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THE RELATIONSHIP OF INTERACTION BETWEEN PEER COUNSELORS AND LOW-INCOME WOMEN AND DURATION OF BREASTFEEDING

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THE RELATIONSHIP OF INTERACTION BETWEEN PEER COUNSELORS AND LOW-INCOME WOMEN AND DURATION OF BREASTFEEDING

By

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ABSTRACT

THE RELATIONSHIP OF INTERACTION BETWEEN PEER COUNSELORS AND LOW-INCOME WOMEN AND DURATION OF BREASTFEEDING

By

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Breastfeeding is recommended for six to twelve months, a goal that is far from being met all women. Multiple regression was performed on selected data from a sample of 250 low-income women to examine the relationship of early postpartum interaction between first time breastfeeding women and peer counselors and duration of breastfeeding. King's model of interaction within the theory of goal attainment was used as the conceptual framework. The variables, timing of the first contact and number of contacts in the first two weeks, after controlling for prenatal contacts, did not predict or explain duration of breastfeeding. An implication for the Advanced Practice Nurse (APN) is that a woman's decision to breastfeed is complex as is breastfeeding peer counseling. The findings of this study suggest that the APN needs to intervene with the breastfeeding woman at 2-3 weeks postpartum and again near 3 months, to evaluate, support and promote longer breastfeeding.

To all breastfeeding women and infants

and those who faithfully support them.

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Introduction

Background of the Problem

Breastfeeding is recognized as optimal nourishment for infants, providing antimicrobial, anti-inflammatory, and immunologic factors to the infant and additional benefits to the lactating mother. Major authorities on maternal and child health strongly advocate breastfeeding for most infants (American Academy of Pediatrics [AAP], 1982; American Dietetic Association [ADA], 1997; American Medical Association [AMA], 1979; Spitzer, 1984; United States Public Health Service [USPHS], 1994; World Health Organization [WHO], 1989). Recognition by health authorities of breastfeeding as a means of preventive care and health promotion is reflected by efforts to promote longer duration of breastfeeding (USPHS, 1994). The ADA in the revised breastfeeding position statement, advocates breastfeeding, ideally for 12 months, because of "the indisputable nutritional, immunological, psychological, and economic benefits" (p. 662). Healthy People 2000 (United States Department of Health and Human Services [USDHHS], 1991) has a breastfeeding objective which is: To increase to at least 75% the proportion of women who breastfeed their babies upon hospital discharge and to at least 50%, the proportion of women who continue breastfeeding until their babies are 5-6 months old (p. 123, 379). Identifying factors which promote the duration of breastfeeding, especially for low-income women, could favorably impact the current

proportion of women who continue to breastfeed and thus move the nation closer to the breastfeeding objective of Healthy People 2000.

A problem is that many women who initiate breastfeeding do not continue to breastfeed as long as recommended (Ryan, 1997; USDHHS, 1991). Nationally, the percentage of women continuing to breastfeed at 5-6 months postpartum peaked in 1984 at 27.5% (Martinez & Krieger, 1985). In 1995, the percentage of all women breastfeeding at 5-6 months had fallen to 20.6% (Ryan, 1997). In 1987, the percentage of low-income women breastfeeding their babies at 5-6 months of age was 7% (Ross Pediatrics, 1996) and had increased to 12.8% by 1995 (Ryan, 1997), a percentage, however, which remains well below the objective of Healthy People 2000.

Breastfeeding beyond early infancy, i.e., one month of age, and in some studies, beyond 3, 4, 6 or 8 months has been related to reduced morbidity in infants and children, e.g., less incidence of lower respiratory tract infections, gastroenteritis, skin disorders, acute and recurrent otitis media, water intoxication, atopic disease, childhood cancer, and Hodgkin's disease (Davis, Savitz, & Graubard, 1988; Duncan et al., 1993; Keating, Schears, & Dodge, 1991; Saarinen & Kajosaari, 1995; Schwartzbaum, George, Pratt, & Davis, 1991; van den Bogaard, van den Hoogen, Huygen, & van Weel, 1991; Wright et al., 1989). Montgomery and Splett (1997) have demonstrated that

economic benefits, e.g., a mean reduction of $478 in WIC costs and Medicaid expenditures per infant, resulted from breastfeeding infants compared to formula feeding infants among those enrolled in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), a program for low-income women.

A reason suggested for fewer women breastfeeding by anthropologist, Dettwyler (1995), is a lack of socio-cultural support for breastfeeding. One of the more recent forms of support for low-income women is that of structured breastfeeding peer counselor programs (Kistin, Abramson, & Dublin, 1994; Long, Funk-Archuleta, Geiger, Mozar, & Heins, 1995).

Purpose of the Study

The purpose of this descriptive study was to examine the relationship of interaction between peer counselors and low-income, first time breastfeeding women and their duration of breastfeeding. Secondary data collected by peer counselors from January, 1994 to May, 1996 were used. Because of the definitive benefits of breastfeeding to the infant and the number of women who are not breastfeeding their infants or, if breastfeeding, not continuing to breastfeed of longer duration, breastfeeding education, promotion, and support becomes an essential concern of the Advanced Practice Nurse (APN). Interaction with a peer counselor might be an important source of support for low-income

breastfeeding women and an important community resource and referral source for APNs providing care to childbearing and childrearing women.

Statement of the Problem

Since breastfeeding is associated with many positive benefits, identifying factors that promote breastfeeding duration is an important component in meeting the Healthy People 2000 breastfeeding objective. Interaction with a breastfeeding peer counselor may be one factor enhancing breastfeeding duration among women of low-income. However, limited research exists regarding the relationship of interaction between peer counselors and first time breastfeeding women and duration of breastfeeding. If early interaction with a peer counselor and a concentration of visits in the first two weeks were shown to be effective in increasing the duration of breastfeeding, programs with early interaction and peer counselors need to be considered as a form of support. As a result, the advantages of breastfeeding longer in duration can reach more low-income mothers and infants.

Research Question

The research question was: What is the relationship of interaction between peer counselors and first time breastfeeding women within the first two weeks of the infant's birth and the duration of breastfeeding after controlling for prenatal interactions? The hypothesis was that an early postpartum

interaction with a peer counselor and an increased number of interactions with a peer counselor in the first two weeks postpartum is related to longer duration of breastfeeding in this population of first time breastfeeding mothers than among women who had an interaction with a peer counselor which began later postpartally with fewer number of contacts in the first two weeks.

Conceptual Framework

This section includes the conceptual discussion of peer counseling in general and breastfeeding peer counseling in particular, followed by the conceptual definitions of the study variables of interaction with a peer counselor and duration of breastfeeding. The conceptual framework of King's (1981) theory of goal attainment is then discussed and linked to the conceptual definitions.

Conceptual Discussion of Peer Counseling

Peer Counseling in General. Peer counseling or peer educators have been used regularly in other health, educational, and social programs since the mid-1960's when the federal government sponsored training programs to develop paraprofessional or "new career" opportunities in the various human services fields (Cohen, 1976). The role of the peer counselor or paraprofessional was to help bridge the gap between consumers and human service agency personnel by a sharing of values, attitudes, and experiences because of their peer status

and, often, the same socio-economic status (Cohen, 1976; Giblin, 1989). Peer counselors also assume some of the routine duties of professionals (Cohen), such as, education, referral to other sources, problem-solving, listening and provision of support. Marin and colleagues (1995) discuss the needs of people of major ethnic groups, low-income populations, women, and the elderly who are often underserved. People of these populations have needs which may not be recognized or understood by health professionals who are often not of similar backgrounds. People of these groups, because of socio-demographic factors and sharing of background characteristics, might be predisposed to perform damaging health behaviors or avoid health promotion measures (Marin et al.). One strategy for meeting the needs of the underserved and for promotion of health and disease prevention is the use of peer counselors (Marin et al.).

Breastfeeding Peer Counselor. The peer counselor of a breastfeeding peer counseling program is a non-professional, or paraprofessional, who provides low-income women with support, teaching, and counseling during the prenatal and postpartum period to help them with breastfeeding (Long et al., 1995). The peer counselor program examined in this study was the Breastfeeding Peer Counselor Initiative (BFI) in Michigan (see Appendix A). The peer counselor in BFI was someone who had breastfed a baby herself and who perceived her breastfeeding experience as successful. A peer counselor often has had the

experience of living in poverty or might be of low income (Kistin et al., 1994), giving her a bond with the low-income woman. This commonality represents a sharing of attitudes, values, and behaviors between peer counselor and the woman (Giblin, 1989). Interaction between the peer counselor and the woman might be facilitated by the nature of the relationship with a person like herself, often because of a mutual trust and caring (Giblin).

Conceptual Definitions of the Study Variables

Interaction with a Peer Counselor. In this study, interaction with a peer counselor included two components, timing of the first contact after the birth of the infant and the number of contacts in the first two weeks postpartum. Conceptually, interaction between a peer counselor and a first time breastfeeding woman was defined as adequacy of support by a peer counselor. Timing and number was a measure of the quantitative component of adequacy of support, an indirect measure.

The first of the two aspects of interaction was timing of the first interaction by a peer counselor. In BFI, either the mother or peer counselor initiated contacts. Timing of the first interaction postpartum varied depending on whether or not the peer counselor routinely visited or made telephone calls to the woman in the hospital, or waited until after discharge to interact with the mother and infant. Timing also depended on

when the peer counselor was notified that a woman had delivered her baby or was requested to visit. Timing of the first interaction with a peer counselor was assumed to be important because in the early days of breastfeeding, a woman who has never breastfed lacks experience, perhaps confidence, might be exhausted, and is more likely to become discouraged or might wean without someone who knows how to help her (Barron, Lane, Hannan, Struempler, & Williams, 1988). A health care professional might not have the training, the time, or the rapport with the woman, to help a woman through these problems at the time the mother needs the help. Early first contact by the peer counselor with the breastfeeding woman might be crucial for the woman in overcoming technical breastfeeding difficulties and for gaining confidence that she can breastfeed.

The second aspect of the concept of interaction with the peer counselor was the number of contacts by a breastfeeding peer counselor with the woman in the first two weeks postpartum, another component of adequacy of support. In BFI, an emphasis was on increased contacts during the first two weeks postpartum to assist in overcoming early obstacles in the learning process. An assumption was that the woman felt comfortable initiating interaction with the peer counselor. One aspect of the relationship of the peer counselor with the woman was of increased accessibility through a pager, 24 hours a day, so that the woman could request help when she needed it, which

facilitated the scheduling of an interaction. The peer counselor and mother cooperatively scheduled follow-up visits.

Duration of Breastfeeding. Duration of breastfeeding was conceptually defined as the length of time that the infant receives any human milk along with nutritional, anti-infective, immunologic, social, emotional, economic and hygienic benefits of breastfeeding (ADA, 1997), which are present during the breastfeeding period and beyond, for the mother and infant. Increased duration of breastfeeding extends the benefits of human milk and the breastfeeding process to the infant and mother(Cunningham, Jelliffe, & Jelliffe, 1991; Goldman, 1993; Lawrence, 1994; Minchin, 1987; Walker, 1993). The length of time of the benefits is immeasurable and not limited to the actual duration of breastfeeding.

Conceptual Model

The conceptual framework used to describe the relationship between the study variables was that of interaction within King's (1981) nursing theory of goal attainment (see Figure 1). The primary focus of the theory is that of the human being's interactions with another human being in a specific situation in mutual presence (King). King describes interaction as "a sequence of verbal and non-verbal behaviors that are goal directed between two or more individuals" (p. 60), a reciprocal ongoing process of reaction and action, based on each person's perceptions. Within these interactions information is gathered

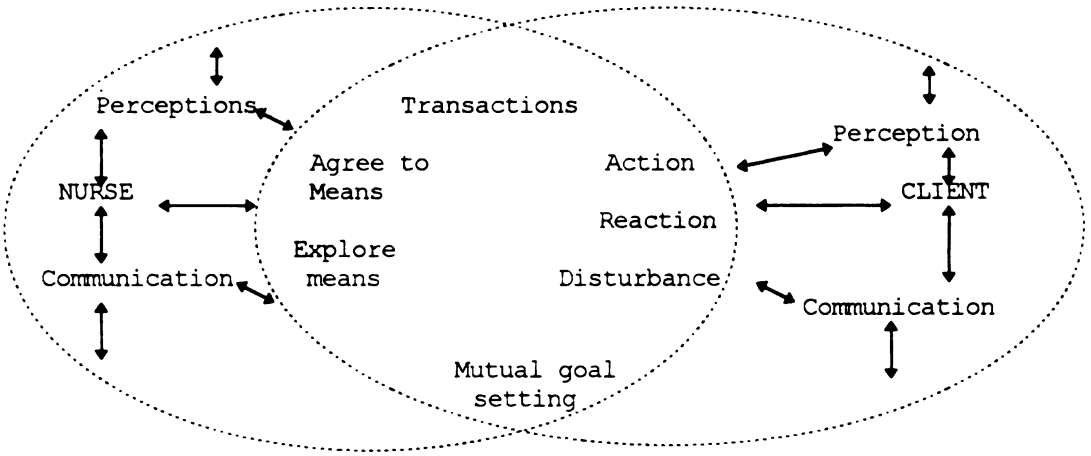

Figure 1. Diagram of King's Theory of Goal Attainment (1981, p. 157).

and appropriate information is given to agree on means to help reach the desired goal. In Figure 1 interaction occurs in the center where nurse and client meet with their individual perceptions after ongoing communication. The interaction leads to a transaction of goal attainment. The outcome or goal for nursing in King's theory is "helping individuals maintain a state of health" (1989, p. 155).

In this study interaction between a peer counselor and a breastfeeding woman included the components of timing of interactions postpartum and number of interactions in the first two weeks (see Figure 2). The peer counselor communicates

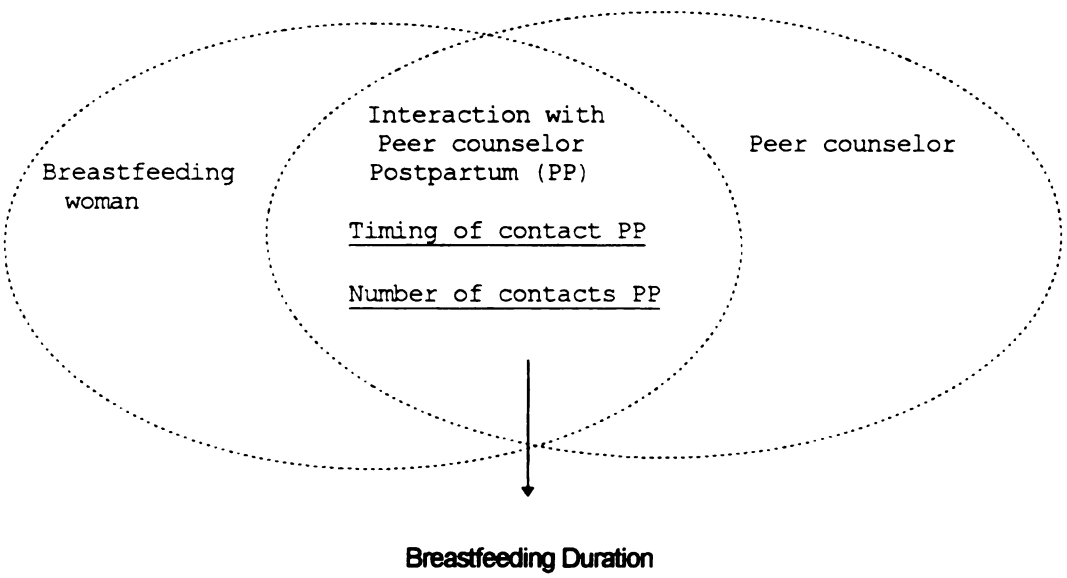

Figure 2. An Adaptation of King's (1981) Theory of Goal Attainment.

with the breastfeeding women either in a face-to-face meeting or through telephone contact. During communication the information component of the theory of goal attainment takes place as well as problem solving of the needs of the woman, i.e., breastfeeding concerns or other stresses in her life. It is the reciprocal interactive process of communication which assists the woman and peer counselor in the decision-making that leads to the transactions of goal attainment, breastfeeding duration. The common goal of the woman and counselor during the first two weeks is to help the woman learn to breastfeed whereby she continues to breastfeed to whatever duration she desires. In Figure 2, the center where the circles of peer counselor and breastfeeding woman meet, depicts open and constant interaction between a peer counselor and breastfeeding woman, which facilitate decision-making regarding the goal, i.e., breastfeeding duration.

Review of Literature

This section reviews the available research on breastfeeding peer counselor programs and duration of breastfeeding and on the timing of the first postpartum contact and number of contacts and the duration of breastfeeding. Two studies exist on the former, none on the timing of the first postpartum contact and one on a study involving 1-3 postpartum contacts. This is followed by a critique of the literature and how this study fills the gaps in the literature.

Recent research has demonstrated that duration of breastfeeding among low-income populations can be prolonged by a woman's interaction with a breastfeeding peer counselor. A study by Kistin and colleagues (1994) of low-income women in Chicago showed that women who interacted with trained peer counselors by telephone (n = 59), had a statistically significant greater duration of breastfeeding (15 weeks) than the women with no interactions with a peer counselor (n = 43), who breastfed for 8 weeks, $p < .05$. It was not reported how many contacts were made with the subjects or when the interactions occurred. The sample consisted primarily of African-American women (68%) with no significant difference in demographics between the control and experimental groups. The control group consisted of women who requested counselors but due to inadequate numbers of counselors, did not have a counselor.

Long et al.(1995) studied a peer counseling breastfeeding program with WIC clients who received peer counseling visits following the infants' births. The women (n = 63) were primarily Native American (95%) and lived in a rural area. The control group (n = 78) consisted of women who were enrolled in WIC one year prior to the peer counselor program. No significant differences in demographics were found between the control and experimental group. This study found that at 3 months postpartum, 49% of women in the experimental group were

breastfeeding compared to 36% in the control group, $p = .08$. The type, timing, and number of interactions were not reported.

In summary, similarities were noted between the two studies of Kisten et al. (1994) and Long et al. (1995). All women participating in a breastfeeding counseling program postpartum were WIC participants and, therefore considered low-income. Although a convenience sample of women was used in each study, ethnicity and geographic area of residence differed. The duration of breastfeeding for the experimental groups in both studies was similar, with at least 64% of the women still breastfeeding at 4 weeks and at least 44% of the women breastfeeding at 12 weeks.

The third study (Saunders & Carroll, 1988) was a quasi-experimental, prospective study without random assignment. The sample ($n = 80$) was a group of low-income WIC women who delivered at a rural hospital and initiated breastfeeding during a 16-month period. While the experimental group of women received three interactions within a two week period by someone under the direction of the WIC nutritionist, it was not known if this person was a peer counselor. The researchers noted that while the experimental group reported 80% of the women breastfeeding at 4 weeks and 50% at 16 weeks, the control group ($n = 75$) reported 71% of the women breastfeeding at 4 weeks and 47% at 16 weeks; the difference between the two, however, was not statistically different. Of women in the experimental group

who received all three interactions (n = 36), however, 95% were breastfeeding at 4 weeks and 67% at 16 weeks which was significantly longer than the control group, p = .001 at 4 weeks and p = .03 at 16 weeks (Saunders & Carroll). The experimental group was also found to be significantly poorer than the control group ($p < .05$). Other demographics of age and ethnicity were not significantly different.

In all studies breastfeeding was defined in a similar manner, i.e., breastfeeding one or more times a day. Limitations of the studies were the small sample size, lack of knowledge of how many were lost to follow up, and lack of control for the variable of previous breastfeeding experience. Saunders and Carroll's (1988) research and Long and colleagues' (1995) did not address previous breastfeeding experience of the study participants. None of the studies had random assignment and two used historical controls. Other limitations of the study by Saunders and Carroll were self-report of the women for the duration variable, and not knowing whether the person or persons involved in the interactions was a professional or a peer counselor.

Gaps to be filled by the current study while not prospective, include a larger sample size, knowledge about the peer counselor, examination of the interventions of timing of the first contact postpartum and of the number of contacts in the first two weeks, control for the number of prenatal

contacts, and control for the variable of previous breastfeeding experience by limiting the sample to women who had no previous breastfeeding experience.

Methods

The methods utilized in this study are presented in this section and include: the research design, sampling procedures, the operational definitions of the study variables, instrumentation, reliability and validity, protection of human subjects, data analysis, and limitations of the study.

Research Design

This descriptive study was a retrospective study using a non-experimental, cross-sectional approach. This study was part of a larger study and a secondary analysis of data of the Breastfeeding Peer Counselor Initiative (BFI). The purpose of the original study was to evaluate BFI in relation to the program objectives, one of which was to increase initiation and duration of breastfeeding among women of low-income.

Sample

The sample was selected from the original sample of 1531 low-income women enrolled in WIC who had entered and completed Breastfeeding Initiative (BFI) in Michigan from January, 1994 to May, 1996. "Completed BFI" meant women had participated in BFI, were no longer breastfeeding and were no longer receiving contacts from the peer counselor. Inclusion criteria for this study were as follows:

- Women who entered the program during the prenatal period and had at least one interaction prenatally and postpartally,
- women who had no previous breastfeeding experience,
- women who had delivered and had initiated breastfeeding, and
- women who continued to breastfeed for at least two weeks postpartum.

After applying the inclusion criteria, the initial sample consisted of 264 women. Missing forms on 12 cases and two missing values for number of prenatal contacts required exclusion of those 14 cases with a final sample size of 250 women.

Operational Definitions of the Variables

Interaction with a peer counselor. Interaction with a peer counselor was operationally defined as the timing of initial postpartum contact of the peer counselor with the woman and total number of contacts between the peer counselor and woman in the first two weeks after delivery. Timing of initial contact was the number of days postpartum when the contact was made, within the first two weeks, calculated from the date of birth to the date of the first contact, and was recorded on the Nutrition Education Log.

Number of contacts was the total number of contacts between a peer counselor and a woman in the first two weeks following the birth of the baby. This number was calculated by counting the number of contacts since the date of birth,

recorded on the Nutrition Education Log. In addition, the number of prenatal interactions with each woman was recorded on the Nutrition Education Log.

Duration of breastfeeding. Duration of breastfeeding was the number of weeks the woman breastfed or fed her infant expressed breast milk at least one time per day. This data was collected during the original study by the peer counselor when the woman self-reported that she had weaned. The data was then entered onto the peer counselor records.

Procedures

See Appendix C for data collection procedures of the original study. The variables, number of prenatal contacts, duration of breastfeeding, timing of the first contact and number of postpartum contacts, were recorded on the Nutrition Education Log (see Appendix D) and gathered by an employee of MSUE who transferred the numbers to computer disk. Subjects were identified by a number only on disk. These data were retrieved from the computer disk for analysis by the researcher.

Instrumentation

The form from which data was collected for this study and from which it was transferred to computer disk for the researcher was the Individual WIC Nutrition Education Form. On this form was recorded the date of birth and date and type of each contact with the woman who is identified by a number.

Duration of breastfeeding was on computer disk from the previous study.

Reliability and Validity

Reliability was not established for the instruments for the original study. Measures were taken to minimize the threats to reliability. These measures were ongoing inservices by the administrator and statistician of BFI for the peer counselors on use of the instrument. Consistency of collection of data among the peer counselors and consistency within the individual peer counselor across their clients was encouraged.

Content validity was not established in the original study. A measure taken to lessen the threat to validity was that of face validity by having approval of the registered dietitians and lactation consultant in the BFI program that "the instrument looks as though it is measuring the appropriate construct" (Polit & Hungler, 1995, p. 354).

A recheck of 21 subjects' data by an employee other than the original employee who entered data on the computer disk, showed a lack of consistency in 17% of the variables, timing of the first contact, number of contacts, and prenatal contacts. The variables of age, race, and duration of breastfeeding showed 100% consistency. A major limitation was lack of access by the researcher to the records in order to establish reliability on all of the data used in this study.

In this study the researcher checked reliability of the variable duration by a cross check of other data on the computer disk which indicated the duration of breastfeeding. The data was consistent on all cases checked.

Protection of Human Subjects

The original data collection had approval from the University Committee on Research Involving Human Subjects (UCRIHS). This researcher ensured the confidentiality of subjects by not having access to any forms with identifying information and did not trace the coded identifying numbers to the original participants. The data for this study are maintained on a computer disk on which subjects were entered by an ID number only with no identifying information. No potentially dangerous or adverse effects to women or infant participants are known or have been identified. The present study obtained approval from UCRIHS (See Appendix F).

Data Analysis

Data analysis was performed by the investigator using the computer program, SPSS 7.0 for Windows. Descriptive statistics of frequencies, percentages, and measures of central tendency, were utilized to analyze the demographic characteristics of the sample.

The only demographic data available were age and race. In addition to the descriptive statistical analysis, chi square analysis was performed on the demographic variables of age and

race and the dependent variable, duration, to ascertain any systematic differences between the three groups of women and how long they breastfed. A significance level of $p = < .05$ was used in all analyses.

To answer the research question, what is the relationship of the interaction between peer counselors and first time breastfeeding women of low-income within the first two weeks of the infants' birth and the duration of breastfeeding after controlling for prenatal contacts, hierarchical stepwise regression was performed. The extraneous variable of number of prenatal contacts was entered first to control for any effect prenatal contact might have on duration of breastfeeding. The next variable entered was timing of the first contact followed by the number of contacts. The regression procedure was performed to show which variable or combination of variables accounted for the most variance in the duration of breastfeeding once the variance from prenatal contacts was removed.

Timing was entered into the hierarchical regression before number of contacts based on the following reasons: (a) The correlation matrix validated that the earlier the contact, the greater the number of contacts ($r = .466$, $p = .01$); (b) early contact makes possible an increase number of contacts, so it must come first. An initial contact that is not early might preclude an increased number of contacts in the first two weeks. The study of Saunders and Carroll (1988) suggested this because

of those women who had 3 contacts, a postpartum contact within 1-3 days of the infant's birth occurred; and (c) deductively, it can be concluded that without early establishment of breastfeeding it is not possible to breastfeed to 6 months and for some women, an early contact insures that she will continue to breastfeed past difficulties.

Assumptions

The assumptions were that the data on breastfeeding duration was accurate. Another assumption was that the mothers accurately reported cessation of breastfeeding to the peer counselor.

Limitations

The design of secondary analysis inherently has some limitations due to previously designed forms with predetermined data. This limits the availability of other data, such as more information on demographics, in particular, level of education, marital status, and income. Lack of established reliability and validity of the instruments was a limitation. Inaccuracies in the data entry likely occurred and because of limited access there was no way for the researcher to verify and correct the errors. Access to the original forms was restricted to employees of MSUE by the consent originally signed by the women.

A convenience sample was used in which only women who voluntarily agreed to participate were included. With this type of non-probability sampling, there is no way to determine if

there were any systematic differences between women who agreed to participate in the peer counselor program and those who did not. In addition the inclusion criteria for this sample created a limitation in the study by not allowing the researcher to include those who weaned before two weeks.

Further limitations of the study were the selection of only two aspects of the peer counselor program, that of the quantitative components of the timing of the first contact and number of contacts in the first two weeks. These components did not measure qualitative aspects of the peer counselors' interactions or of the program and thereby created a significant limitation in evaluation of the program.

Results

This section includes the description of the sample and study variables, the analysis of the research question, and additional analyses.

Demographic Characteristics

The ages of the women ranged from 14 to 35 years with a mean age of 21.58 years (*SD* = 4.02). Sixty-four percent of the women were white (*n* = 160), 26% were Black (*n* = 65), 5% were Hispanic (*n* = 12), 1% were Asian or Pacific Islander (*n* = 3), 1% represented themselves as biracial (*n* = 2), and only one was American Indian or Alaskan Native.

Description of the Research Variables

The research variables were timing of the first postpartum contact in the first two weeks, number of postpartum contacts in the first two weeks, and duration of breastfeeding. Sample size for the frequency analyses was 250, with the exception of timing of the first contact. The mean timing of the first contact (n = 184) was 3.59 days (SD = 3.39), and the mode was on the day of birth. An unexpected finding was that 66 women had no contact in the first two weeks, which became a missing value for timing of the first contact. This decreased the sample size for the regression to 184 women, as well as affected the mean number of contacts in the first two weeks. The number of postpartum contacts (n = 250) ranged from 0 to 10 contacts with a mean of 1.85 contacts (SD = 1.80). The number of prenatal contacts (n = 250), the extraneous variable, ranged from one contact to 19 contacts with the mean number of 2.13 contacts (SD = 1.91).

The range of duration of breastfeeding (n = 250) was 2 to 76 weeks with mean of 14.58 weeks (SD = 13.07). However, it is important to note that the median, 10.50 weeks, and the mode, 3 weeks, created a different picture of the distribution which was, in fact, positively skewed (see Figure 3). In this study, 74% of the women were breastfeeding at 4 weeks, 69% at 6 weeks, 43% at 12 weeks, 30% at 16 weeks, and 16% at 26 weeks. The graph shows a pattern of decline of breastfeeding after a peak of those who breastfed 3 weeks and again at 13 weeks.

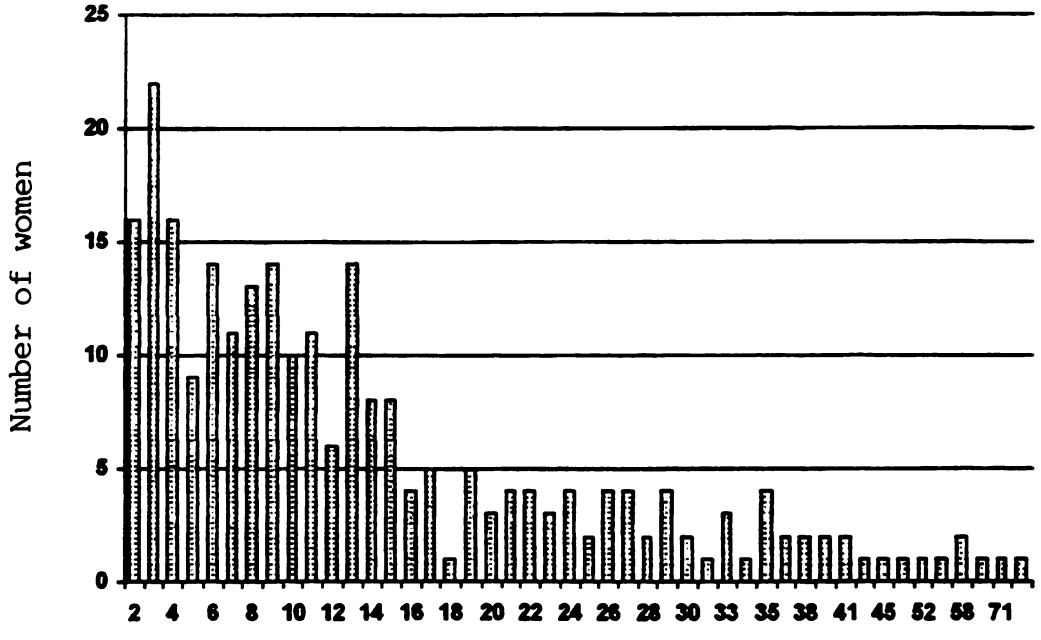

Figure 3. Bar Graph Reflecting Duration of Breastfeeding Among Women in the Sample (N = 250).

Analysis of the Research Question

The research question asked: What is the relationship of interaction between peer counselors and first time breastfeeding women within the first two weeks of the infant's birth and the duration of breastfeeding after controlling for prenatal interactions? Analysis of the data failed to demonstrate a relationship between these variables (see Table 1). Therefore, neither timing of the first postpartum contact nor the number of postpartum contacts within the first two weeks were found to be significant predictors of breastfeeding duration. The p-value for the significance test (t) failed to reach significance for either variable. The hypothesis that earlier postpartum interactions of first time breastfeeding women with a peer

Table 1

Summary of Hierarchical Stepwise Multiple Regression Analysis for Timing and Number of Prenatal and Postpartum Contacts as Predictor Variables of Duration of Breastfeeding, Controlling for Number of Prenatal Contacts (N = 184).

Variable	R^2	B	β	p-value of t
Number of prenatal contacts	.01	.68	.11	.16
Timing of the first contact postpartum	.02	.47	.12	.14
Number of contacts in the first two weeks	.03	.70	.09	.29

counselor and increased number of interactions with a peer counselor in the first two weeks postpartum was related to longer duration of breastfeeding was not supported.

Additional Analyses

Other factors were explored to provide further insight into the association between the demographic characteristics, age and race, and duration of breastfeeding. Chi square analyses were performed. Analyses of the data failed to demonstrate a significant relationship between the variables, age and race, $\chi^2(4, n = 243) = 6.271$, $p = .180$ and $\chi^2 (4, n = 243) = 1.171$, $p = .883$, respectively, with duration of breastfeeding.

A t-test was performed to ascertain if there was a significant difference of duration of breastfeeding between the group of women who had contact by a peer counselor within the first two weeks postpartum ($n = 184$) and those who had no contact in the first two weeks ($n = 66$). No significant difference was found ($p = 0.414$).

Discussion

In this section the results of the analysis are discussed in relation to the review of literature and the conceptual framework.

Demographic Characteristics

The mean age, 21.58 years, of the women in this study was similar to that of two studies reviewed in the literature, (Kisten et al., 1994; Saunders & Carroll, 1988). Race of the

women of the current study and studies in the review of literature varied greatly primarily due to the geographic areas within which the women lived. In the current study, the majority of the women were white as compared to other studies on breastfeeding duration where the women sampled were African-American (Kisten et al.), Native American (Long et al., 1995) or Hispanic (Saunders & Carroll).

Research Question

The research question asked if there was a relationship of interaction between peer counselors and first time breastfeeding women in the first two weeks postpartum and duration of breastfeeding after controlling for prenatal contacts. This study's findings did not support that timing of the first contact and number of contacts in the first two weeks was significantly related to breastfeeding duration.

The conceptual model demonstrated that the breastfeeding woman is part of an open interaction system. The variables chosen to conceptually define interaction in this study were two aspects of interaction meant to represent adequacy of support. Timing of the first contact and number of contacts looked at quantitative aspects of adequacy of support and not the qualitative component of content of the interactions such as: (a) ability of the peer counselor to interact, (b) her approach, (c) teaching techniques, e.g., use of hands-on teaching of actual

techniques, or verbal explanation, and (d) receptiveness of the mother. Not studied was the type of interaction: (a) a face-to-face interaction in the hospital, at home, or in the clinic, or (b) telephone interaction. Qualitative components of prenatal contact were not considered and might also account for the lack of significant results.

Other possible explanations for the lack of significance might be that perceptions in the interactions of the peer counselor and breastfeeding woman were not accurate. Poor perception of the verbal and non-verbal behavior can result in less than accurate communication or understanding of what was to be communicated (King, 1981). Possibly an increase in stress in the woman's environment narrowed her perceptual field, thus reducing her ability to communicate with the peer counselor, and ability for both to understand the other and to make decisions. These stresses might be the need to return to work, lack of social support, a move of residence, or financial concerns.

Other factors to consider in the open interaction system of King (1981) are the women's interactions with family members, significant other, and other members of the health care system regarding breastfeeding matters, whether positive or negative. This, too, could result in inaccurate perceptions and interfere with the woman's decision-making process or her ability to accurately perceive the peer

counselor's communications.

Most of the above reflects external factors. Also to be considered are internal factors within the woman, such as what is motivating her to breastfeed, ability to persist through difficulties, self-esteem level, prenatal intent of length of time of breastfeeding, and her perception of support. King's model helps to explain the complexity of the issue surrounding a choice to continue to breastfeed. While the findings did not support the relationship within King's model (1981), the model is still appropriate if other aspects of interaction are found to be important and are added to the model.

In comparing the results to the breastfeeding peer counseling literature, inconsistencies exist where some authors failed to report the timing of the first contact or the number of contacts in the first two weeks; only one study by Saunders and Carroll (1988) reported the number of postpartum contacts. Saunders and Carroll's findings did reveal a significant longer duration of breastfeeding in the group (n = 36) who received all three contacts in the first two weeks as compared to the women who did not receive the full number of contacts postpartum.

Statistically, the homogeneity of the sample of this study might have been a factor. Inclusion of the women who had weaned within the first two weeks might have helped show

significance. Also, removal of outliers in the variable, duration of breastfeeding, was attempted without a significant change in the regression results.

Women did continue to breastfeed in this study for a mean duration of 14.58 weeks. This finding is similar compared to Kistin et al.'s (1994) results which reported a mean duration for breastfeeding being 15 weeks. Duration of breastfeeding in this study with 78% breastfeeding at 4 weeks was slightly longer than Long et al.'s study (1995) of 71% breastfeeding at 4 weeks. The percent of women (69%) breastfeeding at 6 weeks was slightly higher in this study as compared to the percent of women (64%) breastfeeding at 6 weeks in Kistin et al's study. The percent of women breastfeeding at 12 weeks was similar in all three studies, with 43% in this study, 44% in Kisten et al.'s study, and 49% in Long et al.'s study. In this study 16% were breastfeeding at 6 months; however, no data was available from the other peer counseling studies for breastfeeding at 6 months.

In the current study women were excluded from the analysis if they had had any previous breastfeeding experience. One study (Saunders & Carroll, 1988) while reporting a significantly longer duration of breastfeeding for women with more frequent contacts postpartum, did not report previous breastfeeding experience of the women which

might have impacted the duration of breastfeeding. The other studies (Kisten et al., 1994; Long et al., 1995) did not exclude women who had previous breastfeeding experience. Previous breastfeeding experience has been shown to be significantly related to longer duration (Grossman, Fitzsimmon, Larsen-Alexander, Sachs, & Harter, 1990) and might increase the mean of duration of breastfeeding in a sample. This must be considered when comparing the results of this study with the aforementioned studies and it sheds positive light on the mean duration of breastfeeding for this study.

Implications for Advanced Practice Nurses (APNs)

Advanced practice nurses who provide care to pregnant and postpartum women and their infants have an important opportunity to interact with women regarding breastfeeding and how long they might choose to breastfeed. This study demonstrated the complexity of the individual woman's decision-making or goal setting in relation to duration of breastfeeding and the complexity of the relationship of interaction between the peer counselor and women. Reducing interaction to two factors explaining quantitative aspects of adequacy of support was not explanatory of how long a woman breastfed.

In examining the graph for duration of breastfeeding it was striking that after 3 weeks postpartum a drop in

duration of breastfeeding occurred and gradually continued, with another noticeable decline at 14 weeks. For the APN to provide adequate support to breastfeeding women, this finding indicates a need for intervention prior to the critical times of 3 weeks and 14 weeks postpartum. The intervention might be a telephone call or face-to-face contact, to evaluate how the breastfeeding is progressing and to determine whether or not the woman is meeting her own goal for duration of breastfeeding.

From this study we learned that a critical time for ending breastfeeding occurred 3-4 weeks after the birth. According to the current medical protocol, women are seen at 6 weeks postpartum for a medical evaluation. There is a need then for a shift in thinking and change in protocol regarding timing of the postpartum follow-up for breastfeeding women. In addition coordination of services by the peer counselor, Maternal and Infant Support Service staff, community health nurse, WIC personnel and lactation consultant may be indicated. Based on the findings from this study on breastfeeding duration, collaboration of all involved services and continuity of care might assist each woman to meet her goal of breastfeeding duration. APNs are in a position to serve as change agents and advocates for breastfeeding women in order to modify the traditional 6 week postpartum visit practice protocol and to coordinate

services to improve adequacy of support.

In order to reach the Healthy People 2000 breastfeeding objective, the standards of care for follow-up of breastfeeding women postpartum need to be re-evaluated in all health care practices and systems. Based on this study's findings, peer counseling programs need to continue visits beyond the early days targeting the critical times of weaning at 3 weeks and 3 months.

Recommendations for Future Research

The APN can advance knowledge of breastfeeding support through research and dissemination of findings. While the study failed to demonstrate a relationship between the timing of the first postpartum contact and number of contacts in the first two weeks and duration of breastfeeding, it did reveal that the women of this study were breastfeeding beyond the early days. Further research might include other variables, such as type of contact, content of teaching, content of prenatal contacts, social support of the woman, and style of the peer counselor, in relation to duration of breastfeeding in peer counseling programs.

This study examined the interaction between the peer counselor and the woman. Other family members who may have had an influence on the mother's decision-making regarding breastfeeding duration might have been present during the

interaction with the peer counselor; therefore inclusion or exclusion of the other family members in the interaction with the peer counselor could be studied.

A qualitative approach might suggest aspects of a peer counseling program which are important to the women and address other issues, such as self-esteem of women, and style of peer counselors. A combination of quantitative and qualitative methods might provide new knowledge regarding transactions whereby women breastfeed for longer duration.

A different analysis might have been done to determine reasons for the skewness of the variable of duration of breastfeeding. An ANOVA could have been performed to examine duration using a categorical level of measurement, e.g., with timing of contacts and numbers of contacts, to look at differences in these aspects of interaction compared to duration, rather than examining duration as a continuous variable.

One thing that could have been done differently was to include the women who had weaned in the first two weeks. Also, having a control group of women from WIC in the same communities, who wanted to breastfeed but did not have the opportunity to have a peer counselor, would have provided the study with additional data regarding the outcome of this particular peer counselor program and breastfeeding duration.

Conclusion

Evidence exits in the literature that participation in breastfeeding peer counseling programs has been related to significantly longer duration of breastfeeding among low-income women. An attempt in this study to examine two variables, timing and number of contacts in the first two weeks postpartum as related to duration, failed to show significance.

However, it was found that women in this study were breastfeeding beyond the early days. Information gleaned from patterns of weaning dictate that protocols for postpartum follow-up of breastfeeding women and their infants be re-evaluated to address the critical weaning times which occurred at 3 weeks and 3 months, to provide interventions that might support longer duration of breastfeeding.

Clearly more research is needed as peer counseling and the decision to continue to breastfeed is a complex issue. Breastfeeding has been established in the literature as the optimal form of nourishment for infants as well as an important source of components that promote the health of the infant and prevent disease. In the words of the American Dietetic Association (1997), ". . . broadly based additional efforts are clearly needed to increase duration rates of breastfeeding. The establishment of breastfeeding for at least 6 months, but optimally for at least one year, as a cultural norm supported by medical, social and economic practices, is a fundamental

cornerstone of true promotion of wellness" (p. 665). As APNs it is our privilege to foster the promotion of wellness among the mothers and babies in our communities and within our health care system by the promotion and support of breastfeeding.

APPENDICES

Appendix A

Breastfeeding Peer Counselor Initiative

The Breastfeeding Peer Counselor Initiative (BFI), begun in June, 1993, is managed cooperatively by Michigan State University Extension (MSUE) and the Special Supplemental Food program for Women, Infants, and Children (WIC) (see Appendix B).

In Michigan, Extension programs are financed by federal, state, and county funds. The BFI and a nutrition education program, Expanded Food and Nutrition Education Program (EFNEP), are both managed under the Children, Youth, and Family (CYF) division of MSUE.

The purpose of the BFI program is to increase the rate of initiation and duration of breastfeeding among low income women in 13 counties in Michigan with very low breastfeeding rates (MSUE, 1996). BFI models its home visit component after that of EFNEP. A select number of EFNEP paraprofessionals are trained to be breastfeeding peer counselors with BFI. These breastfeeding peer counselors might have visited the woman who enters BFI prenatally more than once in order to teach the basic nutrition class offered by EFNEP. A criterion for the breastfeeding counselors is that they have had a positive breastfeeding experience themselves breastfeeding their infant. Most of the peer counselors are from the same socioeconomic group as WIC clientele (MSUE, 1996).

Within each county, an Extension Home Economist supervises the peer counselor with guidance from the BFI program manager in coordination with the local WIC agency staff. Supervising professionals in WIC and MSUE receive identical training to the newly hired breastfeeding counselor.

The two- or three-day training by the state WIC lactation consultant is followed by a six month probationary period for each peer counselor. Topics covered in training are: Cultural considerations and myths surrounding breastfeeding, identifying and addressing the barriers to breastfeeding with mothers or pregnant women, benefits of breastfeeding, breastmilk properties, anatomy of the breast and physiology of milk production and of milk ejection, breast care, prenatal assessment of nipples, infant feeding cues and behavior, adding solids, and weaning. Also taught are specific techniques of effective breastfeeding including latch on and positioning, signs of milk transfer, assessment of adequate intake in the baby, counseling techniques, problem-solving, and when and where to refer for additional help.

The local WIC staff identify women as potential BFI clients at time of enrollment into the WIC program which commonly occurs during pregnancy or following delivery. The women referred are those who are considering breastfeeding and express an interest in receiving support, or are otherwise identified as needing encouragement and support to breastfeed.

Peer counselors contact clients through a home visit, telephone calls, hospital visits and clinic visits.

Once a referral is received, the breastfeeding counselor makes a telephone call or home visit to enroll the women in BFI and this occurs either prenatally or postpartally. Sometimes a woman is referred prenatally and does not wish to enter the program. After the birth of her child, however, she may reconsider or encounter problems and initiate contact with the breastfeeding counselor.

Either the peer counselor or the mother can initiate the contacts. The breastfeeding counselor is available 24 hours a day to the mother by pager in order to facilitate accessibility to clients. All women receive at least one home visit. The frequency and number of subsequent visits varies, depending on the need of the mother. The plan is that a woman receives several visits or phone calls during the first two weeks after the baby's birth. After the baby is three months of age the peer counselor contacts the women by telephone or face-to-face at least once a month while she continues to breastfeed. In the model used from 1994-1996, breastfeeding women remained in the program until the mother weaned the baby. After 1996, women exit the program when they wean or when their breastfeeding infant reaches 6 months of age (C. McKay, personal communication, March 12, 1997).

APPENDIX B

SPECIAL SUPPLEMENTAL NUTRITION PROGRAM FOR WOMEN, INFANTS, AND CHILDREN (WIC)

WIC is a food and nutrition program funded by the U. S. Department of Agriculture through the Michigan Department of Community Health (MDCH), formerly the Michigan Department of Public Health (MDPH). WIC is mandated to provide breastfeeding promotion services to WIC participants. Participants must be at 185% of poverty or below and meet the nutritional or risk factor criteria of the program. WIC is governed under the regulations in the Child Nutrition Act of 1966 (Code of Federal Regulations [CFR], 1997, p. 266). Local health departments in Michigan deliver the WIC services to the eligible public. WIC's purpose is to correct and prevent malnutrition in low-income pregnant and breastfeeding women, women who are postpartum, and infants and children up to 5 years old who are at health risk due to inadequate nutrition (CFR).

APPENDIX C

Data Collection Procedures

The peer counselors were trained upon commencement of employment on use of standardized forms on which to record information on each of their clients. These sheets were submitted to the administrative office of MSUE upon a woman's exit from the program. The forms were developed in a coordinated effort with other state extension programs who also had peer counseling programs. The data the program was interested in analyzing was collected from the forms completed by the peer counselors and entered into a computer using the statistical program, Stat View. Early 1997 the data was transferred to IBM SPSS. The forms are kept in a locked file in the MSUE office and will be discarded after seven years.

APPENDIX D

Infant
DOB

INDIVIDUAL WIC NUTRITION EDUCATION LOG

DATE	Participant Identification Number		Nutrition Education 1					Nutrition Education 2				
Month / Day / Year	Family Number	Part. I.D.	Type	Module	Eval.	Provider Initials	Staff	Type	Module	Eval.	Provider Initials	Staff
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H-295 Michigan Department of Public Health
Completion of this form is mandatory to comply with WIC Federal Regulations.

By Authority of Act 368, P.A. 1978
See back for instructions.

Appendix E

Letter from MSUE

MICHIGAN STATE
UNIVERSITY
EXTENSION

May 7, 1996

TO: Cindy Church

FROM: Barb Mutch (on for BM)
Coordinating Program Leader

RE: Secondary Analysis of BFI Date

This is in response to your request to use data collected through the Breastfeeding Peer Counselor Initiative (BFI) for secondary analysis for a masters thesis through the College of Nursing.

I understand that Char McKay, BFI Program Manager, has discussed with you confidentiality issues and her, as well as Anne Murphy's, time limitations. We do request shared authorship of any journal publications that may result from this work.

I am pleased MSU Extension will have this opportunity to work in collaboration with the college. Char feels your analysis will be of benefit to the project. Best wishes with the project.

c. Char McKay, Peg McConnell, Anne Murphy
bfiechurch.app

CHILDREN, YOUTH
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LIST OF REFERENCES

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American Academy of Pediatrics. (1982). Policy statement based on task force report: The promotion of breastfeeding. Pediatrics, 69, 654-661.

American Dietetic Association Reports: Position of The American Dietetic Association: Promotion of breast-feeding. (1997). Journal of the American Dietetic Association, 97, 662-666.

American Medical Association: Concepts of nutrition and health. (1979). Journal of the American Medical Association, 242, 2345-2358.

Barron, S. P., Lane, H. W., Hannan, T. E., Struempler, B, & Williams, J. C. (1988). Journal of the American Dietetic Association, 88, 1557-1561.

Code of Federal Regulations, 7. (1-1-97 Edition). Washington, D. C.: Office of the Federal Register, National Archives and Records Administration.

Cohen, R. (1976). "New Careers" grow older: A perspective on the paraprofessional experience, 1965-1975. Baltimore, MD: Johns Hopkins University.

Cunningham, A. S., Jelliffe, D. B., & Jelliffe, E. F. P. (1991). Breast-feeding and health in the 1980's: A global epidemiologic review. The Journal of Pediatrics, 118, 659-665.

Davis, M. K., Savitz, D. A., & Graubard, B. I. (1988). Infant feeding and childhood cancer. The Lancet, 2, 365-368.

Dettwyler, K. A. (1995). Beauty and the breast: The cultural context of breastfeeding in the United States. In P. Stuart-Macadam & K. A. Dettwyler (Eds.), Breastfeeding: Biocultural Perspectives (pp. 167-215). New York: Aldine De Gruyter.

Duncan, B., Ey, J., Holberg, C. J., Wright, A. L., Martinez, F. D., & Taussig, L. M. (1993). Exclusive breast-feeding for at least 4 months protects against otitis media. Pediatrics, 91, 867-872.

Giblin, P. T. (1989). Effective utilization and evaluation of indigenous health care workers. Public Health Reports, 104, 361-368.

Goldman, A. S. (1993). The immune system of human milk: Antimicrobial, antiinflammatory and immunomodulating properties. Pediatric Infectious Disease Journal, 12, 664-672.

Grossman, L. K., Fitzsimmons, S. M., Larsen-Alexander, J. B., Sachs, L., & Harter, C. (1990). The infant feeding decision in low and upper income women. Clinical Pediatrics, 29, 30-37.

Keating, J. P., Schears, G. J., & Dodge, P. R. (1991). Oral water intoxication in infants: An American epidemic. American Journal of Diseases of Children, 145, 985-990.

King, I. M. (1981). A theory for nursing: Systems, concepts, process. New York: Wiley.

King, I. M. (1989). King's general systems framework and theory. In J. P. Riehl-Sisca (Ed.), Conceptual models for nursing practice (pp. 149-158). Norwalk, Connecticut: Appleton & Lange.

Kistin, N., Abramson, R., & Dublin, P. (1994). Effect of peer counselors on breastfeeding initiation, exclusivity, and duration among low-income urban women. Journal of Human Lactation, 10, 11-15.

Lawrence, R. A. (1994). Breastfeeding: A guide for the medical profession. New York: Mosby.

Long, D. G., Funk-Archuleta, M. A., Geiger, C. J., Mozar, A. J., & Heins, J. N. (1995). Peer counselor program increases breastfeeding rates in Utah Native American WIC population. Journal of Human Lactation, 11, 279-284.

Marin, G., Burhansstipanov, L., Connell, C. M., Gielen, A. C., Helitzer-Allen, D., Lorig, K., Morisky, D. E., Tenney, M., & Thomas, S. (1995). A research agenda for health education among underserved populations. Health Education Quarterly, 22, 346-363.

Martinez, G. A., & Krieger, F. W. (1985). 1984 milk-feeding patterns in the U. S. Pediatrics, 76, 1004-1008.

Michigan State University Extension (MSUE). (1996). Final project report: Michigan's ES/WIC nutrition education initiative: Breastfeeding peer counselor initiative: 1993 to 1996. Unpublished manuscript, Michigan State University, East Lansing.

Minchin, M. (1987). Infant formula: A mass, uncontrolled trial in perinatal care. Birth, 14 (1), 25-35.

Montgomery, D.L., & Splett, P. L. (1997). Economic benefit of breast-feeding infants enrolled in WIC. Journal of the American Dietetic Association, 97, 379-385.

Polit, D. F., & Hungler, B. P. (1995). Nursing research: Principles and methods. Philadelphia: Lippincott.

Ross Pediatrics. (1996) Ross pediatrics breastfeeding data. Unpublished raw data. (Available from USDA, Food and Nutrition Services, 77W, Jackson Blvd, 20th Floor, Chicago, IL, 60604).

Ryan, A. S. (1997, 4). The resurgence of breastfeeding in the United States. Pediatrics, Electronic pages, 99. Available URL: http://www.pediatrics.org/cgi/content/full/99/4/e12.

Saarinen, U. M., & Kajosaari, M. (1995). Breastfeeding as prophylaxis against atopic disease: Prospective follow-up study until 17 years old. The Lancet, 346, 1065-1069.

Saunders, S. E., & Carroll, J. (1988). Post-partum breast feeding support: Impact on duration. Journal of the American Dietetic Association, 88, 213-215.

Schwartzbaum, J. A., George, S. L., Pratt, C. B., & Davis, B. (1991). An exploratory study of environmental and medical factors potentially related to childhood cancer. Medical and Pediatric Oncology, 19, 115-121.

Spitzer, W. O. (1984). The periodic health examination. Canadian Medial Association Journal, 130, 1276-1285.

United States Department of Health and Human Services, Public Health Service (1991). Healthy People 2000: National health promotion and disease prevention objectives. (DHHS Publication No. PHS 91-50212). Washington, DC: USDHHS.

United States Public Health Service (USPHS). (1994). The clinician's handbook of preventive services: Put prevention into practice. Alexandria, Virginia: International Medical.

van den Bogaard, C., van den Hoogen, H. J. M., Huygen, F. J. A., & van Weel, C. (1991). The relationship between breast-feeding and early childhood morbidity in a general population. Family Medicine, 23, 510-515.

Walker, M. (1993). A fresh look at the risks of artificial infant feeding. Journal of Human Lactation, 9, 97-107.

World Health Organization. (1989). Protecting, promoting and supporting breast-feeding: The special role of maternity services: A joint WHO/ UNICEF Statement. (Available from WHO Publications Center USA, 49 Sheridan Ave., Albany, NY 12210).

Wright, A. L., Holberg, C. J., Martinez, F. D., Morgan, W. J., Taussig, L. M., & Group Health Medical Associates. (1989). Breastfeeding and lower respiratory tract illness in the first year of life. British Medical Journal, 299, 946-949.