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Preconception Health Care Practices Of Nurse Practitioners In The Primary Care Setting

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**Preconception Health Care Practices of Nurse Practitioners
in the Primary Care Setting**

by

Charlotte Ann Williams

A Thesis

**Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Science in Nursing
in the Division of Nursing
Mississippi University for Women**

Columbus, Mississippi

August 2001

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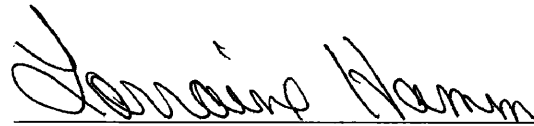
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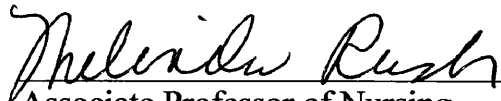
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Abstract

The United States Public Health Service recommends that age appropriate preconception care be provided to all women of reproductive age. Preconception health care provides a woman the opportunity to assess her health status before pregnancy, make appropriate health promoting behavior changes and increase the potential for a healthy pregnancy outcome. Neural tube defects, fetal alcohol syndrome, congenital malformations and low birth weight are examples of adverse infant conditions that can be reduced through preconception health care interventions. Current research suggests that preconception health care according to United States Public Health Service recommendations is not practiced in the primary care setting. This researcher sought to elucidate the preconception health care interventions of nurse practitioners in the primary care setting. Nola Pender's theory of health promotion provided the theoretical framework of this research. A descriptive survey was utilized to answer the research question, What are the preconception health care practices of nurse practitioners in the primary care setting? Data was obtained utilizing the researcher developed questionnaire, Women's Health Care Survey. A convenience sample of nurse practitioners with certification in family, adult, women's health and midwifery were surveyed. Descriptive statistics were used to analyze the data. The findings indicated that preconception care is not offered according to the guidelines set forth by the United States Public Health Service. The majority of nurse practitioners provided counseling about appropriate body weight, basics of a healthy

diet, the importance of exercise and smoking cessation, however, interventions more directly related to a woman's health during pregnancy were provided by less than half of the respondents. Less than one-third screened for drug abuse, discussed benefits of folic acid supplementation or counseled abstinence from alcohol usage. Determination of rubella immunity and education about health risks associated with emptying a cat litter box were rarely provided.

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This year was marked by the addition of some wonderful colleagues to my life. Without doubt, the graduating class of 2001 has experienced a good deal of grief and joy during this year. We were fortunate to have classmates that truly cared for one another and helped each other along the way.

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Chapter I

The Research Problem

Preconception health care focuses on improving the health status of a woman prior to pregnancy. Birth outcomes can be adversely affected by events that occur during the first few weeks following conception before the signs of pregnancy are pronounced. Preconception care (PCC) identifies perinatal risks and provides interventions to improve the course of pregnancy and the health of the neonate. Intervention and counseling allow a woman the opportunity to evaluate her health and make beneficial, health-promoting changes. Preconception health care reduces a woman's reproductive risks prior to conception (Culpepper & Jack, 1990) and thereby reduces infant mortality and morbidity (Hawkins, Roberto-Nichols, & Stanley-Haney, 2000).

Establishment of the Problem

Preconception health care is a preventative strategy that promotes the health of women prior to pregnancy. PCC includes screening and counseling for behaviors and physical conditions that may pose a risk to maternal and neonatal health during pregnancy. Congenital conditions such as neural tube defects, low birth weight, prematurity and fetal alcohol syndrome could potentially be avoided if preconception care interventions were followed (Public Health Service, 2000). Since 1989, preconception health care has been recommended by the U.S. Public Health Service as a component of primary care for women of reproductive age (Public Health Service Expert Panel on the Content of

Prenatal Care, 1989). PCC has the potential to decrease rates of infant mortality and morbidity, similar to the decrease accredited to prenatal care (Conway et al., 1995).

Preconception care and counseling have been shown to improve the outcomes of pregnancy. Improved outcomes include a reduction in congenital anomalies, neonatal complications, spontaneous abortions and cesarean section rates (Conway et al., 1995). The United States ranks 24th in infant mortality in comparison to other developed countries (Centers for Disease Control, 1989). A large disparity exists between white and black infant mortality rates with blacks having a twenty-fold risk of infant death. Reducing infant mortality was a national health objective for the year 2000.

Infant mortality is defined as death before one year of age. Nationally, the five leading causes of infant mortality in 1997 were Sudden Infant Death Syndrome, Respiratory Distress Syndrome, disorders related to short gestation/low birth weight, newborns affected by maternal complications of pregnancy and congenital anomalies (Centers for Disease Control and Prevention, 1999). The six leading causes of infant death in the state where the research was conducted were disorders related to short gestation/low birth weight, congenital malformations, chromosome abnormalities, Sudden Infant Death Syndrome (SIDS), Respiratory Distress Syndrome, bacterial sepsis and newborns affected by maternal complications of pregnancy. PCC has the potential to reduce the frequency of neonatal/infant morbidity and mortality.

Prematurity and low birth weight often require increased hospitalization with costs for neonatal intensive care ranging from 1,000 to 2,500 dollars per day. Lifetime costs for one premature infant are estimated at \$500,000 (March of Dimes, 2001). The economic

costs of birth defects are estimated to be \$244,000 per case for initial hospitalization and over eight billion in lifetime costs for all birth defects in 1992 (March of Dimes, 2001).

The state in which the study was conducted had 18 cases of Spina bifida/Meningocele in 1999, slightly under the national average of 1 case per 2,000 births (Mississippi State Department of Health, 2000). The medical cost for one case of Spina bifida/Meningocele was \$294,000 in 1992. This translates to \$5,292,000 in total medical costs for one category of birth defect for the state in one year. The lifetime cost of care for one child with Spina bifida/Meningocele is estimated at 489 million (March of Dimes, 2001). In 1999, fifteen percent (6,619) of the state's total births were premature and 10% (4,421) weighed less than 2,500 grams (Mississippi State Department of Health, 2000). Birth defects, prematurity and low birth weight result in high costs in human suffering in addition to medical expenditures (March of Dimes, 2001).

Preconception health care and counseling should be an integral component of routine care for all women of childbearing age. Preconception health care should include physical assessment, identification of risk factors and counseling interventions. In Protocols for Nurse Practitioners in the Gynecologic Setting, Hawkins, Roberto-Nichols and Stanley-Haney (2000) divide preconception care into six areas: history, physical exam, laboratory, education, referral/consultation and follow-up. A complete history including medical, gynecologic, genetic, social, nutritional, drug use, toxin exposure, immunization and partner's health are reviewed. A comprehensive exam includes height, weight, vital signs, general physical and pelvic exam. Laboratory studies include pap smear, blood Rh and type, hemoglobin, hematocrit, urinalysis, RPR/VDRL and immunity status (Hepatitis,

Varicella, Rubella, HIV and, if indicated, toxoplasmosis and CMV). Health behavior education should optimally be implemented at least one month prior to conception and include: 1) Avoidance of environmental toxins, 2) Cessation of smoking and alcohol consumption, 3) Initiation of an exercise program, 4) Acquire current immunizations, 5) Eat a balanced diet and avoid undercooked meats 6) Initiate vitamin therapy (folic acid 0.4mg), 7) Avoid or decrease caffeine intake, 8) Consult regarding prescription medications and herbals, 9) Avoid hot tubs and saunas and 10) Avoid emptying a cat litter box. Referrals and consultations should be implemented for genetic, substance abuse and nutritional counseling. Social services should be contacted for assistance programs and domestic violence intervention. Follow-up includes referral to an obstetrician or midwife if pregnancy occurs. If pregnancy does not occur within one year, referral for further evaluation is necessary (Hawkins et al., 2000).

Although preconception care has the potential to positively impact a woman's overall health and the health of future children, research has shown that primary care physicians are not providing adequate preconception care (Conway, Tzyy-Chn, Mason and Mueller, 1991; Jack, Culpepper, Babcock, Kogan and Weismiller, 1998). Nurse practitioners in the primary care setting are in a unique position to provide preconception care to women. One factor that impacts the provision of preconception care is the motivation of the provider to give care and the client to seek it (Jack et al., 1998).

Reynolds (1998) noted that preconception care has the potential to decrease unintended pregnancy and reduce the probability of fetal damage during organ development. Likewise, a survey by Adams, Bruce, Schulman, Kendrick and Brogan

(1993) suggested that planned pregnancies had a lower risk of adverse pregnancy outcomes. Preconception health care may reduce the number of unintended pregnancies by educating women about the benefits of preparing for pregnancy in advance. PCC addresses knowledge deficits that may exist concerning maternal health and optimum birth outcomes. PCC should be an integral component of primary care services (Public Health Service, 1989).

Research has shown PCC to be cost-effective for certain medical conditions that increase the risk of congenital anomalies. Preconception health care for women with chronic illnesses such as diabetes and hypertension are cost-effective primarily due to the high cost of neonatal intensive care. Health care that is based on prevention is cost-effective and increases the health of mother and child. Preventative health care improves the quality of life by reducing morbidity and mortality.

Fetal Alcohol Syndrome, low birth weight and neural tube defects are examples of birth conditions that are considered preventable (Public Health Service, 1990; Public Health Service 2000). Research in the area of maternal and infant health has improved our understanding of factors that impact fetal health. A recent impetus for preconception care has been the link between folic acid supplementation and neural tube defects. Folic acid supplementation has been shown to decrease the rate of neural tube defects such as Spina bifida and anencephaly by 50-70% (March of Dimes, 1999). In order to receive full protective benefit, a daily multivitamin containing 0.4mg of folic acid should be consumed for at least three months prior to conception and throughout the first trimester. Even if a woman is not currently planning on becoming pregnant, it is recommended that she take

folic acid supplements because half of all pregnancies are unplanned (Reynolds, 1998; Public Health Service, 2000).

Cigarette smoking intervention prior to pregnancy can improve a newborn's health. Smoking while pregnant is harmful to the fetus and increases the chance of low birth weight and preterm delivery. The effects of smoking continue to have a negative impact on infants and children, as the exposure to cigarette smoke increases the risk of SIDS, asthma, upper respiratory infections, pneumonia and bronchitis. Approximately 25% of women in the United States are cigarette smokers when they learn of their pregnancy (Zapka, Pbert, Stoddard, Ockene, Goins and Bonollo, 2000). The majority of these women continue to smoke throughout pregnancy. Although some smoking cessation interventions have been successful, most women (66%) relapse by six months postpartum (Zapka et al., 2000). Cessation efforts must continually be promoted throughout infancy to prevent relapse. Current data suggests that smoking cessation intervention is cost-effective compared to the medical costs of caring for low birth weight infants (Institute of Medicine, 1995).

The extension of prenatal care into routine care for women of childbearing age was proposed by the United States Public Health Service in a 1989 report Caring for Our Future: The Content of Prenatal Care. The Expert Panel Report recommended that primary care providers counsel women in their reproductive years regarding high risk behaviors. For example, low birth weight is associated with alcohol and tobacco consumption (Institute of Medicine, 1995). Although federal advisories have recommended abstinence from alcohol during pregnancy since 1981, many physicians

(75% in one survey) were not convinced that total abstinence was necessary during pregnancy (Diekman, Floyd, Decoufle, Schulkin, Ebrahim, and Sokol, 2000).

The differences between physician practices and federal guidelines suggest a need for improved dialogue between the public and private sectors (Diekman et al., 2000).

A survey of obstetrician-gynecologists by Power, Holzman and Schulkin (2000) revealed that less than half of the physicians screened for folate intake of female patients of childbearing age. Only one-third screened pregnant patients for folate intake, although nearly all respondents were aware of the value of folic acid in preventing neural tube defects. The practice of preconception care varied greatly among obstetrician-gynecologists and was not in accordance with the recommendations of the Public Health Service.

In 1990, the United States Public Health Service published a set of objectives for increasing maternal care and decreasing the infant mortality rate. A priority in maternal and infant health was to increase to 60% the proportion of primary health care providers who provide age-appropriate preconception care and counseling (Public Health Service, 1990). Unfortunately, data were not available to determine if preconception care and counseling goals were achieved. The Public Health Service's agenda for this decade, Healthy People 2010, restated the need for preconception care, placing particular emphasis on the risks associated with alcohol, tobacco and illegal substance consumption. Preconception screening and counseling should be offered in the primary care setting in order to mitigate pregnancy risks (Public Health Service, 2000).

The adoption of preconception care practices by physicians has been slow. Studies have shown that adherence to the Expert Panel's recommendations is low, as are the frequency of preconception counseling on alcohol and tobacco consumption, use of illicit drugs and adequate nutrition (Peoples-Shep, Hogan, and Ng'andu, 1996). Research has revealed that primary care physicians do not provide preconception care according to the recommendations of the Public Health Service (Barron, Ganong and Brown, 1987; Conway et al., 1995). Furthermore, numerous barriers exist in the delivery of preconception care including limited time, inadequate training and lack of reimbursement (Conway et al., 1995).

The American College of Obstetricians and Gynecologist (ACOG) is the accepted authority on prenatal care. Prenatal care has been accepted as an integral part of well woman care since 1959 when ACOG published Standards for Obstetric-Gynecologic Services. Routine care during pregnancy reduced poor birth outcomes and infant mortality. ACOG standards according to Guidelines for Women's Health Care (ACOG, 1996) differ from recommendations by the United States Public Health Service (1989; 1990). ACOG standards state that preconception care should be offered to women with specific health concerns or those planning pregnancy. However, the Public Health Service's recommendations specifically state that all women of childbearing age should be offered preconception care. Differences in recommendations have resulted in various standards of care being provided to different segments of the population. According to Damus, Freda and Merkatz (1993) women that receive prenatal care from a Public Health Department are generally provided more counseling than women at private clinics.

ACOG in agreement with other government and nongovernment agencies recommends that women of childbearing age consume 400 micrograms of folic acid daily. Since January 1998, the U. S. Food and Drug Administration has mandated that grain products be enriched with 140 micrograms of folic acid per 100 grams food product. There are few adverse effects associated with folic acid supplementation.

Most primary care providers would agree that preconception care is beneficial, yet the practice remains minimal. Conflicting guidelines and adherence to more traditional standards which address health education needs at the first prenatal visit are two factors that may account for variation in the delivery of PCC. The Public Health Service has promoted preconception care for all women of childbearing age since 1989. Providing preventative health care to all citizens is beneficial to society. It is cost-effective and promotes the wellness of women and their families. Nurse practitioners must take advantage of opportunities to make a positive difference in the health of their clients and the delivery of health care.

Significance to Nursing

Preconception health care has been recommended by the United States Public Health Service since 1989 (Public Health Service Expert Panel, 1989). Nurse practitioners as providers of preventive care have an ethical responsibility to deliver quality client care. Clinical practices that reflect the recommendations of the Public Health Service are in the best interests of the client and the nursing profession.

Few scholarly articles address the nurse practitioner as a provider of preconception health care. Most research has focused on obstetricians and family practice physicians.

However, several studies have revealed that nurse practitioners provide a level of care which is on par with physicians and is more thorough than the care provided by physicians (Kennedy, 2001; Zapka et al., 2000; Baldwin, Raine, Jenkins, Hart and Rosenblatt, 1994).

The intention of the research was to elicit the clinical practices in regard to preconception care of nurse practitioners in the primary care setting and to provide insight into the level of care that was provided. The results of the research may serve as a primary resource for other studies on preconception care practices of nurse practitioners and may generate increased awareness of the importance of PCC. Providing prevention-based care as recommended by the Public Health Service increases the quality of practitioners' services.

The research was guided by Nola Pender's Health Promotion Model. Pender (1987) was concerned with the factors that influence a person to make behavioral changes which promote health. Nurse practitioners in the primary care setting must take advantage of all opportunities to counsel clients about preconception care. The nurse practitioner assists with health-promoting behavior through intervention and client empowerment. The client is ultimately responsible for making health decisions and behavior changes that will influence health and well-being.

Nurse practitioners often encounter women that would benefit from counseling on pregnancy preparation, therefore it is important that preconception care practices be a component of nursing curricula. Education is the key to awareness of the positive benefits of preconception health care. Health care professionals that are cognizant of the

benefits of PCC are able to participate more fully in promoting the health of clients and the community.

The nurse practitioner is the educator/counselor to the client. Nurse practitioners must be aware of their client's educational level in order to communicate effectively. Many women lack education about pregnancy and are not aware of the effects certain behaviors have on pregnancy and birth outcomes. Through education and counseling strategies, the nurse practitioner can build trust with the client and thereby, increase the chance that positive health behaviors will be adopted.

Theoretical Framework

Nola Pender's health promotion model served as the theoretical framework for the research. Pender's health promotion model is closely aligned with the precepts of preconception health care. The Health Promotion model identifies concepts relevant to promoting health behaviors. The model contains the interrelations of cognitive, social, behavioral, environmental, and situational factors which impact the adoption of health promoting behaviors. An individual's characteristics and experiences impact one's behavior-specific cognitions, which in turn impact commitment to a plan of action for health promoting behaviors. Health promoting behaviors may be adopted at any point in the model, however, commitment to a plan of action directly impacts health promoting behavior. Immediate competing demands and preferences also influence health behavior (Pender, 2000).

The promotion of health is an important nursing function. Nurse practitioners are responsible for providing health promotion in the clinic setting where primary

interventions improve the health of individuals and families. Preconception care is a preventative health care approach to well woman care. Nurses provide guidance in health promotion to individuals, families and communities due to their frequent ongoing client contact. The nurse is also responsible for being a role model for health promotion. Although Pender specifically addresses the role of the nurse in health promotion, nurse practitioners are included in later books and articles (Pender, 2000).

Health is an individual and a social responsibility. Pender notes that her proactive model of health promotion is in line with national goals of the United States Public Health Service. Preconception health care is a component of the national prevention objectives in Healthy People 2010 (Public Health Service, 2000). Health promotion is a key component of preconception care. The promotion of a woman's health before pregnancy may result in the prevention of many adverse neonatal conditions.

Pender's beliefs concerning health promotion are congruous with the ideals and goals of preconception health care.

Preconception health care is focused on the promotion of health and the prevention of disease. A comprehensive approach to health promotion incorporates the environmental, cultural and social conditions of the individual. PCC incorporates health promotion into routine clinic visits. By identifying environmental, social and cultural risk factors of pregnancy, appropriate interventions are provided to ameliorate the risks. The nurse practitioner offers anticipatory guidance and counseling to motivate the client to make beneficial health behavior changes. In alignment with Pender's model, the nurse practitioner is responsible for developing an individualized care regimen with the client.

The one-on-one nature of education and counseling assists and motivates client commitment to a health promotion plan. The health care provider gives the client current scientific information to assist decision-making regarding healthy behaviors. Motivation is critical in the initiation and maintenance of health promoting behaviors. Ultimately, the client must take responsibility for her health.

Pender's model also identifies modifying factors that may serve as barriers to the adoption of healthy behaviors. Modifying factors include demographic characteristics (age, race, sex), biological factors (genetics), interpersonal influences (support of family), situational factors (sick child) and behavioral factors (personality). These modifying factors are cues that influence a client's engagement in health-promoting behavior. The health promotion model directs the health care provider to assess the whole client when establishing health-promotion goals.

Assumptions

For the purpose of the study, the following assumptions were made:

1. Preconception health care improves the health of women by identifying health risks and providing appropriate interventions.
2. The individual has a drive toward health, a positive high-level state (Pender, 1987).
3. The identification of health risks can lead to health promoting behavior and increased well-being. (Pender, 1987).

Statement of the Problem

Preconception care has the potential to positively impact a woman's overall health and the health of her children. Pregnancy outcomes can be adversely affected by events

that occur during early pregnancy when organogenesis occurs. Often a woman may not be aware of pregnancy during this stage of fetal development. Preconception care provides counseling and specific health interventions to maximize the health of mother and infant. Health care prior to pregnancy has the potential to reduce the incidence of birth defects and low birth weight. Research suggests that primary care physicians are not providing adequate preconception care (Conway et al., 1995). Nurse practitioners in the primary care setting frequently encounter clients that could benefit from preconception care and counseling. Limited literature exists that addresses the nurse practitioner as provider of preconception care.

Research Question

This study was guided by one research question. What are the preconception health care practices of nurse practitioners in the primary care setting?

Definition of Terms

For the purpose of the study, the following four terms were defined:

1. Preconception health care practices

Theoretical: Physical assessment and counseling that addresses a woman's medical and family history, current medications, nutritional status and environmental factors of home and work. This assessment will allow a woman the opportunity to evaluate her health and make beneficial changes. Culpepper et al. (1990) defined preconception health care as "an organized, comprehensive program that identifies and reduces women's reproductive risks before conception" (p.1147).

Operational: Preconception health care is the physical assessment and counseling practices that focus on a woman's health prior to pregnancy in order to promote positive birth outcomes. Preconception health care includes counseling for complications of pregnancy and birth defects, rubella immunity, appropriate body weight, health risks of toxoplasmosis, healthy diet, folic acid supplementation, abstaining from alcohol, importance of exercise, smoking cessation and screening for drug abuse.

2. Nurse Practitioners

Theoretical: "a registered nurse with advanced academic and clinical experience which enables him or her to diagnose and manage most common and many chronic illnesses, either independently or as part of a health care team. A nurse practitioner provides some care previously offered only by physicians and in most states has the ability to prescribe medications. Working in collaboration with a physician, a nurse practitioner provides high quality and cost effective individualized care" (American College of Nurse Practitioners, 2000, p.1).

Operational: a registered nurse in the state whose name appears on the Board of Nursing's list of nurse practitioners that are currently certified as a family, adult, women's health or nurse midwife practitioner and provide care in a primary setting.

3. Primary care setting

Theoretical: outpatient or community clinic where basic level of accessible, comprehensive, coordinated, continuous and accountable healthcare is provided that emphasizes the client's general health needs (Hickey, Ouimette and Venegoni, 1996).

Operational: the outpatient or community clinic where basic level of accessible,

comprehensive, coordinated, continuous and accountable healthcare is provided by nurse practitioners who respond to the Women's Health Care Survey.

Summary

The prevention of suffering and disease is an important component of nursing. Improving the health of a woman prior to conception, increases the chances for a healthy pregnancy and delivery. Preconception care affords a woman the opportunity to evaluate her health and partake in health promotion interventions. Such care has the potential to reduce infant mortality and morbidity, resulting in a reduction in dollars spent on tertiary and secondary care of infants with adverse conditions. Surveying the preconception health care practices of nurse practitioners may elicit information on the standards of practice in current use and may highlight areas for improvement.

Chapter II

Review of Literature

Since 1989, numerous studies on preconception care have been conducted. This literature review provides a look at the present state of preconception care provided in the United States. The majority of research articles addressed the delivery of preconception care by physicians. Few studies directly addressed nurse practitioners as providers of preconception care. This chapter provided a basis for evaluating preconception care practices of nurse practitioners.

The United States Public Health Service has recognized preconception care to be a vital component of health promotion and disease prevention. The Public Health Service's Expert Panel on the Content of Prenatal Care (1989) suggested that preconception care be provided to women at the time of a negative pregnancy test. Many perinatal risk factors can be identified in the primary care setting where medical and educational interventions can be implemented. However, it is not known if such identification leads to appropriate treatment and improved pregnancy outcomes. Jack et al. (1998) sought to determine if preconception risk assessment at the time of a negative pregnancy test leads to effective interventions by primary care physicians to lower a woman's risks.

A randomized controlled trial at the Department of Family Medicine at Brown University was conducted to evaluate physicians' clinical intervention for women with existing preconception risks. Over a two year period, one hundred seventy participants

who had received negative pregnancy tests were enrolled in the study. The participants were randomized (based on the flip of a coin) to either a usual care group (control) or an intervention group. The physicians and the women in the intervention group were notified about identified pregnancy risks. Participants randomized to the usual care group received no information. Chart review and telephone interviews were used to assess the care that each woman received in relation to their risk factors (Jack et al., 1998).

The intervention and control groups were given the Preconception Risk Survey, a screening instrument to assess readiness for pregnancy and identify psychosocial and medical risks. This survey information was supplemented with questions regarding social support, depression and alcoholism. An appointment with a primary care physician was provided for all women, however, the intervention group was given a brochure explaining pregnancy risks. The primary care physicians were informed of the women's identified risks and the need for intervention and counseling. Chart audits and phone interviews were conducted to determine if risks were identified and treated.

Both groups were of similar composition for demographic factors and distribution of specific health risks. The majority (76) of the subjects had five to nine risk factors identified representing 36.55% of the total risks. Subgroup analysis revealed that there were few differences in the proportion of risks addressed. Risks most likely to be addressed were cigarette smoking, sexually transmitted diseases, family planning and nutritional factors. Factors not likely to be addressed were HIV infection, genetic risks, drug abuse and barriers to medical care. Informing women and their primary care providers about specific risks did not increase the number of women receiving risk

interventions. Only 18%-48% of women with an identified risk had that risk addressed during the first health care visit. For 78% of the subjects, at least one risk was addressed by their physician during the year following the negative pregnancy test.

Jack et al., (1998) explained the lack of preconception care as: 1) the primary care provider did not see value in the intervention (due to doubt that a risk existed or that a behavior would be changed), 2) physicians were not prepared to provide preconception care, and 3) competing demands regarding physician time and resources. Several factors which may have contributed to the minimum difference between the control group and the intervention group: 1) under and over reporting of risks by the women, 2) under reporting of interventions by physicians due to the risk having been previously identified or not recorded, 3) cross contamination may have occurred between groups since the same physicians were caring for both and 4) the women in the usual care group may have been sensitized to the risks of pregnancy due to the assessment process (Jack et al., 1989).

The research concluded that physicians are not providing a full array of preconception risk interventions during routine office visits scheduled for that purpose. Development of office protocols for preconception health care may help promote risk identification and intervention.

Conway, Tzyy-Chyn, Mason & Mueller (1995) questioned if primary care residents are adequately prepared to provide preconception care. Preconception care has the potential to reduce infant mortality supporting the need that preconception care be an integral part of residency programs for primary care and internal medicine. Conway et al. (1995) were concerned that women of childbearing age were not provided adequate

preconception care by primary care doctors secondary to reduced emphasis in residency programs.

The researchers sought to “assess and compare the attitudes, knowledge and management skills of internal medicine and family practice residents in caring for women of reproductive age” (Conway et al., 1995, p. 67). They hypothesized that family practice residents would provide preconception care more often than internal medicine residents. The study emphasized behavior modification and health promotion for women of reproductive age. Particular attention was focused on hypertension and diabetic care. Social and environmental issues that affect pregnancy were not addressed.

A large inner-city public teaching hospital was chosen as the setting. A convenience sample was drawn from residents in internal medicine and family practice programs. The residents were given a self-administered questionnaire and participation in the study was voluntary. The questionnaires were administered at the resident work sites and completion was monitored. A total of 143 residents completed the survey with an overwhelming majority being in internal medicine.

The instrument was developed based on recommendations for preconception care derived by the U.S. Preventive Services Task Force, the American College of Obstetricians and the U.S. Public Health Service Expert Panel. Questions focused on knowledge, decisions and attitudes when treating women of reproductive age prior to pregnancy. The questionnaires also had a minor theme of care for women with newly diagnosed pregnancy. The content was evaluated by a panel of attending physicians. Content validity was very high with scores of 1.00 for the knowledge scale, 0.97 for the

management scale and 0.89 for the attitude scale. Construct validity was not assessed due to the small sample size. A descriptive summary analysis was performed.

Demographic analysis revealed that 75% of the 115 internal medicine respondents were male and had graduated from medical school more than five years previously. Family practice residents tended to be female (58%) and were likely to have completed medical school less than five years previously. The median age for both groups was 30. Researchers compared scores on knowledge and found that family practice residents' scores were slightly higher than internal practice residents with median scores of 8.5 and 5.0, respectively, out of a total 18.0 points. Family practice residents scored higher in knowledge at year two ($p=0.0379$) but not in year one or three. The knowledge scores overall were considered low. Management scores for both groups were low with family practice residents scoring 7.0 and internal medicine residents scoring 6.0 out of a total of 14.0. Attitudes toward preconception care were overall positive with family practice scores being significantly higher for post graduate year one ($p=0.0076$), year two ($p=.0038$) and year three ($p=0.0003$). Overall, both groups had a low number of correct responses to knowledge questions about preconception care and newly diagnosed pregnancy. Both groups missed the majority of management questions on risk reduction, health promotion and medication use in the preconception period or early pregnancy. When accounting for resident's clinical experiences, rotation through a high risk prenatal clinic increased all scores (knowledge, management and attitude) for both groups of residents, except for the attitude scores for family practice. Rotation through the high-risk clinic did not create a statistically significant difference between the knowledge,

management or attitude scores of internal medicine and family practice. There was no statistical improvement on scores in knowledge, management or attitude as residents advanced through their internships.

The overall low scores suggest that primary care residents may not have been adequately trained in the care of women of reproductive age. The residents failed to address family planning, safer sex, sexually transmitted diseases or rubella immunization. The original hypothesis that family care residents would perform better than internal medicine residents was not supported. Family practice residents scored better only in their attitude toward preconception care. There was a significant knowledge difference for the second year of residency with the family practice group performing better, however, this improvement was not seen in the third year. There was no clear-cut significant improvement as residents advanced through their respective programs. Both groups did display attitudes that reflected the importance of preconception and early prenatal care.

Preconception and early pregnancy care are important aspects of preventive care. Such care holds the keys to reducing infant mortality and morbidity. Primary care providers should be trained to prevent the preventable. The study by Conway et al. (1995) concluded that residency training programs need improvement and recommended further research in teaching and in delivery of preconception care.

Barron, Ganong and Brown (1987) examined preconception health teaching of nurse practitioners. As nurses, these researchers were concerned that preconception care was not being extended to all women of reproductive age. As noted by Barron et al. (1987), primary care providers tend to limit preconception care to women with specific

health problems, even though the benefits of PCC have been demonstrated by numerous researchers.

The purpose of Barron et al.'s (1987) study was to investigate the preconception self care practices taught by nurse practitioners to female clients of childbearing age as part of routine healthcare visits. The investigators prepared a model for preconception counseling called PREPARED: P for physical data, age, weight, and height, R for reproductive history, pelvic exam, and review of menstrual cycle, E for exercise, P for past medical history, immunizations and dental care, A for alcohol, smoking and drug use, R for relatives (family history), E for environment, and D for diet and vitamins. The PREPARED model was based on research that identified risks to pregnancy. The model facilitates the health care provider by serving as a reminder for key points of preventive preconception education.

The sample was comprised of fifteen nurse practitioners that practiced in a setting where they routinely cared for women at risk for pregnancy. Names were obtained from lists from the primary care special interest group of the St. Louis, Missouri Nurses Association. Subjects were informed of the topic, preconception health teaching, and nature of the study by telephone. Thirty minute interviews were scheduled at the practitioner's convenience.

The intent of the study was to elicit information that practitioners provide to most clients. An audiotape was made of a client presenting to a nurse practitioner with a common health problem and social behaviors found in the general population. The client had an uncomplicated reproductive and medical history, smoked cigarettes (half

pack/day), had questionable calcium intake, occasional alcohol use and body weight ten pounds above ideal. The study participants were individually interviewed at their home or office. The participants were given an anecdotal record of the client and were given the two questions that would be asked at the end of the interview. The study participants listened to the audiotape of a nurse practitioner interviewing the client. The participants were asked if they needed more information on the client and what information they would provide to the client. The interviews were tape recorded.

From the PREPARED model, twelve teaching categories were derived: nutrition, smoking, preconception weight, alcohol use, menstrual cycle review, drug use, exercise, vitamin intake, environmental hazards, dental care, immunizations and other. The taped interview responses were categorized by these topics. Reliability of the categories was established and differences in classification were resolved through discussion. Nutrition (87%) and smoking (80%) were the most frequently addressed topics. Approximately half of the participants discussed preconception weight, alcohol use, menstrual cycle review and other health related topics. Roughly, one-third addressed drug use and exercise. Vitamin intake, environmental hazards, dental care and immunizations were rarely or never addressed. Chi-squared analysis indicated a significant lack of teaching when compared to the PREPARED model categories. Half of the participants requested more information concerning the client's reproductive and family history.

Barron et al. (1987) provided plausible explanations for the participant's low scores. The high frequency of responses related to nutrition and smoking was not surprising to the researchers since this topic is frequently addressed in other care settings.

The practitioner's response level to alcohol use (53%) was unexpectedly low. Mild fetal alcohol syndrome can be induced by the consumption of two drinks daily in early pregnancy. The study participants may have assumed that the stimulus client did not need counseling for alcohol use since she drank occasionally, not daily. Preconception weight may have been addressed to a lesser degree since the client was only ten pounds overweight. The lack of menstrual cycle review by half of the participants is low, since fertility awareness is important for the client that is preparing for pregnancy.

The responses for drug intervention were low. This reflected either a lack of awareness of drug usage during pregnancy or the tendency to discuss drug use after conception. Although exercise has numerous beneficial effects, only one-third of the practitioners commented on exercise. One explanation may be that exercise has traditionally focused on relieving pregnancy discomfort and was not considered part of preconception teaching. Only one practitioner stated that vitamin use should be addressed. This sample of nurse practitioners may not have known about the research by Smithells et al. (1983) that indicated folic acid supplementation during the perinatal period reduced the incidence of neural tube defects. The lack of responses concerning immunizations and dental care may reflect traditional thinking that these areas are part of the prenatal consultation. It was expected that nurse practitioners would discuss obvious environmental dangers such as radiation exposure and cat litter but there were no responses to this category (Barron et al., 1987).

An obvious trend was revealed when responses were compared to the client interview. The most frequently discussed areas were the same areas mentioned during the

interview. If a topic was not mentioned in the client interview, the nurse practitioners tended not to address it. One explanation for this may be that obstetrical health teaching has not expanded into the preconception period. A number of subjects thought the idea of teaching the client before pregnancy was unusual.

Barron et al.(1987) concluded that nurse practitioners failed to address several critical preconception health concerns. The researchers also noted that many opportunities for preconception health teaching are probably overlooked. This study demonstrated the need to determine the routine clinical practices of nurse practitioners in the arena of preconception health care. As promoters of preventive care, nurse practitioners must be aware of the need to address preconception health with all women of childbearing age.

Power, Holzman and Schulkin (2000) sought to assess obstetrician-gynecologists' knowledge level and clinical practices concerning folic acid. Folic acid, a water-soluble B vitamin, is found in green leafy vegetables, fortified foods and vitamin supplements. Controlled studies have shown that daily folic acid supplementation by women of childbearing age can reduce the incidence of having an infant born with a neural tube defect by 50-70%. Approximately 4,000 pregnancies a year are affected by a neural tube defect. Unfortunately, folic acid supplementation by women of childbearing age is significantly below the daily average allowance. Many women are unaware of the link between folic acid and neural tube defects. Increasing the knowledge of physicians and the public would improve health and reduce medical costs.

In 1999, Power et al. mailed questionnaires (1,030) to American College of Obstetricians and Gynecologists (ACOG) Fellows. The experimental group was composed of the Collaborative Ambulatory Research Network, two hundred and thirty obstetrician-gynecologists that volunteer to participate in research surveys. Eight hundred questionnaires were sent to non-Network ACOG Fellows. The non-Network Fellows were selected by computer at random and were over sampled to ensure that the group is representative of ACOG. A follow-up mailing was sent to all nonrespondents six weeks after the initial mailing. The survey consisted of multiple choice questions focused on assessment of physician's practices and knowledge level about nutrition during pregnancy. Demographics, opinions and education were also elicited.

Four hundred eighty-eight surveys were returned reflecting a response rate of 47%. The response rate was greater from the Research Network Fellows (176) than from the control group of ACOG Fellows. Over half (58%) of the respondents were male. The mean age was 45.6 and males were significantly older than females. Gender was a significant factor for one question and Network affiliation was not found to be significant.

Eighty-five percent of the physicians responded that they or a staff member routinely counseled pregnant patients about diet. Approximately three-fourths of the respondents thought that diet counseling would result in better patient health and two-thirds believed it would result in better pregnancy outcomes. Sixty-six percent of respondents screened pregnant patients for folate intake and 53% screened nonpregnant patients of childbearing age. Most screened pregnant patients for folate intake by

interview (59%) with less than 5% utilizing questionnaires or blood tests. These results were not influenced by the respondents age or sex.

Physicians that screened patients for folate intake were more likely to counsel about nutrition and were more likely to believe that nutritional counseling would improve patient health and pregnancy outcomes. These physicians also answered more of the knowledge questions correctly. Most (90%) were aware that folic acid deficiency could lead to macrocytic anemia, however, few (20%) were aware of possible manifestations of maternal folate deficiency or that folate deficiency increases serum homocysteine levels. The majority of respondents were aware that alcoholics (91%), smokers (61%), and lactating women (53%) were at increased risk of folate deficiency. Males in the sample demonstrated more awareness than the females in regard to the link between smoking and folate deficiency.

Nearly all respondents were aware of the protective value of folic acid supplementation in preventing neural tube defects when folic acid supplementation is begun prior to conception and continued during the first trimester. Only 23% were aware that folic acid supplementation was also protective against miscarriage.

The results revealed that obstetrician-gynecologists are aware of the link between folate and neural tube defects but are less knowledgeable about folate metabolism. However, this increased awareness did not translate into increased screening of patients for folic acid intake or counseling about nutrition.

Adams, Bruce, Shulman, Kendrick and Brogan (1993) defined preconception care as "consultation and counseling provided by a health professional that occurs shortly

before a couple attempts conception" (p. 955). As advocates of preconception care, these researchers sought to determine the percent of women that could benefit from one or more preconception interventions. Four interventions recognized as influencing pregnancy outcome were evaluated: alcohol consumption, cigarette smoking, inadequate weight and delayed initiation of prenatal care.

A population-based study of 12,452 mothers in four states questioned their preconception behaviors and family planning. Mothers were chosen from the Pregnancy Risk Assessment Monitoring System (PRAMS) database in four states. Demographic information was gathered from birth certificates and questionnaires. Mothers were mailed a ten page questionnaire three to six months post delivery. Repeat mailings and administration of questionnaires by phone were methods of follow-up.

Statistical analysis included logistic regression to evaluate associations, point estimates, standard errors for population variables and F tests to compute values for model testing. For logistic regressions, women were divided into three groups: planned, mistimed and unwanted. Separate sets of logistic regressions were performed for each group. Each demographic variable received an F test. Models of the relation between demographic variables and maternal behaviors of alcohol consumption, smoking and body mass index were computed.

The survey return rate was 77% or 9,535 respondents. Sixty percent of the mothers reported that the pregnancy was planned, 30% were mistimed and 10% were unwanted pregnancies. Planned pregnancies were greatest among women that were identified as having a lower risk for adverse pregnancy outcomes. Planned pregnancies

were highest among women with more than twelve years education and lower with less education. Logistic regression comparing women with planned pregnancies to those with unwanted pregnancies showed certain significant associations. Being ages 20-29, white or “other” racial category, married, more educated and nonsmoker categories had fewer unwanted pregnancies.

Only mothers who had planned their pregnancies and had at least one of four risk factors (nicotine use, alcohol use, underweight or delayed prenatal care) were candidates for preconception counseling in this study. Approximately one-third of the mothers sought early prenatal care, did not smoke or drink more than three drinks per week and were not underweight (ie. no risk factors). Another third had one or more risk factors but did not plan their pregnancies. The majority of mothers (62%) did not have an indication for preconception counseling based on the limited number of preconception risks used to identify need. The remaining 38% of the sample could have benefited from such intervention. Women with the greatest number of demographic and behavioral characteristics associated with adverse pregnancy outcomes were most likely to have unintended pregnancies and be without preconception care.

Diekman, Floyd, Decoufle, Schulkin, Ebrahim, Sokol (2000) assessed the knowledge, attitudes, current clinical practices and educational shortcomings of obstetrician-gynecologists regarding patient’s alcohol use during pregnancy. Prenatal visits are an important time to identify, counsel and refer women to appropriate treatment services. Physician advice is an important influence in a woman's decision to decrease substance abuse. Physician's beliefs and perceptions often determine whether certain

health problems are identified and managed . The American College of Obstetricians and Gynecologists advises that pregnant women should be questioned at their first prenatal visit about alcohol use. ACOG also recommends the use of T-ACE (Tolerance-Annoyed, Cut down, Eye opener) to screen for alcohol use.

Of 1,000 physicians sampled, 604 completed questionnaires (60% return rate). The questionnaire consisted of 20 multiple choice and Likert scale items. Survey questions included alcohol screening practices, opinions on thresholds for prenatal alcohol use, counseling and referral practices, perceived barriers to alcohol assessment and need for assessment training. Demographic and workplace questions were included in the survey.

Descriptive statistics were utilized to describe knowledge, attitudes, clinical practices and educational needs. Some questions were combined to yield category-specific information and some percentages were pooled. Standard statistical techniques were used to adjust for differences due to gender and year of medical school graduation. Chi squared tests were used to determine differences in categorical data. A *P* value $<.05$ was statistically significant in all analyses.

The respondent's median age was 41, with male physicians' average age being older than female physicians'. Sixty percent of the respondents were male. The median year of medical school graduation was 1984. Fifty-one percent of the sample was in group private practice, 21% were in solo practice and 28% were in salaried positions.

The first documented clinical reports of fetal alcohol syndrome occurred in 1973 and warning labels have appeared on alcohol products since 1990. The increased

awareness of fetal alcohol syndrome was reflected in differences among providers according to year of medical school graduation. Graduates prior to 1990 were significantly more likely to consider higher amounts of alcohol consumption to be without risks and were less likely to use an alcohol screening questionnaire. Later graduates were more likely to discuss adverse effects and advise abstinence or reduction in consumption. Graduation prior to 1973 resulted in a significantly lower knowledge level concerning drinking level risks and adverse outcomes.

Most physicians (97%) reported asking pregnant patients about alcohol usage. Forty-eight percent personally obtained the information, 41% utilized non physician staff and 19% utilized self-administered questionnaires. Almost one-fourth used a standardized alcohol screening questionnaire.

Ninety percent of the respondents questioned pregnant patients further about the extent of alcohol use when it was reported, however, only 50% advised and educated about consequences of drinking during pregnancy. Thirty-six percent provided counseling to current or suspected drinkers. Only 25% reported that pregnant women should abstain from alcohol. Although male respondents were more likely to believe in complete abstinence during pregnancy, male respondents were less likely to advise abstinence and have referral sources when patients reported moderate alcohol use. Ninety-six percent felt that they were somewhat to very prepared to assess alcohol use. In contrast, 27% felt that their medical school training was inadequate. Preparation and adequate medical training were associated with the use of an alcohol screening questionnaire.

Barriers to assessment of alcohol use included lack of time, patient sensitivity, need for additional training/ information, lack of referral sources and lack of reimbursement by insurance providers. Advance training in assessment, counseling, additional information on alcohol levels and adverse pregnancy outcomes were cited as necessary for improving clinical skills.

Cigarette smoking during pregnancy is harmful to the fetus, increasing the chance of low birth weight and preterm birth. Smoking increases the child's risk of Sudden Infant Death Syndrome, asthma, upper respiratory infections, pneumonia and bronchitis. Zapka, Pbert, Stoddard, Ockene, Goins and Bonollo (2000) sought to assess providers' smoking cessation counseling with low-income pregnant and postpartum women at community health centers. The study was part of a trial to test multicomponent intervention. Obstetric and pediatric clinicians and Women, Infants and Children (WIC) staff at six community health centers completed surveys that assessed intervention practices, knowledge, attitudes and organization facilitators. One hundred seventy-one (69%) clinicians and staff completed surveys. Performance factors were measured with analysis of variance and regression analysis.

The survey instrument was based on empirical evidence, theoretical models and research. Survey items related to provider counseling were based on the National Cancer Institute's four A's of smoking cessation counseling: Ask, Advise, Assist, Arrange. The instrument contained 15 items (some multipart) plus 10 demographic items. The dependent measure in these analyses was a composite score of the provider's self-reported smoking intervention practices.

Variables thought to affect performance were based on social cognitive theory and organizational theory. These variables included knowledge, role perception, effectiveness of counseling, self efficacy, difficulty (barriers), priorities, provider motivation and organizational facilitators (work environment). Linear modeling techniques were utilized to relate factors associated with performance. The bivariate association of each factor was computed first. For categorical factors, mean performance in each category was computed by analysis of variance. For continuously scaled factors, regression of performance was computed and the slope coefficient was reported. Factors bivariately associated with performance were entered into an analysis of covariance to explore the independent associations with performance. Interaction effects of factors were tested for statistical significance and were retained if they were significant at the .05 level.

The mean age of respondents was 40 years (range 24-64). The mean number of hours spent in direct patient contact was 27. Performance scores differed significantly by clinic type. Prenatal clinic providers had the highest performance scores. Pediatric providers had the lowest, perhaps due to perceiving the child as the client (Zapka et al., 2000). Differences in scores were also found among provider type. Nurse practitioners and nutrition staff scored the highest scores. Non-Hispanic Black and White providers had significantly higher scores than Hispanic providers. Older provider age was significantly associated with higher test performance. Sex, multilingual ability, number of years employment, weekly hours of patient contact and community health center location did not have an influence on performance scores.

The knowledge level scores for all providers were fairly low. Providers viewed smoking intervention as an effective part of their role and were moderately confident in their abilities. Personal motivation was ranked high and intervention difficulty was ranked as medium to high.

Most providers (75%) agreed with the statement, "The mothers we see in our practice have so many other problems in their lives that stopping smoking is a very low priority for them" (Zapka et al., 2000, p.82). The majority of these providers (83%) felt that intervention was a high priority even though the women had many problems in their lives. Forty-three percent felt that women wanted their providers to provide smoking cessation counseling. Providers at WIC and prenatal clinics had higher overall performance scores than pediatric clinics. Greater knowledge, older age and provider's perception of the importance of counseling were significantly associated with higher test performance scores.

Performance scores reflected the need for improvement by all clinic program types. Prenatal clinic providers had the highest overall performance scores followed closely by the WIC staff. Physicians felt better prepared to counsel patients if they had attended training classes.

Nurse Practitioners and midwives had the highest performance scores of all provider types. Diekman et al. (2000) suggested that one reason for differences between types of providers may be the greater emphasis nursing programs place on patient education and counseling. Nurse practitioners may also have more contact and continuity with patients, therefore, facilitating counseling efforts. WIC scores may have been inflated

due to a computerized prompt to ask about smoking status. There were no prompts in the pediatric and prenatal settings.

Performance scores were high in areas of assessment and advice, but low for arranging support and discussion of nicotine replacement therapy. The researchers believed that training curricula should emphasize assistance and follow-up steps in order to increase patient success and decrease relapse.

Multivariate analysis provided rich insight into the independent factors that affect provider's practices. Of demographic characteristics assessed, only increasing age was significantly related to improved practice. Knowledge was significantly associated with performance. Providers with greater knowledge have likely received more training than those with lower knowledge scores. Increased knowledge of the connections between smoking and fetal damage may provide a greater impetus to provide counseling intervention.

This study demonstrated the need for provider training in smoking cessation intervention. Providers in the community health environment are missing opportunities to consistently promote patient health. Emphasis should be placed on providing assistance and follow-up, rather than strictly assessment and advice. Priority should be given to incorporate pediatricians into continuing smoking cessation efforts thus helping to prevent relapse during the postpartum period. The results of this study suggest that physician's practices fall short of national health care objectives (Zapka et al., 2000).

Pender, Walker, Sechrist and Frank-Stromberg (1990) evaluated the explanatory and predictive ability of Pender's Health Promotion Model (HPM) by evaluating

workplace health programs. Although many employers offer workplace health promotion programs, erratic participation and dropouts are common. The extent that participants engage in health promoting behaviors and the factors that determine continuation is important to employers and health care providers.

Historically, illness prevention models were based on the fear of disease as the primary motivation to adopt a healthy lifestyle. The Health Promotion Model focuses on achieving a healthy lifestyle without the threat of disease. The HPM is based on seven cognitive-perceptual factors that play a role in the adoption of a health promoting lifestyle. The purpose of Pender et al.'s (1990) study was twofold. Primarily, the study was a test of the usefulness of the multivariate HPM in explaining the occurrence of health promoting lifestyles among employees in workplace programs. The secondary purpose was to determine if the model was predictive of health promoting lifestyles.

Six Midwest companies participated in the study. A total of 589 employees participated and provided complete data. The majority of participants were male (54%), white (83%) and married (65%). The mean age was 38 years. One-half of the participants had college degrees. The most frequently occurring salary range was \$40,000 to \$60,000.

All cognitive-perceptual factors in the HPM, except benefits and barriers, were examined as explanatory or predictive variables of a health promoting lifestyle. The importance of health in relation to other life values such as happiness, wisdom and self-respect were measured by the ten-item Health Value Survey. A test-retest reliability of .92 was reported at four weeks. Perceived control of health was assessed with Forms

A and B of the Multidimensional Health Locus of Control Scales. The combined forms consisted of three 12-item scales with a six point Likert format. Since perceived self-efficacy is a behavior-specific belief, perceived personal competence was used to measure general behavioral skill. The Personal Competence Rating Scale consists of 8 items with a 6-point Likert response format to assess perceptions of competence. The definition of health was measured by the Laffery Health Conception Scale. It is comprised of 28 Likert items with four subscales of seven items, each measuring different views of health. Perceived health status was measured using a four-point response format ranging from poor to excellent.

Demographic characteristics assessed for this study were age, gender, marital status, education, income and ethnic/racial background. The behavioral factor of stage of exercise was either acquisition (less than 6 months) or maintenance (greater than 6 months), depending on the length of participation at the beginning of the study. The likelihood of engaging in health promoting behaviors was assessed by the Health Promoting Lifestyle Profile (HPLP). The HPLP is a 48 item instrument that consists of the self-actualization, health responsibility, exercise, nutrition, interpersonal support and stress management subscales. A four-point response item was used to determine frequency of each behavior. Following an explanation of the study, program participants signed consent forms and completed the test battery. The Health Promoting Lifestyle Instrument was administered again three months later.

Data from the six corporations were combined for analysis since participants did not vary significantly on measures of lifestyle, demographic or cognitive/perceptual

variables. Employees enrolled in workplace programs tended to score highest on self-actualization and exercise. They scored lowest on health responsibility and stress management. Lifestyle Profile, health responsibility, nutrition and stress management scores increased significantly from initial testing to retest. Self-actualization and interpersonal support scores did not change significantly over time. The exercise scale showed a significant decrease from initial testing. The reported decrease in exercise was substantiated by fitness program records of exercise frequency. This correlation provided validity to the HPLP self-report measure.

Correlations among the independent variables were examined to detect collinearity. Hierarchical multiple regression of initial health-promoting lifestyle against health-specific cognitive/perceptual variables, general cognitive/perceptual and modifying variables were performed to determine which variables in the model contributed to an explanation of health-promoting lifestyle. Four cognitive/perceptual variables and three modifying variables from HPM explained 31% of the variance in health-promoting lifestyle. Each variable made a statistically significant, $p < .05$, contribution to the regression equation. Study participants were likely to report healthy lifestyles if they believed the following: they were personally competent in dealing with life situations, rated their personal health status as high, expressed a belief that their health was not influenced by chance or fate and had a wellness-based definition of health. Perceived importance of health was not a contributing factor. The significant variables identified at initial testing and at three months were identical except for "believing health to be internally controlled" which emerged as a predictor of healthy lifestyle at three months (Pender et al., 1990, p. 329).

Canonical correlation was also used to test the extent to which the dimensions of a health-promoting lifestyle explained the variables of the HPM. Overall the relationships in canonical correlation paralleled the correlations found in multiple regression with the exception of "phase of exercise" (Pender et al., 1990, p. 329). Phase of exercise did not contribute to the explained variance in health-promoting lifestyle.

In this study, perceptions of health control, personal competence, definition of health and health status were identified as constructs of the HPM associated with health-promoting lifestyle behaviors among employees enrolled in work site wellness programs. Consistent findings among multiple regression and canonical correlation analyses of the variable relationships add strength to the conclusions of this study.

Perceptions of health as internally controlled rather than the result of luck or chance was associated with health-promoting lifestyles. However, the belief that powerful others influenced health was positively related to health promoting practices. Therefore, participation in workplace programs may reflect a reliance on others in the group to sustain healthy behaviors. Employees with a greater internal locus of control may pursue healthy behaviors independently.

Perceived personal competence as predictive of health promoting behavior was in agreement with other studies that point to the importance of viewing the self as competent. Interventions directed toward increasing the worker's sense of competence may contribute to motivation and skills needed to continue health promotion programs.

Defining health as wellness increased the extent to which healthy behaviors were adopted, whereas defining health as the absence of disease contributed nothing. The

results suggest that the desire for well-being may be a more effective motivator for healthy living than fear arousal based on future threats. Positive evaluation of personal health was also associated with a healthy lifestyle.

Valuing health was not a significant determinant of a health-promoting lifestyle. The modifying factors of gender, age and length of participation in a program contributed modestly to a health promoting lifestyle. As shown in other studies, women and older adults were more likely to exhibit desirable health behaviors. Employees with longer periods of participation in the program had healthier lifestyles.

Employees improved significantly in reported lifestyle in regard to responsibility for health, nutrition and stress management over a three month period. This improvement demonstrated the positive impact of workplace programs on health practices, however, the decrease in frequency of exercise over the same three month period highlighted the importance of incorporating physical fitness activities into a sustainable daily regimen.

Pender et al.'s (1990) study reinforces the need for nurse practitioners to provide health promotion intervention and counseling. Nursing interventions directed toward increasing a client's sense of competence greatly improves the likelihood that health promoting behaviors will be adopted and continue. Counseling interventions that define health as wellness, not simply as the absence of disease, also increase the extent to which healthy behaviors will be pursued. Instilling a desire for well-being is a more effective motivator for healthy living than the fear of future health threats.

Summary

This literature review documented the shortcomings of healthcare providers in the delivery of preconception care. Although preconception and early pregnancy care are key components to reducing infant mortality and morbidity, Conway et al. (1995) concluded that physician's performed poorly in providing preconception care. Jack et al. (1998) found that physicians often did not follow through on specific interventions for their patients even when requested in advance of the visit. Barron et al. (1987) concluded that nurse practitioners failed to address several critical preconception health concerns and that many opportunities for preconception health teaching were overlooked. However, nurse practitioners performed better than physicians in providing smoking cessation assessment and counseling in the study by Zapka et al. (2000).

The study by Power et al. (2000) reflects the lack of preconception care among physicians in clinical practice according to the recommendations of the United States Public Health Service. Only one-third of the physicians screened pregnant patients for folate intake and almost one-half failed to screen nonpregnant patients, although they were aware of the benefits of folic acid. This falls short of the United States Public Health Service's recommendation that all women of childbearing age be provided preconception care. According to Diekman et al (2000), barriers to providing preventive care and counseling included lack of time, patient sensitivity, need for additional intervention training, lack of referral sources and lack of reimbursement by insurance providers. These barriers were similar to those noted by Jack et al. (1998).

Primary care providers are responsible for promoting the health of their clients through assessment, intervention and follow-up. Providers in the community health environment are missing opportunities to consistently promote patient health, falling short of national objectives (Zapka et al., 2000). Following national guidelines helps to insure that all healthcare is appropriately offered, timely and beneficial. In general, the literature reflects the inconsistent delivery of preventative health care services.

Pender et al. (1990) addressed the factors that influence an individual to make health-promoting behavior changes. The results suggest that primary care providers should not only provide information about healthy behaviors, but should also motivate the client to make needed changes. Nurse practitioners should direct interventions toward increasing the client's sense of competence. The practitioner in alliance with the client should develop a plan that can be achieved and incorporated into the client's daily routine.

Recommendations of Jack et al. (1998), Conway et al. (1995) and Barron et al. (1987) recommend and justify the need to assess the preconception health care practices of nurse practitioners. As promoters of preventive care, nurse practitioners must be aware of the need to address preconception health with all women of childbearing age.

Chapter III

The Method

The purpose of this study was to determine the preconception health care practices of nurse practitioners in the primary care setting. The empiricalization of the study is discussed in this chapter. The setting, population, sample, instrumentation, data collection, statistical analysis and limitations are identified.

Design of the Study

A descriptive survey design was chosen for this research. The purpose of a descriptive survey is to describe and document aspects of a situation as it naturally occurs (Polit and Hungler, 1999). A survey is appropriate for determining information through direct questioning of a sample of respondents. Surveys are applicable to many populations and are a common component of nonexperimental studies. Questionnaires are a form of data collection used in survey research (Polit and Hungler, 1999). The research design was appropriate because the researcher sought to describe and document the preconception health care practices of nurse practitioners without inferring correlation or causation.

Setting, Population and Sample

The setting for this study was a rural Southeastern state. This state has been traditionally ranked unfavorably in several social indicators. The rates for teenage pregnancy, poverty and infant mortality are among the highest in the United States.

Twenty-two percent of all babies born during 1995 were to teenagers, compared to a national average of 13% (State Department of Health, 2000). The percent of persons living in poverty is 16.8%, well above the national poverty average of 12.6% (US Census Bureau, 1999). The US infant mortality rate for 1996 was 7.2 deaths per 1,000 live births. The infant mortality rate within the state was 9.7 for the same year (US Department of Health and Human Services, 2000).

The sample consisted of nurse practitioners whose names appeared on the State Board of Nursing's certified list of nurse practitioners with certification in adult, family, nurse midwifery, and women's health/OB-GYN. The total population of nurse practitioners in the state was 1,197. According to the State Board of Nursing (2001), seven hundred and nine practitioners hold certification in the following primary care areas: family (593), adult (42), women's health/OB GYN (42) or nurse midwifery (32). An additional criteria for inclusion was a clientele greater than 10% female.

Survey participants were chosen by random, systematic sampling from the accessible population of 699 nurse practitioners certified in family, adult, women's health/OB GYN or nurse midwifery. A number from 1-4 was randomly selected as the starting point. The sampling interval was four. The name at the starting point and every fourth name thereafter comprised the survey sample. If a name was encountered that was personally known to the researcher, that name was skipped and the following name was selected. The convenience sample included participants who returned the questionnaire and met criteria for inclusion in the study.

Instrumentation

Data were collected using a researcher designed questionnaire, Women's Health Care Survey (Appendix A). The Women's Health Care Survey is a ten-item instrument with an attached seven-item demographic section. The survey assessed the preconception care practices that nurse practitioners offer their clients. Each of the ten items of the Women's Health Care Survey has one correct response according to the guidelines set forth by the U. S. Public Health Service. Each protocol should be provided to all women of childbearing age. Participants checked the response that most accurately corresponded to their clinical practices. The following preconception care counseling and interventions were used: 1) risk factors for pregnancy and birth defects, 2) rubella immunity and immunization, 3) appropriate body weight, 4) health risks associated with cat litter, 5) healthy diet, 6) benefit of folic acid, 7) abstinence from alcohol, 8) exercise, 9) smoking cessation and 10) screening for drug abuse.

The second section of the survey assessed seven demographic variables. Demographic information provided data for comparisons of practitioners by age, sex, years of practice, specialty, position, practice setting, and percentage of female clients seen in practice.

Each survey item was evaluated independently. The Women's Health Care Survey was not tested for reliability or validity, however, face validity was assumed based on a pilot test. The pilot test was conducted on four nurse midwives. The questionnaire was evaluated for clarity and ease of administration. Questions were answered according to directions and demographics were appropriately completed. Responses were diverse

signifying differences in practices among practitioners, thus supporting the need for further research in this area.

Procedures

Permission to conduct the research was obtained from the Committee on the Use of Human Subjects in Experimentation at Mississippi University for Women prior to the implementation of data collection. (See Appendix B). Potential participants were mailed a letter of introduction and informed consent (See Appendix C) that disclosed the nature of the study and insured confidentiality. Enclosed with the introductory letter were the Women's Health Care Survey and a return envelope.

Participants were guaranteed confidentiality and informed that voluntary completion and return of the survey implied consent to participate. Participants were provided an e-mail address and telephone number to register concerns or complaints. The research spanned a time period from April to May 2001.

The pilot study established face validity. The questionnaire was clearly worded and easy to complete. Questions were answered according to directions and demographics were appropriately completed. No changes in methodology were made.

Method of Data Analysis

The purpose of this study was to describe the preconception health care practices of nurse practitioners. Data Analysis consisted of descriptive statistics and measures of central tendency. Descriptive statistics were used to measure sample characteristics and document the preconception health care practices of nurse practitioners. Each item was

analyzed independently. Frequency distribution and percentiles were used to describe responses for survey items.

Summary

A descriptive survey design was employed to examine the preconception health care practices of nurse practitioners in the primary care setting. The population consisted of primary care nurse practitioners with a notable female clientele. A researcher-designed instrument was used to elicit routine clinical practices. A pilot test conducted on four midwives established face validity of the survey instrument.

Chapter IV

The Findings

Preconception care (PCC) improves the health status of women prior to pregnancy by identifying perinatal risks and providing interventions to reduce risks. PCC is recommended by the United States Public Health Service for all women of reproductive age. PCC has the potential to reduce the occurrence of adverse neonatal conditions such as neural tube defects, low birth weight, prematurity and fetal alcohol syndrome.

This study was guided by the research question, What are the preconception health care practices of nurse practitioners in the primary care setting? Nola Pender's theory of health promotion provided the theoretical framework for this research. The promotion of a woman's health prior to pregnancy is the fundamental basis of PCC. To achieve the purpose of this study, a descriptive, researcher-designed survey was implemented. The Women's Health Care Survey was utilized to elicit practitioners' routine practices in the clinical setting. The data was analyzed using descriptive statistics. A description of the sample and analysis of data are presented in this chapter.

Description of the Sample

The accessible population for the study consisted of family, adult, women's health/OB GYN and midwife nurse practitioners certified in the state. One hundred seventy-five surveys were mailed to nurse practitioners randomly selected from a list provided by the Board of Nursing. Ninety-one (52%) surveys were returned, however,

only fifty-eight (33%) of the practitioners who responded met the requirements for inclusion in the study and correctly followed the directions. Questionnaires not meeting the requirements for inclusion or with more than one response marked were discarded.

The majority of nurse practitioners in the sample were female (91%). The mean age of respondents was 42.5 years, with a range from 28 to 62 years. The average number of years in practice was 5, with a range from 1 to 28 years. The respondents generally had five years or less experience (67%) with the majority of these having only one to two years. Ten percent of the sample had ten years or more experience as a nurse practitioner. The distribution of nurse practitioner's demographic characteristics by sex, age and years in practice can be found in Table 1.

Table 1
Demographic Characteristics of Nurse Practitioners by Frequency and Percentage

<u>Variable</u>	<u>f</u>	<u>%</u>
Sex		
Female	53	91.4
Male	5	8.6
Age (Years)		
28-30	7	12.1
31-40	17	29.3
41-50	28	48.3
51-60	6	8.6
>60	1	1.7
Years in Practice		
1-5	39	67.2
6-10	14	24.1
11-20	2	3.5
21-30	3	5.2

Note. n=58

The practitioners were asked to indicate their specialty area, current position and current practice setting. The primary specialty area chosen by the majority of nurse practitioners (76%) was family nurse practitioner. Most survey participants (81%) were employed as a family nurse practitioner. The category choice “other” was indicated by practitioners with certification in more than one area. Distribution of the nurse practitioners by primary specialty area and current position are given in Table 2.

Table 2
Distribution of Nurse Practitioners According to Primary Specialty Area and Current Position by Frequency and Percentage

<u>Variable</u>	<u>f</u>	<u>%</u>
Primary Specialty Area		
Family	44	75.9
Women’s Health	6	10.3
Midwife	4	6.9
Adult	1	1.7
Other (>1 specialty)	3	5.2
Current Position		
Family	47	81.0
Women’s Health	4	6.9
Midwife	4	6.9
Adult	2	3.4
Other (internal medicine)	1	1.7

Note. n=58

The participants were asked to indicate their current practice setting from seven options. The largest percent (37.9%) reported employment in a family practice setting. Thirteen respondents reported employment as “other” and specified their work setting as community health center, rural health, private medical office, factory, school health, hospital or not specified. Distribution of practice settings can be found in Table 3.

Table 3
Distribution of Nurse Practitioners According to Current Practice Setting

<u>Variable</u>	<u>f</u>	<u>%</u>
Family Practice	22	37.9
Other	13	22.4
OB/GYN Practice	9	15.4
Public Health Clinic	5	8.6
Own Practice	3	5.2
Emergency Room	3	5.2
College Health	3	5.2

Note. n=58

The participants were asked to indicate the percentage of women seen in clinical practice. Most respondents reported a female clientele of 50-75%. The distribution of the percentage of female clients are given in Table 4.

Table 4
Distribution of the Percentage of Practitioner's Female Clientele by Frequency and Percentage

<u>Variable</u>	<u>f</u>	<u>%</u>
10-25%	6	10.3
25-50%	8	13.8
50-75%	30	51.7
75-100%	14	24.1

Note. n=58

Data Analysis

The research question that guided this study was: What are the preconception health care practices of nurse practitioners in the primary care setting? In this study, the preconception interventions most commonly provided by nurse practitioners were counseling about appropriate body weight, basics of a healthy diet, importance of exercise and smoking cessation. More than half of the participants responded positively to providing these preconception health care interventions to all women of childbearing age. These interventions promote the health of the client and may improve the course of pregnancy and ultimately, the health of the neonate. Nola Pender's theory of health promotion, which provided the theoretical framework for this study, supports the promotion of positive health behavior changes whenever possible.

Sixty-two percent of respondents provided counseling concerning the importance of maintaining appropriate body weight to all women of childbearing age. Another 15% provided weight counseling to women that requested information.

The importance of exercise was addressed by 77% of nurse practitioners. Others (15.5%) provided this information to women that were pregnant or that requested information. A small number of practitioners failed to address the importance of physical activity. Counseling about the importance of exercise was the second most commonly addressed intervention.

Counseling about the importance of smoking cessation was provided by 79.3% of respondents. Another 13.8% provided counseling to pregnant clients or clients requesting

information. Smoking cessation was addressed by nurse practitioners to a greater degree than for any other single intervention.

Six out of the ten preconception care (PCC) interventions in the survey were addressed by less than fifty percent of nurse practitioners in this survey. Preconception interventions that were infrequently provided included assessing risk factors for complications/birth defects, determining rubella immunity, discussing the potential health risk of emptying a cat litter box, counseling the benefits of folic acid supplementation, educating about alcohol abstinence and screening for drug abuse.

Few providers (13.8%) determined risk factors for pregnancy complications and birth defects during routine care for all women of childbearing age. The greatest percent of respondents (37.9%) determined risk factors for women that requested counseling or were considering pregnancy. Approximately one-fourth of those surveyed provided this care to pregnant women (24%) or did not address (24%) this issue.

Determination of rubella immunity was extremely low with 5.2% addressing this issue. Twenty-one respondents (36.2%) provided this care to women who were pregnant, considering pregnancy or requested information.

The potential health risk of emptying the cat litter box was addressed by 5.2% of the respondents. Twenty-six respondents (44.8%) provided information on the risk of contracting toxoplasmosis to pregnant women. This issue was not addressed by 37.9 % of the practitioners.

Only 24% of the respondents counseled all women of childbearing age regarding the benefits of taking a daily multivitamin containing 400mcg folic acid. Another 24%

provided this information to women that were considering pregnancy. Twenty-two percent provided folic acid information to pregnant clients. Slightly more than one-fourth of the sample did not voluntarily address this important issue.

Education about the importance of abstaining from alcohol use was provided to all women of childbearing age by 37.9% of the nurse practitioners. Forty-one percent provided this information to women that were pregnant. A small percentage of providers only routinely educated those considering pregnancy or requesting information.

Approximately one-third of the participants screened for drug abuse. Screening was provided to pregnant clients and those requesting information by almost one-third of the practitioners. One-fourth did not provide this screening. Table 5 presents the distribution of survey respondents that provided preconception care according to the recommendations of the United States Public Health Service (1989).

Table 5
Distribution of Respondents Providing Preconception Care According to the Public Health Service's Recommendations by Frequency and Percentage

Intervention was routinely provided for each concept as follows, in order of survey:

<u>Variable</u>	<u>f</u>	<u>%</u>
1. Risk factors for complications/birth defects	8	13.8
2. Determine rubella immunity	3	5.2
3. Importance of appropriate body weight	36	62.1
4. Potential health risk of emptying cat litter box	3	5.2
5. Basics of a healthy diet	38	65.5
6. Benefits of daily folic acid supplementation	14	24.1
7. Importance of abstaining from alcohol use	22	37.9
8. Counsel about the importance of exercise	45	77.6
9. Stress the importance of smoking cessation	46	79.3
10. Screen for drug abuse	17	29.3

Note. n=58

Additional Findings

Nurse practitioners with less than five years of experience were compared to those with five or more years. Respondents with less than five years experience (n=31) most often claimed family nurse practitioner as their primary specialty, current position and specialty area. The majority of those with greater than five years experience (n=27) claimed family nurse practitioner as their primary specialty and current position. The setting for those with more experience tended to be "other" (29.6%) with family practice

(22.2%) and OB/GYN (18.5%) being largely represented. Both groups tended to have 50-75% female clients.

Both groups were fairly consistent in the percentage of respondents that provided care according to the United States Public Health Service's recommendations. Although the percentage difference was small, no one with five or more years of experience determined rubella immunity. Table 6 provides a comparative distribution between these groups for interventions that were provided according to recommendations of the United States Public Health Service (1989).

Table 6
Comparison of Practitioners by Years of Experience that Provide Preconception Care
According to the Public Health Service's Recommendations by Frequency and Percentage

Intervention was routinely provided for each concept as follows, in order of survey:

<u>Variable</u>	<u>Experience Level</u>			
	<u>< 5 Years</u>		<u>5 Years +</u>	
	<u>f</u>	<u>%</u>	<u>f</u>	<u>%</u>
1. Complications/birth defects	5	16.1	3	11.1
2. Determine rubella immunity	3	9.7	0	0
3. Appropriate body weight	20	64.5	16	59.3
4. Health risk of handling cat litter	1	3.2	2	7.4
5. Basics of a healthy diet	21	67.7	17	63.0
6. Daily folic acid supplementation	8	25.8	6	22.2
7. Abstaining from alcohol use	13	41.9	9	33.3
8. Importance of exercise	23	74.2	22	81.5
9. Importance of smoking cessation	23	74.2	23	85.2
10. Screen for drug abuse	8	25.8	9	33.3

Note. n=31 and n=27, respectively

A notable percent of nurse practitioners provided several PCC interventions to women considering pregnancy or requesting information more frequently than to all women of childbearing age. These interventions included assessing risk factors for pregnancy complications and birth defects (31%), determining Rubella immunity (24%), educating about the health risk associated with cat litter (12%), counseling on the benefits of folic acid supplementation (29%) and screening for drug abuse (17%).

Summary

The demographic characteristics of the majority of participants revealed a female population, ages 28 to 62, with an average of five years clinical experience. Most of the participants were certified family nurse practitioners whose current position was as a family nurse practitioner and whose work setting was family practice. The majority of the participants reported a client base composed of 50-75% women.

Survey results revealed that practitioners do not routinely provide comprehensive PCC to all women of childbearing age. Nurse practitioners were fairly consistent in providing information about appropriate body weight, basics of a healthy diet and exercise and smoking cessation. Interventions that were more specific to women and pregnancy, such as risk factors for pregnancy/birth defects, rubella immunity, risks of disease associated with cat litter, folic acid supplementation and alcohol abstinence were addressed less frequently. Practitioners did offer some of these components more often to women that were considering pregnancy or requested information. Nurse practitioners addressed risk factors for pregnancy complications and birth defects, Rubella immunity, risk associated with cat litter, folic acid supplementation and screening for drug abuse to a greater degree for these women.

Chapter V

The Outcomes

Health care prior to conception affords a woman the opportunity to engage in health promoting behaviors and increase the potential for a healthy pregnancy and a healthy newborn. Neural tube defects, fetal alcohol syndrome, congenital malformations and low birth weight are examples of adverse infant conditions that may be prevented if preconception care (PCC) interventions are followed. Current research suggests that PCC is not practiced in the primary care setting according to United States Public Health Service recommendations.

The research question that guided this study was: What are the preconception health care practices of nurse practitioners in the primary care setting? The majority of nurse practitioners in this study provided counseling about appropriate body weight, basics of a healthy diet, the importance of exercise and smoking cessation. Interventions more directly related to a woman's health during pregnancy were provided by less than half of the respondents. Less than one-third screened for drug abuse, discussed benefits of folic acid supplementation or counseled abstinence from alcohol usage. Determination of rubella immunity and education about health risks associated with emptying a cat litter box were rarely provided. These findings indicate that preconception care is not offered according to the guidelines set forth by the United States Public Health Service.

Failure to provide all women of childbearing age with PCC places women and newborns at risk for serious health complications. Nola Pender's theory of health promotion, which provided the theoretical framework for this study, supports the tenets of PCC as recommended by the United States Public Health Service.

Summary of Findings

The sample for this study consisted of 58 nurse practitioners that practiced in a primary care setting in the Southeastern region of the United States. The majority were female, between the ages of 28 to 62 years, with an average of five years experience. Greater than one-third had one to two years experience. The mean age was 42.5. The majority of practitioners were certified as family nurse practitioners and worked in a family practice setting with a clientele composed of 50-75% females.

Data analysis revealed that preconception care is not being provided by nurse practitioners in a consistent manner according to United States Public Health Service recommendations. The preconception interventions most commonly provided by nurse practitioners were counseling about appropriate body weight, healthy diet, exercise and smoking cessation. These interventions may be appropriate for clients whether male or female, young or old. Interventions that more directly addressed women's health during pregnancy or neonatal health were provided to all women of childbearing age by less than half of the respondents. Fewer than one-third screened for drug abuse, discussed benefits of folic acid supplementation or counseled on alcohol usage. Rubella immunity and the possible health risk associated with emptying a cat litter box were rarely addressed.

Discussion

The data indicated nurse practitioners do not routinely provide all components of preconception care to all women of childbearing age. Only one survey revealed a provider that routinely gave preconception care and counseling to all women of childbearing age. It is interesting to note that the provider was a family nurse practitioner that was employed in school health with five years of experience. Perhaps the setting and prevalence of teenage pregnancy in the state made this practitioner more aware of the need for education and intervention.

The PCC interventions addressed in this study were not inclusive of all possible interventions for PCC. The survey questions addressed components that should be recognizable to primary care providers. Assessment of a woman's risk factors for pregnancy complications and birth defects tended to be provided to pregnant clients or was not done. One-third of the respondents did discuss this information with those that requested it or were considering pregnancy. Although this appears acceptable, the actual number of clients that ask and/or present for a preconception consultation may vary greatly, therefore, preconception care information may only reach a small percent of the nurse practitioner's clientele. Assessment of risk factors is extremely important. Maternal conditions such as diabetes and hypertension can be managed during pregnancy with positive health outcomes for mother and neonate. Failure to assess women for each component of preconception care leaves her and her unborn child vulnerable to numerous adverse health conditions.

Rubella immunity was determined by only 5.2% of the practitioners. A woman who is not immune to German measles and becomes infected, risks the possibility for a wide range of birth defects, which include microcephaly, mental retardation, intrauterine growth retardation, vision and hearing impairment. Rubella immunization cannot be given during pregnancy and pregnancy should be avoided for three months post inoculation (Wong, Hockenberry-Eaton, Wilson, Winkelstein, Ahmann and DiVito-Thomas, 1998).

Only 5.2% of the nurse practitioners discussed risks associated with emptying a cat litter box. Toxoplasmosis can be spread through contact with cat feces, which might occur when changing the litter box. Maternal infection can cause hydrocephaly, cerebral calcifications, chorioretinitis, seizures, mental retardation, microcephaly and deafness (Wong et al., 1998). Informing women of the risks associated with cat litter before pregnancy helps minimize the chance of exposure during early pregnancy.

Despite the March of Dimes' ongoing campaign to raise public awareness about the benefits of folic acid, slightly less than one-fourth of the practitioners addressed this concern with all women of childbearing age. Supplementation in the form of a daily multivitamin containing 400mcg of folic acid has been shown to reduce the incidence of neural tube defects when taken prior to pregnancy. Once a woman confirms pregnancy with a care provider, several weeks or months of crucial development have occurred. Folic acid supplementation after seven weeks gestation does not have a preventative effect for neural tube defects (Power et al., 2000). More than one-fourth of the sample did not discuss folic acid supplementation.

Alcohol and drug abuse screening is applicable during numerous types of patient encounters, however, it is particularly important for women of childbearing age. The amount and frequency of alcohol use that causes fetal alcohol syndrome has not been established. Fetal alcohol syndrome is a preventable birth defect and is recognized as the leading cause of mental retardation, outranking Down syndrome and Spina bifida (Wong et al., 1998). Maternal drug abuse also places an infant at risk for a wide variety of defects and diseases. A drug addicted neonate is at increased risk of Narcotic Abstinence Syndrome, HIV, SIDS, prematurity, sepsis, cerebral infarcts, cardiac anomalies, renal defects, low birth weight and decreased head circumference. Screening women of childbearing age for alcohol and drug usage, as well as, repeated attempts at intervention and education may help reduce the incidence of fetal alcohol syndrome and adverse events associated with maternal drug abuse. Less than half of the practitioners counseled the importance of abstaining from alcohol or screened for drug abuse.

The majority of nurse practitioners did provide some components of preconception care on a routine basis to all women of childbearing age. These components were appropriate body weight, basics of a healthy diet, importance of exercise and smoking cessation. Education and counseling on these issues are extremely important to health and well-being, however, components that were more specific to women's health and pregnancy to a large degree were overlooked. Some interventions, such as folic acid supplementation and Rubella immunization, must occur before pregnancy in order to provide benefit. These findings are similar to those of Jack et al. (1998) where physicians were most likely to address cigarette smoking, sexually transmitted diseases, family

planning and nutrition during preconception visits. These interventions are applicable to the general population and may be less offensive to patients. Physicians in the same study were highly unlikely to address HIV infection, genetic risk factors, drug abuse and barriers to obtaining medical care. Nurse practitioners were also unlikely to address genetic risk factors (risk factors for pregnancy complications and birth defects) or drug abuse.

The findings of this research were also similar to those of Barron et al. (1987) whose study elicited the information on preconception care that nurse practitioners provided to an average client. Similar to the findings by Barron et al.(1987), nurse practitioners commonly addressed nutrition, smoking and body weight. Immunizations and environmental hazards/cat litter were rarely or never addressed by nurse practitioners in either study. Exercise, which was a frequent intervention in this study, was rare in Barron et al.'s (1987) research. Both studies revealed that several preconception health concerns were not properly addressed by nurse practitioners. As noted by Barron et al.(1987), this may be due to a lack of knowledge and/or traditional thinking about prenatal care.

The high frequency that nurse practitioners counsel smoking cessation was also reflected in the study by Zapka et al. (2000). Nurse practitioner and midwives outperformed physicians and other health care workers in providing smoking cessation counseling. Zapka et al. (2000) attributed this difference to the greater emphasis that nursing programs placed on education and counseling. Education and counseling are an integral part of nursing. Nursing theory often acknowledges the role of a nurse as educator and counselor. Pender et al. (1990) determined the factors that influence client

participation in health promoting behaviors in a wellness program setting. Interventions directed to increasing a client's sense of competence may increase their motivation to continue health promoting behaviors. Preconception counseling interventions should likewise motivate the client to adopt a healthy lifestyle. Interventions based solely on the fear of disease are less likely to be successful as interventions based on motivation toward an improved state of health. The ideals of PCC may best be achieved in wellness focused visits where preventative care can be offered in an ongoing long-term manner, thereby facilitating learning and compliance.

A study by Conway et al. (1995) that focused on physician residents in primary care attributed low knowledge and clinical management scores to lack of training in the care of women of reproductive age. Similar to the findings in regard to nurse practitioners, residents failed to address rubella immunization when treating women of reproductive age. Conway et al. (1995) concluded that residency training programs should be improved. Perhaps the duration of nurse practitioner programs limits a nurse's exposure to preconception care. Clinical experiences may vary widely depending on the education and practices of the preceptor, therefore, it is important that nurse practitioners continue to enhance their knowledge through seminars, post-masters education, research and publications.

The frequency of nurse practitioners who provided counseling about the benefits of taking a daily multivitamin containing 400 mcg folic acid to all women of childbearing age was low. Although the March of Dimes had an extensive advertisement campaign which promoted daily vitamin use for women, it appears that many health care

professionals may not be aware of its benefits. A survey of obstetrician-gynecologists found that 54% screened nonpregnant patients of childbearing age for folic acid intake (Power et al., 2000). Likewise, fifty-three percent of the nurse practitioners in this survey discussed the benefits of folic acid supplementation prior to pregnancy (including those that requested information or were considering pregnancy). The delivery of preconception care appears to be fairly equivalent among the various types of primary providers. The studies previously reviewed indicate preconception care is not provided in a consistent, comprehensive manner. Perhaps, this reflects the importance placed on certain interventions during training, the perceived importance of particular interventions and/or the lack of consistent guidelines for preconception care. In addition, the idea of care prior to pregnancy is not widely known and PCC is not sought by the general population.

Diekman et al. (2000) found that almost all of physicians in their survey screened for alcohol use among pregnant women, however, only 50% provided follow-up education about the consequences of drinking during pregnancy. Ninety percent of nurse practitioners in this study discussed the importance of abstaining from alcohol use to pregnant and nonpregnant clients. Screening that is not followed by intervention (education, counseling, referral), as was the case for residents, does not benefit the client. Nurse practitioners appear to have performed better than physicians in educating the client about alcohol use. According to Diekman et al. (2000) barriers to alcohol use assessment included lack of time, lack of reimbursement, patient sensitivity and lack of referral resources.

Reasons for the lack of preconception care by nurse practitioners may be similar to those given by Jack et al.(1998) whose study concluded that physicians were not providing a full array of preconception risk interventions. These reasons were: 1) primary care provider did not see value in the intervention, 2) providers were not adequately prepared to provide preconception care and 3) competing demands on provider's time and resources. Nurse practitioners in this study may be limited by one or more of these reasons. Depending on the health care setting, time limitations and lack of reimbursement may play the larger role in determining a provider's ability to give comprehensive preconception care. The barriers of time and reimbursement are reflected in the larger percentage of practitioners who offered certain components of preconception care only to women that were considering pregnancy or requested information. This may reflect a judicious use of time and resources, however, it does not promote preconception care among women with unplanned pregnancy. Since 50% of all pregnancies in the United States are unplanned, at least half of the women that could benefit from preconception care would not receive it (Reynolds, 1998).

Research by Adams et al. (1993) found that 38% of the women in a large population based study could have benefited from PCC. Furthermore, women with the greatest number of demographic and behavioral characteristics associated with adverse pregnancy outcomes were more likely to have unintended pregnancies. Providing preconception care primarily to women considering pregnancy or requesting information is more in line with ACOG standards (1996), than the United States Public Health Service (1989). PCC must be provided consistently on a community wide basis in order to derive

a benefit such as a decline in infant morbidity and mortality or a reduction in the disparities between black and white infant mortality rates.

The pace of primary health care delivery as well as the barriers to delivery (Diekman et al., 2000 and Jack et al., 1998) create a situation where care must be given quickly and concisely according to reimbursement codes. Furthermore, the close work and mentor relationship between the nurse practitioner and collaborating physician creates an environment where care is more in line with the medical model, as opposed to a nursing model where traditionally enumeration was not consistent with treatment. Nurse practitioners are providing care that is based on health promotion and prevention. Health promotion interventions are often more time consuming than interventions focused on curing. However, nurse practitioners are limited in providing preventative services due to lack of reimbursement and time in today's health care system. Reimbursement for preventative services may eventually occur due to increased consumer and economic demand.

Conclusions

Based on the statistical analysis and findings of items in this study, a number of conclusions were drawn. The first conclusion is that primary care nurse practitioners in this study do not routinely provide comprehensive preconception care to all women of childbearing age as recommended by the United States Public Health Service. Secondly, these practitioners tended to provide components of preconception care that were applicable to the general population. Components of preconception care that were more consistently provided to all women of childbearing age were appropriate body weight,

basics of a healthy diet, the importance of exercise and smoking cessation. Issues more applicable to a woman's health during pregnancy were not addressed as frequently. Fewer than one-third of the study participants discussed benefits of folic acid supplementation, rubella immunity or potential health risk associated with emptying a cat litter box.

Preconception care should be offered according to the recommendations of the United States Public Health Service which specifically state that all women of childbearing age should be offered preconception care. Differences in recommendations have resulted in various standards of care being provided to different segments of the population. Women that receive prenatal care from a Public Health Department are generally provided more counseling than women at private clinics (Freda, Damus and Merkatz, 1993). Conflicting guidelines and adherence by providers to more traditional standards where health education needs are addressed during the first prenatal visit are two factors that may account for variation in the delivery of PCC.

Providing PCC to all women of childbearing age insures that women experiencing an unintended pregnancy would derive the same benefits as those who sought PCC. In order to derive a public health benefit, such as a decline in infant morbidity and mortality or a reduction in the disparities between black and white infant mortality rates, PCC must be provided in a consistent manner to all women of childbearing age.

Implications for Nursing

Several implications for nursing were derived from this study. Implications for nursing practice, research, theory and education are discussed. It is important that nurse practitioners become aware of the impact that preconception care can have on women and

newborns. Preconception care must become a routine clinical practice if benefits are to be realized.

The exploration of preconception health care practices offered by nurse practitioners has several implications for the practitioner in primary care. Findings indicate that nurse practitioners should be more aware of the benefits of preconception care and find opportunities to appropriately provide it. A prime opportunity would be at the time of a negative pregnancy test or yearly exam. In the clinical setting, nurse practitioners should initiate methods for screening and intervention. The public is not generally aware of preconception care and opportunities to educate the community should not be overlooked.

Nurse practitioners need to be aware of available community resources. Smoking cessation, drug/alcohol intervention programs, financial and other resources may be necessary to enable the client to follow through on health promoting changes.

There is limited research that addresses the nurse practitioner as a provider of preconception care. Findings from this study suggest that additional research is needed to further understand the delivery of PCC by nurse practitioners. There is also a need to determine facilitators and barriers to providing PCC according to the United States Public Health Service's recommendations.

Research that is outcome based could promote PCC among the health care community and the public sector. Research that elicits ways to improve the practice and delivery of PCC is needed in order to establish a consistent method for the health care community to follow.

This research supports the use of Pender's Health Promotion Model as a conceptual framework for providing interventions to promote the health of female clients. Pregnancy, birth and neonatal health can be improved if preconception care interventions are followed. The nurse practitioner's role is to educate and motivate the client to make changes in behavior which promote health.

PCC promotes the health of the woman and her unborn child. In alliance with the patient, the nurse practitioner develops a plan of action and goals that can be achieved. Achievement of goals promotes the client's sense of control (even more important during pregnancy) and self-efficacy. Such efforts on a state and/or national level have the potential to improve the health of women and children.

Health is an individual and a social responsibility. Nurse practitioners can promote the health of the community by promoting the agenda of the United States Public Health Service. Pender's health promotion theory is in line with the focus and goals of PCC and the United States Public Health Service.

Nurse practitioners and other health care providers should be more knowledgeable about PCC and its benefits. Findings from the current study suggest that nurse practitioners may be lacking basic knowledge about certain components of PCC. Efforts should particularly focus on the need for primary care providers to assess and educate interventions such as Rubella immunity, drug and alcohol abuse, risk factors for pregnancy/birth defects, toxoplasmosis transmission and folic acid supplementation. These interventions were provided by less than one-fourth of the practitioners surveyed. Preconception care, with its focus on prevention, should be thoroughly addressed in

nursing programs, as well as, incorporated into the curricula of undergraduate and graduate programs.

Education of the client is a large part of PCC. Many women lack education about pregnancy and may not be aware of the effects certain behaviors have on pregnancy. Through counseling strategies and education, the practitioner can build trust with the client and increase the likelihood that health promoting behaviors will be adopted.

Limitations

The design of this study imposed constraints on the ability to generalize the findings. A convenience sample of nurse practitioners within a limited geographical area were utilized due to constraints of time and monetary funding. External validity of the study was thereby limited. The clinical practices of nurse practitioners in this study may not be generalizable to other nurse practitioners in the United States.

Another limitation was the small sample size ($n=58$). Time constraint during the implementation phase was also a factor. One hundred seventy-five surveys were mailed to potential participants. Of ninety-eight returned questionnaires, fifty-eight met the criteria for inclusion in the study and were answered according to directions. The instrument used for data collection was researcher designed and only had face validity.

The researcher was aware of minimized control for certain intervening variables, however, important findings regarding preconception care delivery by nurse practitioners emerged. Nurse practitioners in the primary care setting are not providing comprehensive PCC according to the recommendations of the United States Public Health Service. However, the level of care provided by nurse practitioners in this study was generally

equivalent to that given by physicians and nurse practitioners in other studies (Barron et al., 1987, Conway et al., 1995 and Zapka et al., 2000). Care provided to women in accordance with traditional prenatal standards translates to missed opportunities to improve the health of women and newborns. These findings prompted the researcher to make recommendations for future studies concerning preconception care.

Recommendations for Further Study

Based on the findings of this study, the following recommendations for future research include:

1. Enlargement of the study to include a broader geographical area and larger sample size.
2. Outcome based studies to establish a relationship between PCC and improved pregnancy outcomes.
3. Conduction of research to examine nurse practitioner's barriers to providing preconception care and women's barriers in obtaining PCC .

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Appendix A
Women's Health Care Survey

Women's Health Care Survey

Please mark the one answer that best describes your routine practices in a clinical setting.

1. I determine risk factors for pregnancy complications and birth defects for:

- Women that are pregnant
- Women considering pregnancy
- Women of childbearing age
- Women that request counseling
- Do not address
- Other, please specify _____

2. I determine rubella immunity and provide immunization to:

- Women that are pregnant
- Women considering pregnancy
- Women of childbearing age
- Women that request immunization
- Do not address
- Other, please specify _____

3. I counsel about the importance of maintaining appropriate body weight to:

- Women that are pregnant
- Women considering pregnancy
- Women of childbearing age
- Women that request counseling
- Do not address
- Other, please specify _____

4. I educate about the potential health risk of emptying the cat litter box to:

- Women that are pregnant
- Women considering pregnancy
- Women of childbearing age
- Women that request counseling
- Do not address
- Other, please specify _____

5. I instruct about the basics of a healthy diet to:

- Women that are pregnant
- Women considering pregnancy
- Women of childbearing age
- Women that request counseling
- Do not address
- Other, please specify _____

6. I counsel regarding the benefits of taking a daily multivitamin containing 400mcg of folic acid to:

- Women that are pregnant
- Women considering pregnancy
- Women of childbearing age
- Women that request counseling
- Do not address
- Other, please specify _____

7. I educate about the importance of abstaining from alcohol use to:

- Women that are pregnant
- Women considering pregnancy
- Women of childbearing age
- Women that request counseling
- Do not address
- Other, please specify _____

8. I counsel about the importance of exercise to:

- Women that are pregnant
- Women considering pregnancy
- Women of childbearing age
- Women that request counseling
- Do not address
- Other, please specify _____

9. I stress the importance of smoking cessation to:

- Women that are pregnant
- Women considering pregnancy
- Women of childbearing age
- Women that request counseling
- Do not address
- Other, please specify _____

10. I screen for drug abuse for:

- Women that are pregnant
- Women considering pregnancy
- Women of childbearing age
- Women that request testing
- Do not address
- Other, please specify _____

Appendix B

**Approval of Mississippi University for Women
Committee on Use of Human Subjects in Experimentation**



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February 23, 2001

Ms. Charlotte Ann Williams
c/o Division of Nursing
P. O. Box W-910
Campus

Dear Ms. Williams:

I am pleased to inform you that the members of the Committee on Human Subjects in Experimentation have approved your proposed research as submitted.

I wish you much success in your research.

Sincerely,

A handwritten signature in black ink, appearing to read "Vagn K. Hansen".

Vagn K. Hansen, Ph.D.
Vice President
for Academic Affairs

VH:wr

cc: Mr. Jim Davidson
Ms. Terri Hamill

Appendix C

Letter Of Introduction and Informed Consent

Charlotte Ann Williams
156 South Canton Club Circle
Jackson, Mississippi 39211

April 18, 2001

Dear Prospective Survey Participant:

My name is Charlotte Ann Williams. I am a registered nurse and a student in the Master of Science in Nursing program at Mississippi University for Women. I have sent you a survey that assesses the health care and health education practices offered by nurse practitioners in a primary care setting. The findings of this survey will be of a descriptive nature and will elucidate the routine care given to women. I am requesting that you participate in my study. Less than 10 minutes of your time will be required to complete the survey.

Completion and return of the enclosed survey indicates your agreement to participate in the study. Participation is voluntary and confidentiality will be strictly maintained. There are no identifying marks on the survey or return envelope and I do not ask for your name.

If you would like more information or would like to express an opinion, you may e-mail me at caw2@muw.edu or you may contact me at (601) 991-9520. Thank you for your time.

Sincerely,

Charlotte Ann Williams