approval letters are to be filed with the Human Subjects Review Committee at the completion of the study. However, because you do not utilize a signed consent form for your study, the filing of signatures of subjects with the HSRC is not required.

Your study was determined to be exempt from further TWU HSRC review. However, another review by the Committee is required if your project changes. If you have any questions, please feel free to call the Human Subjects Review Committee at the phone number listed above.

Sincerely,

Dr. Linda Rubin, Chair
Human Subjects Review Committee - Denton

cc. Dr. Carolyn Gunning, College of Nursing
Dr. Margaret Beard, College of Nursing
Graduate School

Human Subjects Review Committee
P O Box 425619
Denton, TX 76204-5619

March 7, 2000

Dear Dr. Linda Rubin,

Re: Nurse Practitioner Impact on Health Care Outcomes in Rural Clients

After the presentation of my prospectus for the dissertation, my committee made a few minor changes to my questionnaire. The study remains the same, however the language on my cover letter has changed, and I have added arrows to the questionnaire to make it more user friendly. I have enclosed a copy of the new cover letter as well as the new questionnaire. If you have any questions, please call me (972) 938-1674.

Respectfully submitted,

Lisa Taylor
135 N Falling Leaves
Waxahachie TX 75167-9045

Approved 3/8/2000

Human Subjects Review Committee
P O Box 425619
Denton, TX 76204-5619

April 4, 2000

Dear Dr. Linda Rubin,

Re: Nurse Practitioner Impact on Health Care Outcomes in Rural Clients

After the presentation of my prospectus for the dissertation, the Dean of the College of Nursing recommended a few minor changes to my questionnaire. The study remains the same, however some of the questions have been restated for clarity. I have enclosed a copy of the new questionnaire. If you have any questions, please call me (972) 938-1674.

Respectfully submitted,

Lisa Taylor
135 N Falling Leaves
Waxahachie TX 75167-9045

Approved 4/5/2000

TEXAS WOMAN'S UNIVERSITY

DENTON / DALLAS / HOUSTON

[redacted]

THE GRADUATE SCHOOL
P.O. Box 425649
Denton, TX 76204-5649
Phone: 940/898-3400
Fax: 940/898-3412

April 28, 2000

Ms. Lisa G. Taylor
135 N. Falling Leaves
Waxahachie, Tx 75167

Dear Ms. Taylor:

I have received and approved the prospectus entitled **"Nurse Practitioner's Impact on Primary Health Care Outcomes in Rural Clients"** for your *Dissertation* research project.

Best wishes to you in the research and writing of your project.

Sincerely yours,

Leslie M Thompson

Leslie M. Thompson
Associate Vice President for Research and
Dean of the Graduate School

LMT/sgm

cc Dr. Margaret Beard, Nursing
Dr. Carolyn Gunnings, Nursing

APPENDIX B

Permission to Use Instruments

Subject: Your note
Date: Thu, 02 Jul 1998 10:18:59 -0700
From: Grant Marshall <grantm@rand.org>
To: alamo152@flash.net

Hi Lisa,

I think your plan to use "health care provider" is a fine. You might want to consider examining whether levels of satisfaction differ according to type of provider. (I'm sure you've intended to do that).

Best of Luck!

Grant

Grant Marshall

April 11, 1997

Dear Ms. Taylor,

Thank you for your interest
in the enclosed papers.

Good luck with your research!

--Grant Marshall

Date: Mon, 1 Nov 1999 9:21:00
From: "Pamela J. Gagnon" <PGagnon@qmetric.com>
Organization: QualityMetric, Inc.
To: alamo152@flash.net

Monday, November 01, 1999

Lisa Taylor Itasca Health Care Center
MS, RN, FNP
135 N Falling Leaves
Waxahachie, TX 75167-9045
United States

Dear Lisa:

In response to your recent request, I am happy to grant you permission to use and reproduce the SF-12 or SF-36 Health Surveys for the following: Nurse Practitioner Impact on Health Care Outcomes of Rural Clients. Permission to use the SF-36 and SF-12 is granted royalty free for individual research and institutional non-commercial use. Organizations wishing to resell, sub license, or otherwise distribute the SF-36 or SF-12 survey forms or scoring algorithms as part of their product or service offerings (whether or not a fee is charged) should contact QualityMetric for commerc licensing information. Contact QualityMetric for permission to use the surveys for additional projects as they occur. Information about related publications is available on the Internet at www.sf-36.com and www.QMetric.com.

We have added you to our mailing list and will also forward your name and address to the Medical Outcomes Trust (MOT). We encourage you to become an MOT member.
Sincerely,

John E. Ware, Jr., Ph.D.

Executive Director, Health Assessment Lab
Senior Scientist, The Health Institute

President and Chief Executive Officer
QualityMetric, Inc.

Research Professor of Psychiatry
Tufts University School of Medicine

Adjunct Professor of Health and Social Behavior
Harvard University School of Public Health

APPENDIX C

Cover Letter and Instruments

TEXAS WOMAN'S UNIVERSITY

College of Nursing

Dear Health Care Consumer,

I am a doctoral student in the college of nursing at Texas Woman's University. I am interested in primary health care for the citizens of rural Texas. The purpose of this study is to identify and describe what you think about health care, how you take medication, and, generally, how you feel today. By completing this questionnaire you will provide meaningful information to increase our understanding of your thoughts and feelings. Completing this questionnaire will take between 15 and 30 minutes of your time. All of your responses will remain confidential. Please keep this page for future reference.

If you are at least 18 years old and give your free and voluntary consent to participate in this study, please fill out this questionnaire and return it in the enclosed envelope. I understand that the return of my completed questionnaire constitutes my informed consent to act as a participant in this research study.

If you have any questions, concerns, or would like a summary of the results of the study, please call (214) 564-6354 or write Lisa Taylor, P. O. Box 425546, Denton, TX 76204-5546. If you have additional questions, or questions about your rights as a subject, you may contact my advisor Dr. Beard (940) 898-2420 or the office of research and grants at (940) 898-3377 at Texas Woman's University.

I would like to thank you in advance for your time and effort. In appreciation for helping me with this project, the first 50 participants who complete and return this questionnaire have a chance to win a $50.00 WalMart gift certificate!

Sincerely,

Lisa Taylor
P. O. Box 425546
Denton, TX 76204-5546

I understand that the return of my completed questionnaire constitutes my informed consent to act as a subject in this research. On the following pages are some things people say about health care. Please read each one carefully, keeping in mind the health care you are receiving now. (If you have not received care recently, think about what you would expect if you needed care today.) We are interested in your feelings, good and bad, about the health care you have received. The phrase 'health care provider' includes physicians, physician assistants and nurse practitioners.

How strongly do you AGREE or DISAGREE with each of the following statements?

(Circle One Number on Each Line)

	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
1. Health care providers are good about explaining the reason for medical tests	1	2	3	4	5
2. I think my health care provider's office has everything needed to provide complete medical care	1	2	3	4	5
3. The health care I have been receiving is just about perfect	1	2	3	4	5
4. Sometimes health care providers make me wonder if their diagnosis is correct	1	2	3	4	5
5. I feel confident that I can get the health care I need without being set back financially	1	2	3	4	5
6. When I go for health care, they are careful to check everything when treating and examining me	1	2	3	4	5
7. I have to pay for more of my health care than I can afford	1	2	3	4	5
8. I have easy access to the medical specialists I need	1	2	3	4	5
9. Where I get health care, people have to wait too long for emergency treatment	1	2	3	4	5

How strongly do you AGREE or DISAGREE with each of the following statements?

(Circle One Number on Each Line)

	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
10. Health care providers act too businesslike and impersonal toward me	1	2	3	4	5
11. My health care provider treats me in a very friendly and courteous manner	1	2	3	4	5
12. Those who provide my health care sometimes hurry too much when they treat me	1	2	3	4	5
13. Health care providers sometimes ignore what I tell them	1	2	3	4	5
14. I have some doubts about the ability of the health care providers who treat me	1	2	3	4	5
15. Health care providers usually spend plenty of time with me	1	2	3	4	5
16. I find it hard to get an appointment for health care right away	1	2	3	4	5
17. I am dissatisfied with some things about the health care I receive	1	2	3	4	5
18. I am able to get health care whenever I need it	1	2	3	4	5

When was the last time you received health care? _____

Which type of health care provider did you use? (please circle only one) Physician Nurse Practitioner Physician assistant

Remembering the last time you received an antibiotic (for infection), please answer the following questions.

I have received a prescription for an antibiotic (for infection), in the past.

NO (skip to question #27) YES Yes (continue with #19)

How strongly do you AGREE or DISAGREE with each of the following statements?

(Circle One Number on Each Line)

	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
19. The last time I got a prescription for an antibiotic, I bought it within two days.	1	2	3	4	5
20. The last antibiotic I bought was expensive.	1	2	3	4	5
21. The last antibiotic I received, I took the exact number of times each day (once a day, twice a day, three times a day, four times a day), as written on the prescription.	1	2	3	4	5
22. The last antibiotic I received, I took the exact way my health care provider told me to (before meals, after meals, with food, without food, around the clock, or only during the day).	1	2	3	4	5
23. I always finish all my antibiotic, even if I feel better after only a few days.	1	2	3	4	5
24. I like to save a few antibiotics for the next time I get sick.	1	2	3	4	5
25. If I start to have side effects from my antibiotic, I stop taking it.	1	2	3	4	5
26. Which type of health care provider prescribed this antibiotic for you? (please circle only one)	Physician	Physician assistant	Nurse Practitioner		

YES

The following questions ask you about the way you have been feeling during the past month.

NO

27. In general, would you say your health is (please circle one)	Excellent	Very Good	Good	Fair	Poor
28. How much bodily pain have you had during the past month? (please circle one)	None	Very mild	Mild	Moderate	Severe

Please check the box for the one answer that comes closest to your feelings.

	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
29. How much of the time, during the past month, has your health limited your social activities (like visiting with friends or close relatives)?	☐	☐	☐	☐	☐	☐
30. How much of the time, during the past month, have you been a very nervous person?	☐	☐	☐	☐	☐	☐
31. During the past month, how much of the time have you felt calm and peaceful?	☐	☐	☐	☐	☐	☐
32. How much of the time, during the past month, have you felt downhearted and blue?	☐	☐	☐	☐	☐	☐
33. During the past month, how much of the time have you been a happy person?	☐	☐	☐	☐	☐	☐
34. How often, during the past month, have you felt so down in the dumps that nothing could cheer you up?	☐	☐	☐	☐	☐	☐

35. Which type of health care provider did you use 6 months ago? (please circle only one)

Physician Physician assistant Nurse Practitioner

Please check the box that best describes whether each of the following statements is true or false for you.

	Definitely True	Mostly True	Not Sure	Mostly False	Definitely False
36. I am somewhat ill	☐	☐	☐	☐	☐
37. I am as healthy as anybody I know	☐	☐	☐	☐	☐
38. My health is excellent	☐	☐	☐	☐	☐
39. I have been feeling bad lately	☐	☐	☐	☐	☐

For how long (if at all) has your health limited you in each of the following activities?

	Limited for more than 3 months	Limited for 3 months or less	Not limited at all
40. The kinds or amounts of vigorous activities you can do, like lifting heavy objects, running or participating in strenuous sports	☐	☐	☐
41. The kinds or amounts of moderate activities you can do, like moving a table, carrying groceries or bowling	☐	☐	☐
42. Walking uphill or climbing a few flights of stairs	☐	☐	☐
43. Bending, lifting, or stooping	☐	☐	☐
44. Walking one block	☐	☐	☐
45. Eating, dressing, bathing, or using the toilet	☐	☐	☐

46. Does your health keep you from working at a job, doing work around the house or going to school? (please circle one)	Yes, for more than 3 months	Yes, for 3 months or less	NO
47. Have you been unable to do certain kinds or amounts of work, housework or schoolwork because of your health? (please circle one)	Yes, for more than 3 months	Yes, for 3 months or less	NO

48. Which type of health care provider did you use 1 year ago? (please select only one) Physician Physician assistant Nurse Practitioner

The following questions will provide demographic information, and allow the researcher to compare you with others. Please remember, this and all information contained in this questionnaire is confidential and will only be used for statistical analysis by the researcher. No one else will see your answers or questionnaires. Please fill in the blanks or circle the best response.

49. What is your age? _____

50. What is your gender? Male Female

51. What is your race/ethnicity? White Black Hispanic Asian

other (please specify)_____

52. What is your marital status? Single Married Divorced
Widowed Separated

53. What is your yearly household income? $0 - $10,000 $10,001 - $25,000
$25,001 - $50,000 $50,001 - $75,000 $75,001 - $100,000 above $100,000

54. Do you receive Medicare, Medicaid, or both? Medicare Medicaid Both

55. Do you have health insurance? YES NO

56. Does your health insurance pay for part or all of your medication? NO Yes(part) Yes(all)

57. How far is it, in miles, to the nearest health care facility (doctor's office)? _____ miles

58. Which type of health care provider did you last use? (please select only one) Physician Physician assistant Nurse Practitioner

59. Please circle ***all*** conditions that you currently have.

High Blood Pressure Diabetes
Congestive Heart Failure Cancer Depression
Heart disease Lung disease

Other _____ None _____

60. What is the highest grade you completed in school?

below 5th 5th 6th 7th 8th 9th 10th 11th 12th technical school
some college associates degree bachelors degree masters degree doctorate degree

61. Which type of health care provider do you use most of the time? (please select only one) Physician Physician assistant Nurse Practitioner

Thank you for completing this survey. If you have any questions or comments please feel free to call me at (214) 564-6354. You may obtain a copy of the results of this survey by calling me at (214) 564-6354, or writing to: Lisa Taylor, P. O. Box 425546, Denton, TX 76204-5546.