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THE RELATIONSHIP BETWEEN PRENATAL CARE AND THE SIZE AND COMPOSITION OF THE SUPPORT NETWORK

presented by

Anne M. Colby

has been accepted towards fulfillment of the requirements for

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Major professor Rachel Schiffman, RN, PhD.

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THE RELATIONSHIP BETWEEN PRENATAL CARE AND THE SIZE AND COMPOSITION OF THE SUPPORT NETWORK

By

Anne M. Colby

A THESIS

Submitted to Michigan State University in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

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ABSTRACT

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Anne M. Colby

This ex post facto descriptive study, examined relationships between prenatal care adequacy and the size and composition of the support network of 108 low income pregnant women. Secondary analysis was employed using data obtained from a private, not-for-profit comprehensive prenatal care center. Data from the Norbeck Social Support Questionnaire and center prenatal care records were used in evaluating the support network and prenatal care adequacy. Using chi-square statistical analysis, no significant relationships were identified between the size and composition of the support network and adequacy of prenatal care. Concepts related to the utilization of prenatal care must continue to be explored in order to improve utilization.

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Introduction

The infant mortality rate (IMR) in the United States continues to lag behind most other developed countries. In 1993, the IMR reached an all time low of 8.28 per 1,000 live births. However, twenty-one other countries through out the world still have rates lower than the United States (Wegman, 1994). Hubert Humphrey once said, "It has been said that the moral test of government is how that government treats those who are in the dawn of life-the children; and those who are in the shadows of life-the sick, the needy, and the handicapped," (Congressional Record, 1977). If one is to examine how fragile members of this society are treated, only unfavorable conclusions could be made. In the United States, special populations of needy children, the minorities, the poor, and/or rural inhabitants, have IMR's that are not only higher than the overall United States IMR, but have rates that are similar to IMR's in developing countries. Consequently, much national debate is occurring regarding how the United States can best tackle the infant mortality problem.

There is not likely to be one lone solution for the infant mortality problem; it is too multifaceted. Only through research will specific information regarding the relationships among the variables associated with such a complex problem as the IMR be identified. Variables such as adequate prenatal care and adequate maternal social support

have been repeatedly associated with improved IMR's in the literature and need further investigation in order to maximize the impact they can have on the IMR. It was the purpose of this research to examine the relationships between certain aspects of these variables, the adequacy of prenatal care and one component of social support, the support network.

Statement of the Problem

Although some progress in decreasing the IMR has been made, much of it is attributed to improved outcomes for low birthweight (LBW) infants admitted to neonatal intensive care units (NICU). While NICU care is very expensive, prenatal care (PNC) is commonly believed to be cost effective in preventing infant mortality (Aved, Irwin, Cummings, & Findeisen, 1993; Brown & Ryan, 1992; Buescher, Roth, Williams, & Gofoth, 1991; Foster, Guzick, & Pulliam, 1992; McClanahan, 1992), but the reason for this is unclear. Although PNC is believed to be an effective prevention for low birthweight (LBW) and LBW is believed to be the major contributor to the IMR (Goldenberg, 1992; Malloy, Kao, & Lee, 1992; McCormick, 1985; Schwartz, 1990), it appears that the effect of prenatal care on the IMR is multifactorial. It includes not only the early diagnosis of complications such as pre-eclampsia, pre-term labor, intrauterine growth retardation or gestational diabetes, but also other factors, such as the evaluation of the adequacy of the woman's

support network. When problems are diagnosed early, whether they are physical or psychosocial, interventions are then able to be implemented to impact the problem before it becomes critical. However, for both assessment and intervention to take place, the woman must be involved first in primary care, and then in PNC enough to provide adequate opportunity for their occurrence.

If the use of PNC is associated with reduced infant mortality, then the reasons why women are not obtaining this cost-effective, preventive care must be examined. Several authors have explored the barriers that inhibit the use of PNC (Aved et al., 1993; Goldenberg, Patterson, & Freese, 1992; Oxford, Schinfeld, Elkins, Ryan, 1985). The most commonly identified factors could be grouped into three categories: demographic, situational and psychosocial variables. Little is really known about this last category, and even less about the specific aspects of psychosocial concerns. While there has been some research that suggests that social support positively impacts health (Cliver et al., 1992; Culpepper & Jack, 1993; Kahn, 1979; Kaplan, Cassel, & Gore, 1977; Norbeck & Anderson, 1989; Nuckolls, Cassel, & Kaplan, 1972; Villar et al., 1992) there is a paucity of information regarding the support network and prenatal care. This study investigated, through secondary analysis, if one concept of social support, the support network, was related to the use of prenatal care in a group

of pregnant women in a southern Michigan county. The research questions were:

1.) Are there differences in the adequacy of care patterns among women with high numbers of people in their support network and those with few in their support network?

2.) Are there differences in the adequacy of care patterns among women with heterogeneous versus homogenous compositions of support networks?

3.) Are there differences in the adequacy of care patterns among women who have high and low numbers and different compositions of support networks?

Conceptual Definition of the Variables

Adequacy of Prenatal Care

There has been much discussion about the adequacy of PNC in the literature. Adequacy defined in quantitative terms constitutes the majority of that discussion, while the qualitative components have been less widely explored. The American College of Obstetricians and Gynecologists (ACOG) offers standards for PNC (ACOG, 1989). These standards suggest not only the quantitative aspects of PNC, but some of the qualitative components as well. Although the general goals of prenatal care are to provide risk assessment, treat identified conditions, and to educate pregnant women about risk factors, pregnancy care, and infant related issues (Goldenberg, 1992), how each provider accomplishes this is individualistic. This makes attempts at identifying the

qualitative variables such as the content of patient education or emotional support provided at a visit difficult at best. Consequently, many authors discuss PNC in quantitative terms only (i.e., number of visits). This approach assumes that when PNC has started early and a certain number of visits have occurred, that the minimal goals of PNC will have been met to some degree.

For the purposes of this study, the adequacy of prenatal care was defined in quantitative terms only. Kessner, Singer, Kalk, and Schlesinger (1973) proposed an index for measuring the adequacy of PNC that has served as the foundation for quantifying adequacy. It is based on three parameters: (a) trimester at which care began, (b) the number of prenatal visits, and (c) gestational age at delivery. Adequate care for this index was defined as care beginning in the first trimester and following the ACOG recommended number of visits for gestational age. This approach assumes that the earlier PNC is initiated the more likely it is that care will be adequate. ACOG (1989) recommends that a woman be seen every four weeks for the first 28 weeks of pregnancy, every two to three weeks for 28 to 36 weeks of pregnancy and once per week thereafter. This would suggest approximately 14 visits for a 40 week pregnancy, and assumes that effective PNC must be continuous. The gestational age at birth component attempts to adjust for the obviously smaller number of visits in

premature births. Without this factor, erroneous conclusions could be reached that preterm birth is caused by inadequate PNC when in fact, preterm birth precludes a woman from obtaining the adequate number of visits.

Alexander and Cornely (1987) revised the Kessner index to address some of its limitations and included three other groups, an intensive care group in which more than the expected number of visits in a single pregnancy was considered, a no care group and a missing data group. The authors felt that these three additional groups were inherently different and could be responsible for some of the conflicting results obtained with the Kessner index. The authors viewed the intensive care group conceptually as potentially having more morbidity or complications. Through examination of this group an attempt was made to see if women who obtained more PNC and were inherently more prone to morbidity were skewing adequacy research. While this index attempted to separate for some of the confounding variables potentially present in the different groups, it still defines adequacy primarily based on the timing of initiation of care. For PNC to be classified as adequate, care must have begun in the first trimester.

Kotelchuck (1994c) proposed an index, the Adequacy of Prenatal Care Utilization Index (APNCU) that addresses some of the limitations of the previous two indices. The APNCU

utilization of received services, and captures the essence of the pattern of PNC utilization. The first concept, initiation of care, is described in terms of two month segments for the first two trimesters (see Table 1) making four initiation categories instead of three trimester divisions, and citing the idea that the second trimester covered too broad a time period to adequately evaluate PNC initiation.

Adequate Care

For the purposes of this study, adequate care was defined as a pattern of care that is initiated early, by the end of the fourth month, and is continuous throughout the pregnancy.

Table 1

Month of Initiation of Prenatal Care Categories

Month care initiated	Adequacy	
1-2	Adequate	
3-4	Adequate	
5-6	Inadequate	
7-9	Inadequate	

differentiate between patterns of care that may yield the appropriate number of visits based on gestational age at delivery, but were initiated after the fourth month, from those in which care was initiated early and then remained continuous.

Kotelchuck (1994c) defines adequate care as care beginning by the end of the fourth month of pregnancy and meeting 80-109% of the recommended number of visits adjusted for gestational age at delivery. Adequate plus care meets the adequate definition, but exceeds the expected number of visits by 110% or greater. Intermediate care is defined as also beginning by the end of the fourth month, but meeting only 50-79% of the expected number of visits. Inadequate care is defined as care beginning after the fourth month of pregnancy and/or meeting less than 50% of the expected number of visits. Adequacy of PNC was defined in this study as according to parameters identified by Kotelchuck (1994c) with initiation of care and frequency of care adjusted for gestational age.

<u>Adequate Care</u>

For the purposes of this study, adequate care was defined as a pattern of care that is initiated early, by the end of the fourth month, and is continuous throughout the pregnancy.

Table 2

Recommended Visits by Week of Gestation - Summary

<u>Weeks Gestation</u>	Recommended Visits
N =37+	(+ (N-36)) visits
37	11 visits
36	10 visits
34-35	9 visits
32-33	8 visits
30-31	7 visits
26-29	6 visits
22-25	5 visits
18-21	4 visits
14-17	3 visits
10-13	2 visits
6-9	1 visit

Note. Table from <u>Adequacy of Prenatal Care Utilization</u> <u>Index: Technical Details and Rationale</u>, by Kotelchuck, M., 1994b. Unpublished manuscript, University of North Carolina at Chapel Hill.

Adequacy of Prenatal Care Utilization Index - Expected

Number	of	Visits	

Month	PNC		<u>Gest</u>	ation	al Ag	e	·				
<u>Began</u>	<u>28</u>	<u>29</u>	<u>30</u>	<u>31</u>	<u>32</u>	<u>33</u>	<u>34</u>	<u>35</u>	<u>36</u>	<u>37</u>	<u>38</u>
9	-	-	-	-	-	-	_	_	_	-	-
8	-	-	-	-	-	-	1	1	1	2	3
7	-	-	1	1	1	1	2	2	3	4	5
6	1	1	1	1	2	2	3	3	4	5	6
5	1	1	2	2	3	3	4	4	5	6	7
4	3	3	4	4	5	5	6	6	7	8	9
3	4	4	5	5	6	6	7	7	8	9	10
2	5	5	6	6	7	7	8	8	9	10	11
1	6	6	7	7	8	8	9	9	10	11	12
Note.	Table	from	Adeo	uacy	of Pi	renata	al Car	e Ut:	ilizat	tion	
Index:	Tech	nical	Deta	ails a	and Ra	ationa	<u>ale</u> , k	by Kot	celchu	ick, M	ί.,
1994b.	Unpu	blish	ed ma	anusci	cipt,	Unive	ersity	y of I	North	Carol	ina

at Chapel Hill.

Adequate Plus Care

Adequate plus is defined as care that exceeds adequate care. It is begun by the end of the fourth month and exceeds the expected number of PNC visits for gestational age.

Intermediate Care

Intermediate care is defined as care that is initiated early, begun by the end of the fourth month of pregnancy, but is not consistent enough to be considered adequate care. <u>Inadequate Care</u>

Inadequate care is care that is not initiated by the end of the fourth month of pregnancy and is not consistent and/or frequent.

Support Network

The concept of social support began to be discussed widely in the literature in the 1970's. It is defined in many different ways by different authors. Although the term support network is not defined in all these studies, it is sometimes discussed by virtue of how support is defined. Nuckolls, Cassel, and Kaplan (1972) suggested that the support network, was a component of psychosocial assets. While support network per se was not defined, psychosocial assets were operationally defined in terms of self, marriage, extended family, social resources (included friendship patterns) and the definition of pregnancy. Three of the assets could be considered components of the support

network: marriage, extended family, and friendship patterns. Kahn (1979) defined his concept of "convoy" as consisting of a set of people on whom an individual relies for support and those who rely on that person for support. He further defined social support in terms of interpersonal transactions that consist of affect, affirmation, and aid. Affect was defined as expressions of respect, admiration, and liking. Affirmation represented agreement with others, and aid represented assistance through means of information, material goods, or personal time. In all these definitions, the concept of a support network is implied. Without a network of individuals to provide assistance whether it be affect, affirmation or aid, the pregnant woman may be unable to obtain the care she needs (i.e., transportation to PNC, baby-sitting for older children during her appointment).

Much of the work of the eighties was based on Kaplan's (1977) and Kahn's (1979) classic studies from the seventies. Norbeck, Lindsey and Carrieri (1981) based their personal network definition on Kahn's work when operationally defining personal network as "...each significant person in your life...all the persons who provide personal support for you or who are important to you now." (p. 65). Mercer and Ferketich (1988) define network support as social embeddedness and having to do with "connections that people have with others in their environment" (p. 27). Aaronson (1989) discussed the distinction between perceived and

received support, and postulated the idea that support cannot be received if it is not perceived to be available from members of a woman's social network. May (1992) defined social network as "the people important to an individual". The underlying assumption in these definitions is that a vital component of support is the support network.

For the purposes of this study, a combination of the definitions of May (1992) and Mercer and Ferketich (1988) was used. Support network was defined as, self reported connections that an individual has to people in their environment who are important to that individual. It was discussed quantitatively in terms of size and qualitatively in terms of composition of relationships identified in the support network. However, with this definition, it is understood that no distinction can be made between the actual presence of support and the perception that support is present.

Size of support network

While several studies report network size in the course of their analyses (Barrera, 1981; May, 1992; Mercer & Ferketich, 1988; Norbeck & Anderson, 1989; Norbeck, Lindsey, & Carrieri, 1983), May came the closest to conceptually defining the concept of size. She identifies the number of network members as buffering the effects of stressful events. The idea of a larger network providing more support is conveyed. Whether the relationship between size and

support is a result of simply having more people to draw support from at any given time, or the result of the diversity of the human being, and having a broader base of human qualities to draw from is not known. Because no two individuals are exactly alike, there is some degree of increasing heterogeneity involved in having higher numbers of people in a support network. While other studies do not define the concept of size of the network, it was felt to be important in the present study to examine this tangible, measurable component of support. The literature describes an average sized network to have between seven and eight members (Mercer & Ferketich, 1988; Norbeck, Lindsey, & Carrieri, 1983). For the purposes of this study network size is defined as the total number of individuals the respondent identifies as being in their support network.

Low numbered group. A low numbered group was defined as less than the average sized group, and assumed to be fewer than necessary to provide adequate support.

<u>High numbered group</u>. A high numbered group was an average sized group or larger and assumed to be large enough to provide adequate support.

Composition of support network

The concept of composition of the support network has not been commonly defined in the literature. Collins, Dunkel-Schetter, Lobel, and Scrimshaw (1993) defined network resources as living with the baby's father, and having one

relative and one close friend in the area. While this does not define composition per se, it does offer one potential combination of a heterogeneous group. Norbeck et al. (1981) describe the support network as being comprised of the significant persons in an individual's life. While several authors have mentioned certain relationships like significant other, family, and friends (Collins, et al., 1993; Mercer & Ferketich, 1988; May, 1992; Norbeck & Anderson, 1989; Norbeck et al., 1983; Nuckolls et al., 1972) only a few include more diverse relationships such as work or school associates; neighbors; health care providers; minister/priest/rabbi; counselor/therapist; or other (Mercer & Ferketich, 1988; Norbeck & Anderson, 1989; Norbeck et al., The most commonly identified relationships have been 1983). the spouse or significant other, family, and friends (Mercer & Ferketich, 1988; May, 1992; Norbeck & Anderson, 1989; Norbeck et al., 1983). Although Mercer & Ferketich (1988) did not report family as a group, they listed each family relationship separately, their category of mother, was reported in the top three with spouse/significant other and friends. While diversity in the composition has not been conceptually defined, it seems plausible that a diverse network could "balance out" the ill effects created by particular members of a network. Aaronson (1989) found that women who perceived support from individuals who smoked, or drank alcohol or caffeine were more likely to exhibit those

behaviors themselves. With a more diverse network, perhaps enough support would be perceived from individuals with healthy behaviors to counteract the support perceived for unhealthy behaviors. It also seems credible that diversity could serve as a safety net in the event that whole groups of support people (i.e., family, friends, work associates) became unavailable.

<u>Homogenous composition</u>. For the purposes of this study, a homogenous composition was defined as containing none or only one type of relationship (i.e., only family members or only friends or only professionals). It is assumed that if all of this one type of relationship comprising the whole of a person's support network, were to cease to exist, the person would no longer have a support network (i.e., if a woman only had family support, and she became estranged from her family for some reason).

<u>Heterogeneous composition</u>. A heterogeneous composition was defined as containing more than one type of relationship (i.e., family, friends and neighbors, professionals, or others). It is further assumed that if one type of relationship, for example family, were to cease to exist, that there would still be other members, for example friends, in the person's support group.

Conceptual Framework

Martha Rogers' Science of the Unitary Human Being (Fawcett, 1989) was selected to explain the relationship

between the variables of adequacy of prenatal care, and the size and composition of the support network. When dealing with components of social support like support network, a certain level of abstraction is necessary. Rogers' model is "a synthesis" (Fawcett, 1989) of systems theory, physics, mathematics, and nursing knowledge. The basic concepts of energy fields and pattern are the foundations for her model. She defines an energy field as the fundamental unit of the living and the non-living (Barret, 1990). It is described as being dynamic, in constant motion, and infinite. Pattern is defined as the "distinguishing characteristic of an energy field perceived as a single wave" (Barret, 1990). Energy field and pattern serve as the foundation for defining the person and the environment.

The person is defined as a Unitary Human Being in which he/she is a pattern, an "expression of life process" and "greater than and different from the sum of its parts" (Garon, 1992). This holistic, timeless view of the individual through the "kaleidoscope" of the whole person allows for some understanding of the illusive, complex nature of humans. During pregnancy, a woman's pattern continues to evolve, a separate yet integrated pattern unfolds within her, that of the fetus. The changes manifested in her pattern then affect her environment through the process of integrality. Integrality addresses the continuous interchange between the person and the

environment. Barret (1990) defines integrality as "continuous mutual human field and environmental field process" (p. 388).

Rogers' views the environment also as a pattern that is "irreducible" and "indivisible" from the human energy field (Garon, 1992). This environmental energy field is composed of, but greater than, anything that interacts with the human energy field. It also is identified by pattern and is integral with the human energy field. Prenatal care satisfies the definition of an energy field in that it is dynamic, in continuous motion and infinite (see Figure 1). Adequacy then, is defined as a pattern of that energy field. While prenatal care is itself a part of the larger environmental energy field, the behavior of the woman to obtain adequate care is what creates the pattern of adequacy within that environmental field, further demonstrating the principle of integrality. Because the pattern of PNC is not known or anticipated for the different components of the support network, it can not be visualized in the model.

It is as an energy field that the concept of a support network is also understood, again as an energy field within the larger environmental field. As the individual interacts with her support system, whether that be with family, neighbors, or health care providers there is a continuous inter-field process that occurs in which the individual and her environment are constantly exchanging. This energy



Figure 1. Conceptual Framework for the Study of the Relationship between Prenatal Care and the Size and Composition of the Support Network.

field of the size and composition of the support network can be envisioned as a bridge between the woman and PNC adequacy patterns (see Figure 1).

The form of the "bridge" also demonstrates the concept of helicy. Helicy describes the "continuous innovative, unpredictable increasing diversity" of the human and environmental field patterns (Barret, 1990). This principle addresses both the size and composition components of the support network. The support network energy field, assumes a different pattern based on the particular characteristics of the support network. With higher numbers of support people identified within the support network, there is more diversity (heterogeneity) within both the human and environmental field patterns, this can be pictured as a high amplitude, frequent wave pattern (see legend Figure 1). Low numbers of support people would then be seen as a small amplitude, infrequent wave pattern (see legend Figure 1). When there are heterogeneous compositions of the group, helicy is once again demonstrated. However, to distinguish between the size and composition patterns in the model, a spiral will be used to demonstrate the composition pattern, with the more tightly coiled spiral pattern representing the heterogeneous composition, and the loosely coiled pattern representing the homogenous composition (see legend Figure 1). Because it is not known what, if any, relationships exist between the size and composition of the support group

and PNC utilization, the four utilization patterns, Adequate Plus, Adequate, Intermediate and Inadequate are not specifically identified in the model. It would be difficult to identify these different patterns without projecting a relationship.

Review of Literature

An extensive review of the literature regarding PNC adequacy, and support networks, particularly in pregnancy, was conducted. There was little information on both variables examined together, consequently studies in which some aspects of PNC or social support are discussed were included.

Adequacy of Prenatal Care

There is a wealth of information regarding the adequacy of prenatal care. It has been discussed from many different points of view, including both qualitative and quantitative aspects. There have been at least three large studies using vital statistic information in which indices quantifying adequacy have been developed (Alexander & Cornely, 1987; Kessner et al., 1973; Kotelchuck, 1994a). In each of these studies adequacy was compared to birth outcomes such as birthweight, gestational age at delivery and/or neonatal mortality, with less than adequate care groups having worse neonatal outcomes. Additionally, Kessner et al. reported adequacy compared to the variable of race, and Alexander and Cornely compared PNC adequacy/utilization to some maternal characteristics.

Despite the research supporting improved neonatal outcomes with adequate PNC, many women still do not obtain adequate PNC. Alexander and Cornely (1987) found that only 66.3% of women received adequate PNC in their study. Kotelchuck (1994a) identified 68.5% of women as having adequate or better PNC with his APNCU Index. According to the Michigan Department of Public Health (MDPH) 79.9% of women who had live births in 1993 began PNC in the first trimester, and 73.6% received adequate PNC that same year (Michigan Department of Public Health, 1993).

There appear to be several factors that affect the utilization of prenatal care. Six demographic characteristics have been repeatedly linked to inadequate They are age, parity, maternal education, family PNC. income, maternal marital status, and race (Alexander & Cornely, 1987; Goldenberg et al., 1992; Kessner et al., 1973). Norbeck and Anderson (1989) found that support provided by the partner and/or the mother was related to improved birth outcomes. While several authors suggest that social support and/or the support network could improve PNC utilization (Aaronson, 1989; Brown & Ryan, 1992; Goldenberg et al., 1992; McClanahan, 1992) there is no research that actually examines the relationship of PNC to the support network. The only real link in the research has been with the presence of a marital or significant other relationship

being related to increased PNC utilization (Alexander & Cornely, 1987; Goldenberg et al., 1992; Norbeck & Anderson, 1988).

Size of Support Network

The component of the size of the support network related to pregnancy in general has not been well addressed in the literature. There has been some discussion of social support and pregnancy, but while social support is assumed to be present to some degree when a person is identified as supportive, a simple numerical discussion of size of the network has not been commonly reported. May (1992) in her study of pregnant adolescents, reported a negative correlation between network size and gestational age at delivery, but postulated that this might have been confounded by teens dropping out of the school. The average network size reported by May was between five and eight. While Norbeck and Anderson (1989), reported the network size of their pregnant sample to be between 5 and 8, and included network size as a component of social support, they do not analyze it as a separate concept. Mercer and Ferketich (1988) in their research examining social support as a predictor of depression and anxiety during pregnancy report a network size of 6 to 8, but do not compare it to PNC utilization. Lantican and Corona (1992) in their study comparing the support networks of Filipino and Mexican-American primigravidas report a network size of 5 to 6, but

once again did not consider PNC as a variable.

Inherent in the concept of size, is the assumption that with more people there is some element of increased support. In fact, Mercer and Ferketich (1988) did report a significant correlation between network size and perceived and received support, but as previously stated, their dependent variables were anxiety and depression rather than PNC utilization.

Composition of Support Network

Once again, although many authors report the frequency of relationships (significant other, mother, family, friends, professionals, etc.) included in the support network of the pregnant woman, the variable of composition itself, has not been examined. There seems to be no discussion as to the relevance of diversity, or different kinds of relationships, within the composition of the support network. Collins et al. (1993) found that in low income women, greater network resources were related to higher infant birthweights and more visits to the clinic for prenatal care. Network resources were identified as having one relative living in the area, having one close friend in the area, and living with the baby's father. This was the study that came closest to examining the variables under consideration, and while a higher score would indicate a more heterogeneous composition than a low score, it did not consider other potential compositions, only the effect of this one specific

composition on birth outcomes. It stopped just short of identifying the adequacy of PNC utilization. Several studies (Mercer & Ferketich, 1988; May, 1992; Norbeck & Anderson, 1989; Norbeck et al., 1983) have identified family support as the most common support group during pregnancy. Lee and Grubbs (1993) found 75% of their inadequate care group sought family guidance in self-care behavior before seeking prenatal care, but failed to mention what percentage of the adequate care group exhibited the same behavior. In their adequate care group, 94% reported that family member helped them with self-care behaviors. In the studies where the support of clergy has been mentioned (Mercer & Ferketich, 1988; Norbeck et al., 1983), the numbers of women identifying supportive clergy have been too small to yield much analysis. Neighbors, health care providers, and counselors are other relationships that have been reported as being in the support network. While there is no research that specifically looks at the diversity of the composition of the support network related to PNC utilization, it seems plausible that a diverse network could "balance out" the ill effects created by particular members of a network, and that the healthy behavior of PNC would surface.

Critique of the Literature

While there is a significant amount of literature about prenatal care and a significant amount of literature regarding social support, there is a gap in the research

relating the adequacy of PNC to the concepts of network size and composition. Many more descriptive studies exploring the exact mechanisms through which PNC is affected by the support network will have to be done before a clear understanding of their relationships is understood.

Although the information relating to prenatal care is often derived from fairly large studies, using vital statistics, the information pertaining to support networks in preqnancy often comes from relatively small studies. This makes generalizations more difficult. For instance May (1992) had a sample of less than 50. In addition to the small sample size, it was a non probability convenience sample for which there was no comparison group. Mercer and Ferketich's (1988) sample had 371 women, and while it was a longitudinal comparative study that controlled for race, marital status, parity, and socioeconomic status, PNC was not discussed. In Norbeck and Anderson (1989) there were 208 women, but neither PNC or the support network was presented. Collins et al. (1993) included 129 women in their study, but used a new instrument for which reliability and validity were not reported. More research that explores the relationship between PNC and support networks is needed.

The main difficulty with the existing research however, is that relationships have not been identified for the variables under consideration in this study. Relationships can only be extrapolated from studies exploring the
variables independently. In the case of the composition of the support network, even more tenuous connections can be made, because it is only aspects of, not the composition itself that is discussed. This study may therefore fill a gap in the literature by examining the relationship between prenatal care adequacy and the size and composition of the support network.

Methods

Design

This study was a secondary analysis of data obtained from a convenience sample from a not for profit prenatal center in a southern Michigan county. The present study was conducted as an ex post facto descriptive design, in which the researcher examined the relationships between the variables. The original study was an evaluation of the center and included prospective surveys and a chart review. As part of the study, women were asked to complete many instruments.

<u>Sample</u>

The sample consisted of 108 women who participated in the original study. Only women from the Center for Healthy Beginnings, a private not for profit organization, were included, because this sample of women was fairly homogenous. This allowed for the control of some extraneous variables. Of these women, only those who identified at least 1 person in their support network were included. The women were primarily in their early twenties, white, single, and multiparous with little education beyond high school. The reimbursement source reported for 91.7% of the sample was either Medicaid or Medicaid pending, implying that the women's incomes were within 185% of the poverty level.

Operational Definitions

The variables of this study were network size and composition and adequacy of prenatal care. The variables have been previously conceptually defined.

Adequacy of Prenatal Care

Four classifications of prenatal care use (based on the APNCU Index, see Kotelchuck, 1994c) were employed to describe adequacy of care. The four categories were Adequate Plus, Adequate, Intermediate, and Inadequate. The Unknown category, or missing data group, was not used in this study. Because it was a smaller study, not using vital statistics, and only Center women were included, it was assumed that the Unknown category would be too small a group to yield much analysis. Consequently, these data were omitted.

The calculation yielding the percentage of PNC visits was based on the ratio of recorded visits to expected visits, with the expected number of visits being equal to the ACOG recommended number of PNC visits when adjusted for gestational age at delivery. Recorded PNC visits were defined as visits that were recorded on the Center records. Gestational age was determined based on the estimated date of confinement (EDC), and was recorded on the Center's records. Initially, data were classified in the PNC Initiation Category (see Table 4) and placed into Adequate or Inadequate groups based on the month of initiation of PNC. Secondly, they were assigned to Adequate Plus, Adequate, Intermediate, or Inadequate groups in the PNC Received Services Category based on the percentage of PNC visits when compared to the recommended number of visits adjusted for gestational age at delivery. The Summary Index Category was then determined by combining these two separate classifications into one.

Adequate Plus Care. Adequate Plus care was defined as care beginning in month 1, 2, 3, or 4 of the pregnancy and exceeding the recommended number of visits by 110% or more.

Adequate Care. Adequate care was defined as care beginning in months 1, 2, 3 or 4 of a pregnancy, and meeting 80-109% of the recommended number of visits based on gestational age at delivery.

Intermediate Care. Intermediate care was defined as care initiated before the end of the fourth month of pregnancy and meeting 50-79% of the recommended number of visits.

<u>Inadequate Care</u>. Inadequate care was defined as initiation of care after the fourth month and/or meeting less than 50% of the recommended number of visits.

Summary Adequacy of PNC Utilization Index Based on PNC

Initiation and Received Services

PNC Initiation Ser Category Cat	egory	Index Category
AdequateAdeAdequateAdeAdequateIntAdequateIntAdequateAdeAdequateAdeAdequateAdeAdequateIntAdequateIntAdequateIntAdequateIntIntermediateAdeIntermediateIntIntermediateIntIntermediateIntIntermediateIntInadequateAdeInadequateIntIntIntIntIntIntIntIntInt <td>equate Plus equate ermediate equate Plus equate Plus equate equate Plus equate Plus</td> <td>Adequate Plus Adequate Intermediate Inadequate Adequate Plus Adequate Intermediate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate</td>	equate Plus equate ermediate equate Plus equate Plus equate equate Plus equate Plus	Adequate Plus Adequate Intermediate Inadequate Adequate Plus Adequate Intermediate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate Inadequate

Note. Table from Adequacy of Prenatal Care Utilization Index: Technical Details and Rationale, by Kotelchuck, M., 1994b. Unpublished manuscript, University of North Carolina at Chapel Hill.

Size of Support Network

The size of the support network was defined as the total number of individuals listed on the Norbeck Social Support Questionnaire (NSSQ) in response to the instructions of, "list each significant person in your life on the right. Consider all the persons who provide personal support for you or who are important to you now." (Norbeck, et al., 1981) (see Appendix C). There is space for up to 24 network members to be listed on the first half page of the questionnaire, the total number of network members listed reflected the size of the network.

Low numbered group. The low group included those listing seven members or less.

<u>High numbered group</u>. The high group was defined as networks including eight or more members.

Composition of Support Network

The composition of the support network was defined by the categories listed by the respondent on the second half page of the NSSQ (see Appendix C). There are nine categories presented in the instructions to be used to identify the relationship of the persons to the respondent. The nine categories are: spouse or partner; family or relatives; friends; work or school associates; neighbors; health care providers; counselor or therapist; minister/priest/rabbi, and other. For the purposes of this analysis however, these nine categories were collapsed into four: family, friends

and neighbors, professionals, and others. Family was defined as including spouse or partner, and other family relationships. Friends and neighbors were collapsed into one category, due to these relationships having no other common denominator with other categories. Professionals included the categories of health care providers, counselor or therapist, and minister/priest/rabbi. Because these three categories, all contain some sort of professional relationship, and have been shown in the literature to yield low numbers, they will be collapsed into one category, that of professionals. Others were defined as school/work associates and others.

<u>Heterogeneous composition.</u> Heterogeneous composition was defined as more than one category of relationships.

<u>Homogenous composition.</u> Homogenous composition was defined as only one category of relationships identified.

Data from the previously defined high and low groups were then combined with the previously defined homogenous and heterogeneous groups to make four additional groups. These groups were: (a) <u>High number/Heterogeneous</u>, (b) <u>High</u> <u>number/Homogenous</u>, (c) <u>Low number/Heterogeneous</u>, and (d) <u>Low</u> <u>number/Homogenous</u>.

Instrument

The NSSQ was developed to be self-administered by Norbeck et al., (1981) to measure various indicators of social support; the support network is one of those indicators. It

asks the respondents to list the people in their lives who support them, to classify them according to nine categories, and then to answer questions about them (see Appendix C). For this study only the components of "number in the network" (Questions 5-6) and "relationship" (Questions 34-53) which identifies the specific category in which a support person is placed by the respondent (Norbeck et al., 1981) were used.

Reliability of the NSSQ has been previously established for network property items, although it should be noted that this included items such as duration of relationships and frequency of contact, as well as network size. The "source of support" category, referred to as composition of the network in this study, did not have reliability reported for it. Test- retest reliability for network size was found to be .85 to .92 at one week (Norbeck et al., 1981) and .58 to .78 at seven months (Norbeck, Lindsey et al., 1983). It was felt that the difference had more to do with true changes in the network rather than with reliability issues. Validity for network components specifically were not reported.

Data Analysis

The data were analyzed using the SPSS, a statistical software package, to report the frequency and percentage for each variable and the demographics of age, education level, marital status, parity, race, and insurance. For question number one, a 2 X 4 contingency table was constructed using

the two network size groups: 1 -7, the low numbered group and 8-24, the high numbered group and the four adequacy of care groups. The chi-square statistic was used to test if the proportion of women in the different adequacy of care patterns were statistically different for women with high or low numbers of people in their support network. Similar statistical analysis was used for question number two using instead a 2 X 4 contingency table to include the two homogenous and heterogeneous composition groups and the four adequacy of care groups. For question number three, the same analysis was utilized using a 4 X 4 contingency table with the four composition/size groups: low/homogenous, low/heterogeneous, high/homogenous, and high/heterogeneous cross tabulated with the four adequacy of care groups. The level of significance was set at the 0.05 level.

Human Subjects Approval

Approval to access the data set was obtained from the University Committee On Research Involving Human Subjects (UCRIHS) prior to the access of the data and data analysis (see Appendix A). In the original study informed consent was obtained at the first prenatal visit. The initial study was also approved by UCRIHS (see Appendix B). This researcher was not provided with any information that would identify the participants directly. Data were reported in aggregate form and were available with identification numbers only.

Assumptions and Limitations

It was assumed that the initial data were obtained accurately and that the respondents had no reason to answer questions falsely. Secondly, it was assumed that the original data were collected without systematic error.

The limitations inherent in these data were mainly related to the non-experimental, non-random, ex post facto design. As with any ex post facto study, the inability to manipulate the variables, the lack of random assignment, and the possibility of incorrectly interpreting the results are weaknesses that were considered. Consequently, there is an inability to determine causality, the most that can be learned from the study is to describe relationships between the variables and to evaluate the strength of those relationships. Additionally, it is understood that limitations exist in the generalizability of the findings. While the women included in the sample were mainly economically disadvantaged, and the results might be generalizable to low socioeconomic groups, they were also mainly white and could not be used to predict relationships for other racial groups. This is true in regard to other factors associated with the homogeneity of the sample as well. Factors such as parity, marital status, and maternal education also limit the generalizability of the findings.

Results

Sample Description

The average age of the 108 women in the sample was 22.88 years (SD = 5.06). The majority had a high school diploma or GED equivalent, were multiparous, and were either single, divorced, or separated. It was primarily a white sample with approximately twenty percent being African/American or Hispanic; no other races were named. Almost ninety-two percent of the sample had either Medicaid or Medicaid pending insurance status. See Table 5 for a summary of the sample characteristics.

Results of Analysis for Research Questions

For the research variables, the women were divided almost evenly between the small and large support network groups (see Table 6). However, for the composition groups the vast majority were in the heterogeneous group (see Table 6). Consequently, the majority of women were in the high and low heterogeneous groups when the variables were combined (see Table 6). For the PNC groups overall, most of the women received adequate or better PNC (see Table 7). The numbers in the intermediate care group were low resulting in empty cells in the cross tabulation. There were at the most 12 missing cases for any group.

Question 1. Are there differences in the adequacy of care patterns among women with high numbers of people in their support network and those with few or none in their

Sample Characteristics

Characteristics	<u>No.</u>	<u>_%</u>
Maternal age		
10-19	30	27.8
20-29	64	59.3
30 and above	14	13.0
Educational level		
<high school<="" td=""><td>2</td><td>1.9</td></high>	2	1.9
Some high school	33	30.6
H. S. diploma/GED	55	50.9
Some college	13	12.0
Associates Degree	3	2.8
Missing cases	2	0.9
5		
Marital status		
Single	63	58.3
Married/Cohabitating	31	28.7
Separated/Divorced	14	13.0
Number of deliveries		
0	51	47.2
1	21	19.4
2	25	23.1
3	10	9.3
4	1	0.9
-	_	
Race		
Caucasian	86	79.6
African/American	20	18.5
Hispanic	2	1.9
Insurance		
Medicaid	68	63.0
Blue Cross	2	1.9
Other insurance	1	0.9
Cash	6	5.6
Medicaid pending	31	28.7
real percent		

The Frequency and Percent of the Network Size and

Composition Groups

	<u>No</u> .	<u>ətə</u>		
Network Size (N=105)				
Low Number	54	51.4		
High Number	51	48.6		
Missing cases	3			
Network Composition (N=96)				
Homogenous	20	20.8		
Heterogeneous	76	79.2		
Missing cases	12			
Combination (N=96)				
Low Number/Homogenous	14	14.6		
Low Number/Heterogeneou	s		40	41.7
High Number/Homogenous	6	6.3		
High Number/Heterogeneo	us		36	37.5

Frequency and Percent of Adequacy of Prenatal Care Groups

(N=96)

Adequacy of Care	<u>No</u> .	<u>8</u>	. <u></u>
Adequate	18	18.8	
Intermediate	3	3.1	
Adequate	32	33.3	
Adequate Plus	43	44.8	
Missing	12	11.1	

Table 8

<u>Cross tabulation of Adequacy of Prenatal Care by Size of the</u> <u>Support Network</u> (N = 93)

Prenatal Care	Low Number		High	Number
	<u>No.</u>	<u></u>	<u>No.</u>	<u>8</u>
Inadequate	10	(20.8)	6	(13.3)
Intermediate	0		3	(6.7)
Adequate	14	(29.2)	17	(37.8)
Adequate Plus	24	(50.0)	19	(42.)

their support network? (see Table 8). The chi-square statistic was computed and found to not be significant X^2 (3, N = 93) = 4.78, p =.19. Consequently, the proportion of women in the different adequacy of care groups were not statistically different for women with high or low numbers of people in their support network. This suggests that the size of the support network is not related to PNC adequacy.

Question 2. Are there differences in the adequacy of care patterns among women with heterogeneous versus homogenous compositions of their support network? The cross tabulation can be found in Table 9. The chi-square statistic was not significant X^2 (3, N = 86) = 2.98, p = .40. Consequently, the proportion of women in the different adequacy groups were not statistically different for women with homogenous or heterogeneous compositions in their support networks than would be expected if no relationship existed between them. Therefore, having different types of network support groups is not related to PNC adequacy.

Question 3. Are there differences in the adequacy of care patterns among women who have high and low numbers and different compositions of their support network? The cross tabulation can be found in table 10. In this case, the chi-square statistic approached significance X^2 (9, N = 86) = 15.8, p = .07. Once again, the proportion of women in the different adequacy of PNC patterns were not statistically different for women with homogenous or heterogeneous

Cross tabulation of Adequacy of Prenatal Care by

Prenatal Care	Homogenous	Heterogeneous	
Adequacy	<u>No. (%)</u>	<u>No. (%)</u>	
Inadequate	1 (5.9)	14 (20.3)	
Intermediate	0	3 (4.3)	
Adequate	7 (41.2)	22 (31.9)	
Adequate Plus	9 (52.9)	30 (43.5)	

Composition of the Support Network (N=86)

Table 10

<u>Cross tabulation of Adequacy of Prenatal Care by Combination</u> of Size and Composition Groups (N=86)

Prenatal Care	Lov	Low/Hom Low/Het		H	Hi/Hom		Hi/Het	
Adequacy	No	. (%)	No	<u>. (%)</u>	No	<u>. (%)</u>	<u>No</u>	<u>. (%)</u>
Inadequate	1	(9.1)	9	(24.3)	0		5	(15.6)
Intermediate	0		0		0		3	(9.4)
Adequate	2	(18.2)	12	(32.4)	5	(83.3)	10	(31.3)
Adequate Plus	8	(72.7)	16	(43.2)	1	(16.7)	14	(43.8)

Note. Low/Hom = Low numbers and homogenous composition; Low/Het = Low numbers and heterogeneous composition; Hi/Hom = High numbers and homogenous composition; Hi/Het = High numbers and heterogenous composition. compositions in their support networks than would be expected if no relationship existed between them. However, these findings do seem to indicate a trend in which women with more heterogeneous network compositions may have more PNC adequacy.

Discussion

Interpretation of Findings

Overall, the results fail to suggest the presence of a relationship between the size and composition of the support network and the adequacy of PNC. Most of the sample demographics described were similar to the demographic variables consistently identified in the literature as being associated with inadequate PNC (Alexander & Cornely, 1987; Goldenberg et al., 1992; Kessner et al., 1973). The characteristics such as single marital status and low socioeconomic status were the overwhelming majority in this sample. The median age of women delivering infants in the State of Michigan was 27 years (Michigan Department of Public Health (MDPH), 1994), compared to the mean age of the sample being 22. While 67% of the sample had at least a high school education, 80% of mothers in the State of Michigan had at least a high school education (MDPH, 1993). For parity, 47% of the sample were primiparas compared to 39% of the Michigan population (MDPH, 1993). Although the sample demographics should have been consistent with lower PNC adequacy, seventy-five percent of this sample obtained

adequate or better PNC compared to 73.6% receiving adequate care in the State of Michigan (MDPH, 1993). These findings are even more thought provoking when viewed in light of the fact that the MDPH statistics were analyzed using the Kessner Index and this study used the APNCU Index (Kotelchuck, 1994c) which should classify more women as obtaining inadequate PNC than the Kessner index (Kotelchuck, 1994a).

There could be several reasons why more women in this sample received adequate care than might have been expected. The results could be confounded by the fact that the Center was focusing on improving PNC utilization in low income women, and there may have been skewing based on the interventions the Center provided. For instance, the Center may have significantly improved access for these women, as well as providing some increased network support just by virtue of the women participating at the Center. While Kotelchuck (1994a) found 21.1% of women in his sample to receive a poorer rating when compared to the Kessner index, because of interventions at the Center women may have had more continuous care once it was initiated than in the vital statistics sample Kotelchuck used.

Other factors to be considered are that this was a small, fairly homogenous sample, who chose to receive PNC and did so in one setting. Just as larger samples typically provide results that are closer to population

characteristics, having more providers participate in the study could have resulted in very different findings. Having care provided in just one setting, particularly a setting like the center where there was a common goal, typically decreases the amount of variation in the care provided. If care provided by private physicians or other PNC clinics had been included in the sample the findings may have been different. A larger sample would also have been more likely to have had no empty cells in the cross tabulations making the analysis clearer. Finally, all the women included in the sample choose to obtain PNC at some point in their pregnancy. The whole group of women who did not have PNC were excluded from the sample by virtue of how the sample was chosen. The study of the population of women who have no PNC may have lead to very different results.

Problems with Data Analysis

It is difficult to interpret the results with the presence of 2 to 6 cells in each cross tabulation that have frequencies less than 5. The total number in the intermediate care group was so small that there were bound to be empty cells. Collapsing the intermediate and inadequate care groups may have yielded a better statistical analysis. Collapsing these two groups would have left only 1 empty cell, the inadequate/intermediate - high number/homogenous cell. Empty cells inhibit analysis of the variables in question, and then skew the overall chi-square

statistic, because the whole analysis is based on expecting some frequency in each cell and in the empty cells the frequency is zero. Given the number of empty cells the use of Fisher's exact test may have been more appropriate. If the intermediate and inadequate cells had been collapsed, question number 1 would have had no cells with less than 5, and question number 2 would have had only 1 cell with less than 5. The number of women, when compounded by the homogeneity of the sample, was probably not high enough for the statistical analysis attempted.

Another problem with the analysis was the absence of the no network group. Women with no support were not included in the study. There were women in this sample of 108 women for whom data were missing, whether they truly did not have a support network or whether they simply did not choose to complete those sections of the NSSQ is not known. While including more variables, like a no network group may have been problematic with this sample size in a chi-square analysis, the no support group would have been a very different group to consider. The vast majority of women included in this study had a heterogeneous network, and all of them had some network. It may be that the intervention of having a prenatal care center provided the women in the sample access to more supportive relationships. While there were no statistically significant relationships identified, there was also no comparison to a no support group, this

comparison could have yielded some important information regarding support. It is important to make this distinction, because this research does not disagree with other studies that suggest that a support network is related to better neonatal outcomes. It simply suggests there is no relationship between the size and composition of the support network and PNC.

Additionally, by including professionals, one support group must be included for PNC to occur. One cannot have formal PNC without a provider. However, it is not known from this data analysis, whether the women perceived professionals to be in their support network and included them as perhaps their only support or not.

Finally, there may have been more power in the analysis if an Analysis of Variance (ANOVA) had been used. The categories would had to have been identified differently (i.e., mean numbers of support persons) rather than being grouped into high and low network size groups in order for ANOVA to have been utilized. For the composition questions, ANOVA would not have been appropriate due to the necessary groupings of the variable.

Adequacy of Prenatal Care, Size and Composition of the

Support Network

The literature was particularly silent on the relationship of these variables to one another. The only study that came close to suggesting a relationship was

Collins et al. (1993). Their findings of higher network resources (which were defined as living with the baby's father, and having one family member and one close friend in the area) being related to an increased number of prenatal care visits were supported. While not statistically significant, there appeared to be a trend for the heterogeneous compositions to have better PNC utilization. The heterogeneous compositions had the highest numbers in the Adequate Plus groups and, in all except the intermediate care group, the numbers increased with each PNC level.

The major problem with the composition groups was the way they were measured. In the original data it was impossible to separate the network support obtained from the mother from the network support obtained from other members of the family. While the literature suggested that the mother and significant other were the most frequently identified network members (Mercer & Ferketich, 1988; May, 1992; Norbeck & Anderson, 1989; Norbeck et al., 1983) they were grouped together in this study.

The definition Collins et al. (1993) used for their network resources, having one relative living in the area, having one close friend in the area, and living with the baby's father, may have been a better definition for a heterogeneous composition. This information was not available on the NSSQ however, and it is not known if it is available in other records from the Center. The data that

would have been available would have been if the significant other, another relative and at least one friend were listed on the NSSQ, even this would have been a definition that was at least somewhat supported in the literature. This different definition of heterogeneity may have made trends more visible and yielded different results.

While none of the analyses were statistically significant, it is interesting to note that in each case the intermediate care group had no members in the smaller and/or homogenous compositions. Although the numbers in this intermediate care group are far too small to suggest relationships, further research is needed to see which group, if any, has particular characteristics that separate it from other groups (i.e., women with larger, more diverse support networks may not perceive themselves to be in need of as much prenatal care).

Another limitation that was not considered relates to the proximity of the social support network to the woman. If a woman's most supportive relationships live a distance away from her, the positive affects of the support network may be compromised. Particularly the aide components of social support (i.e., baby-sitting, transportation) to be derived from the support network would be more difficult over a distance. The affect and affirmation components may be more accessible over a distance (i.e., over the telephone).

Conceptual Framework

It appears that there is indeed some tendency toward higher numbers and diversity in the support network leading toward increased prenatal care (even though it is not statistically significant, it is certainly clinically significant). This is consistent with the framework. While, relationships were not identified that would allow for the model to be supported, neither would the model be changed based on the results of the study. Due to the problems with the data analysis the model was not adequately tested. There were no relationships identified that would allow the particular PNC patterns to be identified with the particular bridges (see Figure 1). Additionally, the PNC patterns did not vary much within the sample, so it is difficult to determine differences in pattern or the effect of helicy.

In retrospect, a social support model, such as Kahn's convoy of affect, affirmation and aide (Kahn, 1979) may have been more appropriate than a nursing model. While Rogers' model is certainly holistic enough to encompass the variables under consideration, it is so abstract that it is difficult to visualize in concrete terms. A social support model in which the terms were previously identified, and the relationships had been previously tested would have been much less cumbersome.

To attempt to test a new model with such a small sample

size was probably not realistic. However, all things considered, the main difficulty with the research including the conceptual framework was with the statistical analysis. With the empty cells, the analysis prevented adequate testing of the model. For future analysis, I would either choose a social support model or use a larger sample size, with some adjusted definitions to test the model proposed in this research.

Implications

Advanced Nursing Practice

The implications for nurses in advanced practice are related to an increased focus on the support network, and in improving access to PNC. While there were no statistically significant relationships identified between the support network and PNC, there did appear to be a trend in which subjects with the heterogeneous groups had the highest numbers of at least adequate PNC. This, along with other studies that support improved health outcomes with network support (Collins et al., 1993; Norbeck & Tilden, 1989), appear to suggest that assessment of a pregnant woman's support network is important. Ideally, this assessment would occur through primary care, where the support network would be evaluated prior to the pregnancy. In order for nursing interventions to impact the initiation of care, the assessment must precede the pregnancy, however to impact the utilization of care throughout the pregnancy a review of

this assessment needs to occur at the first PNC visit and again later in the pregnancy, probably near the beginning of the third trimester.

Once the nurse in advance practice has assessed the support network, counseling can be done to assist the woman in identifying the support network she has, in identifying additional relationships that may be able to offer support, and in identifying the barriers in building or enhancing her support network. The advanced practice nurse may be able to empower the woman to seek the support she needs. Resources such as the public health department, childbirth education, and dietary counseling can be activated through referrals with other professionals and support groups such as church groups and lay support programs. Through patient education, the importance and benefit of the support network can be taught both to the woman and to her support network members. With the use of change theory, the advance practice nurse can assist the woman to make incremental changes in her support network.

Because the women in the study had PNC that was as adequate as PNC obtained by the general population, and the study sample was characteristic of women who typically obtain less than adequate PNC, a case could be made for providing access to services such as those provided at the center for all women. The study had high rates of PNC adequacy, so providing the services that the center provided

may increase PNC adequacy in the general population as well as for women in low socioeconomic groups. The socialization that occurred at the center, as well as the "one stop shopping approach" where social services, the Women, Infants and Children (WIC) program, and nursing services were available in one visit are interventions that should be considered in increasing PNC adequacy.

<u>Research</u>

As there was very limited research describing the study variables, it is important that other studies are done to define what the relationships are between the support network and PNC. Replication of Collins' (1993) study, which included an element of heterogeneity although not defined as such, and this research with larger sample sizes may shed more light on these relationships. Particularly with the research indicating the importance of the mother and significant other relationship, defining the support network with some of these concepts could be significant. The use of a no support comparison group could also offer some important information.

Studies that compare the care provided by different providers as well as in different settings could also be very important. With the findings of improved PNC adequacy in this low income group of women, more studies need to be done to determine the exact reasons for this level of adequacy.

It may also be that adequacy is not the correct outcome variable in evaluating the importance of the support network. Other studies have looked at low birthweight, infant mortality and gestational age at delivery as outcome variables (Norbeck & Anderson, 1989), perhaps these variables should be used to assess the significance of the support network.

This study raises more questions than it answers. Number one, is a support network important in PNC adequacy? Is a heterogeneous support network related to improved PNC adequacy? Is it only in low income women that the support network appears to not be related to PNC adequacy? Is it only in white low income women that PNC adequacy appears to not be related to the support network? For these questions to be answered, there must be more research with larger, more diverse samples and more studies examining these variables need to be conducted.

Summary

This study examined whether or not a relationship existed between PNC adequacy and the size and composition of the support network of a group of low income women. While there were no statistically significant results, there did appear to be a trend suggesting that a heterogeneous composition was somewhat related to better PNC adequacy. Size as defined in this study appeared to be unrelated to adequacy. The most significant finding was the need for

APPENDICES

Appendix A

University Committee on Research Involving Human Subjects

<u>Approval</u>

MICHIGAN STATE

UNIVERSITY

May 31, 1995

- TO: Anne Colby 604 Maple Grayling, MI 49738
- RE: IRB#: 95-260 TITLE: 95-260 THE RELATIONSHIP BETWEEN PRENATAL CARE AND SUPPORT NETWORK: SIZE AND COMPOSITION OF THE SUPPORT NETWORK REVISION REQUESTED: N/A CATEGORY: 1-E APPROVAL DATE: 05/31/95

The University Committee on Research Involving Human Subjects'(UCRIHS) review of this project is complete. I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and methods to obtain informed consent are appropriate. Therefore, the UCRIHS approved this project and any revision listed above.

- **RENEWAL:** UCRIHS approval is valid for one calendar year, beginning with the approval date shown above. Investigators planning to continue a project beyond one year must use the green renewal form (enclosed with the original approval letter or when a project is renewed) to seek updated certification. There is a maximum of four such expedited renewals possible. Investigators wishing to continue a project beyond that time need to submit it again for complete review.
- **REVISIONS:** UCRIHS must review any changes in procedures involving human subjects, prior to initiation of the change. If this is done at the time of renewal, please use the green renewal form. To revise an approved protocol at any other time during the year, send your written request to the UCRIHS chair, requesting revised approval and referencing the project's IRB # and title. Include in your request a description of the change and any revised instruments, consent forms or advertisements that are applicable.



PROBLEMS/ CHANGES: Should either of the following arise during the course of the work, investigators must notify UCRIHS promptly: (1) problems (unexpected side effects, complaints, etc.) involving human subjects or (2) changes in the research environment or new information indicating greater risk to the human subjects than existed when the protocol was previously reviewed and approved.

OFFICE OF RESEARCH AND GRADUATE STUDIES

If we can be of any future help, please do not hesitate to contact us at (517)355-2180 or FAX (517)432-1171.

University Committee on Research involving Human Subjects (UCRIHS)

Michigan State University 232 Administration Building East Lansing, Michigan 48824-1046

> 517/355-2180 FAX: 517/432-1171

Sincerely 2 David E. Wright, Ph.D UCRIHS Chair DEW:kaa/lcp

cc: Rachel F. Schiffman

The Michigan State University IDEA is Institutional Diversity, Excellence in Action

Appendix B

University Committee on Research Involving Human Subjects

Approval for Original Data

MICHIGAN STATE UNIVERSITY

OFFICE OF VICE PRESIDENT FOR RESEARCH AND DEAN OF THE GRADUATE SCHOOL EAST LANSING . MICHIGAN . 48824-1046

TO: Rachel Schiffman

March 2, 1993

FO: Rachel Schiffman, Ph.D. Mildred Omar, Ph.D. A230 Life Sciences

RE: IRB #: 92-115 TITLE: FACTORS INFLUENCING PREGNANCY OUTCOME CATEGORY: 1-C REVISION REQUESTED: February 23, 1993 APPROVAL DATE: March 1, 1993

The University Committee on Research Involving Human Subjects' (UCRIHS) review of this project is complete. I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and methods to obtain informed consent are appropriate. Therefore, the UCRIHS approved this project including any revision listed above.

UCRIHS approval is valid for one calendar year, beginning with the approval date shown above. Investigators planning to continue a project beyond one year must seek updated certification. Request for renewed approval must be accompanied by all four of the following mandatory assurances.

- 1. The human subjects protocol is the same as in previous studies.
- 2. There have been no ill effects suffered by the subjects due to their participation in the study.
- 3. There have been no complaints by the subjects or their representatives related to their participation in the study.
- 4. There has not been a change in the research environment nor new information which would indicate greater risk to human subjects than that assumed when the protocol was initially reviewed and approved.

There is a maximum of four such expedited renewals possible. Investigators wishing to continue a project beyond that time need to submit it again for complete review.

UCRIHS must review any changes in procedures involving human subjects, prior to initiation of the change. Investigators must notify UCRIHS promptly of any problems (unexpected side effects, complaints, etc.) involving human subjects during the course of the work.

If we can be of any future help, please do not hesitate to contact us at (517) 355-2180 or FAX (517) 336-1171.

Sincerely David E. Wright, Ph.D **UCRIHS** Chair

DEW:pjm

Appendix C

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Network Data WHEN YOU HAVE FINISHED YOUR LIST, PLEASE TURN TO PAGE 2. You do not have to use all 24 spaces. Use as many spaces as you have important persons in your life. and list as many people as apply in your case. Use the following list to help you think of the people important to you, Use only first names or initials, and then indicate the relationship, as in the following example: to you. Please list each significant person in your life on the right. Consider all the persons who provide personal support for you or who are important Example: Ś æ 5 eic. First Name or Initials MARY T. SAM MRS. R Bog PLEASE READ ALL DIRECTIONS ON THIS PAGE BEFORE STARTING. SOCIAL SUPPORT QUESTIONNAIRE © 1980 by Jane S. Norbeck, D.N.Sc. University of California, San Francisco Revised 1982 - other – minister/priest/rabbi - counselor or therapist health care providers neighbors - work or school associates friends family members or relatives - spouse or partner BROTHER NEIGHBOR Relationship FRIEND MOTHER TREND Page 1 2.6 24 23 22 .ĭ .ĭ 19 18 17. 15. 16. 4 μ 12 Ξ ē 9 .00 6 v æ ŝ N First Name or Initials PERSONAL NETWORK Date_ Number _ Relationship I E 1 1 1 5] 155 5. [52] 121 1051 -47 [46] 3 [49] . [42] . [39] 1 14 [40] 24 133 [36] 124 []] 1221

Norbeck Social Support Questionnaire: Part Used for Support

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