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WOMEN'S PERCEPTIONS OF TELEPHONE NURSING CARE WITHIN AN ANTENATAL HOME CARE PROGRAM

By

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Abstract

Purpose/Problem:

Telephone nursing care (TNC) has replaced some home visits to increase efficiency of The Ottawa Hospital Antenatal Home Care Program (AHCP). There is limited published research addressing TNC in similar settings to guide program development. Therefore, the researchers and organization chose an evaluation strategy to explore the clients' perceptions of TNC.

Objectives:

1. Perform a systematic literature review of TNC in the high risk antenatal population.
2. Profile high risk antenatal population receiving telephone nursing care.
3. Describe clients' perceptions of telephone nursing care.
4. Explore the feasibility of this methodology for continuous program evaluation and informing development and improvement.

Method:

A mixed methods approach was used. Two surveys and a semi-structured interview were completed by 13 participants. Data were analyzed using descriptive statistics and constant comparative analysis.

Results:

Sample was similar to the population in diagnosis, maternal and fetal outcomes. Anxiety scores were high and women identified the highest needs related to high risk pregnancy, psychological and information domains. Four main themes emerged: the experience of being at home, perceptions of the telephone care, perceived benefits, and perceived health systems issues.

Conclusions:

TNC in this population is complex; containing elements of the nursing process. Participants perceived that the care provided surveillance of the pregnancy, reassurance, support, and expert care. They appreciated the accessibility and stated that the TNC reduced use of urgent care services. Although the interview process is cumbersome for use in continuous program evaluation, there is potential to develop a survey instrument suitable for this client population.

Table of Contents

List of Tables

List of Figures

List of Appendices

Chapter 1 – Introduction

This thesis chronicles a research project using a mixed methods design to explore client perceptions of telephone nursing visits within a Canadian antenatal home care program (AHCP). The clients are women who are at least 24 weeks gestation and are experiencing a high risk pregnancy.

Prior to the development of the first Canadian antenatal home care program in 1985, many women experiencing a high risk pregnancy were cared for in hospital until delivery or resolution of the problem. Since the mid 1980's, hospitalization has been replaced in some centers by home care provided by experienced obstetrical nurses for select diagnoses. As demand for home care services has increased, Canadian antenatal home care programs have replaced some of the face-to-face visits with telephone visits. Initially the clients receive daily home visits. When the client's condition remains stable, telephone visits are gradually introduced in place of home visits.

Recently, The Ottawa Hospital Antenatal Home Care Program staff questioned whether these phone visits were meeting the clients' needs. Therefore, I undertook a utilization-focused evaluation (Patton, 1997) of the AHCP telephone visiting, in collaboration with the program's multidisciplinary team. The purpose of the evaluation was to explore the experience of telephone nursing visits from the clients' perspectives.

The format of the thesis is two manuscripts that are connected by three chapters which present information that is not described in detail in the articles. The chapters are organized in the following manner: an introduction (present chapter), the first manuscript, Chapter 3, the second manuscript and finally a concluding chapter.

Context

The rate of preterm birth (< 37 weeks gestation) has increased from approximately 6% in 1991 to 7.6% in 2000 (Health Canada, 2003). The earlier a baby is born, the more likely the infant is to die or have some physical or neurological sequelae related solely to prematurity. Approximately 1-2 percent of all babies are born before 32 weeks gestation (Health Canada, 2003). These premature infants account for "approximately 60% of the infant mortality and 50% of the long term infant neurological morbidity" (Health Canada, 2003, p 73.). Many women with high risk pregnancies will deliver prematurely either because labour begins spontaneously or because delivery is iatrogenically precipitated due to concern for the health of the mother and/or the unborn baby (Health Canada, 2003). High risk pregnancy creates stress and uncertainty for women and their families regarding the health and safety of the pregnant woman and her unborn baby. Research further suggests that adverse pregnancy experiences may have long term impact on women's mental and physical health. (Bernazzani & Bifulco, 2003; Heaman, 1992, 1998b; Maloni, 1993b; Maloni, Brezinski-Tomasi, & Johnson, 2001).

Move from Hospital to Home Care

In Canada and the USA, many women, with high risk pregnancies due to such conditions as threatened preterm labour, gestational hypertension, antepartum bleeding and premature rupture of membranes, are treated by hospitalization and bed rest in an attempt to delay delivery. Some women have been hospitalized for 3 to 4 months of their pregnancy. Since 1985, nine Canadian centers in seven provinces have developed antenatal home care programs to allow clients to remain at home with their families and reduce hospital costs (Wallace, 2003).

Antenatal home care programs in Canada are small and few in number. Evaluations published by four of these antenatal home visiting programs indicate that maternal satisfaction is enhanced when the woman is cared for at home and that outcomes between hospital and home care are similar for both mother and baby (Harrison et al., 2001; Heaman, 1997, 1998b; Salvador et al., 2003; West, Palmer, & Tier, 2000). However these evaluations have not focused on the telephone component of the programs.

While published research indicates that most women prefer to remain at home whenever possible (Harrison et al., 2001; Heaman, 1992, 1998c; Heaman, Robinson, Thompson, & Helewa, 1994; West et al., 2000), this does not mean that women are unaffected by bed rest at home. Women face both physical and mental challenges. Psychological stressors include uncertainty, loss of control, concerns for the fetus, confinement, boredom, and family stresses including role reversal (Heaman, 1992, 1997, 1998b; Maloni, 1993b). Social support from family, friends and health care professionals appear to mediate some stressors (Gupton, Heaman, & Ashcroft, 1997; Gupton, Heaman, & Cheung, 2001; Harrison et al., 2001; Heaman, 1992, 1998b, 1998c). Physical deconditioning resulting from bed rest, including calcium loss from bone and loss of muscle mass, does not reverse immediately upon return to normal activity. Some women, in fact, may take years to recover (Maloni, 1993a, 1993b).

As referral to antenatal home care programs increased, the programs identified the need for a different approach to meet the increasing demand for services. Telephone follow-up has been identified as one strategy to facilitate adjustment of clients and families after discharge from hospital, provide a mechanism for early response to clients'

increased signs and symptoms, and respond to client and family concerns (Hartford & Wong, 2000). Information from an informal survey conducted by Donna Wallace (Wallace, 2003), indicated the Canadian antenatal home care programs use a combination of home and telephone visits. The student researcher communicated with each of the programs and learned that no Canadian program has conducted an evaluation of telephone nursing visits.

The Ottawa Hospital Antenatal Home Care Program

The Ottawa Hospital Antenatal Home Care Program (AHCP) was developed in 1999 and is funded by The Ottawa Hospital (TOH). TOH is a tertiary center with approximately 8000 births per year and provides obstetrical care at two campuses. In addition to the local obstetrical patients, women are referred and transferred to TOH from eastern Ontario, Baffin Island and the Hull region in western Quebec.

Since it's inception in 1999, the AHCP has monitored high risk pregnant women with select diagnoses at home instead of in hospital. A complete description of the program's admission criteria is in Appendix A.

Women, who reside outside the AHCP boundaries, may stay with relatives or friends within the city or in a recently opened 4-bed outpatient unit in order to receive AHCP services. The AHCP nursing care provides ongoing risk assessment, maternal and fetal health surveillance, education, emotional support and case management while allowing women to remain out of hospital. Additional benefits include decreasing the congestion of hospital beds and reducing overuse of hospital nursing resources.

For the first 2 years, experienced obstetrical nurses visited the women daily in their homes. During home visits, physical assessments include maternal vital signs, fetal

heart monitoring by auscultation or electronic fetal monitoring, abdominal palpation for uterine activity, and venipuncture as necessary. Case management activities include referring the women to other health professionals when indicated i.e. psychology, public health, social work, notifying the physician of any change in health status or risk assessment, and advocating for the client. Since the high risk pregnancy creates uncertainty and stress for the family, AHCP nurse also provide psychosocial support. Education is a major focus of nursing care and is tailored to the individual client. Information is provided about the specific condition, self monitoring, when and how to access health care, fetal growth and development, nutrition, stress management strategies and prenatal education including labour, delivery, breastfeeding, postpartum recovery and infant care (Heaman, 1998a).

In response to increased demand for services and budget constraints, telephone mediated care was gradually introduced to replace some of the home visits for the most stable clients. By March 2003 a specific protocol for weaning home visits to telephone nursing care was developed and approved by the institution's multidisciplinary Perinatal Committee. The number of telephone visits was individualized depending on the woman's diagnosis and acuity of symptoms. The AHCP protocol for increasing telephone visits is in Appendix B. This change in protocol enabled the AHCP to increase the client census to approximately double its prior capacity.

Currently, women newly admitted to AHCP receive home visits at least three days in a row. Telephone visits by the same nurses are gradually introduced to replace some of the home visits when the nurse, client and physician agree that the client is able to monitor herself and the risk to herself and her unborn baby has stabilized. Nursing care

is carried out using the telephone as the communication instrument. Nursing telephone services are similar to face-to-face visits and include physical assessment, emotional and social support, case management, and education. Physical symptoms are assessed by asking the client questions about her self-monitoring and exploring signs or symptoms she may be experiencing. Fetal well-being is determined by the woman's report of fetal movement and any changes in movement patterns as well as other physical signs or symptoms she has noticed. Self-assessment is diagnosis specific and includes such monitoring as frequency of contractions, assessment of vital signs, vaginal discharge and fetal movement. Education focuses on honing the woman's ability to monitor physical symptoms and fetal well-being; addressing the woman's questions regarding her condition; and meeting information needs regarding her pregnancy, nutrition, labour, delivery and postpartum. Case management and referral to other health care professionals are managed in the same manner as during a home visit. The nurse may decide during a telephone visit that an unscheduled home visit is warranted or she may send the client to the obstetrical assessment unit (triage) for further investigation.

An evaluation of the AHCP was done in 2001 (Salvador et al., 2003). However, telephone nursing visits were not a part of the program at this time. To date, although the women are satisfied with the antenatal home care program, little research has been done on telephone nursing visits within such antenatal home care programs. Research is needed on the gaps in knowledge related to telephone visits by high risk pregnancy programs providing ongoing home care to replace hospitalization. This thesis addresses one area where knowledge is limited by reviewing the literature and exploring the women's perceptions of telephone nursing visits within the antenatal home care setting.

Conceptual framework for the thesis research: Patton's utilization-focused evaluation

Patton's utilization-focused evaluation framework (Patton, 1997) was used to guide the research design. Utilization-focused evaluation is "a process for helping primary intended users [to] select the most appropriate content, model, methods, theory, and uses for their particular situation" (Patton, 1997, p. 22). Patton states that when an evaluation "is conducted systematically and empirically through careful data collection and thoughtful analysis, one is engaged in evaluation *research*." (Patton, 2002, p. 10) The aims of the utilization-focused evaluation approach are to use research to inform practice, to ensure that the evaluation meets the needs of the primary stakeholders and that the stakeholders will take responsibility for using the findings of the evaluation. Additionally, the goal of a utilization-focused evaluation is to develop methods and tools that can be integrated into the organization or program to provide information that can guide ongoing quality improvement. Therefore, the final step in the evaluation is to evaluate the process and provide a written report of the research findings along with the process evaluation to the organization.

With a utilization-focused approach, the evaluator works closely with the stakeholders to create an evaluation process that addresses the stakeholders' goals. In order to have input from the appropriate people when planning the utilization focused evaluation, the first step in the process is to identify who the stakeholders are. The stakeholders are then included in determining the purpose and intended uses of the evaluation, prioritization of the evaluation questions and issues, and development of the final research question. An appropriate research design becomes evident once the research question is finalized. Following design and method planning, the data are

collected and organized. The interpretation of the findings is shared with the users and the evaluator facilitates the use of the findings. The final step is to evaluate the process and make recommendations for ways to include the evaluation process as part of program operations. The users, in this case, the management, physicians and nurses of the AHCP, then have a responsibility to apply the evaluation findings and implement the recommendations.

As advocated by Patton, the student researcher and her multidisciplinary thesis committee, consisting of a sociologist, perinatal nurse researcher and a physician specializing in maternal fetal medicine, identified the primary stakeholders to be invited to participate in the planning process for the research. The AHCP nurses and manager, program director and medical director were identified as the primary stakeholders and were invited to meet with the research committee (student researcher and thesis committee). During this meeting the student researcher presented her ideas and discussion ensued regarding the information and areas of research that would be most useful to the Antenatal Home Care Program. The primary purpose and uses for the evaluation were determined at this meeting.

During the discussion at this meeting, the participants identified that the AHCP had introduced telephone nursing visits in 2001 and developed a formal protocol for introducing telephone visits in 2003. This protocol was presented to the multidisciplinary perinatal committee consisting of the obstetrical program's physicians, managers and nursing staff and adopted as a guide for practice in March of 2003. No evaluation of the protocol had been undertaken and the client perspective had not been included when the

protocol was developed. Therefore the telephone nursing visits were identified as a focus for the evaluation.

Once the primary focus was identified, the evaluation questions and issues were prioritized and the research questions honed. The team agreed that gaining an understanding of the women's perceptions of telephone nursing care would provide information that could be essential for program enhancement. This led to identification of the purpose and problem.

Purpose/Problem

In order to increase efficiency of the Ottawa Hospital Antenatal Home Care Program, telephone nursing visits were instituted to replace some home visits. However clients' perceptions of the telephone visits had not been evaluated. In order to obtain a more complete picture, the student researcher and the organization recognized a need to describe the telephone nursing care in this setting from the perspective of the clients. The focal research question was then formulated.

"How do clients perceive antenatal telephone nursing care in the home?"

Once the research question was honed, the thesis committee agreed upon the specific thesis objectives.

Objectives

Phase I

1. Perform a systematic review of the literature related to ongoing telephone nursing care in the high risk antenatal population to identify what the literature says about telephone nursing care. (Chapter 2)

Phase 2

2. Create a profile of the high risk pregnant study participants. (Chapter 3)
3. Describe the clients' experiences of telephone nursing care within the AHCP. (Chapter 4)

Phase 3

4. Create a report of the research findings and the strengths and limitations of a utilization-focused approach to evaluating the AHCP provision of telephone nursing care.
5. Make recommendations for program changes and enhancements, based on the research findings and address such areas as nursing practice, education and future research (Chapter 5).

Thesis Format

This thesis takes the format of a 'manuscript based' thesis and is composed of five stand-alone chapters including the current introduction, a systematic literature review formatted as a paper for publication, a chapter presenting the quantitative data profiling the population studied, a qualitative research study exploring the women's perceptions of telephone nursing care formatted for publication, and the conclusions which are written in the form of a report summarizing the findings for the AHCP. A brief synopsis of chapters two through five follows.

Chapter 2 is a systematic review of the literature on telephone nursing care in the at risk antenatal population requiring ongoing care. The systematic review was specifically focused to inform the evaluation of The Ottawa Hospital Antenatal Home Care Program telephone nursing visits. The available literature on telephone nursing care

of women with high risk pregnancies was reviewed to identify what is known about the nursing interventions used in telephone nursing care, outcomes and costs or cost savings attributed to telephone care, and the client and provider perspectives on nursing care provided by telephone. Information gleaned from previous research was used to guide development of the research strategy and help formulate the interview guides. Chapter 2 is a manuscript formatted for submission to *JOGNN* for publication. The evidence summary tables are included as appendices.

The quantitative methods used to profile the sample population along with the results are presented in Chapter 3. Data about the nursing care received and maternal and fetal outcomes were gathered from the health record. Data were also gathered using two participant surveys; a quantitative needs assessment using a modified form of the Supportive Care Needs Survey (SCNS) (Foot & Sanson-Fisher, 1995) and the Pregnancy Perception of Risk Questionnaire (Gupton et al., 2001). The women completed sociodemographic and clinical information questions included at the end of the SCNS questionnaire. The information from the sample population was compared and contrasted with the available data that the AHCP program maintains on the total population for statistical purposes. Similarities and differences between the sample included in the evaluation and total AHCP population for 2005 were identified in this manner.

Chapter 4 is a manuscript that presents the qualitative research findings. The format is according to the author guidelines for *Birth: Issues in Perinatal Care*. The women's perspectives of telephone nursing care were obtained through analysis of semi-structured interviews for emerging codes and themes. Thirteen interview transcripts were analyzed using the editing style approach (Polit & Beck, 2004). The analysis was

facilitated by the use of NVIVO software. The themes and sub categories that emerged from the interviews are used to describe the women's perceptions of the telephone care provided by the AHCP nurses.

The concluding chapter (5) reviews the feasibility and utility issues of conducting an ongoing evaluation of women's perceived needs in the AHCP. It presents the strengths and limitations of evaluating the program's provision of telephone mediated care. Recommendations for AHCP program enhancements and continuous quality improvement initiatives are also presented, including recommendations for nursing practice, education, and future research. Chapter 5 is in the form of a report to the organization.

Chapter 2

SYSTEMATIC REVIEW OF TELEPHONE NURSING IN HIGH RISK ANTENATAL CARE

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Abstract

Objective

Review the research literature on telephone nursing care for high risk pregnant women cared for at home instead of in hospital.

Data Sources

Cinahl, EMBASE, OVID Medline, PsycINFO, and Cochrane Database; 1966 to May, 2006.

Selection Criteria

Research studies were limited to nurses/midwives providing high risk antenatal care by telephone in place of, or to reduce hospitalization.

Data extraction

Two reviewers independently extracted data and assessed the study trial quality using the Critical Appraisal Skills Programme (CASP) tools, then met, compared results and reached consensus on disagreements.

Data Synthesis

Thirteen reports (11 studies) were included. They had differing definitions of high risk pregnancy and measured different organizational, health, and interaction outcomes. Detailed descriptions of telephone care and reasons for participant satisfaction were generally lacking. Maternal and infant outcomes varied from no effect to positive effect. Study quality was moderate or weak.

Conclusions

The reviewers were unable to clearly identify an optimum frequency of telephone visits, maternal or infant benefit attributable to telephone care when combined with home visits

or if the differing definitions of high risk pregnancy affected outcomes. More research is needed in these areas. Although no harm was demonstrated by telephone care in any of the studies, the impact on reducing preterm birth and increasing birth weight is unclear. The general satisfaction of the women, the lack of evidence of harm and the cost savings when telephone care is provided, suggest telephone nursing may be a viable intervention to shorten or delay hospitalization. Further research is needed to evaluate this intervention.

Key words

antenatal, home care, high risk pregnancy, telephone nursing, nursing care

Introduction

Nine tertiary care centers across Canada have developed antenatal home care programs. These programs enable high risk pregnant women with select diagnoses to receive nursing care at home instead of in hospital. As the demand for antenatal home care services increased, these programs substituted telephone calls to the women in place of some of the home visits in order to increase program capacity and remain cost efficient. Telephone nursing visits in antenatal home care programs are used to provide psychosocial support; maternal and fetal risk surveillance and emotional assessment; recommend interventions; and provide education about the woman's specific diagnosis, prenatal care and individualized labour and delivery information. The nurse also refers the women to other health care services when appropriate. Published research about antenatal home care programs consists of program evaluations focused on home visits (Harrison et al., 2001; Heaman, 1998b, 1998c; Heaman et al., 1994; Salvador, 2001; Salvador et al., 2003; Simonsen-Anderson, 2002; West et al., 2000) and small studies of women's experiences of bed rest at home and in hospital (Heaman, 1997, 1998a, 1998b, 1998c; West et al., 2000).

Nursing regulatory bodies describe telephone nursing care as complex, requiring nurses with specialized nursing knowledge and skill including clinical and assessment skills, competency in the technologies used, and refined communication and documentation skills (CNA, 2001; College of Registered Nurses of Manitoba, 2002; Simonsen-Anderson, 2002). Additionally, Wilson and Hubert (2002) propose that the nurse's role as caregiver and decision-maker when providing telephone care is underestimated and undervalued.

Literature Search

Since little was known about the provision of telephone nursing care in the antenatal home care setting, a systematic literature review was carried out to explore the published information about telephone nursing visits during high risk pregnancy. The following objectives were developed to define the literature search.

1. To describe the effectiveness and other benefits of providing telephone nursing care in high risk pregnancy for the mother, infant or system; for example reduced length of hospital stay, later gestational age at delivery or cost savings.
2. To identify any differences between face-to-face and telephone visits provided by nurses imparting continuous care to women in the antenatal period.
3. To describe women's perceptions, experiences or satisfaction with telephone nursing care.

Inclusion/Exclusion Criteria:

Any systematic reviews and primary research studies were included, regardless of quality, provided they met the criteria for the population, interventions and measurement of outcomes. The population of interest was pregnant women diagnosed with increased risk of preterm birth due to symptoms in the current pregnancy. who were receiving telephone nursing care. Telephone nursing visits were to replace or reduce hospitalization and be carried out by a consistent nurse or team of nurses. The telephone contact could be combined with face-to-face visits or be the sole contact with the patient. Nurses/midwives were required to contact the women a minimum of once every two weeks and the contact continued for at least one month. Studies must have measured at least one of organizational, maternal or infant outcomes such as length of stay in hospital

or readmission rates; cost benefit, pregnancy outcome, birth weight, or the women's perceptions of or experiences with telephone nursing care.

Systematic reviews and studies were excluded if the telephone care was not provided by a nurse or midwife, or if the call was not directly related to patient care (eg. equipment issues or program operations). Studies were also excluded if they were related to triage, call centers, after hours advice lines or programs where the nurse did not have an ongoing relationship with the client or if they were focused primarily on a telehealth method other than the telephone.

Search Strategy

The literature in Cinahl, EMBASE, OVID Medline®, PsycINFO, and Cochrane Database were searched from 1966 to May 2006. Search terms included telenursing, telemedicine, telehealth, telephone, supportive care, patient education, distance education, nursing care, home nursing, nursing assessment and nursing diagnosis, prenatal, antenatal, obstetric and perinatal. The search was limited to research conducted with humans and research reports which were written in English. The complete search strategy is included in Appendix C.

Literature Review

Review methods

Two reviewers reduced the number of articles step-wise by first reviewing the titles, secondly reading the abstracts of potentially relevant papers and finally, reading the remaining papers. At each step, articles that did not fit the criteria were discarded. Table 1 explains the selection process in greater detail. The reviewers compared their lists of included and excluded papers. There was agreement for most rejections at each step.

However, where disagreement occurred about the relevance of a paper, discussion ensued until agreement was reached.

The articles selected for review were then read and a quality appraisal was done independently by each reviewer using the Critical Appraisal Skills Programme (CASP) tool (Milton Keynes Primary Care Trust, 2002) relevant to that study design. The CASP tools include separate appraisal prompts for different study designs i.e. randomized controlled trials (RCT), qualitative, or cohort studies and consider the relevance of the paper to the review objectives. Thus, if the study is deemed to have less applicability or relevance to the goal of the review, the study quality may be rated lower than when only the methodology is rated. Each tool consists of 10 to 12 broad questions with subheadings that guide systematic and consistent appraisal with regard to appropriateness of the research question/issue, recruitment of the sample, introduction of potential bias, validity of the results and application of the results locally.

The reviewers compared their quality ratings for each study and discussed the studies until a consensus was reached when the ratings differed. A synopsis of the studies' relevant findings, strengths, limitations and quality ratings organized according to the review objectives are found in Tables 1 and 2 (Appendix D).

Results

Article Selection

Three systematic reviews and three hundred and forty-one papers were identified from the literature search and a further 22 papers gleaned from scanning the reference lists were reviewed. The three systematic reviews referred to triage centres and physician calls and therefore were excluded. We found no systematic reviews on antenatal nursing

care by telephone. Articles pertaining to populations other than pregnant women were excluded because of differences from the perinatal population in age, illness/diagnosis and treatment. Studies in normal pregnancy or postpartum were also excluded as the focus of this review was high risk pregnancy. Thirteen papers representing 11 studies meeting the stated inclusion criteria were identified by the stepwise review described above. Figure 1 shows the decision tree for the article selection. A general discussion of the studies and findings follows.

Research Critique

Of the 13 antenatal papers, 9 were randomized controlled trials, one was a cohort retrospective comparison, two were qualitative studies and one was a cost benefit analysis of a cohort from a previous RCT. In 3 studies contact with the patient was more frequent than weekly (Moore et al., 1998; York et al., 1997), including one with daily contact (Bochm, Glass, & Reed, 1996); in 3 other studies the nurses made weekly phone calls to clients (Brooten et al., 2001; Bullock, Browning, & Geden, 2002; Finfgeld-Connett, 2005); 5 studies made contact approximately once every 1 to 2 weeks (Bryce, Stanley, & Garner, 1991; Little, Saul, Testa, & Gaziano, 2002a; Little, Saul, Testa, & Gaziano, 2002b; Norbeck, Dejoseph, & Smith, 1996; Oakley, Rajan, & Grant, 1990) and 1 study only stated that regular contact was made (Hutti & Usui, 2004). Only two of the studies defined a high risk pregnancy according to symptoms experienced in the current pregnancy such as preterm labour, ruptured membranes and gestational hypertension (Brooten et al., 2001; York et al., 1997). Three other studies defined risk of preterm birth (PTB) according to symptoms in the current pregnancy or preexisting risk factors such as low socioeconomic status, race, or a previous PTB or low birth weight infant (Hutti &

Usui, 2004; Little et al., 2002a; Little et al., 2002b). The remaining 7 studies (8 papers) defined a pregnancy to be high risk according to factors such as smoking, African American race, poverty and/or a history of one or more previous preterm births or low birth weight infants.

As the analysis of the articles proceeded, it became evident that the telephone nursing interventions provided in the studies could be separated into three broad categories: nursing care replacing hospitalization, social support, and nurse case management. Nursing care in place of hospitalization consisted of assessment of emotional status, available support systems, monitoring maternal symptoms and vital signs, and fetal surveillance; teaching; and referral when required. The nursing care was provided in a combination of home and telephone visits.

Telephone social support was provided either alone or in combination with home visits to the participants. Support consisted of providing a non-judgmental listening ear, discussing pregnancy needs, providing information when asked by the woman, and appropriate referral to other services or agencies.

Nurse case management was provided to participants who were attending outpatient clinics and offices. The aim of the case management was to reduce hospitalization and increase birth weight or gestational age at birth. Definitions of nurse case management differed among the studies. Nursing case management consisted of assessment of the pregnancy status, teaching related to the pregnancy and diagnosis, signs and symptoms of complications and early intervention strategies, provision of support and coordination of care with the woman's health care providers as necessary.

The outcomes measured varied among the studies and included participant satisfaction with the intervention provided, prevention of preterm birth, increase in birth weight, length of hospital stay (LOS) and rehospitalization rates for mothers and infants, cost of providing telephone care or cost savings by avoiding or reducing hospitalization or improving maternal and neonatal outcomes; alone or in combination with home visits.

When the quality of the studies was rated, taking into consideration the relevance to the review objectives, there were no strong studies. Five studies were considered to be of moderate quality (Brooten et al., 2001; Bullock et al., 2002; Finfgeld-Connett, 2005; Little et al., 2002a; Norbeck et al., 1996). The remaining 8 reports were rated as weak (Boehm et al., 1996; Bryce et al., 1991; Hutti & Usui, 2004; Little et al., 2002b; Moore et al., 1998; Muender, Moore, Chen, & Sevick, 2000; Oakley et al., 1990; York et al., 1997).

The research critique has been organized by review objective. The papers discussed under each objective are organized according to the nursing intervention provided in the study. This organization allows the reader to clearly identify the outcomes attributed to an intervention strategy as the articles are critically appraised. Tables 1 and 2 (Appendix D) summarizing the studies are also organized in this manner. Table 1 refers to objective 1 (benefits of telephone nursing care). All 13 papers addressed this objective in some manner. Table 2 refers to objective 3 (satisfaction). Only five studies addressed women's satisfaction with the telephone nursing care. There is no table for objective 2 as no studies were found that compared telephone nursing care and face-to-face care.

Objective 1: Benefits of Telephone Care

Nursing Care at Home Replacing Hospitalization

York, Brown, Samuels, Finkler, Jacobsen, Persely, et al. (1997) were the only researchers to examine the effect of early discharge from hospital combined with home nursing care for women with high risk pregnancies. Only women with diabetes or hypertension were eligible to participate. Women in this study were enrolled antenatally and postpartum. Women recruited antenatally remained in the same group through the postpartum period. The antenatal women were randomly assigned to early discharge from hospital (n=24) according to a set protocol or remain in hospital (n=31) until hypertension or diabetes control reached the usual levels. The intervention group received a minimum of 5 home visits all within the first 3 days following discharge and "3 weekly telephone calls or clinic contacts until delivery" (1997 p. 5).

During the postpartum period, the women were discharged home when they met the criteria for their assigned group. The postpartum control group (n= 51) received no follow-up care by nurse specialists after discharge, although they did receive support and instructions about self-care from the staff nurses prior to discharge. Women in the treatment group (n= 42) were contacted by the nurse specialist soon after delivery to assist with preparation for discharge and were discharged when specific criteria were met. After discharge, women and infants received 2 scheduled home visits and 10 phone calls over an 8 week period.

The mean gestational age at enrollment for the antenatal intervention group was 26 weeks and 24 weeks for the control group. Outcomes measured included functional status of the women, length of hospital stay, readmissions and cost of the program. The

study found that women with diabetes in the early discharge group had fewer rehospitalizations for glucose control, p =.048 (3 women in the treatment group and 8 women in the control group) and a mean difference of 2.6 days less in hospital (p = .08) when rehospitalized for glucose control. Charges for the rehospitalizations were also significantly less in the intervention group (p = .02). Mean cost savings for the intervention group was $2,683.00. There was no difference between groups in gestational age at delivery. Finally, women with diabetes in the control group had three times more infants with low birth weight. However this did not reach statistical significance (p = .056). Data were not presented for the hypertensive women.

York et al. (1997) found no differences in postpartum maternal and infant outcomes. However, combined home and telephone visits were found to reduce hospital length of stay and rehospitalization rate and saved an average of US$12,555.00 per mother-infant dyad.

The participants in this study had diagnoses that are common to antenatal home care programs. The study does have several limitations however. No power calculation was done to indicate effect size and sample size was small. Therefore the ability to detect the effect of the intervention is unknown. Additionally, the study did not report the data for the hypertensive women in the study. The frequency of nurse-patient contact was less in the intervention group than the women in the control group. The difference in the frequency of the nurse-patient contact between the control and intervention groups may have been a confounding variable that may have decreased any differences between the two groups.

Although the differences in maternal and infant outcomes were not statistically significant, this study indicates that caring for these women at home is cost effective. Outcomes for women and babies appear to be no worse than the outcomes of those cared for in hospital. The study did not have enough power to determine if this was true or due to chance. Additionally, this study did not describe the content of the telephone calls or analyze the telephone nursing care separately from the home visits. Therefore the relevance of the findings addressing Objective 1 of this systematic review is limited.

Social Support

Two qualitative studies (Bullock et al., 2002; Finfgeld-Connett, 2005) and three RCTs (Bryce et al., 1991; Norbeck et al., 1996; Oakley et al., 1990) looked at telephone social support offered to women with high risk pregnancies. Again the amount of telephone contact differed among the studies; weekly in the studies by Bullock et al., and Finfgeld-Connett and every two weeks in the studies by Bryce et al., Norbeck et al., and Oakley et al.

Studies by Bullock et al., Finfgeld-Connett and Norbeck et al. were judged to be moderate quality and the studies by Bryce et al. and Oakley et al. were considered to be weak quality for the purpose of this review. Two qualitative studies will be discussed first, followed by the moderate quality RCT and lastly the two weak RCTs.

Bullock et al. (2002) used a convenience sample of 20 pregnant women, defined to be at risk due to their low socioeconomic status. They explored the feasibility of implementing social support by telephone and assessed the program's acceptability to the participants. Bullock and her colleagues analyzed the nursing logs of the weekly telephone calls to the women. Seventy-one percent of the sample received over half of

the scheduled telephone calls and 25% only received a quarter of the weekly calls. The nurse made at least 3 calls for every call that reached the participant. Average length of the calls, once the participant was contacted was 20 minutes. Although the participants were encouraged to contact the nurse by pager at any time of the day or night only 12 pages were received in the 16 weeks of the study and the average length of time for responding to pages was 15 minutes. More than half the pages were regarding some stress in the participant's life, 4 were to share the news of the baby's birth and the rest were to reschedule the weekly call. Bullock et al. noted that a strong rapport developed during the study between the nurse and the client. These young socially disadvantaged women made great effort to be available for the telephone call; even arranging to be near a phone at a prearranged time when they did not have a telephone of their own. The researchers also noted that the rapport may have been enhanced by the lack of visual cues to the differences in social status between the providers and the client. Barriers that are potentially present when social differences are visible may have been eliminated by using the telephone. Additionally the authors proposed that the women may have felt more in control of the conversation when they were in comfortable and familiar surroundings. While the topics covered during the telephone calls were varied, three main categories were identified; pregnancy-related complaints, problems with the partner, and problems with children or other family members. Women also identified the importance of the nurse's accessibility by pager.

This study presents useful information for planning telephone interventions regarding call length and content, as well as what the women appreciated about the telephone calls.

Finfgeld-Connett (2005) studied a subgroup of 21 women enrolled in an RCT about smoking cessation and stress reduction to elucidate the telephone support provided to pregnant, low income smokers. Constant comparative analysis of the nurses telephone logs was carried out using NUD*IST 4 software in this qualitative study.

Finfgeld-Connett concluded that nursing presence and the change in smoking behaviours were difficult to measure. She noted that the findings were congruent with Oakley's definition of social support which includes provision of a non-judgemental listening ear, discussion of pregnancy needs, provision of information when asked and referral to appropriate professional or volunteer agencies. In addition, she noted that the nursing logs included elements of nursing presence such as: maintenance of psychological presence, interpersonal reciprocity (mutual desire to work together), therapeutic communication and attention to the here and now, and expert nursing practice in the nurse-patient interaction (p. 19).

Limitations of the studies by both Bullock et al. and Finfgeld-Connett relate to using nursing logs of the telephone calls for analysis rather than transcripts of audiotaped calls. The nurses may have recorded in the logs their perceptions of the discussions rather than exactly what was said, which has the potential to introduce provider bias. Provider bias may have been avoided by using transcripts of the telephone calls instead of the nurses' telephone logs. Recall bias may have been introduced by the nurse completing the logs of the calls after the telephone conversation was concluded. Generalizability of the findings may be limited by the purposeful samples which focused mostly on low socioeconomic status as a risk factor.

Norbeck et al. (1996), in a pilot study prior to the RCT reported here, identified that African American women lacking social support from their partner or mother were at greater risk of poorer pregnancy outcomes. They developed and tested a questionnaire in the pilot study to identify women who lacked support from her mother or a partner. Norbeck et al. used their questionnaire in this RCT to identify women lacking social support from both their partner and mother.

African American women with a singleton pregnancy between 16 and 26 weeks gestation who were Medicaid eligible were assessed for adequacy of social support from either their mother or partner (n = 319). Women identified as lacking support (n = 114) were randomized at this point into control and intervention groups. Consent was obtained only from those participants randomized into the intervention group. Women in the intervention group who consented were provided a program of support consisting of home visits every two weeks and telephone contact in the intervening week. Validated tools were used to assess social support, anxiety or stress and self-concept. Analysis of the data was according to intention to treat. The authors concluded that an intervention aimed at providing social support to African American women lacking support from their mother or partner could lower the incidence of LBW (9.1% in treatment group versus 22.4% in the control group, P = .045). They further indicated that LBW was associated with prematurity in this group.

The study design was well planned, with attention to the specific population, use of validated tools for assessment and randomization methods that would decrease confounding variables. However, the intervention was poorly described, actual frequency of the telephone contact with the intervention group and the type of support provided by

telephone were not described. Further, the analysis did not consider the separate contributions of telephone and home visits to the findings. Knowledge gained in studies about a specific race may not be transferable to other racial groups. The lack of information about the telephone support and the exclusive focus on African American women limits the relevance of this study for addressing objective 1 of this review.

Bryce et al. (1991) randomized women at risk for preterm delivery according to poor obstetrical outcomes in previous pregnancies to receive an antenatal social support program. The intervention group (n = 981) received a home visit immediately after randomization and every 4 to 6 weeks thereafter. They received telephone calls from the same midwife between the home visits. Each intervention participant received expressive support from a single midwife who provided sympathy, empathy, understanding, acceptance, affection and attempted to act as a confidante.

Analysis of the control and intervention groups was according to intention to treat and compared the proportion of preterm births (PTB) in each group. Simple odds ratios were calculated for the secondary hypotheses that the program effect would be greatest in women with low SES and the least existing social support. Birth outcome was affected by a history of previous PTB and current multiple pregnancy. The hypothesis that social support would decrease preterm birth was not supported. Further no effect was shown for women with the lowest SES, who lived alone or lived with only other children. Positive effect (odds ratio 0.59, 95% CI 0.36-0.96) was shown for women in the highest professional social class.

Although a power calculation was done prior to the study and the numbers required were achieved, the control group had fewer preterm births than anticipated

which reduced the study's power to predict a 25% decrease in PTB from 80% to 60%. Utility of this study for planning telephone care is limited by the analysis of the total program without indicating the individual contributions of telephone and home visits. Further, no data were presented about the frequency and content of the telephone calls.

Oakley et al. (1990) randomized 509 high risk pregnant women at less than 24 weeks gestation. Risk was defined as a history of the birth of a previous infant weighing less than 2500 grams. The control group (n = 255) received normal antenatal care and the intervention group (n= 254) received a program of social support in addition to normal prenatal care. The social support was provided by four research midwives. They were available 24 hours a day to discuss any topic identified by the women related to her pregnancy or her circumstances, provision of information and advice only when requested and appropriate referral to other health professionals. Support was provided in 3 home visits at 14, 20 and 28 weeks gestation and through telephone contact or home visits at least twice between home visits. In addition the women were able to page the midwife at any time. Outcomes were determined by review of a contact form completed for each contact by the midwife detailing the purpose of the contact, the length, content and result as well as who initiated the contact; tape recorded home visits, chart audit for pregnancy outcomes and a satisfaction questionnaire mailed to participants.

The authors found that 75% of the sample was working class with a high incidence of stressful life events such as inadequate housing and chronic problems. The intervention group infants weighed an average of 38 grams more than the control group infants (95% CI – 72.6 to 146.6). Eighty-two percent of the women in the intervention group and 81% in the control delivered at term (≥ 37 weeks gestation). While similar

numbers of infants in each group were admitted to NICU (35 in the intervention group and 37 in the control group), the intervention group infants required less invasive resuscitation and less intensive neonatal care although the exact differences were not described. Additionally, the mothers and babies in the intervention group used significantly fewer health services (60% of the intervention group vs. 69% of the control group) and more women reported their health to be better (70% 'good' or 'very good' in the intervention group and 61% in the control group). The authors concluded that social support has the capacity to affect pregnancy outcomes.

This study had an 80% power to identify a 150 gram difference in mean birth weight between the groups. Although the authors reported that the intervention group used significantly fewer health services postpartum and reported better health, the p-values were not reported. The authors did not describe the telephone and home visit contacts separately although, in this study, they did indicate that these data were collected. Therefore it is difficult to determine if the participants perceived a difference in the listening ability or the helpfulness of the midwives between the home and telephone visits.

In summary, two qualitative studies and three RCTs explored the effect of social support. Social support was offered by telephone to women who were socially disadvantaged in all the studies. Only one study included women of other classes.

The two qualitative studies described the type of support provided. Bullock et al. described in detail the telephone care provided, the contact frequency and some of the challenges encountered when contacting poor young women. The authors conclusions that telephone contact may increase the woman's sense of control and reduce the

perception of social barriers between the provider and the client are interesting and may be useful when planning questions about telephone nursing care.

Finfgeld-Connett described the elements of nursing care according to social theory and nursing presence. These are useful concepts to keep in mind when planning nursing care by telephone.

In the single study that studied the effect of social support in all classes, only positive effects were demonstrated for professional women and the authors concluded that there was no evidence that social support could prevent preterm birth. The other two RCTs indicated that mean birth weight was increased when women received social support. Additionally, one study found that prematurity was decreased and the other study found that the infants required less intensive intervention. The three RCTs did not describe the telephone interactions or frequencies. The variation in positive and null effects of social support in high risk pregnancy and the lack of information regarding the telephone care provided, do not allow the reviewers to clearly identify benefits attributable to telephone nursing care.

Nurse case management

Seven papers representing five studies explored the effect of specialized nursing care by telephone or home visits plus telephone contact with high risk pregnant women who were monitored closely as outpatients by physicians. One of the goals of these studies was to reduce the incidence of preterm birth and therefore does have the potential to impact hospital length of stay and hospitalization frequency. One of the studies was rated as moderate (Brooten et al., 2001) quality and the quality of the rest of the studies was judged to be weak. Definition of pregnancy risk and type of nursing care differed

among the studies. Therefore, the definition for pregnancy risk and the descriptions of the nursing care will be presented with the discussion of each study.

In a randomized controlled trial of 173 women and 194 infants, Brooten et al. (Brooten et al., 2001) explored the effect of providing half of a high risk pregnant woman's prenatal care through home visits by a Master's prepared nurse specialist (APN). Pregnancy risk was determined by identified problems in the current pregnancy that would increase the risk of preterm birth (PTB) such as hypertension, diabetes and preterm labour.

The authors hypothesized that women at risk for preterm delivery were often poorer and had difficulty attending clinic appointments due to transportation challenges. Missed clinic appointments were attributed to the clients having to spend several hours on local transit to attend clinic and lack of child care. The authors further hypothesized that home visits for some of the woman's care would increase accessibility of care and enable the women to maintain prescribed treatments such as bed rest to reduce risk of preterm birth. They believed that the home visits would therefore decrease missed appointments, improve pregnancy and infant outcomes and in turn decrease health care costs.

The APN visited the women in the intervention group (n = 85 women and 94 infants) at home on alternate weeks to provide maternal and fetal assessment, assess maternal health/risk behaviours, activity level, emotional status, coping, support systems and basic environmental supports. Appropriate interventions were carried out when required and medications were monitored and adjusted in consultation with the physician. The women were seen by the physician at the clinic on the weeks that the APN did not

visit. The women could call the APN during the day or evening during the week and from 8 am to 12 pm on weekends.

Women in the intervention group contacted the APN an average of 50 times each from prenatal enrollment to 6 weeks postpartum. They had more prenatal visits and fewer acute care visits (t = 0.04). Hospitalization was less frequent (41 women in the intervention group and 49 in the control group) and they stayed a total of 250 fewer days in hospital prenatally and postnatally when they were hospitalized. Length of hospitalization for childbirth was similar in both groups. In the intervention group, 11 more infants were born at term ($\geq$ 37 weeks) and 6 fewer infants were born at < 29 weeks gestation. The infants also weighed an average of 300 gms. more at birth ($p < .05$), stayed in hospital a total of over 100 days less and were readmitted to hospital less frequently (19 vs. 36).

Providing the specialized nursing care at home cost an average of US$2,039.00 per mother/infant dyad. Average cost savings per participant were US$3,983.00 prenatally, US$345,000.00 for intrapartum hospitalization and US$196,000.00 from reduced infant rehospitalizations in the first year of life. The infant savings were attributed to the increased gestational age at delivery.

This study indicated that nursing case management consisting of a combination of home visits and telephone contact can have significant impact on pregnancy outcomes and costs. While this study paid close attention to assessing maternal and infant outcomes and costs, the contribution of the telephone availability and contact to the study findings is unknown.

Boehm et al. (1996) randomly assigned high risk pregnant women to usual high risk antenatal care or usual care plus telephone contact daily from the same nurse (the research nurse) starting as early as 20 weeks gestation. Increased pregnancy risk was defined as a history of a previous preterm birth less than 37 weeks that was unrelated to known iatrogenic causes such as fetal growth restriction, diabetes or pregnancy induced hypertension in a past or present pregnancy. Both the control (n = 21) and intervention groups (n = 21) received a contact number for 24 hour service and were scheduled for prenatal physician visits at least every two weeks from 20 weeks gestation to delivery. At each prenatal visit, a vaginal exam was done to assess any change in the cervix. The intervention group received daily telephone calls that followed a structured interview format in addition to the same physician follow-up. At each call the nurse asked seven questions related to well-being, signs and symptoms of preterm labour, tocolytics medication compliance if this was prescribed and an open-ended question that invited the participant to discuss any other unusual problems or symptoms. The outcomes measured included the clinical course of the women, maternal and neonatal hospital length of stay and use of medications and bed rest during pregnancy. Data were also gathered on a third group of 22 women who refused to participate in the study to determine if there were any differences in the three groups.

The sample size of 42 participants was less than the 160 required to predict a decrease in the incidence of preterm birth with 75% certainty. Boehm et al. noted that 1,525 telephone interviews were made during the study. They found no significant difference in the clinical maternal and fetal outcomes among all three groups. This study

lacked sufficient power to be able to detect significant changes or lack there of with certainty.

Both the control group and the intervention group received the same increased surveillance (increased clinic visits, 24 hour contact phone number, written education). The only treatment difference between the groups was the addition of the telephone contact for the intervention group. This attempt to eliminate other confounding variables gave strength to the study goal of assessing the impact of a telephone intervention. However, the small sample size may have reduced the ability to show any effect of the telephone care. The practitioners were also not blinded to the treatment groups. Therefore the women in the study may have received increased treatment that also lessened the ability of the trial to show a positive effect from the telephone nursing care. The frequency and length of the telephone calls, and the women's responses to the questions were not described in this study.

Little et al. (2002b) reported the clinical and financial outcomes of a telephonic nurse case management program. They hypothesized that women receiving telephonic nurse case management would have increased gestational ages at birth, increased mean birth weight and use fewer clinical resources therefore reducing costs compared to women receiving standard care. Increased pregnancy risk was defined by low income and attending a high risk obstetrical clinic. Telephonic nurse case management consisted of risk assessment, patient education, coordination of care and patient advocacy. There were 123 women (n = 59 control and n = 64 intervention) who completed the study but the women with twin pregnancies were excluded from the analysis. Therefore data on only

111 women were analyzed. The women were randomly assigned to receive usual care (n = 50) or the telephonic intervention (n = 61). The nurse case manager telephoned the intervention group once every 7 to 14 days.

The demographic characteristics of the intervention and control groups were not significantly different. However the intervention group had significantly larger proportions of patients with obesity, anemia, preterm labour symptoms and undiagnosed vaginal bleeding while the control group had significantly more substance abusers. Little and her colleagues found that more infants in the intervention group had increased birth weights (p = .023) and maternal costs were reduced an average of $501.31 when inpatient and outpatient charges were combined. Little did not find a significant increase in gestational age for the intervention group compared to the standard care.

No power calculation was done to determine the sample size required to show a difference in the outcomes. However the small sample size (n = 111), in this study may have limited the researchers' ability to detect a difference between the groups. Although participants were randomized to either an intervention or control group, the groups were not balanced with respect to pregnancy related problems. Since the randomization methods were not described, it is not possible to determine if the difference between the groups was due to a flaw in the randomization procedure or due to the small sample. These factors may have confounded the study results. Additionally, the protocol for the telephone contact was described but the actual content of the calls, the mean number of calls to each client, and ease of contacting the women were not presented.

Little and her colleagues published another paper (Little et al., 2002a) on the above study reporting the results of the satisfaction survey. They used a post-test only

control group experimental design to explore the effect of nurse case management by telephone on satisfaction, the relationship between satisfaction ratings and population demographics and the relationship between satisfaction and pregnancy outcome.

Results and limitations of the satisfaction survey are presented and discussed in detail in Objective 3. Results that pertained to Objective 1 only are discussed here. There was no significant difference in satisfaction between racial groups. Higher satisfaction was associated with participants receiving the intervention (p .001) and having lower historical risk scores (p .015). When regression analyses were conducted, satisfaction was not related to costs, pregnancy outcome or demographic differences.

Response rate to the satisfaction survey was acceptable (57.7%). However, those who returned surveys over represented participants requiring an interpreter, Hispanics and those with less than high school education. This may be due to perceived coercion when the nurse case manager contacted the women to complete the questionnaire or may indicate that those who were less satisfied with the program chose not to complete the satisfaction survey rather rate the program poorly. Validity and reliability of the questionnaire is not stated. The questionnaire did not include any open ended questions that would invite the participant to express thoughts or impressions about other areas not addressed by the questionnaire.

Moore and her colleagues (1998) hypothesized that telephone calls by a registered nurse to low income women from 24 to 37 weeks gestation would lower the number of preterm births and low birth weight infants. Three groups of women were considered to be at risk for preterm birth or low birth weight infants: all black women, other women 18 years old or less and other women who scored at least 7 on the Wake Forest University

School of Medicine risk assessment tool. Women (N= 1554) were randomized to the intervention group (n = 775) and the control group (n = 779). The intervention group was to receive three telephone calls per week from the nurse and could page the nurse if they wished. The telephone calls were not structured but were to address health status related to the pregnancy, perception of contractions, nutrition, smoking, and substance use. The nurse also made recommendations based on her assessment and discussed other issues identified by the woman.

Researchers calculated that a sample size of 1540 women was needed for a power of 80% and alpha of .05 to determine a decrease in preterm birth rate and an increase in birth weight. Although the sample recruited was sufficient to meet the power requirements, attrition and loss to follow-up reduced the sample to less than the required size (N = 1433). A significant decrease in preterm birth (p = .004) and LBW (p = .02) was found only in a subgroup of Black women over 19 years old (Moore et al., 1998). Positive findings may have been biased by the inclusion of Black women who did not have risk factors for preterm birth. In fact the greatest effect on preterm birth was among the Black women who were considered at low risk for preterm birth (p = .027). Therefore the authors found no conclusive evidence for the benefits of telephone nursing care.

The authors also stated that the nurses were able to only complete an average of 1.5 calls a week to each participant instead of the three calls originally planned. They also indicated that the mean length of each call was 3.6 minutes. This length of time seems insufficient to complete an assessment, provide recommendations and discuss the woman's concerns. The actual content of the telephone calls was not described so we are unable to determine if the protocol was adhered to. The imbalance in recruitment between

Black and women of other races as well as the lack of description of the telephone call content limit the information that can be used from this study to inform Objective 1of this review.

Muender et al. (2000) conducted a cost benefit analysis of the telephone intervention for the cohort of Black women 19 years of age or over from the study by Moore et al. (1998) discussed above. Providing the telephone program cost US$117.00 per participant. When this cost was subtracted from the intrapartum costs incurred by the control group, telephone case management to Black women who were at least 19 years old saved US$227.00, regardless of SES. A limitation is that this cost analysis lacked data on the utilization of health care services prior to admission for delivery. As in the main study by Moore et al., the inclusion of Black women who were not identified as being at risk for preterm birth may have skewed the results of the cost analysis.

Hutti et al. (2004) compared costs and maternal and neonatal outcomes with or without telephone nursing case management (TNCM) using insurers records of charges and outcomes. They conducted a retrospective review of the insurers' records for 4,950 pregnant women who delivered around the same time and received care from the same physicians. Women were assessed for risk factors at three periods in the pregnancy: less than 28 weeks (T1), over 29 weeks (T2) and postpartum (T3). Pregnancy risk was determined if the woman had preexisting medical problems such as hypertension, diabetes cardiac disease or asthma, or a previous or current obstetrical history of preterm labour, cerclage, preeclampsia, ruptured membranes, bleeding, contractions, multiple or teen pregnancy. Women with risk factors received TNCM (intervention group n = 1204). The authors do not describe the TNCM, however. The comparison group (n = 3,746)

consisted of women who had used the insurer's services for their pregnancies in the past 18 months but had not been part of the TNCM program. The frequency of the telephone contact was not stated but appeared to be approximately every 2-3 weeks.

The authors examined the percentage of women identified with risk factors at each time period, whether the woman received case management, and the effect of case management on preterm birth below 36 weeks gestation, type of delivery, birth weight under 2500 grams, LOS in NICU, and maternal ICU stay after delivery. The study found that 368/1204 women were referred for case management, most women with high risk conditions were identified early and most referrals during pregnancy were appropriate. However 70% received case management when no risk factors were identified. Those identified with risk factors later in pregnancy or postpartum did not always receive case management. The infants from the comparison group were admitted to NICU 2.5 times more frequently than the intervention group. The costs for the intervention group were significantly less than the comparison group (US$1818.00 vs. US$4587.00, $P < .0005$). As expected, the costs for women having moderate or high risk were higher than those with no risk. However the costs were higher for women identified as having moderate risk than those considered to be high risk.

This study had several limitations which may have affected the results and the interpretations. Data were taken from insurers records and downloaded to the researchers who checked for accuracy. Risk assessments for participants in the intervention group were incomplete at the time of the study so the researchers attempted to replicate the risk assignments from the insurer's records of diagnoses and outcomes. Additionally, the published article has discrepancies between the data tables and the written text. The table

quoted did not correspond to the information in the text and it was impossible to understand how the conclusions were reached. Also a large percentage of women with no risk factors received case management which may have led to more positive outcomes for the intervention group. Again the frequency and type of interventions provided over the telephone were not described and participant satisfaction was not evaluated.

In summary, seven papers discussed five studies on nursing case management; four studies were RCTs, one paper was a cost benefit analysis of a cohort of an RCT, one was a post-test only control group experimental design and one was a descriptive retrospective review. The maternal and infant outcomes varied among the studies. Four studies indicated that the overall preterm birth rate did not change with nursing case management. One study found that a cohort of women (Black over 19 years of age) had fewer preterm births and the other three studies indicated that the gestational age was increased at delivery for the intervention groups; two also found that the intervention group had higher birth weight.

One study found that hospitalization rate and length of stay were both decreased and four studies found that hospitalization costs were significantly reduced when the women received nursing case management by telephone.

Although the protocol for the telephone care was described in all but one study, descriptions of the call length, contact frequency, and content were generally lacking. The actual nursing care that was provided in addition to the protocol for the telephone visit was only described in the qualitative study by Finfgeld-Connett. The length of the calls was only described in two studies and the call frequency varied from daily to once every two weeks. Therefore there is limited information provided by these studies to

guide the reviewers in determining the type of nursing care that can be provided by telephone or the optimum frequency for nursing telephone contact. Also, the variation from no effect to positive effect does not provide clear evidence of the benefit of telephone nursing care on maternal and infant outcomes. Therefore the reviewers concluded that although telephone nursing care did not clearly demonstrate an improvement in maternal or infant outcomes, the telepho0ne visits did not appear to cause increased harm. However, with rare events, large sample sizes would be needed to determine this.

All five studies that examined costs did find that hospitalization costs were decreased when nurses provided care that included telephone nursing. Therefore, the reviewers were able to conclude that care provided by telephone was not worse in these studies than the usual care provided and had the potential to decrease hospital length of stay and cost of hospitalization.

Objective 2: Differences Between Face-to-face and Telephone Visits

None of the identified studies compared telephone visits and home visits.

Objective 3: Satisfaction

Six studies (Brooten et al., 2001; Bullock et al., 2002; Hutti & Usui, 2004; Little et al., 2002a; Oakley et al., 1990; York et al., 1997) reported information on satisfaction. The satisfaction findings will also be organized and discussed according to the nursing interventions used in the studies.

Nursing care in place of hospitalization

York et al. (1997) found no significant difference in satisfaction between the intervention group who received home and telephone nursing care in place of

hospitalization and the control group. York et al. did use a tested and validated satisfaction survey tool (LaMonica-Oberst Patient Satatisfaction Scale). Contents and scores on the satisfaction scale were not discussed in more detail. The small sample (n=96) may have limited the researchers' ability to identify trends or differences in the satisfaction ratings between the control and intervention groups.

Social support

Bullock et al. reported that the telephone nursing support was well received by the participants. They appreciated the informality of the telephone calls and that the availability of the nurse by pager was very important although rarely used. Women preferred the telephone visits to face-to-face visits as they did not feel obligated to clean the house prior to the visit or to "play hostess." They also appreciated that the program was provided just for them with no obligations.

Oakley et al. found that most women were satisfied with the telephone provision of social support. They also stated that the participants indicated the midwives' helpfulness (94%), information (56%), advice (56%), and ability to listen (80%) were important factors for satisfaction. These researchers had an excellent response rate (94%) to the satisfaction survey. However, the authors did not state whether a validated tool was used. Responses of the control group were not reported except to state that 7% responded that they appreciated the home visits of the midwife despite not actually receiving one.

Nurse Case Management

Brooten et al. used the *LaMonica-Oberst Patient Satisfaction Scale* and reported that the intervention group was significantly more satisfied ($P < .001$) than the control group. However no other details regarding satisfaction were reported.

Participants in the study by Hutti et al. were reported to be satisfied overall with the nurse case management program but no further details of the questionnaire or responses are given.

The study by Little et al. (2002a) provided the most detailed information about satisfaction. They used a post-test only control group experimental design to explore the effect of nurse case management by telephone on satisfaction, the relationship between satisfaction ratings and population demographics and the relationship between satisfaction and pregnancy outcome. Pregnancy risk was defined as low income and having a high risk pregnancy. The authors did not define a high risk pregnancy. Population and interventions were reported in detail earlier (Little et al., 2002b). Briefly, poor women attending a high risk obstetrical clinic were randomized to receive telephone nurse case management or usual care. The nurse telephoned the intervention group participants every 7-14 days and the women could also contact the nurse.

Participants completing the study (N = 123, 70.3% of total sample) were low income women and predominantly non-Caucasian. There was a poor response to the mailed satisfaction questionnaire until the nurse case manager for the control group called the participants and obtained answers to the questionnaire. Only 57.7% of the participants answered the satisfaction questionnaire. Control and intervention groups were comparable in description. Those who answered the survey were predominantly participants who required an interpreter, Hispanics and those with less than high school education.

Satisfaction was significantly higher in the intervention group on questions relating to health teaching and instructions (p .001), opportunity to ask questions (p .001),

nurse's ability to answer your questions (p .001), frequency of contacts by the nurse (p .001), and overall experience (p .001); availability of the nurse (p .04); and confidence in the nurse providing care (p .01). No significant effect was noted for the questions which addresses education and support materials (p 0.06) and the teamwork between health providers and insurers (p 0.09). There was no significant difference in satisfaction between racial groups. Higher satisfaction was associated with participants receiving the intervention (p .001) and having lower historical risk scores (p .015). Regression analyses were performed and satisfaction was not found to be related to costs, pregnancy outcome or demographic differences.

An initially poor response rate may indicate that those who were less satisfied with the program chose not to complete the satisfaction survey rather than rate the program poorly. Overrepresentation of poor participants and those requiring an interpreter may be due to perceived coercion when the nurse case manager contacted the women to complete the questionnaire. The questionnaire did not include any open ended questions that would invite the participant to express thoughts or impressions about other areas not addressed by the questionnaire. Also, the validity and reliability of the questionnaire is not stated.

Four of the six studies reported that the women in the intervention group were more satisfied than those in the control group. One reported no difference in satisfaction in the two groups and one study did not report the satisfaction ratings of the control group. Two studies (Brooten et al., 2001; Oakley et al., 1990) did not ask for separate responses on the home and telephone visits that were provided. Only two studies used a validated survey tool to assess satisfaction (LaMonica-Oberst Patient Satisfaction Scale).

However, the contents of the scale and the scores were not discussed (Brooten et al., 2001; York et al., 1997).

Provision of programs which included telephone support was generally well received when satisfaction was assessed. Satisfaction was attributed to the helpfulness, ability to listen and availability of the nurse or midwife; to the provision of information and advice; and to the informality of the telephone call and lack of visual cues of social barriers.

Limitations of the Systematic Review

This systematic review was limited to published English language reports potentially excluding studies that met these inclusion criteria but were written in a language other than English or had not been published. Publication bias towards reporting only positive results may have limited the number of studies reporting no difference or a negative effect from telephone nursing care. Although every attempt was made to identify relevant published articles, there is also a possibility that some articles may have been missed.

Conclusions

Thirteen papers on telephone nursing care met the inclusion criteria for the systematic review. These studies explored a variety of facets of telephone nursing care including organizational outcomes (e.g. length of stay in hospital, frequency of contact, length of the telephone calls, cost of telephone nursing care or transitional care compared to the cost for hospitalization costs), health outcomes (e.g. effect on preterm birth and maternal and neonatal morbidity/mortality), interaction outcomes (e.g. social support), and client satisfaction with telephone nursing care. None of the studies explored

telephone contact from the perspective of the nurse provider, other health care professionals or compared telephone nursing care to face-to-face visits. Only two studies investigated the provision of telephone care for women with high risk pregnancies attributed to symptoms in the current pregnancy alone and only one research study compared women who remained in hospital to women receiving home nursing care (telephone and home visits) following early hospital discharge. One study was British, one was Australian and the majority (11) was American.

Risk of Preterm Birth

Beneficial effects on preterm birth rate and birth weight were not evident. Four studies found no difference in preterm birth rate or low birth weight while five studies showed that telephone nursing care had a positive effect, reducing the preterm birth rate or increasing gestational age and birth weight at delivery.

The studies appeared to demonstrate a trend to increased gestational age and increased birth weight in participants receiving TNC. However only three of the 9 RCTs had sufficient power to determine the effectiveness of their intervention. The remaining studies were either underpowered (4) or did not indicate (2) what power was required to reduce the possibility of chance. While there was an apparent trend in the majority of the studies to increasing gestational age and infant weight at birth, due to the lack of power this cannot be stated with conviction. Meta analysis of the RCTs was not possible as the definitions of risk of preterm birth differed among the studies.

Some of the differences in the findings among studies may be due to the differences in populations defined to be at risk. Although their risk of preterm birth is higher than the normal population, many women with social risk factors or who have had

a previous preterm birth or low birth weight infant deliver subsequent babies at term (Slattery & Morrison, 2002; Wen, Smith, Yang, & Walker, 2004). This may explain, in part, why some studies found the telephone care to have a positive effect on pregnancy outcome and others found telephone care had no effect. Also, nursing telephone interventions may possibly have different outcomes when risk is defined by socioeconomic and historical risk factors than when risk is defined by symptoms and diagnoses in the current pregnancy.

Telephone Contact

Telephone contact also differed in the studies. No study compared groups receiving different frequencies of telephone nursing care. Frequency of the telephone contact ranged from daily to once every two weeks. Only two studies commented on the call length which averaged 3.6 minutes in the one study and 20 minutes in the other. One study also noted that the nurse made three telephone calls for every call they completed. No identified study taped the telephone calls and analyzed the content from tape transcripts; although two studies did analyze the content of the nurses' call logs.

Benefits of telephone nursing care may be affected by the frequency and length of the contacts. In addition the frequency, length of the telephone call and the interventions provided may be different depending how the risk of preterm birth was defined. More research is needed to understand the interplay of the risk factors with the frequency and length of the telephone.

Furthermore, studies that combined telephone and home visits (5) did not describe the separate contributions of telephone and home visits to the study findings. Without research that clearly identifies the separate contributions of telephone and face-to-face

contact to maternal, fetal and organizational outcomes, we are unable to clearly determine beneficial or harmful effects of telephone nursing care.

Nursing Care

Interventions studied also differed; provision of care at home to reduce the length hospitalization, provision of social support, or case management of women attending prenatal clinics and physicians' offices (described differently in each study). The protocol for telephone nursing care provided was stated in all the studies and included some or all of the following: assessment, education, intervention and support. However, no studies compared or contrasted the effect of nursing activities carried out by telephone with face-to-face nursing visits. The two qualitative studies (Bullock et al., 2002; Finfgeld-Connett, 2005) described social support which is only one element of telephone nursing care. In addition, five of the 11 studies combined face-to-face care and telephone care and did not describe telephone and home visit interactions separately. Lack of studies evaluating the telephone nursing care hinders the clear identification of the nursing care provided by telephone within the high risk antenatal population.

Social Support

Social support was effective in reducing preterm birth in one study and had no effect on preterm birth in another. Two studies (qualitative) described the telephone social support provided to high risk pregnant women. Significant cost benefits of telephone care were realized in the five studies that included cost analyses.

Lack of clear maternal and infant benefit attributable to telephone nursing care may be due to a few different factors. Preterm birth is a multifactorial problem and risk of preterm birth was defined differently in each study. Additionally, none of the studies had

sufficiently large sample sizes to determine outcomes effectively. The reader should note however that there was no negative effect demonstrated for programs using telephone nursing care. This may indicate that no harm is done when women are contacted by telephone.

Organizational Outcomes

Cost benefits (decreased length of hospital stay for mother or infant and lower cost of providing telephone care) were realized in all five studies that examined the costs of providing telephone nursing care. Telephone nursing care may decrease hospital length of stay and therefore, decrease the costs attributed to the care of high risk pregnant women.

Satisfaction

Client's experiences and perspectives were limited to satisfaction surveys developed by health care providers and analyses of nursing logs (Bullock et al., 2002; Finfgeld-Connett, 2005) to elucidate support needs of the clients and supportive nursing activities. Satisfaction surveys indicate that women do appreciate the telephone calls even though there were no differences in outcomes considered desirable by the researchers. Perhaps, telephone nursing care provides benefits to the participants that are not elicited by structured surveys. A clear understanding of why the women appreciate the contact at home is lacking. Additionally, we do not know whether client satisfaction in this population has an impact on maternal and fetal outcomes.

While telephone nursing care is reported to decrease health care costs in other populations (Beebe, 2001; Gagnon et al., 1997; GESICA Investigators, 2005; Hagan, Morin, & Lepine, 2000; Hartford & Wong, 2000; Krumholz et al., 2002; Little, Saul,

Testa, & Gaziano, 2002), there is a paucity of research on telephone nursing care as part of a home nursing service designed to shorten or delay hospitalization for high risk pregnant women.

Telephone nursing care is a complex interaction using therapeutic nurse-client relationships that encompass provision of information, referral, education, and support while considering the client's cultural, spiritual and psychosocial needs and preferences (CNA, 2001). Further research is needed to elucidate the type of care provided during telephone nursing contact in this population; describing telephone nursing care from the perspectives of the clients, nurses and other health care providers, and what is related to the clients' perception of satisfaction. These descriptive studies should inform the directions and variables to be tested in future randomized controlled trials assessing the optimum frequency of telephone nursing visits, the benefits of telephone nursing visits, whether telephone nursing care is different when pregnancy risk is defined by social factors, medical and obstetrical history, or current pregnancy concerns and what impact client satisfaction has on maternal and fetal outcomes. Randomized controlled trials with more tightly controlled variables and larger sample sizes are required to explore the effects of telephone nursing care with or without home visits on maternal and fetal outcomes and telephone nursing care's role in reducing antenatal hospital length of stay. Multi-centered trials may be needed to obtain samples of sufficient size in this specialized population.

In addition, qualitative studies are needed to elucidate the women's perceptions of telephone nursing care when used to decrease or replace antenatal hospitalization. Satisfaction surveys developed by professionals exploring topics that the health

professionals deem important may miss valuable and rich data which may be provided when the clients' perspectives are solicited and they are encouraged to express themselves in their own words. The perspectives of health care providers and other professional stakeholders would also be beneficial to study in this manner.

Health care systems differ in accessibility and provision of care between countries. Most of the American studies focused on the lower socioeconomic populations when studying telephone care. Preterm birth and low birth weight are not solely the problem of the lower socioeconomic classes. Other socioeconomic classes may benefit differently from telephone care than the findings from these papers. Caution should be used when translating findings to other high risk antenatal populations without further study.

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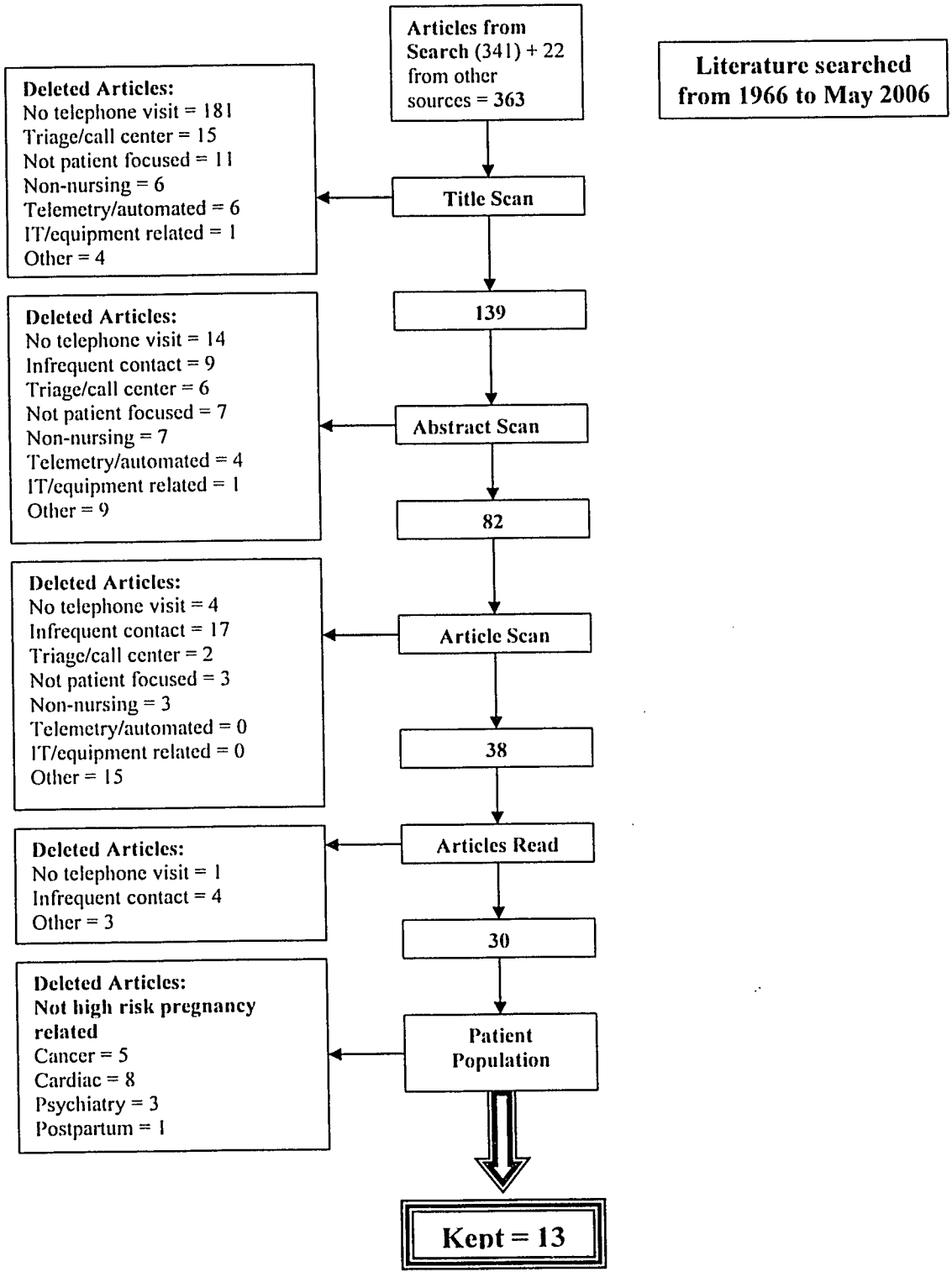
Figures

Figure 1: Systematic Literature Review Article Selection Decision Tree



Chapter 3 – Quantitative Methods

Phase 2a: Client Profile

This chapter describes the quantitative methods used to profile the participants and the results obtained. Additionally, the data from the sample are compared and contrasted with the available data from 2005 for the total antenatal home care program (AHCP) population.

In Phase 2a of this study, eligible AHCP clients were approached by the AHCP nurses and asked to participate in the study. Recruitment took place during the five month period from May to September, 2005. Interested clients were contacted by the research assistant and the study was further explained. Consenting clients completed a survey of perceived needs, participated in an in-depth, semi-structured interview to explore their experience with telephone mediated nursing care (next chapter) and at the end of the interview completed the Pregnancy Perception of Risk Questionnaire (PPRQ) (Heaman, Gupton, & Gregory, 2004). Two questionnaires were used in combination with information from the health record to gather information about the client's demographics, outcome of the pregnancy and the AHCP stay to describe the characteristics of the sample.

Profiling Objectives

Information about the sample was obtained from the participants and chart review in order to:

- Describe the characteristics of the sample and the telephone contact;
- Compare the sample to the population in order to assess representativeness;
- Assess the women's needs and perceived importance of these needs;

- Assess anxiety level related to the pregnancy;
- Assess preferences for involvement in decision making to help elucidate the extent to which the woman wished to be involved in planning her care; and
- Pilot the Supportive Care Needs Survey (SCNS) (The Cancer Council NSW's Cancer Education Research Program, 2000) and the PPRQ to examine the utility of these tools for the high risk pregnant population.

Methods

Sample

Permission to access women admitted to AHCP was obtained from the nursing and medical directors of the program. Since newly admitted clients to AHCP receive daily home visits for a minimum of three days, each participant must have been enrolled in the program for at least 1 week prior to recruitment to allow that woman to have experienced telephone nursing visits. By interviewing all consenting clients in the program in a five month period, we anticipated that participants would represent the various stages of care within the program from newly admitted to almost ready for discharge and from women with a need for closer surveillance to those who were more stable. This five month period was also chosen for pragmatic reasons related to the student researcher's availability and timelines.

Women were eligible to participate in the study if: they met the AHCP admission criteria (Appendix A); were able to speak, read and write in English; had experienced at least 2 telephone nursing visits from the AHCP nurses; and, were able to provide written consent.

Participants were recruited by the AHCP nurses, excluding the student researcher. A general explanation of the study and an information sheet were given to eligible clients. Interested clients completed a form providing their name, telephone number, email address, street address, and anticipated due date. This form was returned to the AHCP nurses who placed the forms in a sealed envelope which was delivered to the research assistant (RA). The RA contacted the participants, answered their questions and explained the research project in more detail. She obtained verbal consent from the participants and verified the mailing address. Once verbal consent was received an appointment was made for the interview to take place in 1- 2 weeks and a consent form was mailed to the participant along with the modified SCNCS. The information sheet, contact information form and consent form are in Appendix E.

A day or two prior to the scheduled interview, each participant was contacted by the RA to confirm the interview date and time and to remind her to complete the SCNS prior to the interview. Questions were included at the end of the survey that asked about the woman, her obstetrical history and her current pregnancy problems. The research assistant (RA) then met with the client-participant to complete the interview. Prior to conducting the interviews the RA obtained a signed consent and following the interview waited while the participant completed the PPRQ. A copy of the signed consent, the SCNS, audio tape of the interview and the PPRQ were collected by the RA and returned to the student researcher for transcription and analysis. All tapes, transcripts and other study data are kept in a locked filing cabinet.

Quantitative Instruments

The Supportive Care Needs Survey

The unmet needs survey, was adapted from the Supportive Care Needs Survey (SCNS) developed by The Cancer Council New South Wales (NSW) Cancer Education Research Program (2000). The SCNS has been used to assess the unmet needs in different populations including cancer, heart failure, and colposcopic examination (Billie Bonevski et al., 2000; B. Bonevski, Sanson-Fisher, Girgis, & Perkins, 1998; Davidson, Cockburn, Daly, & Fisher, 2004; Foot & Sanson-Fisher, 1995; Girgis, Boyes, Sanson-Fisher, & Burrows, 2000; Kerr, Harrison, Medves, & Tranmer, 2004).

The original tool consisted of 71 questions and required approximately 20 minutes to complete. The first section consisted of 52 'needs' items requiring the respondent to indicate level of need on a 5-point scale where 1 indicated the item was not applicable; 2 indicated no need, already satisfied; 3 indicated a low need for help; 4 indicated a moderate need for help; and, 5 indicated a high need for help. Two other items assessed the clients' desire for support and people services. Five specific domains are included in these questions: psychosocial needs, health information needs, physical and daily living needs, patient care and support needs, and interpersonal communication needs. Socio-demographic data and information about participants' disease and treatment characteristics were sought in the last section.

Foot and Sanson-Fisher (1995) tested the validity and reliability of the instrument. Using Cronbach's alpha, the internal reliability of the first 4 factors was reported as 0.90 and factor 5 was 0.78. When the instrument was administered to a group of patients a

second time 10-14 days later the weighted Kappa correlations were all greater than 0.4, indicating moderate to substantial test-retest agreement.

When reviewing the list of questions included in the SCNS, the student researcher felt that most questions addressed needs that were similar to needs expressed by AHCP clients. To substantiate the clinical impression, the original list of needs was compared to the literature on high risk pregnant women's experiences with bed rest (Durham, 1999; Gupton et al., 1997; Heaman, 1992, 1997, 1998a, 1998b, 1998c; Heaman et al., 1994; Josten, Savik, Mullett, Campbell, & Vincent, 1995; Maloni, 1993a, 1994; Maloni et al., 2001). The listed needs were then modified slightly to reflect the needs of the pregnant population. The second section of disease characteristics and sociodemographic data were more substantially changed due to the differences between the cancer population and pregnant women.

In order to test face validity, expert obstetrical nurses reviewed the adapted questionnaire to assess the content for clarity and completeness. Revisions or refinements were made to the questionnaire based on the feedback received from these people. The revised questionnaire found in Appendix F was then pilot tested to assess clarity, readability, comprehensiveness and ease of completion from the client perspective.

Three women experiencing high risk pregnancies completed the questionnaire and provided feedback. The women who pilot tested the questionnaire were either previous clients or those hospitalized and not eligible for AHCP so potential participants were not used and thereby eliminated from the study.

Pregnancy Perception of Risk Questionnaire (PPRQ)

In order to minimize the possibility of focusing the participants' attention on the topics addressed in the questionnaire and away from their own thoughts, the PPRQ was completed after the interview, while the research assistant waited.

The PPRQ is a self administered questionnaire consisting of 9 questions. It measures the woman's perception of risk to her pregnancy according to two factors; risk to herself (4 items) and risk to her baby (5 items). The woman marks her perceived level of risk for each item on a 100 mm line. Her risk for each item is obtained by measuring the distance from the beginning of the line to where the woman has placed her vertical mark. The score for each item can range from 0 to 100. To calculate the woman's perception of risk, the scores for each item are added and the total is divided by 9 to give an overall score out of 100.

Heaman et al. (2004) have validated the Pregnancy Perception of Risk Questionnaire (PPRQ). Although the results have not been published, they were presented at the 15th National AWHONN-Canada Conference in Regina in November, 2004. Because of redundancy, Heaman et al. removed 2 questions from the original 11 item questionnaire leaving nine items in the validated tool. Internal consistency and reliability based on Cronbach's alpha was high (.87) for the total scale, .84 for the Risk for Baby subscale and .81 for the risk for Self subscale. The PPRQ was positively related to a high level of stress as assessed by the State Trait Anxiety Index (STAI). Construct validity using the known groups technique showed that women with a high risk pregnancy scored significantly higher on the PPRQ than women with an uncomplicated pregnancy. When Heaman et al. compared the PPRQ to the biomedical prenatal risk

scoring form, the PPRQ was positively related; thereby providing convergent validity. Test-retest reliability was also high when the test was administered again one week later. Analysis by Heaman et al. showed a Pearson's *r* of .88 for the total scale, .86 for the Risk for Baby subscale and .87 for the Risk for Self subscale.

Since this tool is specific for pregnancy and in particular identifies women's perception of their pregnancy risk, it was an appropriate tool to use in this study to help describe the population. A copy of the PPRQ is in Appendix G.

Demographic and Descriptive Data

Demographic data and information about the woman's current pregnancy and past obstetrical history were gathered from questions included at the end of the needs questionnaire. Information provided by the women included:

- Age, marital status (single, stable relationship), education, and job.
- History of infertility or pregnancy loss.
- Past pregnancies and experiences related to those pregnancies.
- Diagnosis of risk in this pregnancy.
- Perceived activity level prior to pregnancy complications.
- Health care decision making preferences and whether decisions were made according to her preference.

Chart audit was used to collect information about the frequency and content of home and telephone visits, gestational age at delivery, birth outcome, and maternal and infant morbidity in the first two days after birth. Statistical information kept by the AHCP was used to describe the eligible clients that did not participate and the total AHCP population for 2005.

Ethical Considerations

Research ethics board approval was obtained from both the hospital and the university. The ethics certificates are in Appendix H. The study records are well organized and will be kept for a minimum of 15 years as per ethical guidelines and terms of approval from the institutions.

Written, informed consent was obtained from all participants and included permission for a chart review. Since the student researcher works within the antenatal home care program and is responsible for providing nursing care, the other nurses working in the AHCP recruited clients to the study. The RA was hired to contact and interview the clients. The RA called all interested clients to answer any questions about the study and explain the study in greater detail. Clients approached for this study were assured that the quality of care they received would not be affected by declining to participate in the study or sharing information with the RA. The woman was then given an opportunity to change her mind about participation. The RA also conducted the interviews to ensure that the student researcher was not perceived to coerce participants in this study and that no blurring of the boundaries between research and therapeutic relationship occurred between the clients and researcher.

Analysis

Quantitative data obtained from the modified SCNS, the PPRQ, and descriptive data collected from the participants and chart reviews were analyzed using frequency distributions and where appropriate calculation of the mean and median, using SPSS 13, student version. Characteristics of the sample were compared with the program population to assess representativeness.

Results

Thirty-four clients admitted to the AHCP over the study period were deemed eligible to participate in the study. Of the 34 eligible clients, 8 clients were not approached to participate in the study before they were discharged from AHCP and 9 declined to participate. Of the remaining 17 clients, three clients delivered before the RA could arrange an interview and one client agreed to participate but the RA was unable to contact her. Thirteen clients agreed to participate and completed the SCNS and PPRQ. A flow diagram detailing the recruitment information is in Figure 2.

Table 3 presents the data describing the study sample, all clients eligible for the study and the antenatal home care population for 2005. The distribution of the sample across the two campuses was similar as was the number of women with preterm labour and singleton and multiple gestations. The sample was predominantly English speaking, had more women who experienced bleeding in the pregnancy (APH), fewer women who had ruptured membranes prematurely (PPROM) and no women with gestational hypertension. More women in the sample were admitted to the AHCP between 24 and 30 weeks. Although they were discharged from the AHCP at similar gestational ages to the total AHCP population, more women in the sample were discharged to community follow-up and fewer were sent to hospital. In addition, the women experiencing preterm labour in the sample group remained 1-1.5 weeks longer with AHCP.

Figure 2: Recruitment Diagram

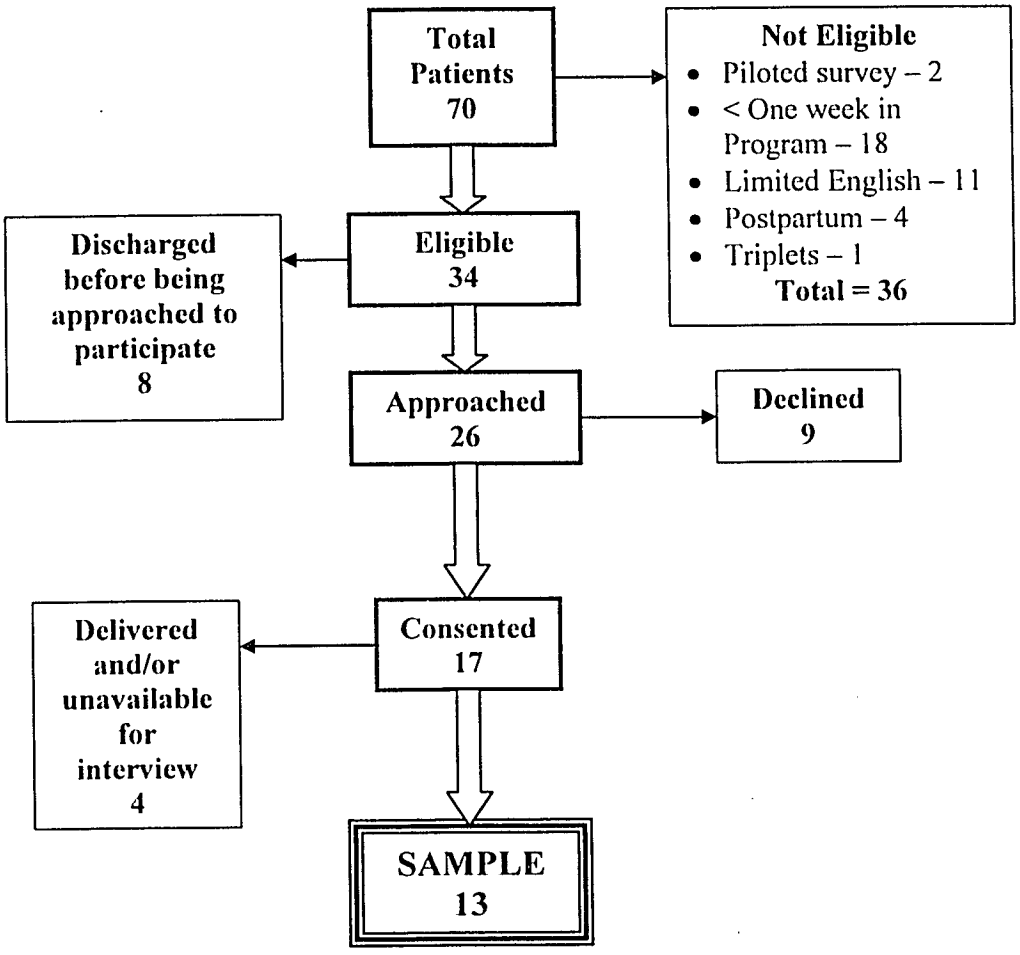


Table 3

Description Of The Sample And Total Population

	Participants *n=13*	All eligible study clients* (April – Aug 2005) *n=34*	All patients in 2005 *N=143*
Campus	***n* (%)**	***n* (%)**	***N* (%)**
Civic	7 (53.8%)	14 (41.2%)	70 (49.0%)
General	6 (46.2%)	20 (58.8%)	73 (51.0%)
Language (first)			
English	11(84.6%)	N/A	N/A
French	2(15.4%)	N/A	N/A
Diagnosis			
PTL	7 (53.8%)	20 (58.8%)	50 (35.0%)
PPROM	1 (7.7%)	5 (14.7%)	25 (17.5%)
APH	4 (30.8%)	5 (14.7%)	25 (17.5%)
PIH	0 (0.0%)	3 (8.8%)	31 (21.7%)
Oligo	1 (7.7%)	1 (2.9%)	5 (3.5%)
IUGR	0 (0.0%)	0 (0.0%)	2 (1.4%)
Other	0 (0.0%)	0 (0.0%)	5 (3.5%)
Single/Multiple Gestation			
Singleton	10 (76.9%)	27 (79.4%)	119 (83.2%)
Twins	3 (23.1%)	7 (20.6%)	20 (14.0%)
Triplets	0 (0.0%)	0 (0.0%)	4 (2.8%)
Gestation Admitted to AHCP**			
24-28	7 (53.9%)	12 (35.3%)	32 (22.4%)
28-32	7 (54.1%)	16 (47.1%)	52 (36.4.2%)
32-36	1 (7.7%)	7 (20.5%)	45 (31.5%)
≥ 36	0 (0.0%)	0 (0.0%)	3 (2.1%)
Where Discharged to**	***n* (%)**	***n* (%)**	***N* (%)**
Hospital	3 (23.1%)	14 (41.2%)	80 (55.9%)
Home	11 (84.6%)	21 (61.8%)	63 (44.1%)
Average AHCP Length of Stay by Diagnosis (days)	**Average # days**	**Average # days**	**Average # days**
PTL	31.7	25.6	20.3
Hypertension	0	11.7	12.8
PPROM	19	28.8	13.9
APH	22.8	22.8	15.9
Oligo	0	19	18.8
IUGR	0	0	8.5

* Total eligible population includes the 26 approached and the 8 eligible clients not approached (*n*=34)

**one person was admitted and discharged from AHCP twice

***These were either clients with multiple admissions or discharged prior to delivery and lost to follow-up

Table 4 presents the maternal data available to describe both the study sample and eligible study population. The sample was similar to the eligible study population in most respects including age, presence of a partner, number of pregnancies, number of children, and history of previous pregnancy problems. The sample had more caesarean births, more infants weighing at least 2000 grams and fewer babies admitted to NICU as seen in Table 5 found in Appendix I.

Table 4
Description of the Eligible Study Population and Sample: Maternal Data

	Study Sample *n=13*	**All Eligible Clients* (May – Sept 2005)** *n=34*
Age	*n* (%)	*n* (%)
≤ 20	0 (0.0%)	2 (5.9%)
21-30	6 (46.2%)	16 (47.0/%)
31-40	7(53.9%)	16 (47.0%)
Partner		
Yes	12 (92.3%)	31 (91.2%)
# Children		
no children	5 (38.5%)	21 (61.8%)
1child	7 (53.8%)	11 (32.4%)
2 or more children	1 (7.7%)	2 (5.8%)
Number of Pregnancies		
First	5 (38.5%)	15 (44.1%)
Second	3 (23.1%)	7 (20.6%)
Third or more	5 (38.5%)	12 (35.2%)
Previous Pregnancy Problems		
Not Applicable	5 (38.5%)	15 (44.1%)
Yes	6 (46.2%)	15 (44.1%)
No	2 (15.4%)	3 (8.8%)
Unknown	0 (0.0%)	1 (2.9%)

* Eligible sample included study sample i.e. 21 eligible but did not participate + 13 participants

The sample women preferred to be actively involved in the decisions made about themselves and the baby. As can be seen in Figure 3, although the women preferred to be actively involved in making decisions 9 of 12 women perceived that they participated less in the decision making than they would have liked. One participant's answers on decision making were excluded because she selected multiple answers for both decision making questions.

		Desired decision-making style $n = 12$*				
Perceived actual decision-making $n = 12$*		Physician decides	Physician + client input	Shared decision	Client decides + physician input	Client decides
	Physician decides		2		2	
	Physician + client input		1	3	1	
	Shared decision			2	1	
	Client decides + physician input					
	Client decides					
	* *One respondent was excluded from this chart as she selected multiple answers for each of these questions so was omitted from the analysis*					

Figure 3: Decision making style: The shaded cells indicate that the preferred decision making style was how the woman perceived decisions were made. The cells above and to the right of the shaded cells indicated that the woman perceived that the physician had more input into the decisions than she wished. The squares below and to the left of the shaded cells indicate that the client perceived she had more control in the decision making than she wished to have.

Table 6 (Appendix J), presents additional data collected only from the sample. In addition to preferring to be involved in decision making the women also considered themselves to be at least somewhat physically active prior to having their activity restricted by their high risk pregnancy.

The SCNS took the women 20 to 30 minutes to complete. No-one complained about the length of time to complete the questionnaire. They also did not indicate that any questions caused them distress. Table 7 presents a distribution of the highest frequency of needs in each domain identified in the SCNS. The frequency of responses indicating high or moderate unmet needs in each domain were summed and ranked in order to identify the individual need items that received the highest ratings. The domains most often reflected in the high needs were the antenatal specific questions added to the SCNS, the psychological domain and information needs domain.

Table 7

The Frequency Distribution of the Highest Need Ratings **(n = 13)**

The frequency of the moderate (4) and high (5) needs scores for each item were summed and then ranked to show the items receiving the most high need scores.

Need Domain	Item	Number	Percent
Specific to Antenatal Clients	Fears about unborn baby	9	69.2
Specific to Antenatal Clients	Tired of waiting	5	38.5
Specific to Antenatal Clients	Bed rest when feels well	5	38.5
Specific to Antenatal Clients	Recognizing when I should go to hospital	5	38.5
Specific to Antenatal Clients	Involved in decision making for myself	5	38.5
Specific to Antenatal Clients	Involved in decision making for my baby	5	38.5
Specific to Antenatal Clients	Monitoring my condition	4	30.8
Specific to Antenatal Clients	Feelings of missing out	4	30.8

Table 7

***The Frequency Distribution of the Highest Need Ratings* (n = 13)**

The frequency of the moderate (4) and high (5) needs scores for each item were summed and then ranked to show the items receiving the most high need scores.

Need Domain	Item	Number	Percent
Psychological	Feeling useless	6	38.5
Psychological	Anxiety	5	38.5
Psychological	Uncertainty about the future	5	38.5
Psychological	Feeling bored	4	30.8
Psychological	Feeling down or depressed	4	30.8
Psychological	Fears about the cancer (changed to problem) returning	4	30.8
Psychological	Keeping a positive outlook	4	30.8
Psychological	Finding meaning in this experience	4	30.8
Psychological	Changes to usual routine and lifestyle	4	30.8
Psychological	Concerns about the ability of those close to you to cope with caring for you	4	30.8
Information	To be informed about things you can do to help yourself get well	6	46.2
Information	Hospital staff to convey a sense of hope to you and your family	5	38.5
Information	The opportunity to talk to someone who understands and has been through a similar experience	5	38.5
Information	To be given explanations of those tests for which you would like explanations	5	38.5
Information	To be informed about your test results as soon as feasible	5	38.5
Information	To be adequately informed about the benefits and side-effects of treatments before you choose to have them	4	30.8
Physical & Daily Living	Not being able to do the things you used to do	7	53.8
Physical & Daily Living	Work around the home	4	30.8
Patient Care & Support	Obstetrician acknowledges and shows sensitivity to your feelings and emotional needs	5	38.5
No specific domain	Cost of hospital parking	11	84.6

Figure 4 shows the proportion of the respondents who indicated some need and those that indicated no need in each domain. The results are displayed in the form of a bar graph. The graph demonstrates that a higher proportion of participants had some level of need in all domains than those that had no need.

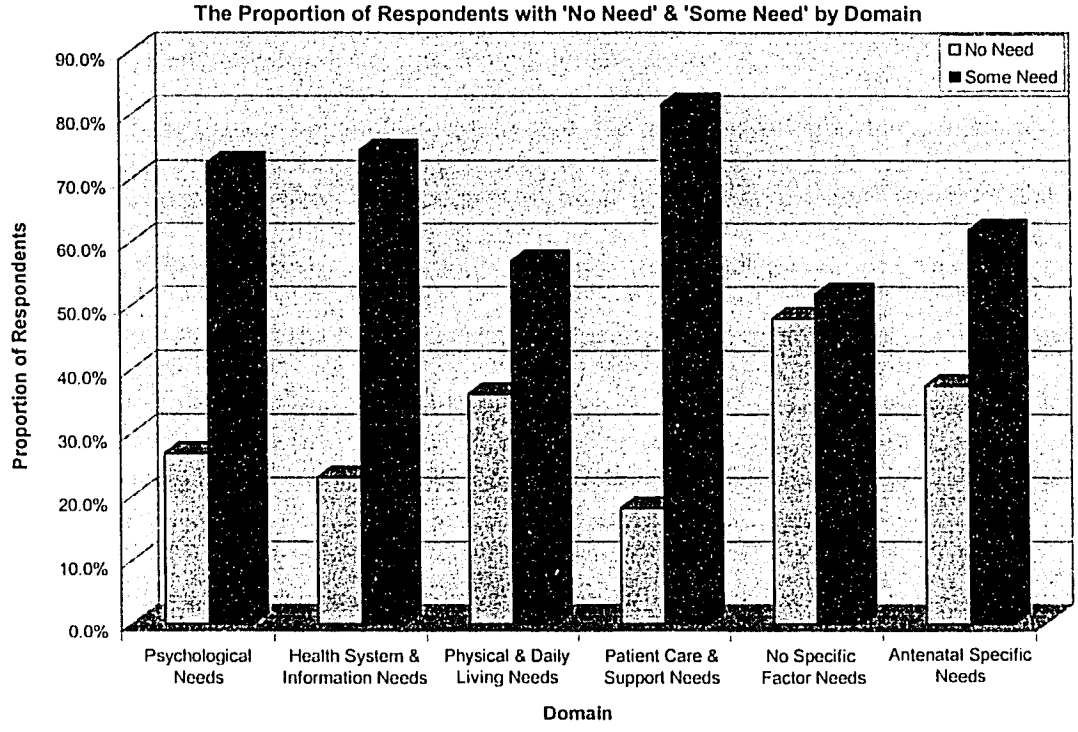


Figure 4: ***The Proportion of Participants with 'No Need' and 'Some Need' in Each Domain.***

Pregnancy Perception of Risk

The high PPRQ scores found in Table 8 indicate that the participants were very anxious about themselves and their pregnancy. The PPRQ scores for the women in this study (mean risk score of 43.8 and a SD of 16.6) are similar to the findings of Heaman and Gupton (2004) who reported a mean score of 41.3 and standard deviation of 19.2 for women with complicated pregnancies and a mean score of 24.0 with SD of 14.5 for

women with uncomplicated pregnancies. A high score on the PPRQ is related to a high state anxiety level (Heaman, 2004).

The PPRQ took less than 10 minutes to complete. However some of the women were conflicted about where they would rate their level of risk. They indicated that they would rate their risk differently if they were having symptoms than when they were not experiencing symptoms. Some even made two marks on the line and labeled these marks to explain the differences in risk perception. For the purposes of this study, when this occurred the two scores were summed and averaged to provide the final score for that item. This does indicate the need for a tool that is sensitive to the perceived differences in risk when symptoms or circumstances change. The questionnaire was only administered at one time point so it was not possible to observe if the tool was sensitive changes in anxiety level over time or due to nursing interventions.

Table 8
***Pregnancy Perception of Risk* n = 13**

	Mean	SD
The risk for myself	33.1	24.5
The risk for my unborn baby	64.1	21.4
My risk of hemorrhaging	51.9	28.6
My risk of having a caesarean section	64.0	33.2
My risk of dying during this pregnancy	16.2	13.8
My baby's risk of being born prematurely	58.2	31.5
My baby's risk of having a birth defect	30.3	22.8
My baby's risk of NICU admission	56.6	30.2
My baby's risk of dying during this pregnancy	20.2	24.2
Total Risk Score	394.5	149.3
Final Risk Score (total/9)	43.8	16.6

Telephone Visits

The number of telephone visits and home visits differed depending on the diagnosis and the acuity of the participant's condition. As indicated in Table 9, the participants diagnosed with preterm labour received an average of twice as many telephone visits (66.67%) as home visits (33.3%); those diagnosed with APH received an average of one third more telephone visits (60.9%) as home visits (39.1%) and the participants with PPROM received approximately the same number of telephone (52.2%) and home visits (47.8%) on average. Table 10 in Appendix K provides a detailed description of the telephone visits as documented in the clients' charts. Several of the participant-initiated contacts are in response to a message left by the nurse and when the participant paged the nurse after clinic. The clients in this program are asked to page the nurse when they return from clinic and ultrasound in order to answer any questions that the client may have following the appointments and to familiarize the clients with the use of the pager.

Table 9
Number of Telephone Visits and Home Visits

Participant	Phone visits with client (nurse initiated)	Client initiated contacts	Home visits
1 PTL	23	5	17
2 PTL	24	1	9
3 PTL	29	12	17
4 PTL	7	2	8
5 PTL Twins	8	4	10
6 PTL Twins	38	12	13
7 PTL Twins	5	6	9
8 APH	15	4	10
9 APH	16	4	13
10 APH	12	2	9
11 APH admission #1	2	5	6
11 APH admission #2	8	2	7
12 PPROM	2	6	16
13 Oligo-hydramnios	9	5	8

Conclusions

This small sample of women did represent a range of pregnancy conditions, length of stay in the program and those discharged to hospital and community as the researchers anticipated. While the quantitative results from this study cannot be generalized to other programs or populations due to the small homogeneous sample, the pilot provides evidence that it is feasible to routinely use the tools to collect information from high risk antenatal clients. The modified SCNS was easy for the women to complete and did identify needs relevant to the participants. A shorter validated tool may be useful to identify areas for the AHCP to concentrate on and where intervention may be helpful.

The PPRQ requires further testing to identify what scores indicate high anxiety when used in a clinical setting. However, this tool is a very short and easy tool to use as a screening tool when women enter the program to help identify anxiety level and where the anxiety is focused (on herself or her baby). The tools did indicate that anxiety is high among the antenatal home care program women and that women would like to be more involved in decision making regarding themselves and their pregnancy. The AHCP can now focus on developing strategies to help these women manage their anxiety and help them become more involved in the decision making process.

This study identified gaps in the institution's data collection that hinder evaluation of the program when compared to the inpatient high risk antenatal population. Easily accessible data on the length of stay and the pregnancy outcomes of both populations would be valuable for the institution to collect in order to compare the two cohorts and help evaluate the effectiveness of home care versus hospitalization. In addition, this study gathered data that describe the frequency and type of telephone contact made between the clients and the nurses, and confirmed that many of the nursing visits are made by telephone.

Chapter 4

Casting light on shadow: Describing telephone nursing care in a Canadian antenatal home care program

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Abstract

Background:

A systematic literature review revealed limited research on women's perceptions of telephone nursing visits when antenatal domiciliary care replaces hospitalization for high -risk pregnant women.

Objective:

To describe clients' perceptions of telephone nursing visits.

Setting and population:

13 women with high-risk pregnancies, between 24 and 37 weeks gestation, were recruited from a program providing home care instead of hospitalization.

Method:

This qualitative study used semi-structured interviews. Interviews were transcribed and analyzed for emerging codes and themes.

Results:

Four themes emerged: the experience of being at home, "just a call", more than "just a call", and perceptions of health care resource use. Women staying at home with a high risk pregnancy experience isolation, boredom, stress and uncertainty. Although their perception of the telephone contact is "a short call to check in," they describe a complex therapeutic interaction with the nurse. Benefits perceived by the women included reassurance, access to a knowledgeable health care provider, and information. They also identified challenges like difficulty describing their symptoms over the phone and feeling "tied to the phone."

Conclusions:

While the women did not always recognize the complexity of the telephone nursing care, they clearly articulated the benefits they perceived including: remaining at home with family, reduced stress, education, support, and rapid access to appropriate health care. Exploring the women's perceptions of telephone nursing care has helped elucidate how the nursing process is carried out by telephone. Their perceptions can be used to inform development and improvement in similar programs.

Key words: telephone nursing, qualitative research, patient perceptions, antenatal, high risk pregnancy.

Chapter 4

Casting light on shadow:

Describing telephone nursing care in a Canadian antenatal home care program

Background

Risk of preterm birth has been attributed to many different factors. Known preexisting factors that increase the potential for preterm birth (< 37 weeks gestation) include social and behavioural factors such as smoking, poverty, poor nutrition, high stress; historical obstetrical risk factors such as previous preterm birth or low birth weight infant (< 2500 gms.) and preexisting maternal medical conditions such as diabetes, hypertension, and autoimmune disorders (Health Canada, 2003). While the incidence of preterm birth or low birth weight infants is increased in women with these problems, not all these women will have a preterm birth even if they had a previous preterm birth (2, 3). Other women have symptoms such as preterm labour (PTL), premature rupture of membranes (PPROM), bleeding (APH) and gestational hypertension in the current pregnancy that predispose them to preterm birth or a low birth weight infant. Health care providers attempt to delay delivery in these women by hospitalization, activity restriction, medication and close surveillance of mother and fetus.

When a woman is at high risk for preterm birth, she often spends several weeks in hospital. Research indicates that many women would prefer to be at home with their families whenever possible (4-12). However, women at risk for preterm birth who are cared for at home have physical and psychosocial stresses and concerns requiring nursing support. (4-7, 13-16). Shortened hospital stays coupled with the seriousness of the event to pregnant women and their families support the need for a cost effective method of

providing effective and efficient care at home for this population. Since the early 1980s small Canadian antenatal home care programs serving high risk pregnant women have been developed at 9 centers in 7 provinces (Wallace, D. Canadian Antenatal Home Care Programs. 2003, October; *Unpublished)*. These programs care for women at risk for preterm birth due predominantly to PTL, PPROM, APH, and gestational hypertension with proteinuria.

Evaluations by these and similar programs concluded that patients were very satisfied with being at home instead of hospital, outcomes for mother and baby were similar to those patients remaining in hospital and home visits cost less than hospitalization (4, 6-8, 12, 18, 19). None of these evaluations assessed telephone nursing care.

A recent systematic review (Kaye, D., Aylward, D., Graham, I., Davies, B., & Fung, K. F. K. Systematic review of telenursing in high risk antenatal care. 2006; *Unpublished*) identified studies related to telephone nursing care instead of hospitalization for pregnant women at increased risk of preterm birth. The review identified a paucity of literature on the use of telephone nursing visits to provide continuous domiciliary care at home to this population. Only one of 13 studies explored telephone nursing care combined with home visits in a similar population (20). The remaining studies (21-32) explored the provision of telephone nursing care as an adjunct to physician or clinic visits. Only two studies defined a pregnancy as high risk according to symptoms experienced in the current pregnancy (PTL, PPROM, APH or gestational hypertension). The remainder of the studies defined a pregnancy to be at risk according to factors such as low socioeconomic status (SES), previous history of preterm birth (< 37

weeks gestation) or low birth weight infant (LBW) (<2500 grams). The frequency and content of the telephone nursing care and the interventions studied vary widely among the studies. Findings also varied among the studies. Of the five studies that indicated satisfaction with the programs only three identified any factors that increased the women's satisfaction. The factors mentioned included accessibility, helpfulness, ability to listen, and absence of discriminating visual cues (24, 31 32). Significant cost savings were realized in five studies (20, 22, 26, 28, 30) and the savings were attributed to decreased length of hospital stay and the cost efficiency of telephone care or telephone care combined with home visits. Variable results were reported for decreasing preterm birth (PTB) and LBW from no effect (20, 21, 23, 26, 28) to reducing PTB and LBW in the intervention groups (22, 29, 31, 32). Although they did not find a decrease in preterm birth or low birth weight, the gestational age and the birth weight of infants was increased in the intervention groups in four studies (22, 28, 31, 32). The review concluded that more research was needed to identify optimum frequency of telephone visits, compare telephone visits to face-to-face visits, determine if definition of risk (social factors, preexisting medical or obstetrical risk factors or problems in the current pregnancy) has an impact on the outcomes or frequency of telephone visits, describe the nursing care provided by telephone, and to explore the women's, nurses' and other health care providers' perceptions of telephone nursing care

Satisfaction surveys

Client satisfaction surveys conducted as part of program evaluations (27, 33-38), are frequently developed from the perspective of the health care professionals. "Consequently, the results of service evaluations are based on the assumption that clients

find specific program elements and outcomes valuable, when in fact, they are rarely consulted before hand and, if they were, they might identify an entirely different set of factors as essential" (35) p. 181.

The importance of soliciting clients' views, when evaluating programs, is now recognized (39, 40). The systematic review by Currell et al. (39) comparing telemedicine to face-to-face made two recommendations that were of interest. They concluded that further research must consider the client perspective when studying any telehealth care and that satisfaction surveys do not adequately assess the perspective of clients. The conclusions made by Currell at al. and the lack of information found on women's perceptions of telephone nursing care in high risk pregnancy in the systematic review by Kaye et al., led to the development of the objective for this study.

Objective

Describe the experiences of telephone nursing care within the AHCP from the perspective of the woman.

Setting

The setting for this study is an antenatal home care program provided by a hospital in Eastern Ontario. This hospital is a tertiary care center for obstetrics serving the Ottawa region (population 800,000) and is the referral center for eastern Ontario, western Quebec and Baffin Island. Two of the 3 campuses provide obstetrical inpatient services for both low and high risk patients. Each campus has approximately 4000 births per year. The AHCP serves clients with singleton or multiple pregnancies that are diagnosed with preterm labour (PTL), prelabour preterm rupture of membranes (PPROM), gestational

hypertension, or bleeding in the third trimester (APH) from 24 weeks to delivery or resolution of the complications. Other diagnoses are considered on an individual basis. Currently admission to the AHCP is by referral from a physician. Until inception of this program, women with any of the 4 diagnoses would normally have stayed in hospital until resolution of the condition by delivery or otherwise.

In March of 2003 a formal protocol for replacing antenatal home visits incrementally with telephone nursing visits was adopted by the multidisciplinary perinatal care committee at the hospital. The change was introduced to increase the program capacity while keeping the costs down. Currently up to 8-10 clients may be enrolled in the program at a time, depending on the acuity of the client's condition. The program has 4 part time nurses working the equivalent of 2 full time positions.

The Antenatal Home Care Program serves a small specialized population of 100 to 150 women per year. Approximately 50% of the clients have threatened preterm labour, 25% have gestational hypertension, 13% have PPROM, 11% have APH and 1% has another diagnosis.

Method

Sample

Recruitment to the study occurred after a client had received care by the AHCP for a minimum of 1 week so that participants would have experienced telephone nursing visits. By interviewing all consenting clients in the program over a five month period, it was anticipated that participants would represent the various stages of care within the program from more intensive care due to less stable condition to stable progression and from newly admitted to almost ready for discharge. Ceasing recruitment after five

months was also a practical decision in order to allow the student researcher to complete the requirements for a Master of Science, Nursing in a reasonable time frame.

We were interested in interviewing women who were enrolled in the program, able to communicate in English, had received at least two telephone nursing visits, and could provide written consent.

Ethical Considerations

Since the student researcher works within the antenatal home care program and is responsible for providing nursing care, the other nurses working in the AHCP recruited clients to the study. A hired research assistant contacted all interested clients to answer any questions about the study and explain the study in greater detail. Clients approached for this study were assured that declining to participate would not affect the quality of care they received and that any comments or information shared or her decision not to participate would not jeopardize her care within the AHCP. The client was also given an opportunity to change her mind about participation.

The research assistant (RA) conducted the interviews with the women to ensure the women did not perceive any coercion from the student researcher. This also avoided any blurring of the boundaries between research and therapeutic relationship that might have occurred between the clients and researcher.

Interviews were audiotaped and transcribed verbatim. All identifying information was removed from the interview transcripts. The transcripts and the tapes are kept in a locked filing cabinet accessible only to the student researcher until after the publication of the study. The tapes will then be destroyed. The transcripts will be kept in a secure area for 15 years.

Permission was also obtained to do a chart review. Chart review provided information on the home and telephone nursing visits, maternal and fetal outcomes, such as gestational age at entry to and discharge from AHCP, and diagnosis to corroborate and supplement the participant's information.

Written, informed consent (Appendix E) was obtained from all participants and research ethics board approval was obtained from both the hospital and the university. Ethics certificates are in Appendix H.

The RA hired to conduct the interviews was experienced in qualitative interviewing. Training was provided that addressed the objective of the study and the population she would be interviewing. After the RA had completed the first interview, the audiotape was reviewed by the student researcher. There were no major difficulties noted with her interview technique. Minor adjustments were made to the interview, and to the RA's technique and probes. As the study interviews were completed, the student researcher listened to the transcripts and refined the interviewer's technique if necessary.

Recruitment

A convenience sample of all consecutive clients enrolled in the AHCP during a five month period was approached, by the AHCP nurses, to participate in this study. The nurses informed the women about the study. Women who were interested in learning more about or participating in the study were contacted by the RA. She explained the study in greater detail and sought verbal consent before proceeding. All consenting women were mailed a written explanation of the research study and an appointment was made for the face-to-face interview approximately one to two weeks later. The RA contacted each participant a few days before the appointed interview to remind her of the

interview time and ensure that the woman was still willing and able to participate. When the RA and the participant met for the interview, written consent was obtained. As recommended by Witkin and Altschuld (41), the interviews took place at a time and place mutually acceptable to client and interviewer.

Development of the Participant Interview

A semi-structured format was developed to guide the interview (Appendix L). Questions were open-ended and suggestions for probes were included to help ensure richness of data gathered. The questions for the interview guide were developed from the literature (4, 6, 15, 40, 42, 43) and the expert opinions of the AHCP clinical nurses. The interview guide was reviewed by selected people, including content experts and former clients, for clarity and comprehensiveness. Revisions were made based on their feedback. The interview guide was then tested in 2 preliminary interviews with clients who agreed to pilot test the interview. The clarity, comprehension and appropriateness of the questions was examined and question wording was revised again based on the clients' feedback. Time required to complete the interview and burden of participation were also assessed. The interview took approximately one hour and the clients did not find the process burdensome.

Analysis

Interview transcriptions were compared to the audiotape to verify accuracy as soon as possible after the interview. Wording and punctuation were edited where necessary and identifying information was removed. The transcripts were analyzed following the editing analysis style (44). NVIVO was used to organize the data. General

categories or themes were identified and a code book was developed that provided a definition for each code (Appendix M).

The editing analysis style is an inductive approach that involves constant comparative analysis. As new codes emerged, they were added to the code book and previously analyzed interviews were reviewed to determine whether these codes may have been present but overlooked previously. All of the transcripts were coded with the new code wherever it was identified. Similar codes were then grouped under new, more general categories and the categories were then grouped into main themes.

The student researcher and another independent researcher (NL), with perinatal expertise and familiarity with qualitative research, read the first 4 transcripts and coded them separately. They then compared the codes and where necessary, discussion ensued until agreement was reached. To ensure that the coding remained consistent, the same independent researcher reviewed the student researcher's coding for an additional four client interviews. The codes and the passages coded were then reviewed by the thesis supervisor (IDG) to ensure that the passages were coded appropriately given the codes and definitions. Finally the research committee members (IDG, BD, KFKF) validated theme choices and code groupings. Where a difference of opinion occurred about code or theme choices, discussion and revision took place until consensus was reached.

Data saturation was deemed to be achieved when a code was mentioned by at least 3 participants (Appendix N).

Results

The 13 women, 21-37 years old, were mostly in stable relationships and had at least high school education. Almost half were pregnant for the first time. Six of the 8

women, who had been pregnant before, also had problems in at least one other pregnancy (see Table 11).

As can be seen in Table 12, approximately half of the women were diagnosed with preterm labour in this pregnancy. Gestational age at admission ranged from 25 to 34.5 weeks gestation and length of stay with AHCP ranged from 1.5 weeks to almost 7 weeks. Each woman received at least half of their nursing visits by telephone and paged the nurse at least once during her stay. Most of the women indicated high anxiety on the Pregnancy Perception of Risk Questionnaire (PPRQ).

No new codes were identified in interviews 12 and 13. Therefore, further interviews were not conducted. Data saturation (mentioned by 3 women) was achieved for all the codes except two. Only two women mentioned partner support and one mentioned not being reassured, therefore these are not discussed.

Table 11
Profile of the Women

ID #	Age	Partner	Education	# of pregnancies	Previous problem pregnancy	Other children
1	32	Yes	College or university	1		0
2	23	Yes	Some college	1		0
3	21	Yes	High school	3	No	0
4	33	Yes	College or university	1		0
5	31	Yes	College or university	3	Yes	1
6	28	Yes	College or university	2	Yes	1
7	34	Yes	College or university	1		0
8	33	Yes	College or university	2	Yes	1
9	29	Yes	College or university	1		0

10	33	No	Some college	4	No	3
11	30	Yes	College or university	2	Yes	1
12	28	Yes	College or university	3	Yes	1
13	37	yes	College or university	4	yes	1

Table 12

Pregnancy related data and AHCP home and telephone visit frequency

* Patient admitted to AHCP twice in this pregnancy

ID #	Diagnosis	Gestation at AHCP admission	Length of AHCP care (weeks)	# telephone visits (nurse initiated)	# Patient initiated calls	# home visits	PPRQ score
1	Preterm labour	25.5	3.5	23	5	17	56.2
2	bleeding	26	4	24	1	9	15.6
3	Preterm labour	29	6	29	12	17	32.4
4	Preterm labour	25	5	7	2	8	34.6
5	Oligo-hydramnios	32	4 .75	8	4	10	41.7
6	Preterm labour	28	6.75	38	12	13	42.9
7	Ruptured membranes	30	3	5	6	9	74.0
8	Preterm labour	32	2.75	15	4	10	61.1
9	Bleeding	29.5	3.25	16	4	13	46.7
10	Preterm labour	25	8	12	2	9	19.3
11*	Placenta previa	24.5 32.5	1.5 2.5	2 8	5 2	6 7	46.0
12	Preterm labour	30	2.75	2	6	16	39.0
13	Oligo-hydramnios	34.5	3	9	5	8	60.6

Themes

Four main themes emerged: the experience of being at home, "just a call", more than just a call, and perceived health system resource use. Three of the four themes have several categories which in some instances are further divided into sub-categories as seen in Table 13 (Appendix N).

The Experience of Being at Home

During the interviews, the women talked about the stress, uncertainty, boredom, isolation, and confinement they experienced both in hospital and at home. These feelings weave through all the themes, creating a poignant backdrop for their perceptions of the Antenatal Home Care Program and the telephone nursing visits. The women's quotes illustrate the feelings they expressed and are found in Table 14.

Home vs. Hospital

In the hospital women described feelings of confinement, boredom, isolation. Staying at home meant being in their own environment with room to move, family and friends close by, and a perceived reduction in stress. Familiar places and comfortable surroundings often ameliorated but did not completely eradicate the feelings of boredom and isolation.

Isolation/Boredom

Isolation has many different faces. There is social isolation, isolation from health care, and the isolation of the experience itself (experiential isolation). Social isolation was perceived when these women couldn't leave home to socialize. Their partners were often at work and their network of friends visited but there were many hours during the day when they had no-one to talk to.

Participants said that waiting for a week between physician visits could seem like an eternity when there were risks to the pregnancy or the health of the baby. They really wanted an expert to reassure them that their baby was alive and well more frequently than the clinic contact.

The experience was isolating since these women and their families were not certain of the outcome and often their sphere of friends had not experienced problems with a pregnancy or birth. The family and friends didn't understand the feelings or the needs the woman had during this pregnancy. Knowing that others have had similar experiences comforted them even when the outcomes were not perfect.

Social isolation and inactivity led to boredom. The women stated that they became tired of reading or watching TV and missed the interaction with others.

Anxiety and Uncertainty

Uncertainty about the health or actual survival of the baby caused stress. Recognizing when to seek medical attention and indeed, understanding why the symptoms she was experiencing required hospitalization last week and not now were other sources of stress and uncertainty. The uncertainty was intensified if the woman could not perceive a difference between her current symptoms and when she was initially hospitalized. Boredom and restricted activity gave these women time to think about the problems they had and at times the stress and uncertainty were magnified.

Transition

Several transitions from one state or place to another were identified by the women. Transition could produce stress or relief depending on whether the transition was perceived as negative or positive. At times, uncertainty about the future for herself or her

unborn child, the perception of increased symptoms or indeed actual worsening of her condition created stress. At other times women were stressed by the length of time from diagnosis to resolution of the problems or delivery. Advancing gestational age or stabilization of symptoms led to relief and decreased stress.

The first transition mentioned was from hospital to home. At home, joy at being in their own environment was tempered with the stress of being away from the hospital and expert medical care.

Table 14 ***Theme: The Experience of Being at Home***

	Participant quotes
ID #	**Hospital versus home**
7	*"It's just so much better to be at home, ...I'm so much more relaxed to be at home than to be in the hospital;...So being at home was just so much easier cause you're in a familiar environment around people that you actually know and trust and want to be with...It's just a lot easier to deal with""*
8	*"I didn't want to stay at the hospital because it's boring; it's expensive and boring you know. There's not much to do."*
	Isolation (at home)
	Social Isolation
10	*"It's been one of the difficult things for me sort of being isolated while I'm here at home..."*
1	*"Well being stuck in bed was difficult for many reasons, like physically... and mentally, like it's tough you know you wake up every day ... "OK, what am I going to do today? Well nothing, what's the sense of waking up? ... There's nothing, you just lie in bed all day long."*
13	*"You spend most of the day by myself ... not talking to anybody so it's, that's pretty lonely, cause now I'm like, tired of watching TV and tired of being reading book."*
12	*"But it got boring, very boring."*
	From health care
8	*"...I can see the doctors and the nurses at the clinic once a week...You know it's kind of far in between."*
	Experiential isolation
11	*"Because sometimes you feel as if you are the only one going through this kind of a case..."*
4	*"... overall I think it's a process you are going through alone anyway."*
	Anxiety and uncertainty
5	*"I won't feel a hundred percent ... that nothing happened ... until the baby's born and I see that the lungs are good, that the kidneys are good."*
1	*"Because you find yourself worrying about every little thing when you're in a situation like that."*
4	*"....it's like you really don't know what the heck was gonna happen right?"*
	Transition
10	*"You've just been in the hospital for six days and now they're telling you "oh it's okay"*(to go home*). Yeah but it wasn't a week ago so why is it okay now you know. ... It's not that they (*AHCP nurses*) didn't answer our questions it's just like I say it's anxiety ..., as much as they can repeat the same things over and over again, it takes a while before you feel comfortable that what they're telling you is right."*

Table 14 *Theme: The Experience of Being at Home*	
	Participant quotes
7	*"You're nervous going home, you're like so thrilled to be going home cause you want to get out of hospital but at the same time it's that saying of "Oh my God, I'm not going to be [able to] hit a call button and somebody's there whenever anything happens."*
5	*"I was accustomed to the daily visits and it* [switch to telephone visits] *was a little disconcerting just because it was, you sort of count on the reassurance of the coming in and having the monitor on the baby so you can see ok yeah, the baby's okay so it ... made me a little bit more nervous to not have that."*
11	*"...it's stressful to go to triage ...it's good that there is somebody you can call [the nurse] before that can guide you and then if they feel necessary they can tell you to go to hospital."*

Once the women were settled at home, the next transition occurred when the nurse began replacing home visits with telephone visits. Stress is evident in one woman's account of how she felt when the nurse started phoning her instead of a home visit.

Making the decision to return to hospital when symptoms occurred was also a source of stress for some women. Both recognizing that symptoms were serious enough to warrant a trip to hospital and actually going to the obstetrical triage (triage) caused stress.

"Just a Call"

When the women were asked about the telephone calls, their spontaneous first response (Table 15) was that they received a quick call lasting only a few minutes. They said that the purpose of the call was to "check in" with them or to make sure they were OK between home visits.

Table 15 *Theme: "Just a Call"*	
ID #	**Participant Quotes**
2	*"...it was just a quick check up to make sure everything was good and if I had any questions."*
4	*"...there was always someone who would just call and say 'I'm just checking in and how are you?' and 'Any questions?'*
4	*"Like it's just they ask you their few questions; you answer; you have a little bit of a chit chat and then that's it"*
11	*"Phone visits are more just for reassuring that they are there if there's anything...."*
1	*"Pretty basic. Just basically, you know how are you feeling; are you having any contractions; has anything changed? It just gives you the opportunity to - I guess if you have any concerns at that point to express them and know whether that raises a flag for the nurses at all."*

More Than "Just a Call"

But at the same time, the women indicated that it was so much more than 'just a call'. When the interviewer probed for a deeper understanding of what the women could describe (Tables 16 and 17) about the telephone visit, they described the content of the telephone calls in detail and also added what benefit they derived from the calls. Many women referred to monitoring, support, reassurance, information/education, and accessibility. In addition they mentioned the connecting as a "life line", and the importance of the nurse knowing them as a person.

The women described the telephone visits as providing reassurance that their condition was indeed stable, that some possible changes in their perception of symptoms were indeed minor or needed further assessment by a home visit or a visit to the obstetrical assessment unit (triage). The checking in each day was also important to these women in order to stay connected for information, reassurance or to ask questions that had occurred to them since the last contact. The questions were often not seen as important enough to page the nurse for or to call the doctor about, but were still important to the women.

"Monitoring" - Nursing Assessment

At times the women described the nurses' activities as 'monitoring.' They felt that the monitoring was one of the ways the nurses kept careful watch over their babies and the pregnancy and gave the women a sense of security and safety. The women also noted that the nurses asked about physical symptoms, activity monitoring, emotional state, need for social services or referral to other health care services, pregnancy/health care knowledge, and knowledge of self monitoring. Assessment of the baby consisted of

asking about the baby's movements and the woman's perception of any change in fetal status or sense of comfort with fetal well-being. The women indicated that these activities were done whether the call was initiated by themselves or the nurse.

Making a Plan.

The women indicated that, when either the nurse or they were concerned about any physical symptoms or they were unclear about when to go to triage, clear plans were made including when to go to hospital. In addition, the nurse would arrange to call back at a specific time to reassess. The women also indicated that the nurse would make an unscheduled home visit in some instances.

"They Answered All My Questions" – Providing Information.

The women stated that information was offered by the nurses and also provided in response to questions on all aspects of their care. Other subjects that were important to the women but may not have been directly related to their diagnosis or symptoms, such as information on labour and birth or what to expect if the baby was born prematurely, were also covered.

"A Very Good Support Team" – Providing Support

The women frequently referred to the support they received from the nurses. For some, the support was relief of stress or reassurance, for some it was emotional, and for some it was helping to arrange transportation or services when they did not have a means of transport to a physician's appointment or to triage. Referral to other health care providers and support services were also arranged and coordinated.

"Very Reassuring"

Having the nurse readily available to answer questions or discuss concerns, helping the women assess symptoms they were experiencing and creating a plan of intervention if the symptoms continued or changed were perceived as reassuring to the participants. Other elements of reassurance that the women expressed included the expertise of the nurses and the confidence they helped to build.

"Just a Call Away"

The ability to page the nurse with concerns or questions was also valued highly by the clients. Even when the women only paged the nurse upon returning from a physician visit, the knowledge that she could access the nurse quickly with any concerns provided a sense of safety and reassurance. The women stated that the prompt reply from the nurse when she was paged helped them manage their anxiety. In contrast they stated that when they tried to contact their physicians, response time could be much longer and they continued to worry until the physician returned the call.

Expertise

The women indicated that the nursing expertise was appreciated. Several participants indicated that the expertise and broad knowledge exhibited by the nurses created a sense of close surveillance and appropriate care. This gave them the reassurance, confidence and peace of mind to enable them to remain calm while at home.

Building Confidence

The information and teaching by the nurses as well as the access to the nurses when the women had questions or concerns also helped them build confidence in their ability to

remain at home and decreased the stress. They felt reassured that they knew who to contact and what to do if they suspected problems.

Table 16	***Theme: More Than "Just a Call"***
ID #	**"Monitoring" – Nursing Assessment**
6	*"They call once a day and they just ask me how I'm doing – if there's any problems. They ask about the contractions, the discharge,(vaginal) you know what it's like, if it's ... not normal, if it's increased... They ask very specific stuff like that, what I did all day, how long I stood, you know stuff like that and then if I need anything to just call them."*
8	*"...they ask basically the same questions. They'll ask about the kicking, the contractions, how are you doing, anything changed. They'll ask about any discharge. If you say "Well I am contracting more," they will ask you a few more questions like have you been up a lot ... have they intensified, are they painful..."*
10	*"Basically, it's to monitor if I feel the babies moving, how I'm feeling, if anything has changed from the day before, any concerns that I'm having, if I need to, if they need to walk me through anything like a feeling I'm having or a support thing that I'm worried about, where they can provide information for me so basically yeah they just walk me through anything that I need to know. ... If I feel the babies move definitely, just basically they ask me on the phone instead of like they're here so it's all the same information I guess. So it's good."*
4	*"There was just a real sense of them, yeah, monitoring and that was another way they monitored you is that you were always just checking in and, and you just had a sense like, OK they were, they were following you, you know. And that was important like to know that you were being followed."*
11	*"Any problem you just ask them. And every day, you feel every day that your condition is being monitored."*
12	*"I guess it's just that piece of mind of knowing that somebody's monitoring you and knows what signs and symptoms to be looking for. "*
	Making a Plan
12	*"But if there had been any concerns or anything that I would have had, I never got the impression that they wouldn't take the time on the phone and if there were anything even once talking to them on the phone they would have come to see me..."*
6	*"Oh, they're great. They call every single day, like I can call them just the slightest thing, even when I'm not, like a little question or something where I'm not sure like I had a bout of the flu and I didn't know it was the flu but I wasn't, I couldn't eat, I couldn't drink, I went into the hospital for some, for the IV because she was really, the nurse (name) was really worried about it and you know they kept my doctor informed and they were so nice and any question."*
7	*"Well just the availability of being able to call someone at any point and say look I'm feeling this, what's going on with that ... being able to say, okay, 'I'm feeling something weird. Is it a normal weird or is it something that I should be concerned about here?' And ...-have them verify some of the things I was feeling because I was having a hard time too with figuring out if something was a contraction."*
	"They Answered All My Questions" – Providing Information
12	*"They gave me enough information to know what things to look for ..."*
8	*"They made sure to call on the days that they weren't coming ... repeating the same information to make sure that I didn't forget...never once did I have to worry about anything."*
7	*"They're good at addressing ... the worry of okay this is what's happening, I'm concerned about this. Well okay this is what we're looking at you know this is why I don't think it's a concern right now and very down to earth and very, pragmatic. It was "okay, here's what you need to know."*
4	*"I would have some questions that I would ask. ...I was asking a couple of the nurses even about like just labour you know, that kind of thing."*

Table 16	***Theme: More Than "Just a Call"***
9	*"If I did have a question ..., they always have an answer like they don't just leave me in the dark and to just read a book and deal with it myself."*
	"A Very Good Support Team" – Providing Support
10	*"I think the nurses are fabulous, a very good support team ... They're there when you need them."*
13	*"They're really good and they're very supportive and I got the sense I can really talk to them about anything."*
3	*"... just the fact that ... the support was there. It made a big difference. You don't feel so left all on your own, to your own devices..."*
4	*"...and be able to share with them too, like 'This is how I'm feeling about this... I'm going nuts...That, you know I'm going crazy and I'm feeling bad and all this stuff.' But I never had a sense that they were like 'Yeah Yeah I hear it all the time.' They were always very supportive...So it was very good."*
6	*"... I feel like I'm not just a patient you know. I feel like they actually care about this baby and me in general. Like she was the one that told me to ... mention to my obstetrician about the depression I was getting. They're the ones that are setting up a social worker to talk to me about anything that I need..."*
5	*"...I wonder what I would have done had I not had the pager number and had that set up. So it just gave you that extra support and what to do"*
	"Very Reassuring"
11	*"Any time they call ... It's really reassuring. You wait for it. I used to wait for my nurse's call."*
5	*"...it was the telephone visits where I would say stuff like: 'Well I had some cramping kind of feeling' and then they would ask me a couple of questions about that ... and they would always end it with 'if it gets worse or if you feel you have a question call again' and so that was really, really reassuring."*
1	*"Things are changing all the time and a lot of times you don't know if it's serious or not. So to have them be able to say to you: 'No don't worry about that, everything's fine...'"*
3	*"I mean it settles me down more when I have concerns where I feel like 'should I go to hospital or should I call, should I whatever,' they call every day."*
11	*"Any time they call.... It's really reassuring."*
5	*"...having them even just a page away, ... it just gave me that reassurance that if anything were to happen that I'd be taken care of really well and the baby would be fine because of it. But that reassurance was good."*
	"Just a Call Away"
9	*"Help is just a phone call away from someone that knows what they are doing... it makes it more relaxing."*
13	*"And they call every day that they don't see you so you know they're like on a daily basis staying on top of your situation and accessible there if you have any questions or concerns or emergencies you know you can pare us any time you have any issues."*
12	*"It was good to have a call at least from them to speak to them every day, maybe not see them every day. Still kept the lines of communication open and I knew that at any time I could just give them a call and hear right back from them."*
3	*"What I liked about being able to page the nurses if I had any concerns or questions about what I should do on any situation they got back to me within minutes so it wasn't like an hour's wait to have me sit there for an hour twiddling my thumbs getting all worried."*
6	*"Just knowing that somebody's right there. I just page and they call back right away, right away."*
12	*Someone's always there when you have questions to ask about anything that you may be feeling or anything that may seem different or wrong.*

Table 16	*Theme: More Than "Just a Call"*
	Expertise
9	*"If I did have a question for them ... they always have an answer. ...."*
12	*"You can talk to them about anything, not just the pregnancy itself, all the things that go with it."*
13	*"They seem very knowledgeable, so any question I had they were able to answer. There wasn't anything that I ever asked that they said 'Look I don't know' or 'You'll have to ask somebody else.'"*
10	*"... the comfort of knowing that they know what they are talking about."*
	Building Confidence
8	*"Just for me, it made me feel more confident, more reassured."*
5	*"...that was the one thing they did, they made you feel like this is what you do. If this happens, this is what you do and that added to the confidence."*
7	*"...but the fact that you can get a hold of them at any time anyway and if there was an issue then you better go to the hospital or they would come out. Then you knew you were covered and you would have that confidence that yeah it's OK"*

"I Didn't Want Them to Stop Calling" - Connecting

Connecting was mentioned more than once by every participant. The connections important to them included the daily contact, ability to page the nurse during the day with unexpected symptoms or concerns, access to the nurses' expertise, the nurse acting as a link to obstetrical triage and the physician, and also someone they knew and could count on talking to every day.

While the participants felt that they could page and the nurse would respond, they reserved paging usually for major concerns. The daily call from the nurse was anticipated and actually waited for. Some participants mentioned that they saved up non-urgent questions for the telephone visit so that they did not have to interrupt the nurse by paging for minor concerns.

Connecting also eased the burden of isolation caused by activity restriction. Even though some women perceived the experience as solitary in spite of support, the connection with the nurses allowed them to talk about these feelings and they expressed relief at being able to share their feelings.

Connecting allowed the women to talk about the stress and strain of uncertain length and outcome of their pregnancy. The women stated that, when they talked about their fears for themselves or their unborn babies, the nurses presented these fears in a realistic but positive light that encouraged hope.

Convenience

Convenience was important to many women. When they paged the nurse, they indicated that the nurse called back immediately and helped them decide the best course of action. At times this contact averted an unnecessary trip to OAU for assessment. The women said this provided immediate peace of mind and reassurance and decreased family disruption. At times this meant that the partner was not called home unnecessarily from work or that young children were not placed in the care of a friend or family member, causing stress for the child and stress for the parents. Long waits in triage for assessment and decisions were also averted.

Others felt that telephone visits were more convenient once they were comfortable with self-monitoring, as they were shorter and less disruptive to their day. They did not have to be showered and dressed for the nurse's visit and they did not have to entertain. Some women also indicated that they felt less guilty for taking the nurse's time when there were no problems when the visits were by telephone.

At other times the women indicated that they verified their own self-monitoring and decision-making during telephone visits or by paging the nurse. The participants' assessment was validated and relieved the stress of wondering if the trip to triage was really necessary. The women expressed relief that the nurse helped them to decide whether a trip to triage was necessary.

"They Transfer Information to Each Other" - Continuity of Information

The women indicated that another aspect of connecting was related to the nurse sharing information about them with her nursing colleagues and other health care professionals. Some women stated that they appreciated the nurses sharing information by verbal report, documentation in the chart, and among the multidisciplinary team at weekly team meetings. When they required further assessment, some women reported that the AHCP nurses contacted the primary physician or informed the triage nurse that the woman was coming in and what her current concerns were. The participants stated they appreciated not having to always repeat their story and symptoms when they had a new nurse or when they went to triage or clinic.

"They Know Everything About Me" – Holistic Care

The women said that they felt it was important during a telephone call for the nurses to know them. They stated that the nurses' knowledge of their history and situation helped to build trust in the nurses and develop a relationship where the woman felt she could openly express her feelings and concerns. They also appreciated the nurses' willingness and ability to focus on other areas besides the pregnancy problems. They stated that the nurses would address issues related to other aspects of their lives and answer questions about other aspects of their pregnancies. The women appreciated the nurses' undivided attention, the nurses listening to them and focusing on the whole person, not just on the pregnancy or diagnosis. They reported that these actions indicated that the nurses cared about them. They stated that the perception that the nurses cared about them was also an important factor in forming a relationship with the nurses.

Partnership

Discussing any questions or concerns that were raised at clinic visits and responsibility for reporting the findings from clinic gave the women a sense of involvement or partnership in planning their care. They felt this indicated that they were an important part of the team.

Concerns

The participants spoke mostly about the positive effects of the telephone visits. They considered the calls a lifeline that was readily accessible and convenient when they had questions. However they did mention some aspects of telephone contact that they were less satisfied with.

Tied to the Phone

Some women felt tied to the telephone because there was not a set time for the nurse to call. The client did not want to miss the call and also did not want to inconvenience the nurse or cause concern. Knowing before telephone visits began that if a call was missed, the nurse would call back or that she could page the nurse would have alleviated the feelings of guilt and concern when the client couldn't get to the phone immediately.

Visit Preference

A few women indicated that they were much more comfortable when the nurses came to the home to assess them because these women felt that the assessment was more accurate when performed in person by the expert or because the woman did not trust that she had described her symptoms over the telephone clearly enough for the nurse to make an accurate assessment or intervene appropriately.

Table 17	***Theme: More Than Just a Call (continued)***
ID #	**"I Didn't Want Them to Stop Calling" – Connecting**
4	*"But I really appreciated them kind of calling in and I didn't want them to not - to stop calling me, ...because I really did appreciate the calling in you know even if I didn't have much to report."*
8	*"Just the fact that you get to talk to someone; that you don't have to page, if you do have a question ...but it's not really a big worry that it's just something you want to check."*
8	*"You don't feel so isolated. You don't feel left to yourself."*
11	*"You wait for it. I used to wait for my nurse's call, like my nurse hasn't called yet. Like, it was in the back of your mind when those calls would come."*
3	*"Even if they weren't in front of me every day but I talked to one at least every day so it was kind of like okay, a lot more easier for me to go through with this as opposed to two visits a week and then nothing in between."*
6	*"...somebody's calling me every day to make sure that I'm okay, knowing that I'm alone all the time until he gets home..."*
	Convenience
8	*"So I found it helpful because it was days that they weren't coming in and plus it gives you also days that you can just relax; that you don't expect someone during the day all the time....After that [the first three days] sometimes you're tired and you need to get into your routine..."*
12	*"They were convenient you know. No matter what time of day ...When they were coming to see me in person I always felt you know I needed to be showered and dressed and ready for the day as opposed to over the phone it wouldn't matter you know so, you just - I have days here where I just have no energy at all and I'm in my pajamas until four of five o'clock and if I was having home visits I would feel that I couldn't do that."*
9	*"It's convenient ... They call every day which is really good to make sure that you're okay..."*
8	*"...You have someone you can call if you have any concern other than the hospital who are going to ask you anyways to come in...but it's not always convenient [to come in] when you have a child you know. What do you do with him? You have to find someone to baby sit and then go to the hospital, you have to find someone to drive you, have to find parking at the hospital which costs a fortune by the way, and so all of this it's all taken out at least during the day time while they're on..."*
6	*"But the phone visits, they're good too like you know sometimes we don't need them to come and ... I don't want to waste their day either just to come over because I had a gas pain ... I didn't know what it was you know so of course I'm panicking...But at least I was able to call and she was you know she went into detail and told me what to do..."*
	"They Transfer Information to Each Other" - Continuity of Information
13	*"I know that they consult ...with the high risk doctor at the (campus). They're in communication between them all the time so ... there's a flow of communication between them and my doctor so ...it's good to have sort of a coordinated medical care."*
10	*"... They transfer information to each other not only on paper but they talk so ... if another nurse calls she knows exactly what's going on with you. They don't mix you up with other patients or they know ... who they're talking to, what your problems are and all of that ...I mean I think what they're doing is great"*
11	*" ... if you have any concerns you call triage they don't know about you so they ask you so many details and then they will decide based on that. But these nurses they know everything about you, all the details about your case. So you don't have to worry about explaining it to them every time."*
	"They Know Everything About Me" – Holistic Care
6	*Because they know so much about me outside of the pregnancy now that they'll talk to me about you know my personal stuff that I've already told them. ....so to me it's, I feel like I'm not just a patient you know. I feel like they actually care about this baby and me in general..."*
7	*"There's a wide encompassing relationship, it's not the well "I'm focused on this bit of information about your baby as opposed to you know your overall health."*
11	*"These nurses know everything about you, all the details about your case."*

Table 17	***Theme: More Than Just a Call (continued)***
12	*"Before they call you they have all the information"*
	Caring
2	*"I think probably the biggest thing was that they seem to want to actually know the answers to questions and to spend time with you ...They would talk to you about what's going on and you know talk about the baby. It just felt so much more personal that they cared about it."*
10	*"They seem more concerned about... my well-being and best, about the whole thing and that leaves me in a comfort level"*
12	*"They really made you feel that they care about you and your babies and your situation."*
13	*"They seem very friendly and interested in you as a person so that's kind of nice when you don't get that most of the day when you're stuck at home by yourself."*
6	*"Like today I was scheduled for a visit and my phone for some reason is not working and she called triage, she called my mom's house and then finally she showed up here you know, ... they don't just say ah she's not home or I can't get through... They make sure they come see you or get a hold of you so that was, that was great and she was really concerned."*
	Partnership
7	*"And it's also useful that on the clinic day we don't see the nurse at home... we call and check in and that was really cool cause ... it's the fact that you're sort of included in the loop of here this is my experience of the appointment that I had and my perception of it. ... You actually get to be involved in reporting back and that was important."*
	Concerns
	Tied to the Phone
12	*"I guess the only thing* [I didn't like] *with the phone was what time are they going to call and sitting around waiting..."*
5	*"I had that underlying, "I don't want them to call and I don't answer and then they think there's something wrong" so I tried to be close to the phone ... but if I'd gone outside and not taking the portable ... I didn't want to miss it."*
	Visit Preference
6	*"... Because they're not there to see it, so to me it's the most difficult part.....I'd like them here to get your point across clear enough that they can diagnose you properly or help you properly..."*
13	*"I want you here to actually monitor it yourself"*

Perceived Health System Resource Use

The participants identified both benefits and gaps that they perceived in the health care system. They praised the benefits and offered suggestions for changes (Table 18) in the provision of Antenatal Home Care that they felt would provide support during stressful times, meet informational and support needs, and increase satisfaction with care.

Telephone Versus Home Visits

Overall the women were very pleased with the AHCP nursing care and the telephone visits. However, they felt that telephone visits without any face-to-face contact would not be as satisfactory as the combination of home and telephone visits. All of the

women stated that they needed the 3 days of face-to-face visits before beginning to have visits by telephone and wanted the face-to-face visits to continue in some ratio throughout. They indicated that the face-to-face visits helped them gain confidence in their ability to monitor their own symptoms reliably; allowed them to get to know the nurses and for the nurses to get to know them; allowed them to hear the baby's heart beat which provided important reassurance that all was well; and relieved them from the stress of sole responsibility for identifying problems or concerns. They also appreciated that the home visits provided an opportunity for the partner or family to participate.

Substituting telephone visits for some home visits after the initial daily visits was more acceptable to some than others. Some women said that telephone visits were best for "checking in" when everything was stable but preferred a face-to-face visit if they had concerns or wanted detailed information. Although all the women preferred telephone contact to no contact, some women preferred to have more home visits than they received to help them manage their stress. They acknowledged that they did not need home visits everyday but for them at this point every other day or 3 times a week would have been preferable. They preferred to be able to hear the baby's heart beat rather than rely on the movement counts as reassurance or they felt that there were symptoms that they were experiencing that may require hands on nursing assessment, either because of the nature of the symptoms or the difficulty they had in describing the symptoms over the phone to create an adequate picture for the nurse. For others, the telephone call was not a time to ask long involved questions but more for relaying information needs so that the nurse could bring any written material or audiovisual aids to the next home visit. Shorter explanations were acceptable at the time of the telephone call.

Knowing the Nurse

Many women said that knowing the nurse who was calling was important. They felt that they could talk to the nurse about anything because they had usually met face-to-face previously.

Appropriate Service Utilization

Appropriate service utilization was an area where both benefit and challenges were identified. The women said they felt that the nurses calls and visits helped them remain at home reducing urgent care visits to the obstetrical triage and lengthy hospitalization. Fewer visits to the clinic and increased visits by the nurses were felt to be more beneficial as they perceived that the nurses completed a similar physical assessment to that done in the physician's office but spent longer with them than the physician did. For some, the trip to the doctor's office also involved more activity than they were normally allowed. Fear that the extra activity would cause increased symptoms and the fatigue experienced following clinic appointments were other factors in wanting to decrease the frequency of physician appointments. For others the outing provided by going to the doctor weekly was welcomed and the extra surveillance provided by the doctor and ultrasounds were reassuring and eagerly anticipated.

Availability

Lack of AHCP availability between 20 and 24 weeks meant that some of these women were hospitalized and unable to return home until home care support was available at 24 weeks gestation. For others who were at home without the support of home care, this period was stressful and the women said that they used urgent care services instead when they had concerns or questions.

One participant would have liked to have telephone visits to enable her to return home as she lived outside the region. In order to receive home care services she had to stay in the outpatient unit at the hospital. Once her condition was more stable she would have appreciated telephone visits at home instead of having to remain in the self care unit, separated from friends and family.

Others indicated that they would appreciate the ability to page the nurses until later in the evening (the pager hours are currently 8 am to 4 pm). At times, even though the women knew the nurses were not on call, they tried to page prior to going to triage. Several times the page was answered and the women really appreciated this.

Table 18 ***Perceived Health System Resource Use***

ID #	***Home Versus Telephone Visits***
5	*"Initially it really helped having, having the person, the nurse here physically. That was more reassuring definitely as far as the anxiety about, the worry about what was going to happen next. ... There was a difference definitely at the beginning but for me not like just lately as big."*
8	*"They [nurses] set our minds at ease especially the first week ... my husband was home with us...They took the time to talk to him too and so he didn't feel like he was left out of anything. So no, I would rate their service as excellent."*
9	*"When they come here and do their thing you know you get to hear the baby's heart beat again and that always puts a smile on your face"*
2	*At the beginning definitely I preferred the home visit because I felt more reassured....But near the end when there wasn't any changes that wasn't as important for me. It was easier for me just to have a phone conversation."*
8	*"I wouldn't ask as much information like about home care or stuff like that because I wouldn't want to keep them on the phone too long, not because of the way they make me feel but just because... I wouldn't go into detailed conversation over the phone."*
6	*"But as for the phone care I think its fine. It's just my personal way; for me, I'd rather somebody be here."*
	Knowing the Nurse
2	*"I think if I hadn't have met the nurses first that it would've been harder to talk to them over the phone. But because I'd met them all first with face to face visits then it was - I didn't have any problem talking to them on the phone or here."*
	Appropriate Service Utilization
11	*"The other thing about this home care program is they only start seeing you once you're 24 weeks... maybe they should start seeing you once you're 20 weeks or something... after 20 weeks I just ended up being in triage."*
6	*"...to me it's a wasted visit* [physician visit] *'cause I'm in my obstetrician's office 5 minutes literally and she's great but it's just, they've (nurses) already done everything, they already checked. ... I'd rather cut down on my doctor visits and ultrasounds and just have the home care nurse come in and see me 3 days a week and make me feel a heck of a lot better."*
1	*"We could've been at the hospital ten times you know in those couple weeks but they kept us from doing that which I think probably saved the hospital a lot of money..."*

Table 18 ***Perceived Health System Resource Use***	
1	*"Just to have that support and have that network there, available. 'Cause you know that's the thing is in a lot of situations you don't know who to call like at 25 weeks you know do I call triage, do I call my doctor? Well this gives you the opportunity that you can call the nurse any time during the day and they'll know whether it ....if it warrants a trip to the hospital or not."*
7	*"I think it does significantly reduce your stress to be at home and I think that probably has a lot to do with how long I managed to keep the baby in before I went into labour, just because I was able to be at home and able to do this* [receive AHCP care]. *It was a blessing having that option available."*
	Availability
3	*"I felt well maybe that the nurses should be able to be paged a little longer than four o'clock as opposed to if I have any worries or concerns and not have to bug triage all the time unless it's a real emergency."*
11	*"That day when I had a big problem I called around 7:00, 7:15 [pm] I think. The nurse did respond and she did tell me to go to triage and she did inform the triage people also that I was coming ...so it helps."*
7	*"I thought it was fantastic. All four nurses were great and even down to like their specific hours when the pager is active but ... I called at you know six-thirty or seven in the morning and someone did call me back immediately even though it wasn't technically when they were you know within the hours."*
4	*"I just felt there was a period of time up until the time I was actually put into the program that I just felt - there was probably three weeks where I just felt like I was alone...I just felt really alone during that period."*
12	*"...the phone visits actually the way that it would work for the outlying areas ... at home talk to them on the phone and then make the trip into Ottawa twice a week for the monitoring instead...I found the phone visits were just as effective as in person other than not having the monitoring."*

Discussion and Conclusions

The women described feelings of stress, uncertainty, and anxiety related to their pregnancy. The anxiety they expressed was also reflected in the high anxiety scores on the PPRQ and is discussed in the literature on antenatal home care (5, 6, 10, 13, 15). The women perceived that the telephone visits reduced their stress and anxiety. They attributed the decrease in anxiety to the accessibility, surveillance, teaching, support, and caring of the nurses. The women greatly appreciated the timely access to the nurse whenever they had a question or concern. They felt that the reduced stress allowed them to carry the pregnancy longer and that they also sought urgent care services less often.

Other perceived benefits included continuity of information, consistent nurses, daily contact, the provision of health information and reassurance. These are also in

keeping with the CNO guidelines which state that the goals of telephone nursing care are to "enhance access to health care; provide clients with information about their health care needs; support the client's decision-making about the most efficient and cost-effective health care resource to meet their health needs; and, support clients coping at home with acute or chronic illness to facilitate client choice and convenience regarding health care needs." (p. 4)

Although the clients did not recognize the calls as complex, they were able to describe in detail the services provided. The telephone nursing care they described in fact included the elements of the nursing process; assessment, planning, intervention, and evaluation of the intervention. In addition, the participants indicated that they appreciated the holistic care they received which included attention to all aspects of the pregnancy, family needs and adjustment in addition to maternal and fetal surveillance, collaboration with her physician and referral to other services when appropriate. The complex care the women described parallels the recommendations for telephone nursing care published by Canadian nursing regulatory bodies and professional organizations (45-48). The College of Nurses of Ontario (CNO) guidelines indicate that telephone nursing care should "encompass client assessment, planning and provision of information as well as support, evaluation and documentation." (46, p. 3) The CNO guidelines further state that the therapeutic relationship "is based on trust, respect and intimacy with the client." (p. 4). These elements have all been described in detail by the women in this study. They also indicated that the caring relationship with the AHCP nurses enhanced satisfaction with the program and indeed was a key element in the perceived success of the program.

The women emphasized the importance of combining home visits with the telephone visits. Meeting them face-to-face helped build the trusting relationships which facilitated sharing of the women's concerns and questions. Additionally, home visits allowed clients to listen to the baby's heart beat. The ability to hear the baby was extremely important to these women and gave them reassurance that the baby was alive and well. Even though they could feel the baby moving and were counting the fetal movements as part of their self-monitoring these assessments were not perceived to be as reassuring as actually hearing the heart beat. The women also indicated that home visits were important when they noticed new or unusual symptoms or when they perceived they were not effectively describing the symptoms they were experiencing.

The ratio of home visits to telephone visits was perceived to be acceptable to some while others would have appreciated more home visits. Reduced comfort with telephone visits appeared to be related to three possible factors: the woman's ability and lack of comfort with monitoring her symptoms and the baby's movements, perception that the telephone contact was more impersonal, or they perceived they had difficulty describing the symptoms over the telephone. When they were more anxious or were experiencing new symptoms, all the women expressed a desire for more frequent home visits or an unscheduled visit. Maintaining flexible ratios of home and telephone visits appears to warranted and should take into account the woman's anxiety levels as well as the symptoms she is experiencing.

Strategies to ensure methodological rigour included: transcription of the interview audiotapes and verification of the transcripts by comparing them to the original audiotaped interviews. In order to minimize threats to interpretation, two people (DK,

NL) coded 25% of the transcripts independently. When there was a difference in coding, discussion took place until a consensus was reached. A code book was created and constant comparison with previous interviews was done to ensure that no coding was missed. Debriefings were also held with the other investigators who were from different disciplines and had different perspectives to further ensure rigour.

The study sample was homogeneous. The women were mostly Caucasian, educated, English speaking and in stable relationships. The perceptions of these women may differ from those of women in other ethnic groups or social circumstances.

While the sample population appeared similar to the rest of the AHCP population there could be unintentional bias created by the recruitment process. Those women less satisfied with telephone visits may have chosen not to participate in the study.

The sample appeared more stable than the total eligible population in this study. This may be due to the small sample size or the fact that the women who are enrolled in the program for less than 1 week would not have received the required number of telephone visits for this study. The apparently increased stability may also be partly due to the length of time required to contact clients and arrange interviews following participant consent. A survey or questionnaire may be a better method for capturing the women who only remain with the AHCP for short periods of time. A validated tool could be developed using the data from this study to inform development of such a questionnaire.

When planning the objectives for program enhancements, the service gaps identified by the women should be taken into consideration. Written information for the women on what to do when they miss the nurses' telephone call would be a welcome

addition to the AHCP. Additionally, increasing the time the AHCP nurse is available by pager into the evening and providing AHCP services to women between 20 and 24 weeks gestation may have the potential to decrease the use of OAU services in this population.

Further qualitative research directions have also been identified such as exploring the families' and health care providers' perceptions of telephone nursing care. While this study focused solely on the perceptions of the pregnant women, the researchers recognize that the partners and families are also important. Exploring ways to support the significant others by telephone would be a valuable next step in researching the perceptions of telephone nursing care. Exploring the provider perceptions of telephone nursing care could also provide valuable insight into challenges and benefits that are not visible to the client population.

The benefit of developing a survey tool to identify the needs of this population has also been indicated. Since stress has been implicated as one of the causes of preterm birth (1), reduction of the stress or perceived reduction of the stress may help to prolong the pregnancy. Randomized trials assessing the perceived and actual decrease in stress are warranted. The relationship between reduced stress and variables such as gestation at delivery, birth weight, length of hospital stay and use of urgent care services may become evident when the intervention group is compared to a control group.

The telephone nursing visits within this antenatal home care program provide a valuable service for these women that has enhanced satisfaction with their health care and decreased their perception of stress. Casting light on the complexity of the telephone interactions highlights the benefits of telephone nursing care as it was provided in this study. The findings of the study will help to guide program development so that the

women's needs continue to be met. Identifying what gaps the women perceive, as well as the strengths, of the program will provide beneficial information to this program and other antenatal programs who wish to enhance their services. In addition, this study suggests that similar telephone nursing care may be a valuable enhancement in other settings providing care to women and families experiencing high risk pregnancy.

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Chapter 5

Executive Summary

Key Messages Gleaned from the Women's Perspectives of Telephone Nursing Care in the Antenatal Home Care Program

Telephone nursing care

The literature on telephone care in high risk pregnancy did not clearly identify a reduction in preterm birth or low birthweight infants that was attributable to telephone care.

Five studies indicated that telephone nursing care could save health care dollars and was acceptable to the women in the studies.

Women in the Antenatal Home Care Program are very positive about the use of telephone visits.

The women stated that they would like home visits combined with telephone visits and they would like the ratio of home to telephone visits to be determined based on their preferences as well as their health surveillance needs.

The women indicated that satisfaction was enhanced by the continuity of the nurses providing their care, the accessibility of the nurses, and the holistic nursing care.

Program planning

Women provided valuable perspectives on health care programs. These perspectives have implications for improved care delivery and increased client satisfaction.

Client/patient representatives should be included in all program planning to ensure that their unique perspectives are brought to the table for consideration.

Program evaluation

Statistics are not readily available to compare outcomes among the outpatient high risk antenatal population, inpatient antenatal population and the Antenatal Home Care Program population (AHCP).

A database for maintaining readily accessible information about antenatal high risk pregnancies would be valuable when evaluating care and maternal and neonatal outcomes. Planning program development and improvement would benefit from the information collected in such a database. The data should include the woman's diagnosis; gestational age at diagnosis, intervention commencement and delivery; the interventions used including hospital or AHCP length of stay; pregnancy outcomes such as maternal and infant morbidity or mortality; maternal hospitalizations antenatally, intrapartum and postpartum as well as the neonate's length of hospitalization.

The tools used in this study could be used routinely to screen the high risk pregnant women for their unmet needs and their pregnancy related anxiety levels. These data would be used to develop individualized care plans. Additionally, the routine collection of these data could provide valuable information for program planning and development

An Advanced Practice Nurse would be able to assist in the development of the information database, educate the health professionals about the benefits of using assessment tools to plan individualized care and evaluate care, develop educational materials for the patient population and help lead research into telephone nursing care

Chapter 5 Women's Perspectives of Telephone Nursing Care in the Antenatal Home Care Program Summary and Conclusions

This concluding chapter, written as a report to the organization, summarizes the research findings from a utilization-focused evaluation of telephone nursing care in the Antenatal Home Care Program (AHCP). The findings relate to clinical nursing practice, program improvement and development and the evaluation process. In addition, the potential role of an advanced practice nurse (APN) related to education, clinical practice and research in this setting is proposed.

The focus for the research was defined, in consultation with the AHCP professional stakeholders (medical director, clinical director, clinical manager, educator, staff nurses). The project was divided into three phases and objectives were developed for each phase.

Objectives

Phase 1

1. Perform a systematic review of the literature related to ongoing telephone nursing care in the high risk antenatal population to explore what the literature says about telephone nursing care.

Phase 2

2. Create a profile of the high risk pregnant study participants. (Phase 2a)
3. Describe the participants' experiences of telephone nursing care within the AHCP. (Phase 2b)

Phase 3

4. Create a report of the research findings including an evaluation of the strengths and limitations of a utilization-focused approach to evaluating the AHCP provision of telephone nursing care (this report).
5. Make recommendations for program changes and enhancements, based on the research findings and address such areas as nursing practice, education and future research.

Phase 1: The systematic review

The objectives of the systematic review were 1) to describe the benefits of providing telephone nursing care in high risk pregnancy for the mother, infant or system e.g. reduced length of hospital stay, later gestational age at delivery or cost savings; 2) to identify any differences between face-to-face and telephone visits when nurses provide continuous care to high risk pregnant women in the antenatal period; and, 3) to describe the women's perceptions, experiences or satisfaction with telephone nursing care.

Thirteen papers (11 studies) on telephone nursing care met the inclusion criteria for the systematic review. These studies explored varied aspects of telephone nursing care including organizational outcomes (e.g. length of stay in hospital, frequency of contact, length of the telephone calls, cost of telephone nursing care or transitional care compared to the cost for hospitalization costs), health outcomes (e.g. effect on preterm birth and maternal and neonatal morbidity/mortality), interaction outcomes (e.g. social support), and client satisfaction with telephone nursing care (survey). All 13 studies addressed the benefits of telephone nursing care to different degrees.

Maternal, neonatal or system benefits (Objective 1)

Five studies showed that telephone nursing care had a positive effect in the intervention group, reducing the preterm birth rate or increasing gestational age and birth weight at delivery. However, four studies found no difference in preterm birth rate or low birth weight between the control and intervention groups. The studies that combined telephone and home visits (5) did not describe the separate contributions of telephone and home visits to the study findings.

Social support provided by telephone was found to be effective in reducing preterm birth in one study and had no effect on preterm birth in another. Two qualitative studies described the telephone social support provided to high risk pregnant women.

Five studies included cost analyses. While the maternal, infant, and system benefits varied with relation to the pregnancy outcome, significant cost benefits were attributed to the provision of telephone nursing care. Shorter maternal hospital stays antenatally and intrapartum, shorter hospitalization of the neonate, reduced intensity of neonatal care required and lower costs associated with providing telephone nursing care contributed to the cost savings

The review identified that the studies did not use the same criteria to define women at increased risk of preterm birth. Some studies defined risk by symptoms in the current pregnancy that predisposed to preterm birth, others defined risk according to preexisting indicators of risk such as African American race, social factors (e.g. low SES, smoking, stress), medical history (e.g. diabetes, hypertension), or previous obstetrical history (e.g. preterm birth, low birth weight infant). Some studies combined two or more factors to define risk. Only two studies investigated the provision of telephone care for

women whose increased risk for preterm birth were attributed to symptoms in the current pregnancy alone and only one research study compared women who remained in hospital to women receiving home nursing care (telephone and home visits) following early hospital discharge.

Other issues identified by the systematic review were the differences in telephone contact length and frequency and differences in the nursing care provided (nursing intervention). The frequency of the telephone contact ranged from daily to once every two weeks. Only two studies commented on the call length which averaged 3.6 minutes in the one study and 20 minutes in the other. One study also noted that the nurse made three telephone calls for every call she completed. Two studies analyzed the content of the nurses' telephone call logs but none of the studies examined tapes or transcripts of the telephone calls between the clients and the nurses. Also, no study compared groups receiving different frequencies of telephone nursing care.

The interventions studied included provision of nursing care at home to reduce the length of hospitalization, provision of social support, or nurse case management to women attending prenatal clinics and physicians' offices (described differently in each study). The protocol for telephone nursing care was stated in all the studies, with varying degrees of completeness, and included some or all of the following: assessment, education, intervention and support. The two qualitative studies (Bullock et al., 2002; Finfgeld-Connett, 2005) described social support which is only one element of telephone nursing care. In addition, five of the 11 studies combined face-to-face care and telephone care but did not describe the separate contributions of telephone visits and home visits to the findings.

These studies did not provide evidence of a clear benefit to the pregnancy outcomes that was attributable to telephone nursing care. This may be due to a few different factors. Methodological issues related to a lack of clear differentiation between the contributions to the findings of telephone and home visits when both home and telephone visits were provided. There was a lack of information about the length of the telephone contacts and lack of investigation into any potential interaction between the frequency of the telephone contacts and the definition of risk or the findings. In addition, the researchers in most of these studies did not indicate whether the protocols for the provision of the telephone care were followed by the providers. Sampling inadequacies related to the lack of a standardized definition for women at risk of preterm labour, concentration on the impact of low socioeconomic status on the findings or outcomes, and inadequate sample sizes to be able to determine the effect of telephone care with a reasonable degree of certainty.

These limitations mean that there is insufficient evidence to determine if telephone nursing care reduced the preterm birth rate or decreased the incidence of low birthweight infants. However, the findings do not indicate that there telephone nursing care had a negative effect. Therefore telephone nursing care may be as safe as keeping women in hospital. In light of the cost savings to the health care system found in five studies, telephone nursing care may be a more cost effective alternative.

Comparison of telephone and face-to-face nursing visits (Objective 2)

There were no studies that examined the differences between face-to-face care and telephone nursing care.

Satisfaction with telephone nursing care (Objective 3)

Exploration of the women's experiences and perspectives were limited to satisfaction surveys developed by health care providers or analyses of nursing logs of telephone nursing care to elucidate the women's support needs and describe supportive nursing activities. The findings indicated that women do appreciate the telephone calls even though there were no differences in the maternal and neonatal outcomes important to the researchers. Perhaps, telephone nursing care provides benefits to the participants that are not elicited by structured surveys. A clear understanding of why the women appreciate the contact at home is lacking.

The lack of standardized interventions and contact frequency among the studies, the variation in the outcomes examined and the population differences did not allow the clear identification of outcomes that can be attributed to telephone nursing care within the high risk antenatal population.

There is a lack of published literature that clearly identifies the women's perceptions of telephone nursing care in the high risk antenatal population. This finding led to the development of the research question and methodology for the evaluative research study.

Phase 2a: Quantitative findings

In this phase, the researchers aimed to profile the AHCP population using two questionnaires and a chart review. The survey instruments appeared to have the potential to guide individualized care planning and to inform continuous program improvement. Therefore, a secondary objective was to pilot the utility of the validated survey

instruments as regular AHCP assessment tools to evaluate high risk pregnant women's pregnancy related anxiety and their needs.

The actual study sample was similar in most respects to the potentially eligible population and to the total AHCP population in 2005. The main differences identified were; the sample population was admitted earlier to the AHCP, the length of stay (LOS) for the women with preterm labour was longer, and the LOS was shorter for those with ruptured membranes. However, the small numbers did not allow analysis to determine if this was statistically significant or due to chance.

Other data were only available for the participants. All participants indicated that they preferred to be involved in making decisions for themselves and their infants. They also felt that they were not included as much as they would have liked in making these decisions. This is an interesting finding that may warrant further investigation.

All of the women considered they were somewhat physically active and over 60% exercised regularly at least three times a week prior to being identified as having a high risk pregnancy. This may have implications for perceptions of activity restrictions or may be one of the variables that affect the level of risk in the pregnancy and impact pregnancy outcome. Further research is warranted to explore this finding.

The modified *Supportive Care Needs Survey (SCNS)* (Foot & Sanson-Fisher, 1995) was completed in 20 to 30 minutes by the study participants. No-one complained that it was too long or that it was distressing to complete. The women's responses indicated that their highest needs were related to the antenatal questions added to the survey by the student researcher. Coping with the uncertainty of their pregnancy outcome, managing activity restrictions, coping with anxiety, information needs about this pregnancy and

recognizing what to do when symptoms occurred were the most frequently identified needs.

Development of a validated needs survey that is specific to high risk pregnant women would be beneficial in planning programs and care that are responsive to the needs of this population. The survey could also be used as an assessment tool completed by the women on admission to the AHCP to help guide the development of an individualized plan of care by the nurses. A shorter questionnaire may be more useful as a clinical assessment tool.

The women's scores on the *Pregnancy Perception of Risk Questionnaire (PPRQ)* (Heaman, 2004; Heaman et al., 2004) indicated that they were highly anxious. This anxiety was corroborated by the responses to the modified SCNS. The highest scores on the PPRQ were related to perceived risk for the baby. This questionnaire was completed easily by the women. This tool could be a useful screening tool that can aid the clinical nurses in their assessment of a client's anxiety level. The nurses could then probe for reasons for the woman's anxiety and develop an individualized plan of care to address the woman's anxiety.

Phase 2b: Qualitative Research

The systematic literature review, completed in Phase 1, identified a lack of research exploring high risk pregnant women's perspectives of telephone nursing care. In addition, the AHCP management and staff indicated that they wished to evaluate their telephone nursing visits. In keeping with the recommendations of Currell et al. (2003), a research study was designed that included qualitative methods to provide a forum where women were encouraged to discuss the telephone nursing visits in terms of what they

perceived rather than answering questions that health care providers considered important.

The research question was: How do clients perceive antenatal telephone nursing care in the home?

The same sample of 13 women participated in semi-structured interviews completed by an independent research assistant. The interview transcripts were analyzed for recurring themes.

Four main themes with subcategories were identified: describing the experience of being at home, "just a call", more than just a call and perceived health system resource use.

In describing the experience of being at home, the women said that they were very glad to be at home with their families. While they liked being home, they indicated that they experienced stress, uncertainty, and anxiety.

When initially asked how they would describe the telephone care the women stated it was *"just a call"* to check in for the day. When the research assistant probed for a deeper understanding of the care that they received by telephone, the women gave a detailed description of the nursing services. The descriptions they gave indicated that the calls were more complex than "just a call." The telephone interventions they described included surveillance, planning, teaching, emotional support and social support. They indicated that the ready accessibility of the nurses, the sense of close monitoring by expert and caring nurses, and the link with the health care system decreased their anxiety and stress. Participants also appreciated the holistic care provided by the nurses. They identified that the nurses were experts who were able to answer questions about all

aspects of the pregnancy, as well as family needs and adjustment to their high risk status. They also described nursing case management activities such as advocacy, communication with other appropriate health professionals, and referral to other service providers. Although the clients did not always recognize the complexity of the telephone nursing care they described, it was evident to the researchers that the women were in fact describing the elements of the nursing process; assessment, planning, intervention, and evaluation.

Other perceived benefits to the telephone nursing care were accessibility, continuity of information, consistent and frequent contact and the provision of health information. The participants stated that the nurses answered pages promptly and the women looked forward to the daily telephone call from the nurse. The telephone nursing care they described reflects the College of Nurses of Ontario guidelines which state that the goals of telephone nursing care are to "enhance access to health care; provide clients with information about their health care needs; support the client's decision-making about the most efficient and cost-effective health care resource to meet their health needs; and, support clients coping at home with acute or chronic illness to facilitate client choice and convenience regarding health care needs." (p. 4)

The women also shared their perceptions regarding health system resource use. Their insight could be useful for planning program development and improvement. They emphasized the importance of combining home visits with the telephone visits. Meeting clients face-to-face helped build the trusting relationships which facilitated sharing of the participants concerns and questions. Additionally, home visits allowed the women to hear the baby's heart beat. The ability to hear the baby was extremely important to these

women and provided reassurance. Even though the women felt the baby moving and counted the fetal movements daily as part of their self-monitoring, these were not as reassuring as hearing the heart beat.

The ratio of home visits to telephone visits was acceptable to some while others would have appreciated more home visits. More frequent home visits or unscheduled visits were considered more desirable by all participants when the woman was more anxious, or the woman was not convinced that she could adequately describe her symptoms over the telephone. Flexibility in the ratio of home and telephone visits should be maintained and take into account the women's needs as well as the acuity of their pregnancy condition.

When planning the objectives for program enhancements, the service gaps identified by the participants should be considered. Some of the women indicated that they felt tied to the phone until after the nurse called that day. They would have appreciated some way of ensuring the nurse did not worry when the participant didn't answer the telephone without having to interrupt the nurse by paging her.

The women would have appreciated the ability to page the AHCP nurse in the evening. They felt the increased availability of the AHCP nurses would decrease their use of the triage services.

Women, who were diagnosed with problems prior to 24 weeks gestation, spoke about the stress and anxiety they experienced and how they wished that the AHCP had been available to them earlier. They expressed concern that their high anxiety might cause them to deliver prematurely and they also indicated that they would have used the obstetrical triage services less frequently during this period if the AHCP was an option.

The women felt that the additional AHCP support would reduce the worry and stress they felt as well as decreasing their use of the obstetrical triage.

Phase 3: Evaluation of the process

Strengths and limitations of the evaluation process

Ethical approval was obtained from The Ottawa Hospital and the University of Ottawa before the research was conducted. The evaluation was designed and carried out using rigorous research methodology.

Systematic review

The systematic review was limited to published, English language reports potentially excluding unpublished reports or studies written in other languages. Using only published reports may have introduced publication bias as there is a tendency towards publishing only positive results. Although every attempt was made to identify relevant published articles, there is also a possibility that some articles were missed.

To decrease the potential for biased reporting of the evidence, two independent reviewers selected and graded the quality of the research papers for the systematic literature review. The Critical Appraisal Skills Programme tools (© Milton Keynes Primary Care Trust) were used to standardize the assessment of the literature. These tools were chosen because they included an assessment of the applicability of the publication to the current situation as well as consideration of the quality of the research. To further ensure the literature review was comprehensive and unbiased, the multidisciplinary research committee reviewed the search strategy, the inclusion and exclusion criteria, and the findings. This committee included a sociologist, a perinatal nurse research expert and a physician researcher with expertise in maternal fetal medicine.

Study population

This evaluation study used quantitative and qualitative data to explore the women's perceptions of telephone nursing care as provided currently by the AHCP. Using mixed methods provides a way to compare data gathered in different ways. When the data are consistent regardless of methodology, the veracity of the findings can be more certain.

The quantitative data gathered from the study population were compared to the total eligible population and the AHCP data that was available for 2005. The similarities among the groups indicated that the sample fairly represented the AHCP population. Data gathered to describe the study sample were comprehensive and included demographic data such as age, education level, presence of a partner and other children, current and past obstetrical history related to the current pregnancy, and outcomes of the current pregnancy such as mode of delivery gestational age, birth weight, admission to NICU and postpartum complications.

Limitations to the data relate to the availability and ease of retrieval of the antenatal statistical data for high risk pregnant women. No data were available for women who remained in hospital or who were at home with similar diagnoses without AHCP support. Also, the data collected for the AHCP were hand collected and maintained in several different locations or required chart audit to collect. The cumbersome methods of data management created barriers to easily accessing and generating reports on selected variables, and reporting outcomes for comparison with other high risk patients with similar diagnoses. Further, neonatal data were not easily obtainable apart from the data on the delivery record and this hampered the ability to track neonatal outcomes beyond

delivery such as NICU and hospital lengths of stay, readmission rates or morbidity and mortality after birth.

The study sample was small but adequate to pilot the survey instruments. Recommendations for further testing and uses for the survey instruments can be made based on the pilot experience.

While the sample population appeared similar to the rest of the AHCP population there could be unintentional bias created by the recruitment process. Those clients less satisfied with telephone visits may have chosen not to participate in the study. Unintentional bias may also have been introduced by the recruitment process. The clinical nurses were given information regarding the inclusion and exclusion criteria for the project; however, they may have only approached the women they perceived to be appropriate to the project rather than all the clients meeting the eligibility criteria. Staff also may have missed the opportunity to recruit participants due to increased workload when the program was very busy. However only 8 of the 34 eligible clients did not have the opportunity to participate as they were discharged from the program before they were approached or before consent was obtained; 9 refused to participate; and, four more clients delivered prior to being contacted by the RA.

Although the quantitative data collected suggested that the sample may be more stable than the total eligible population, this may be due to the length of time required to contact consenting clients and arrange interviews. Clients with more acute conditions and shorter LOS with AHCP were not available when the RA tried to contact them. Therefore the data may lack the perspectives of those women with more acute conditions in a high risk pregnancy and those who stay less than two weeks in antenatal home care.

The clients recruited were well educated and all but one were in stable relationships. Because demographic data on other high risk pregnant women were unavailable, it was not possible to determine if the sample was representative of the general AHCP population. Therefore the findings from this study may not be generalizable to a program population or other programs.

Quantitative study

A validated perceived needs survey was used to explore the types and level of need these women perceived. Alterations were made to the survey to reflect the needs of the high risk antenatal population. These alterations were made using information from the literature on stresses in high risk pregnancy, and the expert opinions of the committee and other experienced perinatal nurses. The survey was then pilot tested with three high risk pregnant women. They felt that the questions fairly represented their needs. Although the survey was long the women answered the questions in 20 to 30 minutes and stated that completing the survey was not a burden. Since the SCNS questions specific to the antenatal population were added for this project, reliability and validity of these questions have not been tested.

A validated, pregnancy specific, anxiety scale was used to measure the participants' anxiety level. The *Pregnancy Perception of Risk Questionnaire* (PPRQ) is a new tool that has recently been tested for reliability and validity. This questionnaire is only 9 questions and takes less than 10 minutes to complete. Although a specific dividing point between low and high anxiety has not yet been determined, the tool is sensitive to pregnancy related anxiety and has been shown by Heaman and Gupton (2004) to correlate well with the State Trait Anxiety Index. The PPRQ was also reported to have

test-retest reliability over one week. However, it is unknown if the questionnaire is sensitive to change over time or to change as a result of interventions to relieve anxiety.

One should note however, that some of the women were conflicted about where they would rate their level of risk. They indicated that they would rate their risk differently when they were having symptoms than when they were not experiencing symptoms. Some women even made two marks on the line and labeled these marks to explain the differences in risk perception. For the purposes of this study, when this occurred the two scores were summed and averaged to provide the final score for that item. This does indicate the need for a tool that is sensitive to the perceived differences in risk when symptoms or circumstances change. Also, the questionnaire was only administered once so it was not possible to observe if the tool was sensitive to a change in anxiety level over time or due to nursing interventions.

Qualitative study

The rigor of the qualitative methods was ensured in several ways. The interview guide was developed with the assistance of the committee and information gathered from the literature on stressors in high risk pregnancy. The interview guide was then piloted to ensure that the interview flowed smoothly, the questions elicited the information as planned and the questions did not distress the women. A research assistant was trained to complete the interviews to prevent the perception of coercion by the participants and to prevent researcher bias. As the interviews were completed, the tapes were reviewed by the student researcher and she addressed any problems with the RA's interview technique or interview probes before the next interview. The research assistant quickly became comfortable with the guide and was experienced in conducting semi-structured

interviews. Therefore the data gathered were considered to be of good quality. The interviews were transcribed, removing all identifying information, and the transcripts were checked against the original tapes to ensure that the transcriptions were correct.

The transcripts were analyzed using constant comparative analysis to identify emerging codes and themes. To ensure that the interview coding was consistent, each time a new code was identified all the interviews that had been previously coded were reassessed for the presence of the new code. To limit the chance of researcher bias, four of the interviews were coded independently by another perinatal nurse researcher. All of the codes and themes were then reviewed by the multidisciplinary research committee. Differences of opinion at any step were resolved by discussion and a consensus was reached before continuing to the next step. Validation of the findings was also sought in presentations to several diverse groups including other student researchers, an international qualitative research conference (Kaye, Graham, Davies, & Fung Kee Fung, 2006a), a national multidisciplinary perinatal conference (Kaye, Graham, Davies, & Fung Kee Fung, 2006b) and a clinical nursing research conference (Kaye, Graham, Davies, & Fung Kee Fung, 2006c). Some attendees at these presentations indicated that they saw similarities between the findings and their own experiences both personally and in their practice. These unsolicited comments further validated the findings.

While this study was only designed as a pilot to explore the women's perspectives, the partner, family and the health care provider should not be forgotten. The researchers acknowledge that the women's partners, families and health care providers may have much to contribute.

Evaluation process

The evaluation process was a valuable and feasible method for planning and conducting a clinically relevant research study. The meetings with the multidisciplinary stakeholders helped to identify and clarify an appropriate focus for the research. In addition, multidisciplinary representation at the planning meeting helped to ensure that the topic had breadth and depth. The inclusion of the professional stakeholders helped to ensure that the question was relevant to the clinicians and the answers were of interest to management. A focus that is clinically relevant and has the interest of management may increase the likelihood that the recommendations from the research findings will be reviewed and instituted according to the institutional priorities. The planning meeting helped to form a link between the researchers and the clinical setting and heightened the awareness of the research project.

This project required a limited amount of time away from clinical duties. The committee met twice during normal team meetings and took a total of two hours to focus the question and obtain a multidisciplinary perspective. The meetings, in addition, to increasing awareness of clinically relevant research encouraged an environment of expectation that the findings would be clinically relevant and a forum for presentation of the research results and recommendations.

The planning meeting did not include client representation and in hind sight, client representation would have provided another valuable perspective. The research findings also indicate that the client perspective is rich and valuable, emphasizing the need for client representation on program planning committees. Therefore I would

recommend that a forum be developed that encourages and welcomes regular client input into program evaluation and continuous quality improvement in this clinical setting.

The multi methods research design helped to triangulate the data and strengthen the findings. The systematic review sought the information already known from the literature. This ensured that the research question would provide a unique perspective that may be of interest to other programs.

The quantitative portion of the study pilot tested the utility of collecting client demographic data and the program statistics in this population. The pilot identified that the data were not easily accessible. It also identified that important statistics on other similar patient populations were not available and therefore comparisons between groups was not possible. As indicated above, these data would be useful for evaluating the effectiveness and efficiency of the AHCP. Useful survey tools were also identified that can be used both for creating individualized client care plans and for informing continuous quality improvement. Dual utility of these instruments decreases the labour required for gathering and analyzing evaluative data. Therefore the tools used for evaluation of the program and are embedded into every day clinical practice and continuous evaluation may be facilitated and less resource intensive.

Conducting, transcribing and analyzing the qualitative interviews was labour intensive but very valuable. This would not be a strategy to undertake continually but did provide valuable information that would be useful to collect periodically for more formal program evaluation. A few patients every year could be asked a shorter version of the open ended questions to include client input into continuous quality improvement. The interview responses also provided valuable information that can be combined with the

information learned from the SCNS to develop a questionnaire to assess the needs of the high risk pregnant woman. This questionnaire would be faster and easier for clients to complete and easier for the program to interpret. The questionnaire could therefore be included in the program's daily operations to inform both individualized care and ongoing evaluation.

The utilization-focused evaluation process provided a clinically relevant, multidisciplinary perspective that may have been lacking if the research had been conducted in isolation from the clinical and management team.

Implications

Implications for Research

The published research on the effectiveness of telephone nursing care in the high risk antenatal population contained 11 randomized controlled trials (RCT). The RCTs, did not have sufficient power to determine the effect of telephone nursing care on maternal and fetal outcomes. A meta analysis of the RCT findings was not feasible as the studies differed in their definitions of increased risk of preterm birth, the nursing interventions studied, and the frequency of telephone contact with the patients. Therefore, further RCTs are required to assess the optimum frequency of telephone nursing visits, and to compare the required frequency of contact by telephone between high risk antenatal groups where pregnancy risk is defined by 1) social factors, 2) medical history, 3) obstetrical history, or 4) current pregnancy concerns. New RCTs should be designed with more tightly controlled variables and plan sample sizes with sufficient power to explore the effects of telephone nursing care with or without home visits on maternal and fetal outcomes and telephone nursing care's role in reducing antenatal hospital length of

stay. Multi-centered trials may be needed to obtain samples of sufficient size in this specialized population.

All the Canadian antenatal home care programs collect their own statistics but there are no provincial or national databases that capture these data. Since the antenatal home care population at each center in 2004 only ranged from 80 clients to 560 clients (SOGC meeting, Edmonton 2004) the ability to combine or compare data from these centers would add to the knowledge base for this select and vulnerable population. Pooling these data may assist health care professionals to gain a clearer understanding of the factors involved in preterm birth.

A statistical database would be useful for evaluation research. The ability to compare outcomes between inpatient and outpatient services (AHCP and possibly physician's offices) may also assist with quality improvement initiatives, for instance the ability to generate reports comparing outcomes between groups.

The modified SCNS has not been validated with the new high risk pregnancy questions added. The information from the qualitative interviews related to the needs in this setting should be added to the questionnaire as new questions. Testing the modified and revised SCNS for validity and reliability would be the next step in the process. Creating a short form of the questionnaire may also be useful. The shorter questionnaire could be used in clinical practice; especially in instances when the long form would be too time consuming or tax the client overly.

The PPRQ requires further testing to determine division points between low, moderate and high anxiety levels. For the AHCP population measuring anxiety or stress levels at serial time points might be useful including not only perceived stress levels but

physiologic markers such as salivary cortisol levels. This may help to identify a correlation between stress levels and health system resource use as well as between stress levels and maternal and neonatal outcomes. The optimum frequency for screening women for anxiety, using the PPRQ should also be determined.

Another study could be to rule out natural decrease in the stress levels as the pregnancy continues, a trial examining the stress in high risk pregnant women should be randomized and two fold; 1) comparing the stress levels of women cared for at home by antenatal home care nurses with those cared for in hospital and 2) performing serial measurements of stress levels in both groups. The stress levels could be assessed by both physiologic markers and a pregnancy-specific stress scale.

While this study focused solely on the perceptions of the pregnant women, the researchers recognize that the partners and families are also important. Exploring ways to support the significant others by telephone would be a valuable next step in researching the perceptions of telephone nursing care. Exploring the provider perceptions of telephone nursing care could also provide valuable insight into challenges and benefits that are not visible to the client population.

Further understanding of the differences in perception of risk between the client and practitioner may also be beneficial. A study exploring the perception of risk of the health care team members such as nurses and physicians and the client may be useful in exploring the teaching given by the professionals and the perception of the client's compliance. Questions such as: "Is there concordance between the practitioner and the client's perception of pregnancy risk?" and "Do nurses, physicians and clients have

similar perceptions of the pregnancy risk?" could provide valuable information that may impact client care and satisfaction.

Implications for Practice

The data about high risk antenatal clients, both inpatients and outpatients, from physicians' offices and hospitals need to be linked. Building a data base of maternal and neonatal information, including all antenatal and postpartum information related to their diagnosis and hospitalizations, clinic visits, unscheduled urgent care visits and antenatal home care program information, would be of great benefit for evaluating obstetrical care in this high risk population.

Provision of information related to coping with high risk pregnancy, activity restrictions and self monitoring were very important to this population. With this knowledge, women may be empowered to participate more actively in decision making for themselves and their babies. Women and their families should be invited to participate in making decisions regarding their health care. Information and support should be provided assisting them to make the most informed choice while considering their own unique circumstances, perspectives and abilities to actively participate. Development of decision aids that include printed information may be helpful for this purpose.

A shorter validated SCNS questionnaire specific to high risk pregnancy could be administered on admission to the program to guide individualized care planning. The same survey could be administered on discharge from the AHCP to evaluate the effectiveness of the program in meeting the clients' needs and identify new needs that may be addressed by inpatient and outpatient services, physicians, or public health. Identifying the perceived needs for this population could help guide program

improvement and development in a manner that is consistent with continuous quality improvement and addresses arrears the clients indicate are important as well as those areas health care practitioners feel are important.

The PPRQ should be piloted as a screening tool to assess each client's anxiety level. The introduction of telephone visits or the balance of telephone to home visits may be tailored to the individual client based in part on the results of the PPRQ anxiety rating. Interventions to decrease anxiety level may also be introduced and tailored to the individual based on the woman's responses on the PPRQ.

Implications for Education

Education for the management team should focus on the need for a user friendly database to collect and retrieve data on high risk pregnant women Program quality improvement initiatives would be greatly enhanced by the ability to easily generate reports on the program and maternal and fetal outcomes. Educating management about the benefits for the program, the hospital and potentially research has the potential to win their support for creating this database.

Information about the importance of collecting and maintaining these data should also be communicated to the physicians, nurses and other health care professionals since they may be instrumental in obtaining the detailed data for the database.

The nurses and other health care professionals should also be informed of the importance of having clients complete the PPRQ and the SCNS. Demonstrating the importance of soliciting the clients' unique perspectives when planning individualized care may raise health care professionals' awareness of the needs of the high risk antenatal client and the importance of providing supportive and individualized health care.

Soliciting their support to use these tools is an important step in integrating the tools into the daily routine of the program.

Since the SCNS and the PPRQ findings indicate that women experiencing high risk pregnancies are very anxious and stress has been implicated as a variable in preterm labour, the importance of assessing and reducing the client's stress and anxiety should be reinforced with obstetrical health care professionals. Educating the nurses and other health care practitioners about the PPRQ and the modified SCNS and their uses may increase the number of women the practitioners assess for anxiety. Making these tools readily available or part of their routine assessment of high risk antenatal women may also help to individualize care related to anxiety and women's needs. Strategies to reduce stress could be provided in written form for the clients and their families as well the practitioners. The PPRQ and the modified SCNS may also identify general topics that many clients are interested in or have to cope with. Written patient education materials may be developed based on these findings.

Implications for an Advanced Practice Nurse Role

An advanced practice nurse (APN) would be a valuable asset in the high risk antenatal setting. Since there is a paucity of research on the impact of telephone nursing care on maternal and fetal outcomes and little is known about the optimum frequency of telephone contact for this population the APN would lead the prioritization and development of research initiatives in these areas. She would also oversee the development of a database to collect the relevant statistical information required to inform program evaluation and continuous quality improvement. Another part of her role

would be to continue the utilization-focused evaluation initiatives identified in this study such as use of the PPRQ and refinement and validation of the antenatal SCNS.

As a clinical expert she would develop training programs for the nurses providing telephone nursing care, including manuals that reflect the evidence gained from this study as well as new research and the guidelines of the relevant professional organizations. The APN could also provide telephone nursing care to complex client's who would benefit from her expertise.

The APN would be available to the clinical nurses providing antenatal telephone care as a consultant. The clinical staff would use her as a resource for information regarding clinical questions and for guidance with more complex clients or clinical situations. The APN could also act as consultant to practitioners in other settings for the high risk antenatal population; sharing her expertise on the provision of telephone. Research on telephone nursing care in other settings may be a useful research project that could be led by the APN.

An APN would also be able to guide the development of statistical database for high risk pregnant women. This database could be used to compare the maternal and neonatal outcomes by setting to identify areas for program change. Comparison of the maternal, neonatal and system outcomes for hospitalized women and those women cared for at home by the AHCP nurses may also be useful for evaluating the effectiveness and efficiency of the AHCP.

Conclusion

Telephone nursing visits within this antenatal home care program provide a valuable service for clients that has enhanced satisfaction with their health care. The

women's descriptions of the telephone nursing care they received is similar to the care guidelines recommended by the College of Nurses of Ontario (CNO) (2003) and the provincial professional nursing organizations (College of Registered Nurses of Manitoba, 2002; Registered Nurses' Association of Nova Scotia, 2000). Casting light on the complexity of the telephone interactions demonstrates that the nursing process of assessment, planning, intervention and evaluation is indeed carried out by telephone in this setting. The women's responses will also help to guide program development that continues to meet their needs. Identifying the perceived gaps as well as the strengths of the program provides beneficial information to this program and other antenatal programs who wish to enhance their services. Similar telephone nursing care may be a valuable enhancement in other settings providing care to women and families experiencing high risk pregnancy.

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Appendices

Appendix A

AHCP Admission Criteria

General Admission Criteria	Gestational Hypertension	Chronic Hypertension	Preterm Labour /Silent Cervical Changes	Preterm Rupture of Membranes	Antepartum Hemorrhage including Placenta Previa	Multiple Gestation With Co-morbidity
Lives within 30 minutes drive of the Ottawa hospital (Permanent or temporary) Ability to read and understand English or French Access to home supports Access to an operational telephone Client willing to comply with program requirements No acute clinical concerns for fetal wellbeing No active P.V. bleeding Fetal movement counts ≥ 10 in 12 hours Normal fetal assessment	24-40 weeks gestation B.P. ≤ 150/100mm/Hg while sitting Proteinuria ≤2+ on dipstick Absence of headache associated with visual disturbances and/or epigastric pain Ability to use electronic blood pressure cuff while on program	Documented history of elevated B.P. prior to 20 weeks gestation Diastolic B.P. ≥90≤105 and systolic ≤160 Absence of active progressive deterioration in kidney status	24-34 weeks gestation Cervical length ≤20 mm confirmed by transvaginal U/S Cervical dilatation ≤2 cms ≤6 contractions/hour Intact membranes Cephalic presentation (Frank or complete breech at discretion of the attending Physician) Positive fetal fibronectin swab stable in hospital for 24 to 48 hours	24-37 weeks gestation Confirmed rupture of membranes Observed in hospital for 48 hours No evidence of active labour No evidence of infection Cephalic presentation (Frank or complete breech at the discretion of attending Physician)	24-40 weeks gestation No evidence of active P.V. bleeding Confirmation of complete or marginal placenta previa by ultrasound Observed in hospital for 48 hours and remains stable	24-36 weeks gestation Multiple gestation with co-morbidity as per admission criteria: PTL, PIH, PPROM, APH Other conditions may be considered on individual basis

Appendix B

AHCP Home and Telephone Visit Protocols

THREATENED PRETERM LABOUR / SILENT CERVICAL DILATATION

Resources & Teaching	Home & Telephone Nursing Assessment: Maternal	Home Nursing Assessment: Fetal	Client Self-Monitoring Program	Nursing Resources & Teaching
Prior to admission to APHC • Complete assessment and risk factors identified • Teaching re: AHCP completed Daily for first 3 days, then 2-3 days/week based on nursing assessment and physicians order Telephone contact by nurse occurs on all non-visit days.	Physical: 1. S/S PTL : • contractions • pv flow/leaking • pelvic pressure/low back pain 2. Medication review – effectiveness, side effects Vaginal exam if client exhibiting signs of PTL and/or may require discharge from program to hospital Psychosocial: 1. Identification of stressors and actions to reduce stressors 2. Compliance with program requirements	1. Leopold's manoeuvre 2. FHR assessment: 24 – 34 weeks: auscultation q visit 3. Fetal movement counts	Review of clients self-monitoring charts: 1. S/S of Preterm labour 2. Self-palpation for contractions t.i.d. & episodes of contractions 3. PV discharge: • colour • odour • amount 4. Hours of rest/activity (types of activity to be included) 5. Fetal movement counts daily	Client education booklets: PTL **Equipment:** 1. B/P cuff 4. EFM/doppler 5. Medications as prescribed 6. Emergency delivery kit **Documentation forms:** 1. Nurse's daily flow sheet 2. Client self-monitoring flow sheet 3. Physician's orders **Evaluation by:** 1. Social work consult as required 2. Nutritionist – dietary evaluation as required 3. Psychology consult as required

dkaye/rev/02/2003

PRELABOUR PRETERM RUPTURE OF MEMBRANES

Frequency of Home Nursing Visits:	Home & Telephone Nursing Assessment: Maternal	Home Nursing Assessment: Fetal	Client Self-Monitoring Program	Nursing Resources & Teaching
Prior to admission to AHCP • Complete assessment and risk factors identified • Teaching re: AHCP completed Daily for first 3 days, then 2-3 days/week based on nursing assessment and physicians order Telephone contact by nurse occurs on all non-visit days.	**Physical:** 1. V/S Temperature and pulse 2. Assessment for uterine tenderness, contractions, pelvic pressure/low back pain 3. Assessment for amnionitis/ infection also includes: chills, generalized malaise 4. Patient assessment of pv discharge for: • colour • odour • amount 5. Medication: review-effectiveness, side effects **Psychosocial:** 1. Identification of stressors and actions to reduce stressors 2. Compliance with program requirements	1. Leopold's manoeuvre 2. FHR assessment: • 24 weeks to discharge : fetal strips at each visit 3. Fetal movement counts	Review of client self-monitoring charts: 1. Fetal movement counts daily 2. S/S PTL • Self-palpation for contractions t.i.d. and episodes of contractions • Pelvic pressure/low back pain 3. Leaking of pv fluid: • colour • odour • amount (# of peripads) 4. S&S of infection • T,P tid. (Client to supply own thermometer) • Malaise • Uterine tenderness 5. Hours rest/activity (types of activity to be included)	Client education booklet: PPROM **Equipment:** 1. Pericare bottles 2. EFM/doppler 3. Medications as prescribed 4. Emergency delivery kit **Documentation forms:** 1. Nurse's daily flow sheet 2. Client self-monitoring flow sheet 3. Physician's orders **Evaluation by:** 1. Social work consult as required 2. Nutritionist – dietary evaluation as required 3. Psychology consult as Required

dkaye/rev/02/1003

ANTEPARTUM HEMORRHAGE/PLACENTA PREVIA

Frequency of Home Nursing Visits	Home & Telephone Nursing Assessment: Maternal	Home Nursing Assessment: Fetal	Client Self-Monitoring Program	Nursing Resources & Teaching
Prior to admission to APHC • Complete assessment and risk factors identified • Teaching re: AHCP completed Daily for first 3 days, then 2-3 days/week based on nursing assessment and physicians order Telephone contact by nurse occurs on all non-visit days.	**Physical:** 1. B/P, pulse prn 2. PV loss 3. S/S PTL • Contractions • PV loss/ leaking • Pelvic pressure/low back pain **Psychosocial:** 1. Identification of stressors and actions to reduce stressors 2. Compliance with program requirements	1. Leopold's manoeuvre 2. Fundal height 3. FHR assessment: • 24-28 weeks: auscultation • 28-to discharge: fetal strip x 3 days then auscultation q visit • fetal strip prn 4. Fetal movement counts	Review of clients self-monitoring charts: 1. PV loss & pad count • colour • odour • amount 2. Fetal movement counts daily 3. Self-palpation for tightenings &/or contractions t.i.d. 4. Hours rest/activity (types of activity to be included)	Client education booklets: APH Equipment: 1. B/P cuff 2. EFM/doppler 3. Emergency delivery kit Documentation forms: 1. Nurse's daily flow sheet 2. Client self-monitoring flow sheet 3. Physician's orders Evaluation by: 1. Social work consult as required 2. Nutritionist – dietary evaluation as required 3. Psychology consult as required

dkaye/rev/02/1003

GESTATIONAL HYPERTENSION

Frequency of Home Nursing Visits	Home & Telephone Nursing Assessment: Maternal	Home Nursing Assessment: Fetal	Client Self-Monitoring Program	Nursing Resources & Teaching
Prior to admission to APHC • Complete assessment and risk factors identified • Teaching re: AHCP completed Daily for 3 days, then 2-3 days/week based on nursing assessment and physician's order Telephone contact by nurse occurs on all non-visit days.	**Physical:** 1. S/S PIH: • headache • visual disturbances • epigastric pain • malaise • nausea & vomiting 2. V/S: B/P (sitting), P 3. Edema & reflex check 4. Urine dipstick (proteinuria) 5. Medication review-effectiveness, side effects **Psychosocial:** 1. Identification of stressors and actions to reduce stressors 2. Compliance with program requirements	1. Leopold's manoeuvre 2. FHR assessment: • 24-28 weeks auscultation • 28 weeks – term: fetal heart rate strip • **N.B. if stable for > 2 weeks** auscultate FHR at each visit and perform FHR strip prn 3. Fetal movement counts	Review of clients self-monitoring charts: 1. S/S PIH 2. Hours of rest/activity (types of activity to be included) 3. Fetal movement counts daily. 4. B/P q.i.d. 5. Urine dipstick 6. 24 hour urine collection as ordered	Client education booklet: PIH/Chronic Hypertension **Equipment:** 1. Urine dipsticks 2. B/P cuff – automatic device 3. EFM/doppler 4. 24hour urine collection bottle as required 5. Medications as prescribed **Documentation forms:** 1. Nurse's daily flow sheet 2. Client self-monitoring flow sheet 3. Physician's orders **Evaluation by:** 1. Social work consult as required 2. Nutritionist – dietary evaluation as required 3. Psychology consult as required

dkaye/rev/02/1003

Appendix C

Systematic Review Search Strategy

**Search for: limit 26 to research [Limit not valid in: CDSR,ACP Journal Club,DARE,CCTR,EMBASE,HealthSTAR,Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations,Ovid MEDLINE(R),PsycINFO; records were retained]

Results: 1-232

Database: CDSR, ACP Journal Club, DARE, CCTR, CINAHL, EMBASE, HealthSTAR, Ovid MEDLINE(R) In-Process, Other Non-Indexed Citations, Ovid MEDLINE(R), PsycINFO Search Strategy:

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1 (telemedicine or remote consultation).mp. [mp=ti, ot, tc, ab, tx, kw, ct, sh, hw, it, tn, dm, mf, nm, id] (15955)
2 (nursing care or home nursing).mp. [mp=ti, ot, tc, ab, tx, kw, ct, sh, hw, it, tn, dm, mf, nm, id] (136980)
3 patient education.mp. [mp=ti, ot, tc, ab, tx, kw, ct, sh, hw, it, tn, dm, mf, nm, id] (128865)
4 (nursing assessment or nursing diagnosis).mp. [mp=ti, ot, tc, ab, tx, kw, ct, sh, hw, it, tn, dm, mf, nm, id] (57776)
5 exp specialties, nursing/ (263077)
6 telenursing.mp. (832)
7 telehealth.mp. (1937)
8 (tele adj (nursing or health)).mp. [mp=ti, ab, tx, kw, ct, ot, sh, hw, it, tn, dm, mf, nm, tc, id] (31)
9 Education, Distance/ (56791)
10 2 or 4 or 5 (386451)
11 "Quality of Life"/ or Terminal Care/ or Palliative Care/ or Pain/ or supportive care.mp. (412039)
12 6 or 7 or 8 (2672)
13 1 and 10 (725)
14 10 and 12 (486)
15 3 and 10 (15862)
16 1 and 12 and 15 (17)
17 12 and 15 (47)
18 1 and 15 (48)
19 10 and 11 (15934)
20 12 and 19 (22)
21 1 and 19 (42)
22 13 or 14 or 17 or 18 or 20 or 21 (1017)
23 limit 22 to abstracts [Limit not valid in: CDSR,ACP Journal Club,DARE; records were retained] (580)
24 limit 23 to english language [Limit not valid in: CDSR,ACP Journal Club,DARE,CCTR; records were retained] (565)
25 limit 24 to human [Limit not valid in: CDSR,ACP Journal Club,DARE,CCTR,CINAHL,Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations; records were retained] (550)
26 remove duplicates from 25 (355)
27 limit 26 to research [Limit not valid in: CDSR,ACP Journal Club,DARE,CCTR,EMBASE,HealthSTAR,Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations,Ovid MEDLINE(R),PsycINFO; records were retained] (232)
28 from 27 keep 1-232 (232)

**Best search May 31 Search for: limit 44 to research [Limit not valid in: EMBASE,HealthSTAR,Ovid MEDLINE(R),PsycINFO; records were retained]

Database: CINAHL, EMBASE, HealthSTAR, Ovid MEDLINE(R), PsycINFO Search Strategy:

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1 nursing care/ or home nursing/ (49021)
2 Patient Education/ (92842)
3 nursing assessment/ or nursing diagnosis/ (47677)
4 exp Specialties, Nursing/ (203155)
5 telenursing.mp. (823)
6 telehealth.mp. (1893)
7 (tele adj (nursing or health)).mp. [mp=ti, hw, ab, it, sh, tn, ot, dm, mf, kw, nm, tc, id] (29)
8 Education, Distance/ (56838)
9 "Quality of Life"/ or Terminal Care/ or Palliative Care/ or Pain/ or supportive care.mp. (328733)
10 telemedicine.mp. [mp=ti, hw, ab, it, sh, tn, ot, dm, mf, kw, nm, tc, id] (12659)
11 1 or 3 or 4 (264358)
12 exp TELEPHONE/ (18398)
13 exp telephone/ not triage.mp. [mp=ti, hw, ab, it, sh, tn, ot, dm, mf, kw, nm, tc, id] (17800)
14 (tele$ not triage).mp. [mp=ti, hw, ab, it, sh, tn, ot, dm, mf, kw, nm, tc, id] (149361)
15 (tele$ not call center).mp. [mp=ti, hw, ab, it, sh, tn, ot, dm, mf, kw, nm, tc, id] (150753)
16 (tele$ not video$).mp. [mp=ti, hw, ab, it, sh, tn, ot, dm, mf, kw, nm, tc, id] (142137)
17 (tele$ not advice line).mp. [mp=ti, hw, ab, it, sh, tn, ot, dm, mf, kw, nm, tc, id] (150844)
18 (tele$ not telemetry).mp. [mp=ti, hw, ab, it, sh, tn, ot, dm, mf, kw, nm, tc, id] (143036)
19 (tele$ not computer).mp. [mp=ti, hw, ab, it, sh, tn, ot, dm, mf, kw, nm, tc, id] (138200)
20 (tele$ not internet).mp. [mp=ti, hw, ab, it, sh, tn, ot, dm, mf, kw, nm, tc, id] (144610)
21 (tele$ not web).mp. [mp=ti, hw, ab, it, sh, tn, ot, dm, mf, kw, nm, tc, id] (148687)
22 telephone.mp,hw. (64449)
23 (patients or clients).mp. [mp=ti, hw, ab, it, sh, tn, ot, dm, mf, kw, nm, tc, id] (4457969)
24 telephone.mp. [mp=ti, tc, hw, ab, it, sh, tn, ot, dm, mf, kw, nm, id] (64269)
25 telephone.tw. (55855)
26 5 or 6 or 7 or 10 or 12 (32176)
27 13 and 14 and 15 and 16 and 17 and 18 and 19 and 20 and 21 (15363)
28 25 or 26 (76764)
29 2 and 11 (10183)
30 9 and 11 (12481)
31 11 and 26 (1838)

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32      26 and 29 (125)
33      26 and 30 (102)
34      27 and 31 (772)
35      27 and 32 (68)
36      27 and 33 (50)
37      25 and 34 (418)
38      25 and 35 (37)
39      25 and 36 (32)
40      37 or 38 or 39 (418)
41      remove duplicates from 40 (325)
42      limit 41 to abstracts (271)
43      limit 42 to english language (258)
44              limit 43 to humans [Limit not valid in:
CINAHL,HealthSTAR,PsycINFO; records were retained] (256)
45      limit 44 to research [Limit not valid in: EMBASE,HealthSTAR,Ovid
MEDLINE(R),PsycINFO; records were retained] (238)
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**The 2 searches were done separately and then the findings were combined and the duplicates removed since neither search identified all the articles that were available.

Revised and updated search May 2006

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Search for: limit 26 to research [Limit not valid in:
EMBASE,HealthSTAR,Ovid MEDLINE(R) In-Process & Other Non-Indexed
Citations,Ovid MEDLINE(R),PsycINFO; records were retained]

Results: 23-59

Database: CINAHL , EMBASE , HealthSTAR , Ovid MEDLINE(R) In-Process
, Other Non-Indexed Citations , Ovid MEDLINE(R) , PsycINFO Search
Strategy:
---------------------------------------------------------------------
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1      nursing care/ or home nursing/ (82638)
2      Patient Education/ (126863)
3      nursing assessment/ or nursing diagnosis/ (64201)
4      exp Specialties, Nursing/ (270829)
5      telenursing.mp. (906)
6      telehealth.mp. (2266)
7       (tele adj (nursing or health)).mp. [mp=ti, hw, ab, it, sh, tn,
ot, dm, mf, nm, tc, id] (39)
8      Education, Distance/ (60328)
9      "Quality of Life"/ or Terminal Care/ or Palliative Care/ or Pain/
or supportive care.mp. (467935)
10      telemedicine.mp. [mp=ti, hw, ab, it, sh, tn, ot, dm, mf, nm, tc,
id] (15056)
11      1 or 3 or 4 (379943)
12       (perinat$ or obs$ or antenat$ or antepart$ or pregnancy).mp.
[mp=ti, hw, ab, it, sh, tn, ot, dm, mf, nm, tc, id] (4864894)
13      2 or 8 (186182)
14      9 or 11 or 13 (994598)
15       telephon$.mp. [mp=ti, hw, ab, it, sh, tn, ot, dm, mf, nm, tc,
id] (83673)
16      5 or 6 or 7 or 10 or 15 (98727)
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17 prenatal.mp. [mp=ti, hw, ab, it, sh, tn, ot, dm, mf, nm, tc, id] (208158)
18 12 or 17 (4906073)
19 9 or 11 or 13 (994598)
20 11 and 19 (379943)
21 16 and 20 (3478)
22 18 and 21 (437)
23 remove duplicates from 22 (294)
24 limit 23 to abstracts (257)
25 limit 24 to english language (243)
26 limit 25 to human [Limit not valid in: CINAHL,Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations; records were retained] (240)
27 limit 26 to research [Limit not valid in: EMBASE,HealthSTAR,Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations,Ovid MEDLINE(R),PsycINFO; records were retained] (219)
33 from 27 keep 23,28,32,43,45,79,98,100,106-107,114-115,118,124,129,133,138,142,149-150,155,163,170-172,175,179,184,190,192,195,199,201,210-211,215,218 (37)

Appendix D

Literature Review Tables

Table 1
Summary Of Systematic Review Findings For Objective 1: Organizational, Maternal Or Infant Benefits

Home Nursing Care in Place of Hospitalization				
Authors & Trial Design	**Intervention & Telephone Contact**	**Maternal and Infant Benefits**	**System Benefits**	**Quality Rating, Strengths and Limitations**
York et al. (1997) RCT Treatment $n = 44$ (24 prenatal, and 20 postpartum) Control $n = 52$ (31 prenatal and 21 postpartum) **Pregnancy Risk Definition** Diabetes or hypertension in pregnancy	**Intervention** Early hospital discharge with transitional nurse care by home visits and telephone contact for pregnant and postpartum women with diabetes or hypertension **Telephone Contact** 3 weekly telephone or clinic contacts. Assessed woman's physical and emotional status, available support systems, environmental adequacy, and availability of equipment for blood glucose monitoring and insulin administration, provided appropriate referrals and ongoing education and counseling.	**Intrapartum Care** **Infant Outcomes** No significant difference in birth weight (BW) or gestational age. Low Birth Weight (LBW) less frequent **Satisfaction** ↑ satisfaction for intervention group ($P = .06$) Tool validated	**Prenatal Care** **Prenatal Hospitalization** No difference in LOS between groups. Intervention group: Fewer rehospitalizations for glucose control (p .048). Charges for rehospitalization less (mean savings US$2,683.00, p=.02) **Cost of Care** Average costs for nursing care (includes telephone and home visits) US$772.00 per participant Mean savings per mother-infant dyad US$12,555.00 **Postpartum Care** No difference in rehospitalization	**Quality Rating:** Weak **Strengths:** Enrolled before and after delivery Population similar to antenatal home care population Demographics of both groups similar Used validated satisfaction tool. *LaMonica-Oberst Patient Satisfaction Scale* **Limitations:** No power calculation stated. Small sample size. No reported result for the women with hypertension. Did not describe fetal assessment during visits or telephone contact. Not known if this was included in care provided. Neither content of satisfaction survey nor areas of greatest satisfaction for intervention group described. Telephone contact not described nor analyzed separately from home and clinic visits. Results of limited use to inform planned research on telephone nursing visits.

Table 1
Summary Of Systematic Review Findings For Objective 1: Organizational, Maternal Or Infant Benefits

Provision of Social Support				
Authors & Trial Design	**Intervention & Telephone Contact**	**Maternal and Infant Benefits**	**System Benefits**	**Quality Rating, Strengths and Limitations**
Bullock et al. (2002) Qualitative *N* = 20 **Sample** >24 weeks gestation and > 18 years old, low income, Medicaid eligible **Pregnancy Risk Definition** Low income (Medicaid enrolled)	**Intervention** Social support: listening ear, information when asked, appropriate referral **Telephone Contact** Weekly contact by nurse plus women could page nurse (mental health graduate student) 24 hours a day 7 days a week. **Results re telephone** Average length 20 minutes. 71% received > half scheduled calls. 25% received one quarter of scheduled calls. Received 12 pages in 16 weeks. Average length of time spent responding to page was 15 minutes.	**Intrapartum Care** **Infant Outcomes**	**Prenatal Care** Pages about stressors in participant's life, and mostly in the morning. Women felt nurse accessibility by pager was important Stressors were pregnancy complaints, problems with children &/or extended family, problems with partner Rapport developed between participants and nurse. Women made great effort to be available for telephone call. Rapport may be enhanced by lack of visual cues. Nurse made at least 3 calls before reaching a participant. Therapeutic communication and expert nursing practice. Collaboration between mental health nurses and prenatal providers safe and cost effective **Prenatal Hospitalization** **Cost of Care** **Postpartum Care**	**Quality Rating:** Moderate **Strengths:** Described the telephone contacts and content of calls Consistent person making calls. Prospective calls. **Limitations:** Satisfaction attributed to lack of visual cues. Was it really the caring of the caller? Nursing logs of calls analyzed not transcripts of telephone calls. May lead to provider interpretation bias. Small homogenous sample. Do other women in other settings have same or different needs? Did not assess prevention or reduction of hospitalization.

Table 1

Summary Of Systematic Review Findings For Objective 1: Organizational, Maternal Or Infant Benefits

Provision of Social Support				
Authors & Trial Design	**Intervention & Telephone Contact**	**Maternal and Infant Benefits**	**System Benefits**	**Quality Rating, Strengths and Limitations**
Finfgeld-Connett (2005) Qualitative $N = 21$ Sample generally below poverty level and usually had high number of stressors **Pregnancy Risk Definition** Smokers who were poor & experiencing a number of stressors (WIC program enrollment)	**Intervention** Telephone-delivered social support to ↓ stress & promote smoking reduction Supportive actions: empathy, congruence, creation of non-judgmental, accepting relationship **Telephone Contact** Weekly and clients able to page the nurse Women talked about their pregnancies i.e. ultrasound results, anxiety about wellbeing of infants as they were often high risk pregnancies, stressful couple/family relationships, housing. Expert nursing practice: sharing information and advice, about pregnancy and infant care, jobs, finances, family problems, positive reinforcement, approval, encouragement	**Intrapartum Care** **Infant Outcomes** **Satisfaction**	**Prenatal Care** Telephone contacts contained: 1) Elements of social support: non-judgmental listening ear, discussion of women's pregnancy needs, information when asked, appropriate referral to other professionals. Congruent with Oakley's definition of social support. 2) Elements of nursing presence: maintained psychological presence, interpersonal reciprocity. **Prenatal Hospitalization** **Cost of Care** **Postpartum Care**	**Quality Rating:** Moderate **Strengths:** Identified some components of telephone care provided and what the women talked about. **Limitations:** Not in place of hospitalization or to decrease hospitalization. Used nurses' phone logs rather than transcripts of the telephone contacts. May lead to provider interpretation bias.

Table 1
Summary Of Systematic Review Findings For Objective 1: Organizational, Maternal Or Infant Benefits

Provision of Social Support				
Authors & Trial Design	**Intervention & Telephone Contact**	**Maternal and Infant Benefits**	**System Benefits**	**Quality Rating, Strengths and Limitations**
Norbeck et al. (1996) RCT *N* = 114 **Pregnancy Risk Definition** African American, low income women lacking support from their partners and mothers	**Intervention** Home visit and telephone contact to provide social support **Telephone Contact** Every 2 weeks	**Intrapartum Care** Significantly ↓ prematurity in treatment group (LBW associated with prematurity in this population) **Infant Outcomes** Significantly ↓ incidence of LBW in treatment group: 9.1% LBW in treatment group vs. 22.4% in control (p = .045) **Satisfaction**	**Prenatal Care Prenatal Hospitalization** **Cost of Care** **Postpartum Care**	**Quality Rating:** Moderate **Strengths:** Power calculation done and numbers achieved for effect size. Randomized by previously generated random number table. Analysis by intention to treat. Tight criteria for inclusion. Used validated tools to assess support, anxiety and self esteem. **Limitations:** Homogeneous sample, all low SES and African American. Possibly limits generalizability to other ethnic populations and social brackets. Randomization by envelope. Only 77% received ≥ 3 of 4 intervention sessions. Telephone contact and frequency not described. Telephone contact not separated from face-to-face contact. Limits ability to interpret contribution of telephone contact to study findings.

Table 1
Summary Of Systematic Review Findings For Objective 1: Organizational, Maternal Or Infant Benefits

Provision of Social Support				
Authors & Trial Design	**Intervention & Telephone Contact**	**Maternal and Infant Benefits**	**System Benefits**	**Quality Rating, Strengths and Limitations**
Bryce et al. (1991) RCT Treatment $n = 981$ Control $n = 985$ **Pregnancy Risk Definition** Poor obstetric history defined as previous preterm birth, low birth weight infant (< 2500 gms), perinatal death, ≥ 3 first trimester miscarriages, a second trimester miscarriage, or antepartum hemorrhage.	**Intervention** Expressive support: sympathy, empathy, understanding, acceptance, affection, act as confidante **Telephone Contact** Between home visits	**Intrapartum Care** No evidence that social support can prevent preterm birth. Preterm birth was affected by history of previous preterm birth and current multiple pregnancy **Infant Outcomes** **Satisfaction**	**Prenatal Care** Positive effect for professional women No effect for low SES women or those living alone or only with children ↓ **Prenatal Hospitalization** **Cost of Care** **Postpartum Care**	**Quality Rating:** Weak **Strengths:** Large sample. Sample size and power calculation done. Interventions provided by midwives who were trained to give intervention Randomized before consent and with consideration for maintaining comparable sample sizes in each group. Analyzed according to intention to treat **Limitations:** Did not have required sample for power to determine effect. Frequency and content of calls not described. Did not provide antenatal care, advice or information. Gestation at admission was much earlier than in antenatal home care program. Did not indicate the individual contributions of telephone and home visits to the outcomes.

Table 1
Summary Of Systematic Review Findings For Objective 1: Organizational, Maternal Or Infant Benefits

Provision of Social Support				
Authors & Trial Design	**Intervention & Telephone Contact**	**Maternal and Infant Benefits**	**System Benefits**	**Quality Rating, Strengths and Limitations**
Oakley et al. (1990) RCT Treatment $n = 255$ Control $n = 254$ **Pregnancy Risk Definition** One previous normally formed infant weighing < 2,500 gms.	**Intervention** Home visits at 14, 20, 28 weeks gestation plus home visits or telephone to provide social support. Social support described as 24 hour a day availability to discuss any topic identified by the women relevant to their pregnancy or circumstances, provide information or advice when requested and provide appropriate referral to other health care professionals **Telephone Contact** Approximately. q2 weeks in between home visits	**Intrapartum Care** Social care has capacity to affect pregnancy outcomes Similar numbers of control and intervention groups delivered at ≥37 weeks gestation (81% vs. 82%) **Infant Outcomes** ↑ in mean BW of 38 gms. (95% CI -72.6 to 146.6) 37 control and 35 intervention infants admitted to NICU Intervention infants admitted to NICU required less invasive resuscitation and ↓ intensive neonatal care.	**Prenatal Care Prenatal Hospitalization** **Cost of Care** **Postpartum Care** Mothers and babies used significantly ↓ health services (60% intervention vs. 69% control) Women reported better health (70% intervention reported good or very good health vs. 61% control)	**Quality Rating:** Weak **Strengths:** Power calculation done for sample size to identify 150 gm difference in birth weight with power of 0.80 High response rate from satisfaction survey (94%) **Limitations:** Did not provide clinical nursing care or assessment. Advice or information only provided at mother's request. Patients not experiencing problems in this pregnancy. Risk determined by previous preterm or low birth weight infant. Did not report level of significance for reported health service use and better health Control group also indicated high satisfaction with intervention provided (they did not receive intervention). Although information gathered on telephone contacts i.e. who initiated contact, purpose, length, content and result these were not reported. Limits applicability to this project. Satisfaction survey not validated and reasons for satisfaction not described.

Table 1

Summary Of Systematic Review Findings For Objective 1: Organizational, Maternal Or Infant Benefits

Nurse Case Management				
Authors & Trial Design	**Intervention & Telephone Contact**	**Maternal and Infant Benefits**	**System Benefits**	**Quality Rating, Strengths and Limitations**
Brooten et al. (2001) RCT Treatment $n = 85$ women & 94 infants Control $n = 88$ women & 100 infants **Pregnancy Risk Definition** Women with pregestational or gestational diabetes, chronic hypertension, diagnosed preterm labour nor high risk of preterm labour (uterine fibroids, previous preterm labour, multiple pregnancy or score of ≥ 10 on modified Creasy tool)	**Intervention** Advanced Practice Nurse (APN) home visits and telephone availability as substitute for half of physician prenatal visits **Telephone Contact** Average 50 calls per participant from 8 weeks gestation to 6 weeks postpartum. Participants could contact nurse from 0800 to 2200 Monday to Friday and weekends 0800-1200 hours.	**Intrapartum Care** Length of hospitalization the same. Intervention group – 11 more infants born ≥37 weeks gestation and 6 fewer infants born at < 29 weeks **Infant Outcomes** ↑ mean BW by 300 gms ($p = .05$) ↓ mean LOS of >100 days + ↓ rehospitalization (19 intervention vs. 36 control)	**Prenatal Care** ↑ # prenatal visits and ↓ acute care visits ($t = 0.04$) **Prenatal Hospitalization** ↓ hospitalization (49 control hospitalized vs. 41 intervention) ↓ mean LOS (250 fewer days in hospital prenatal and postpartum combined for intervention group) **Postpartum Care** ↓ LOS in rehospitalized participants **Cost of Care** Intervention cost per dyad from enrollment to 6 weeks pp. (postpartum) US$2,039.00 **Savings (Average)** -US$3983.00 for prenatal hospitalization -US$345,000.00 intrapartum hospitalization -US$196,000.00 from reduced infant rehospitalization. in first yr. attributed to ↑ gestation at delivery.	**Quality Rating:** Moderate **Strengths:** Used validated satisfaction survey - *LaMonica-Oberst Patient Satisfaction Scale.* Low refusal and attrition rates. Tools for affect validated and sensitive to mood change. Described care to both groups in detail. Followed participants for 1 year postpartum to outcomes. **Limitations:** No definition of preterm labour in current pregnancy. Only commented on number of telephone contacts. No data on telephone calls reported. Limits utility for research question. Contribution of the telephone availability and contact to study findings unknown Satisfaction survey details and content not presented.

Table 1

Summary Of Systematic Review Findings For Objective 1: Organizational, Maternal Or Infant Benefits

Nurse Case Management				
Authors & Trial Design	**Intervention & Telephone Contact**	**Maternal and Infant Benefits**	**System Benefits**	**Quality Rating, Strengths and Limitations**
Little et al. (2002a) Post-test only control group experimental design *N* = 123 Responders to satisfaction survey Treatment *n* = 39 Control *n* = 32 **Pregnancy Risk Definition** Low-income, high risk. Did not define risk further	**Intervention** Nurse case management by telephone for women consisting of risk assessment, patient education, care coordination and patient advocacy **Telephone Contact** Q 7-14 days and patients could contact nurse with non-urgent questions	**Intrapartum Care** ↓ Caesarean births Mode of delivery, gestation and birth weight did not affect satisfaction ratings **Infant Outcomes**	**Prenatal Care** **Prenatal Hospitalization** **Postpartum Care** **Cost of Care** Costs unrelated to participant satisfaction	**Quality Rating:** Moderate **Strengths:** Care of control and treatments groups by different people. Consistent nurses providing care. 58% completed the satisfaction survey. Survey questions and mean responses reported. Regression analyses to determine if confounding variables present that would affect satisfaction ratings **Limitations:** Numbers small Satisfaction survey tool not validated. Response bias possible – only respondents with positive experiences may have chosen to complete survey No open ended questions on survey to elicit responses about other areas important to the respondents.

Table 1

Summary Of Systematic Review Findings For Objective 1: Organizational, Maternal Or Infant Benefits

Nurse Case Management				
Authors & Trial Design	**Intervention & Telephone Contact**	**Maternal and Infant Benefits**	**System Benefits**	**Quality Rating, Strengths and Limitations**
Boehm et al. (1996) RCT Treatment $n = 21$ Control $n = 21$ Non participants $n = 22$ **Pregnancy Risk Definition** Previous preterm birth not related to incompetent cervix, multiple gestation or such conditions as pregnancy-induced hypertension, and IUGR	**Intervention** Both groups had 24-hour contact number and prenatal physician visits including vaginal exam every 2 weeks from 20 weeks gestation to delivery. Telephone contact to women with previous unexplained PTB **Telephone Contact** Daily starting as early as 20 weeks gestation, Assessed symptoms of preterm labour and medication compliance and invited discussion of other problems or symptoms. (Conducted 1,525 telephone interviews)	**Intrapartum Care** Preterm birth rate similar between groups **Infant Outcomes** Increased gestation at delivery Control and treatment groups better outcomes than group refusing to participate	**Prenatal Care** **Prenatal Hospitalization** **Postpartum Care** **Cost of Care**	**Quality Rating:** Weak **Strengths:** Prospective trial. None lost to follow-up. Only difference in treatment between control and intervention groups was the telephone contact Power calculation done for sample size required 80 per group for a power of .75 to predict a difference in the preterm births between the 2 groups. **Limitations** Practitioners not blind to group assignment. May have provided better care to the participants Had less than half of required sample size and a power of .26 to predict a difference in preterm birth between groups Women did not have diagnosed symptoms or problems in this pregnancy. Risk determined by previous preterm birth, low birth weight, low SES and education.

Table 1

Summary Of Systematic Review Findings For Objective 1: Organizational, Maternal Or Infant Benefits

Nurse Case Management				
Authors & Trial Design	**Intervention & Telephone Contact**	**Maternal and Infant Benefits**	**System Benefits**	**Quality Rating, Strengths and Limitations**
Hutti et al. (2004) Retrospective descriptive review of insurers records *N* =4950 Treatment *n* =1204 Comparison *n* = 3,746 -women using insurer services for pregnancy in last 18 months but not part of TNMC program **Pregnancy Risk Definition** Lifestyle issues, smoking drugs depression, past history of diabetes, hypertension, kidney disease, seizure disorder, heart disease, asthma, C/S, Past or current history of cerclage, preeclampsia, PTL, PIH, bleeding, PPROM, current history of urinary tract infection, phlebitis or anemia	**Intervention** Risk assessment and case management by telephone at three time periods: T1 < 28 weeks gestation; T2 > 29 weeks gestation; T3 postpartum **Telephone Contact** Frequency of contact not stated but seemed to be approx 2-3 times/week	**Intrapartum Care** **Infant Outcomes** Fewer NICU admissions with case management (comparison group 2.5 times more frequently admitted to NICU) **Satisfaction** Patients satisfied	**Prenatal Care** Identified appropriately women with high risk conditions early, those identified later or postpartum less likely to receive intervention. Unclear if early case management prevented problems or if the assessment was imperfect 70% received case management when no risk identified Those identified as at risk later in pregnancy did not always receive case management **Prenatal Hospitalization** **Postpartum Care** **Cost of Care** Claims costs significantly less for intervention group - US$1818.00 vs. US$4587.00 ($p < .0005$)	**Quality Rating:** Weak **Strengths:** Large sample size. Intervention group. - significant positive findings **Limitations:** Treatment and control groups not randomly selected & no information on how selection was done. Source data incomplete- researchers attempted to complete data Telephone care provided case management - not defined. Telephone contact frequency and description of care not presented. Satisfaction measurement not described. Discrepancies in data reporting especially table 3 make it impossible to determine if interpretation is correct. Large percentage of women included in treatment group with no risk factors, possibly confounding outcomes

Table 1
Summary Of Systematic Review Findings For Objective 1: Organizational, Maternal Or Infant Benefits

Nurse Case Management				
Authors & Trial Design	**Intervention & Telephone Contact**	**Maternal and Infant Benefits**	**System Benefits**	**Quality Rating, Strengths and Limitations**
Little et al. (2002b) RCT $N = 123$ Treatment $n = 61$ Control $n = 50$ Twin gestations excluded from analysis. Data analyzed for $N = 111$ Control = 50 and intervention = 61 **Pregnancy Risk Definition** Low income high risk pregnancy population attending one of 2 high risk pregnancy clinics	**Intervention** Nurse case management by telephone including risk assessment, support, teaching related to pregnancy and diagnosis, coordination of care **Telephone Contact** Q 7-14 days	**Intrapartum Care** No significant difference in preterm births between groups **Infant Outcomes** ↑ birth weight in intervention group ($p = .023$)	**Prenatal Care** **Prenatal Hospitalization** **Postpartum Care** **Cost of Care** ↓ combined inpatient and outpatient costs for intervention (average savings per participant = US$501.31)	**Quality Rating:** Weak **Strengths:** Power for effect calculated (but not described). **Limitations** Did not achieve size required to determine effect with power calculated. Unequal distribution of diagnoses between groups. Needed to phone participants to administer survey as very few surveys returned by mail. Historical risk and current symptoms defined risk but not stratified for differences. Unknown validity of satisfaction survey. Did not describe satisfaction tool or findings.

Table 1
Summary Of Systematic Review Findings For Objective 1: Organizational, Maternal Or Infant Benefits

Nurse Case Management				
Authors & Trial Design	**Intervention & Telephone Contact**	**Maternal and Infant Benefits**	**System Benefits**	**Quality Rating, Strengths and Limitations**
Moore et al. (1998) RCT *N* = 1554 Treatment *n* = 775 Control *n* = 779 **Pregnancy Risk Definition** 1) Black women all ages 2) White or other women with a preterm risk score of at least 7 on the Wake Forest University Medical School risk assessment tool 3) White or other women ≤ 18 years old	**Intervention** Telephone contact from 24-37 weeks gestation to assess health status, recommend care based on assessment and discuss issues identified by women **Telephone Contact** Planned for nurse to contact 3 times/ week and could page the nurse prn. Actual treatment received: 1-2 times per week Length of calls 3.6 minutes average. Benefits of telephone intervention inconclusive for total population but beneficial for Black women ≥ 19 years	**Intrapartum Care** 44% fewer PTB in Black women ≥ 19 years (p = .004) Greatest effect on Black women at low risk for Preterm birth (p = .027) **Infant Outcomes** Inconclusive effects on LBW and PTB in total population. LBW 26% less frequent in Black women ≥ 19 years receiving intervention (p = 0.02).	**Prenatal Care** **Prenatal Hospitalization** **Postpartum Care** **Cost of Care**	**Quality Rating:** Weak **Strengths:** Randomized and blinded trial. Stratified for ethnicity and age. Power .8 at a =,05 needed 1540 women. Achieved numbers Clinic personnel blinded to group assignment. Large sample **Limitations** Calls were very short (average 3.6 minutes) for all assessments made. Risk determined by SES and historical risk factors; no symptoms of PTL at randomization. Criteria for enrollment of Black women different from others (all black women regardless of SES) Rest of population low-income women This disparity may have confounded results. Goal was 3 calls/week. Only achieved 1-2 calls/week.

Table 1
Summary Of Systematic Review Findings For Objective 1: Organizational, Maternal Or Infant Benefits

Nurse Case Management				
Authors & Trial Design	**Intervention & Telephone Contact**	**Maternal and Infant Benefits**	**System Benefits**	**Quality Rating, Strengths and Limitations**
Muender et al. (2000) Cost benefit analysis of RCT cohort of Black women ≥ 19 years (n = 1,112) from study by Moore et al. (1998) **Pregnancy Risk Definition** Black women ≥ 19 years old	**Intervention** Telephone contact from 24-37 weeks gestation to assess health status, recommend care based on assessment and discuss issues identified by women **Telephone Contact** 1-2 times per week	**Intrapartum Care** **Infant Outcomes** **Satisfaction**	**Prenatal Care** **Prenatal Hospitalization** **Postpartum Care** **Cost of Care** Cost savings from averted events US$227.00 per participant regardless of socioeconomic status. Cost of telephone program US$117.00 per participant	**Quality Rating:** Weak **Strengths:** RCT. Large sample. Considered absolute risk reduction. Included all costs of telephone program **Limitations** Restricted to African American women ≥ 19yrs. Mostly Medicaid recipients. Hospital costs do not reflect actual costs incurred or averted accurately. US study, health care differences between Canada and US may limit applicability to Canadian programs & may have influenced outcomes Lacked data on utilization of health care services prior to admission for delivery. Intervention group: No data on reduction of unnecessary health care utilization

Table 2
Summary Of Systematic Review Findings For Objective 3: Satisfaction

Home Nursing Care in Place of Hospitalization			
Authors & Trial Design	**Intervention & Telephone Contact**	**Satisfaction**	**Quality Rating, Strengths and Limitations**
York et al. (1997) RCT Treatment $n = 44$ (24 prenatal, and 20 postpartum) Control $n = 52$ (31 prenatal and 21 postpartum) **Pregnancy Risk Definition** Pregnant hypertensive or diabetic women hospitalized for control of blood pressure or blood glucose.	**Intervention** Early hospital discharge with transitional nurse care by home visits and telephone contact for pregnant and postpartum women with diabetes or hypertension **Telephone Contact** 3 weekly telephone or clinic contacts. Assessed woman's physical and emotional status, available support systems, environmental adequacy, and availability of equipment for blood glucose monitoring and insulin administration, provided appropriate referrals and ongoing education and counseling.	**Satisfaction** ↑ Satisfaction for intervention group ($P = .06$) Tool validated	**Quality Rating:** Weak **Strengths:** Enrolled before and after delivery Population similar to antenatal home care population Demographics of both groups similar Used validated satisfaction tool. *LaMonica-Oberst Patient Satisfaction Scale* **Limitations:** No power calculation stated. Small sample size. No reported result for the women with hypertension. Did not describe fetal assessment during visits or telephone contact. Not known if this was included in care. Neither contents of satisfaction survey not described nor areas of greatest satisfaction for intervention group. Telephone contact not described nor analyzed separately from the home and clinic visits. Results of limited use to inform planned research on telephone nursing visits.

Table 2
Summary Of Systematic Review Findings For Objective 3: Satisfaction

Social Support			
Authors & Trial Design	**Intervention & Telephone Contact**	**Satisfaction**	**Quality Rating, Strengths and Limitations**
Bullock et al. (2002) Qualitative *N* = 20 **Sample** >24 weeks gestation and > 18 years old, low income, Medicaid eligible **Pregnancy Risk Definition** Low income (Medicaid enrolled)	**Intervention** Social support: listening ear, information when asked, appropriate referral **Telephone Contact** Weekly contact by nurse plus women could page nurse 24 hours a day 7 days a week by mental health graduate student **Results re telephone** Average length 20 minutes. Over 70% received > half scheduled calls Received 12 pages in 16 week Average length of time spent on page was 15 minutes	Acceptable to low SES women Strong rapport developed when visual cues eliminated, Accessibility by pager important to the women even though rarely used. Women did not have to clean house or play hostess. Provided only for women and was obligation-free.	**Quality Rating:** Moderate **Strengths:** Described the telephone contacts and content of calls Consistent person making calls. Prospective calls. **Limitations:** Satisfaction attributed to lack of visual cues. Was it really the caring of the caller? Nursing logs of calls analyzed not transcripts of telephone calls. May lead to provider interpretation bias. Small homogenous sample. Do other women in other settings have same or different needs? Did not prevent or reduce hospitalization

Table 2
Summary Of Systematic Review Findings For Objective 3: Satisfaction

Social Support			
Authors & Trial Design	**Intervention & Telephone Contact**	**Satisfaction**	**Quality Rating, Strengths and Limitations**
Oakley et al. (1990) RCT Treatment *n* = 255 Control *n* = 254 **Pregnancy Risk Definition** One previous normally formed infant weighing < 2,500 gms.	**Intervention** Home visits and telephone availability to provide social support **Telephone Contact** Approximately q2 weeks in between home visits	**Satisfaction** 80% indicated it was important that the midwife listened. 94% found midwife helpful 65% felt it was important that the midwife gave advice and 56% appreciated the information from the midwife. 56% felt it was important that the midwife saw her through her pregnancy 33% felt it was important that she was a midwife. 7% of the control group indicated that they found the visits of the midwife helpful when in fact they had not received visits.	**Quality Rating:** Weak **Strengths:** Power calculation done for sample size to identify 150 gm difference in birth weight with power of 0.80 High response rate from satisfaction survey (94%) **Limitations:** Did not provide clinical nursing care or assessment. Advice or information only provided at mother's request. Patients not experiencing problems in this pregnancy. Risk determined by previous preterm or low birth weight infant. Control group also indicated high satisfaction with intervention provided (they did not receive intervention). Although information gathered on telephone contacts i.e. who initiated contact, purpose, length, content and result these were not reported. Limits applicability to this project. Satisfaction survey not validated. No comparison between the responses of the intervention and control groups

Table 2
Summary Of Systematic Review Findings For Objective 3: Satisfaction

Nurse Case Management			
Authors & Trial Design	**Intervention & Telephone Contact**	**Satisfaction**	**Quality Rating, Strengths and Limitations**
Brooten et al. (2001) RCT Treatment n = 85 women & 94 infants Control n = 88 women & 100 infants **Pregnancy Risk Definition** Women with pregestational or gestational diabetes, chronic hypertension, diagnosed preterm labour nor high risk of preterm labour (uterine fibroids, previous preterm labour, multiple pregnancy or score of ≥ 10 on modified Creasy tool)	**Intervention:** Advanced Practice Nurse (APN) home visits and telephone availability as substitute for half of physician prenatal visits **Telephone Contact** Average 50 calls/participant from 8 weeks gestation to 6 weeks postpartum. Participants could contact nurse from 0800 to 2200 Monday to Friday and weekends 0800-1200 hours.	**Satisfaction** ↑ satisfaction in intervention group, ($P < .001$)	**Quality Rating:** Moderate **Strengths:** Used validated satisfaction survey - *LaMonica-Oberst Patient Satisfaction Scale.* Low refusal and attrition rates. Tools for affect validated and sensitive to mood change. Described care to both groups in detail. Followed participants for 1 year postpartum to outcomes. **Limitations:** No definition of preterm labour in current pregnancy. Only commented on number of telephone contacts. No data on telephone calls reported. Limits utility for research question. Satisfaction survey details and content not presented.

Table 2

Summary Of Systematic Review Findings For Objective 3: Satisfaction

Nurse Case Management			
Authors & Trial Design	**Intervention & Telephone Contact**	**Satisfaction**	**Quality Rating, Strengths and Limitations**
Little et al. (2002a) Post-test only control group experimental design *N* = 123 Responders to satisfaction survey Treatment *n* = 39 Control *n* = 32 **Pregnancy Risk Definition** Low-income, high risk. Did not define risk further	**Intervention** Nurse case management by telephone for women identified as high risk pregnancy from history and risk assessment **Telephone Contact** Q 7-14 days and patients could contact nurse with non-urgent questions	**Satisfaction** Intervention group more satisfied especially those with college education, African and Mexican Americans. Satisfaction not related to outcome, costs or demographic variables in regression analyses Intervention group satisfaction significantly higher on questions related to health teaching and instruction (p = .001), opportunity to ask questions (p = .001), nurse's ability to answer questions (p = .001), frequency of contact (p = .001), overall experience (p = .001), nurse's availability (p = .04), and confidence in nurse (p = .01). No significant effect was noted in questions pertaining to education and support materials (p = .06) and teamwork of health providers and insurers (p = .09)	**Quality Rating:** Moderate **Strengths:** Care of control and treatments groups by different people. Consistent nurses providing care. 58% completed the satisfaction survey. Survey questions and mean responses reported. Regression analyses to determine if confounding variables present that would affect satisfaction ratings **Limitations:** Numbers small Satisfaction survey tool not validated. Response bias possible – only respondents with positive experiences may have chosen to complete survey No open ended questions on survey to elicit responses about other areas important to the respondents.

Table 2
Summary Of Systematic Review Findings For Objective 3: Satisfaction

Nurse Case Management			
Authors & Trial Design	**Intervention & Telephone Contact**	**Satisfaction**	**Quality Rating, Strengths and Limitations**
Hutti et al. (2004) Retrospective descriptive review of insurers records *N* =4950 Treatment *n* =1204 **Pregnancy Risk Definition** Lifestyle issues, smoking drugs depression, past history of diabetes, hypertension, kidney disease, seizure disorder, heart disease, asthma, C/S, past or current history of cerclage, preeclampsia, PTL, PIH, bleeding, PPROM, or current history of urinary tract infection, phlebitis or anemia	**Intervention** Risk assessment and case management by telephone **Telephone Contact** Frequency of contact not stated	**Satisfaction** Patients satisfied	**Quality Rating:** Weak **Strengths:** Large sample size. Intervention group - significant positive findings **Limitations:** Treatment and control groups not randomly selected & no information on how selection was done. Source data incomplete - researchers attempted to complete data Telephone care provided case management - not defined. Telephone contact frequency and description of care not presented. Satisfaction measurement not described. Discrepancies in data reporting especially table 3 make it impossible to determine if interpretation is correct. Large percentage of women included in treatment group with no risk factors, possibly confounding outcomes

Appendix E

Information Sheet and Consent Form

Participant's ID # 196

Information Sheet

Title of the Study: The Perceived Needs of Women Diagnosed with High Risk Pregnancies and Their Experiences with Telephone Nursing Visits within an Antenatal Home Care Program

Invitation to Participate

This is a questionnaire about the needs of women and their families who are experiencing a high risk pregnancy and are being cared for in their homes by The Ottawa Hospital Antenatal Home Care Program.

WHY WE NEED YOUR HELP

For most patients and families, problems in pregnancy or having a high risk pregnancy may bring many stressful emotional and physical challenges. We are worried that patients and their families may be left to cope alone with the problems that can arise in different life areas. Therefore, we would like you to help us identify any problems you have encountered so we can help plan better services for our patients and their families. This study will be conducted in English.

Questions you may have:

What will I be asked to do?

- Fill in the contact sheet information so that the research assistant can contact you to answer any questions you may have, mail you a questionnaire and arrange a time and place for an interview.
- Complete a survey (questionnaire) about what you feel you need at this time of your pregnancy to help you. This survey will take about 20 minutes of your time. This survey will also have some questions that will help describe you for the researcher, for example: your age, job, language you speak.
- Sign a consent agreeing to an interview. The consent will also ask you to allow the researcher access to your chart to obtain information about your pregnancy problems, information about your delivery and about any problems you or your baby may have during delivery or while you are in hospital.
- Participate in an interview with a research assistant about 2 weeks after receiving the survey. When the research assistant arrives for the interview you will give her the completed survey. The research assistant may refer to the survey and ask you to speak more about some of your answers. This interview can be in your own home or if you prefer, the research assistant will arrange another location that is convenient for you.

What can I expect at the interview?

The interview will last about one hour. You may take a break at any time during the interview or choose not to answer any questions that you feel uncomfortable with. The interview will be tape recorded and the interviewer may also take notes. The audiotape will then be typed word for word. Information that may identify you or be linked to you (such as your name or the name of a family member) will be removed from the typed copy of the audiotape. This typed copy and your answers to the questionnaire will be compared to answers from other participants and common thoughts and ideas will be identified. Information will also be collected from your medical chart about your diagnosis, the type of treatment you may have received and information about your delivery and any complications you or your baby may have experienced.

Are there any benefits from participating?

There is no monetary benefit to your participation. Also, you may not get any immediate benefit from participating in this study. However, participation will allow you to think about and to express your feelings. In addition, your answers will provide nurses, physicians and managers with important information that will aid them in planning for future program development.

Are there any inconveniences or risks from participating?

There are no known physical or emotional risks associated with participating in this study. You may refuse to answer questions that you do not feel comfortable answering. If you experience physical effects or adverse emotional reactions after participating in this study please tell the research assistant or your Antenatal Home Care Nurse. You will be referred to the most appropriate health care professional.

Are there any costs or expenses if I participate?

There are no monetary costs to your participation in this research project. We recognize that your time is valuable and appreciate you generously giving your time to answer the questionnaire and participate in the interview.

Are my answers confidential and anonymous?

The information you share will remain confidential. The research assistant, Isabelle Boland, will identify participants by a code number. The file containing the names and code numbers will be kept separately in a locked and secure area at the Ottawa Hospital. Only the research assistant, primary investigator and the co-investigators will have access to the data. All information published or viewed in presentations will be grouped with other responses from other participants so that you will not be identified. Although the person will not be named, at times direct quotes may be used in the presentation or publications. Once the study is completed the tape recordings will be destroyed. The coded transcripts will be kept in a secure area for a period of fifteen (15) years. All identifying information will be removed or changed.

What if I change my mind and want to withdraw from the Study?

You are under no obligation to participate in this study. You may choose not to participate or to withdraw from this study at any time. If you decide to withdraw from the study or not to participate, the care you receive from the Antenatal Home Care Program and your obstetrical care providers will not be changed in any way. You may refuse to answer any questions you feel uncomfortable answering during the interview or in the surveys.

What if I have more questions about the study?

If you have any questions about the study, you may contact the research assistant, Isabelle Boland, or Dr. K. Fung Kee Fung at these numbers:
Research Assistant Isabelle Boland (613) 834-2577
AHCP Medical Director Dr. K. Fung Kee Fung (613) 798-5555 x78551 or kfung@ottawahospital.on.ca

If you have any concerns regarding your rights as a research participant, you may contact the Chairperson of the Ottawa Hospital Research Ethics Board at (613) 798-5555 extension 14902.

Summary

This study is to explore the needs of women experiencing a high risk pregnancy and participating in the Antenatal home Care Program. Your answers will be used along with the answers of other participants to help plan modifications and future development of this program. Your name or any identifying information will remain confidential. Results that are published from this survey will only contain anonymous statistical information.

The Ottawa Hospital
L'Hôpital d'Ottawa

Participant's ID # _____

Title of the Study: ***The Perceived Needs of Women Diagnosed with High Risk Pregnancies and Their Experiences with Telephone Nursing Visits within an Antenatal Home Care Program***

Consent Form

I, _____ and (if applicable) _____ agree to participate in this study. The data from the study will help in the development of programs aimed at improving the care offered to women experiencing high risk pregnancies at The Ottawa Hospital.

I understand that my participation will involve:

- Completing a contact information sheet
- Completing a survey (questionnaire) about my needs during this pregnancy
- Participating in an interview with a research assistant
- Consenting to allow the research team access to my chart to obtain information about my pregnancy, birth and any problems my baby or I may have while we are in hospital.

I understand that only the researchers will know my answers and that all information that could identify me or my family will be kept confidential at all times even if this research is published. I understand that this information will not influence the care received by me or my baby. My doctor/midwife and nurses will not be advised of my participation or responses unless I choose to inform them of my participation.

I understand that I can withdraw from the study at any time and that the care of neither me nor my baby will be affected by my decision to participate or not participate in the study.

I have read the information sheet and I understand the information in this consent form. A copy of the Information Sheet and Consent form will be provided to me so that I can review the information at a later date. I voluntarily consent to participate in the study.

_____ _____

Participant's Name (Please Print) Participant's Phone Number

_____ _____

Participant's Signature Date

_____ _____

Investigator/Delegate's Name (Please Print) Date

_____

Investigator/Delegate's Signature

(Valid until March 15, 2006)

Needs of Women Experiencing High Risk Pregnancy Study

Contact Information Sheet

Name _____

Address _____

Telephone Numbers

Home _____

Cell _____

Email Address

_____

Expected Due Date _____

Civic or General (please circle) for baby's birth

Appendix F

Modified Supportive Care Needs Survey

ANTENATAL HOME CARE PROGRAM PATIENT NEEDS QUESTIONNAIRE

Modified from survey by Foot G., Sanson-Fisher R. Measuring the Unmet Needs of People Living with Cancer. 1995;19(2):131-135.

SUPPORTIVE CARE NEEDS SURVEY
(SCNS)

Associated Papers :

1. The unmet supportive care needs of patients with cancer.
2. Evaluation of an instrument to assess the needs of patients with cancer.

Suggested Citation :

1. Sanson-Fisher RW, Girgis A, Boyes A, Bonevski B, Burton L, Cook P et al (the Supportive Care Review Group). The unmet supportive care needs of patients with cancer. *Cancer* 2000;88(1):226-37.

2. Bonevski B, Sanson-Fisher RW, Girgis A, Burton L, Cook P, Boyes A et al (the Supportive Care Review Group). Evaluation of an instrument to assess the needs of patients with cancer. *Cancer* 2000;88(1):217-25.

Please note:

There is no charge for using the SCNS. However, all users are required to cite the publications referring to the development of the instrument and to give the appropriate acknowledgment to The Cancer Council NSW's Cancer Education Research Program for the development of the instrument.

This is a questionnaire about the needs of patients and their families.

WHY WE NEED YOUR HELP

For most patients and families, problems in pregnancy or having a high risk pregnancy bring many changes. We would like you to help us identify any problems you have encountered so we can help plan better services for our patients and their families.

HOW YOU CAN HELP US

1. Please read through the instructions on the following pages.
2. Answer the questions you feel comfortable answering – there are no right or wrong answers. We are interested in your views.
3. All the information you provide will remain confidential. The responses from all the participants will be grouped together so there will be no way for anyone to identify the answers you provide.
4. When you have finished, please place the questionnaire in the envelope provided and mail it back to the Research Coordinator.

ANY COMMENTS OR CONCERNS?

If you have any questions or concerns, please telephone the Research Coordinator, _____

Thank you for your participation.

In this section, there is a list of items relating to different types of issues or needs that you may have faced as a result of your pregnancy.

For each item, you are asked to indicate your level of need during the time you were cared for by the Antenatal Home Care Program. Please place a circle around the **ONE** number under the heading that best describes your situation or need for help during the time you were on the Antenatal Home Care Program. There are 5 possible responses to choose from:

1 DID NOT EXPERIENCE OR, NOT APPLICABLE
The item did not pose a problem or you did not require help with this problem.

2 ALREADY SATISFIED
You encountered the issue, but it was addressed to your complete satisfaction so you did not require further help.

3 LOW NEED FOR HELP
The item was of minor concern, causing only minimal physical, mental, emotional or social discomfort to you. Your need for additional help was low.

4 MODERATE NEED FOR HELP
The item caused you some concern and discomfort. You had a moderate need for help with the problem or issue.

5 HIGH NEED FOR HELP
The item was a major concern or importance to you. You had a strong need for help with the problem or issue.

In this section, there is a list of items relating to different types of issues or needs that you may have faced as a result of your problems in pregnancy.

Here is an example of how to show your answer.

Since admission to the Antenatal Home Care Program I need help dealing or coping with the following:	NO NEED		SOME NEED		
	Not Applicable/ Did Not Experience	Satisfied – No further help required	Low Need	Moderate Need	High Need
1. Nausea and / or vomiting.	(1)	2	3	4	5
2. Fears about my pregnancy.	1	2	3	4	(5)
3. More information about the side effects of treatment.	1	(2)	3	4	5

If you put circles where we have, it means that:

1. You never experienced nausea or vomiting as result of your pregnancy or treatment. This item therefore did not apply to your situation and you did not need any help.
2. Dealing with fears about the pregnancy is an issue of major concern, with which you strongly desired help
3. You were already satisfied with the amount of information you were given about the side-effects of your treatment, and therefore you did not need any help with this issue.

Supportive Care Needs Survey					
Since admission to the Antenatal Home Care Program I need help dealing or coping with the following:	**No Need**		**Some Need**		
	Have Not Experienced	**Satisfied**	**Low Need**	**Moderate Need**	**High Need**
1. Lack of energy.	1	2	3	4	5
2. Nausea and/or vomiting.	1	2	3	4	5
3. Feeling unwell a lot of the time.	1	2	3	4	5
4. Problems sleeping.	1	2	3	4	5
5. Keeping up the housework.	1	2	3	4	5
6. Frustration at not being able to do the things I used to do.	1	2	3	4	5
7. Being tired of waiting.	1	2	3	4	5
8. Fears about losing my independence.	1	2	3	4	5
9. Anger and confusion about why this is happening to me.	1	2	3	4	5
10. Feeling bored.	1	2	3	4	5
11. Feeling useless.	1	2	3	4	5
12. Anxiety or stress.	1	2	3	4	5
13. Feeling down or depressed.	1	2	3	4	5
14. Overwhelming feelings of sadness or grief.	1	2	3	4	5
15. Fear that the problems will return or worsen.	1	2	3	4	5
16. Fears about the pain and suffering I might experience.	1	2	3	4	5
17. Anxiety about my treatment or surgery.	1	2	3	4	5

Supportive Care Needs Survey					
Since admission to the Antenatal Home Care Program I need help dealing or coping with the following:	**No Need**		**Some Need**		
	Have Not Experienced	**Satisfied**	**Low Need**	**Moderate Need**	**High Need**
18. Fears about my unborn baby's well-being.	1	2	3	4	5
19. Accepting the changes in my appearance and self-image.	1	2	3	4	5
20. An uncertain future.	1	2	3	4	5
21. Worry that the illness/ problems are beyond my control.	1	2	3	4	5
22. Bed rest when I feel well.	1	2	3	4	5
23. Constipation.	1	2	3	4	5
24. Heartburn.	1	2	3	4	5
25. Lack of appetite.	1	2	3	4	5
26. Pain.	1	2	3	4	5
27. Backache.	1	2	3	4	5
28. Headache.	1	2	3	4	5
29. Recognizing when I am contracting.	1	2	3	4	5
30. Monitoring my condition.	1	2	3	4	5
31. Recognizing when I should go to hospital.	1	2	3	4	5
32. Feelings of "missing out".	1	2	3	4	5
33. Working through my feelings.	1	2	3	4	5
34. Learning to feel in control of my situation.	1	2	3	4	5

Supportive Care Needs Survey					
Since admission to the Antenatal Home Care Program I need help dealing or coping with the following:	**No Need**		**Some Need**		
	Have Not Experienced	**Satisfied**	**Low Need**	**Moderate Need**	**High Need**
35. Learning to make the most of my time.	1	2	3	4	5
36. Trying not to worry.	1	2	3	4	5
37. Maintaining a positive outlook.	1	2	3	4	5
38. Trying to find meaning in this experience.	1	2	3	4	5
39. Disruption to my usual routine /changes in my lifestyle.	1	2	3	4	5
40. Stopping work early and suddenly.	1	2	3	4	5
41. A relationship change between me and my partner.	1	2	3	4	5
42. A relationship change between me and my other children.	1	2	3	4	5
43. Changes in other people's attitudes and behaviour towards me and/or my baby.	1	2	3	4	5
44. Concerns about my family's fears and worries.	1	2	3	4	5
45. Concerns about my family's ability to cope with caring for me and/or my baby.	1	2	3	4	5
46. Concerns about my financial situation.	1	2	3	4	5
47. Increased expenses.	1	2	3	4	5

Supportive Care Needs Survey					
Since admission to the Antenatal Home Care Program I need help dealing or coping with the following:	**No Need**		**Some Need**		
	Have Not Experienced	**Satisfied**	**Low Need**	**Moderate Need**	**High Need**
48. Concerns about getting to and from the hospital.	1	2	3	4	5
49. Waiting at clinic and ultrasound appointments.	1	2	3	4	5
50. Having family and or friends with me at the hospital whenever I want.	1	2	3	4	5
51. Having my rights for privacy fully protected when I am at the clinic or hospital.	1	2	3	4	5
52. Having a choice about the specialist (physicians) I see at the hospital or clinic.	1	2	3	4	5
53. Feeling reassured by medical staff that my physical and emotional responses are normal.	1	2	3	4	5
54. Having the nurses attend promptly to my physical needs during my time in the Antenatal Home Care Program.	1	2	3	4	5
55. Having the nurses acknowledge and show sensitivity to my feelings and emotional needs.	1	2	3	4	5
56. Having the nurses acknowledge and show sensitivity to my family's feelings and emotional needs.	1	2	3	4	5

Supportive Care Needs Survey					
Since admission to the Antenatal Home Care Program I need help dealing or coping with the following:	**No Need**		**Some Need**		
	Have Not Experienced	**Satisfied**	**Low Need**	**Moderate Need**	**High Need**
57. Having my obstetrician (specialist physician) acknowledge and show sensitivity to my feelings and emotional needs.	1	2	3	4	5
58. Having my obstetrician (specialist physician) give me and my family a positive sense of hope.	1	2	3	4	5
59. Having a full explanation for every test and treatment or procedure I go through.	1	2	3	4	5
60. Being fully informed about all the benefits and side-effects of treatment or surgery before I agree to have it.	1	2	3	4	5
61. Being fully informed about the odds of treatment success.	1	2	3	4	5
62. Being fully informed about my test results as soon as possible.	1	2	3	4	5
63. Being fully informed about the possible effects of my problems on my health.	1	2	3	4	5
64. Being fully informed about the possible effects of my problems on the health of my unborn baby.	1	2	3	4	5
65. Being fully informed about the things my family and I can do to help me carry the pregnancy longer.	1	2	3	4	5

Supportive Care Needs Survey					
Since admission to the Antenatal Home Care Program I need help dealing or coping with the following:	**No Need**		**Some Need**		
	Have Not Experienced	**Satisfied**	**Low Need**	**Moderate Need**	**High Need**
66. Being fully informed about support groups in my community.	1	2	3	4	5
67. Being involved in decision-making regarding my health.	1	2	3	4	5
68. Being involved in decision-making regarding my unborn baby.	1	2	3	4	5
69. Feeling like a partner with the health care professionals in monitoring my pregnancy.	1	2	3	4	5
70. Feeling like a partner with the health care professionals in making choices.	1	2	3	4	5

71. What was your level of need for <u>easy access</u> to the following services and resources since admission to the Antenatal Home Care Program?

1 = No Need: Not applicable OR never interested in having access to this service or resource

2 = No Need: Fully satisfied with access to this service or resource

3 = Low Need: Had a low desire for better access to this service

4 = Moderate need: Had a moderate desire for better access

5 = High Need: Had a strong desire for better access

While I am on the Antenatal Home Care Program I need access to the following:	**No Need**		**Some Need**		
	Not Applicable/ Did Not Experience	**Satisfied**	**Low Need**	**Moderate Need**	**High Need**
a. Food and drink facilities in or near hospital clinic or ultrasound waiting rooms.	1	2	3	4	5
b. Convenient parking at the hospital.	1	2	3	4	5
c. Cost of parking at the hospital.	1	2	3	4	5
d. Transportation to and from the clinic.	1	2	3	4	5
e. Child-minding at the hospital or clinic.	1	2	3	4	5
f. Child-minding services to help me at home.	1	2	3	4	5
g. Homemaking services.	1	2	3	4	5
h. My obstetrician (specialist physician) will write down all the important points that s/he tells me and my family.	1	2	3	4	5

While I am on the Antenatal Home Care Program I need access to the following:	No Need		Some Need		
	Not Applicable/ Did Not Experience	Satisfied	Low Need	Moderate Need	High Need
i. Library of books and videos about my pregnancy problems.	1	2	3	4	5
j. Written information about ways of managing my pregnancy problems and side effects at home.	1	2	3	4	5
k. The opportunity to talk to someone who understands my situation and has been through a similar experience.	1	2	3	4	5
l. Relaxation classes.	1	2	3	4	5
m. Childbirth education and parenting education or classes.	1	2	3	4	5
n. Counseling and support services.	1	2	3	4	5
o. 24-hour telephone support and advisory service.	1	2	3	4	5
p. Antenatal Home Care Nurse home visits.	1	2	3	4	5
q. Antenatal Home Care Nurse telephone visits.	1	2	3	4	5
r. Monetary allowance for travel, treatment and equipment expenses.	1	2	3	4	5
s. Employment/benefits information or resources.	1	2	3	4	5

In the next section, we are asking you about the support person (s) who helped you.

1. NOT APPLICABLE
Not applicable or you were not interested in obtaining help from this person.

2. ALREADY SATSIFIED
You were already fully satisfied with the help or support given by this person.

3. LOW NEED
Low desire for more help or support from this person.

4. MODERATE NEED
Moderate desire for more help or support from this person.

5. HIGH NEED
Strong desire for more help or support from this person.

What was your level of need for help (related to your problems in THIS pregnancy) from the following people?

	NO NEED		SOME NEED		
Person(s) I would like to help me	**Not Applicable**	**Already Satisfied**	**Low Need**	**Moderate Need**	**High Need**
a. My spouse or partner	1	2	3	4	5
b. My parent(s)	1	2	3	4	5
c. My friends	1	2	3	4	5
d. My colleagues or boss	1	2	3	4	5
e. Home care worker	1	2	3	4	5
f. Meals on wheels worker	1	2	3	4	5
g. Antenatal Home Care Nurse	1	2	3	4	5
h. Dietician	1	2	3	4	5
i. Physiotherapist	1	2	3	4	5
j. Midwife	1	2	3	4	5

	NO NEED		SOME NEED		
Person(s) I would like to help me	**Not Applicable**	**Already Satisfied**	**Low Need**	**Moderate Need**	**High Need**
k. Family physician	1	2	3	4	5
l. Obstetrician	1	2	3	4	5
m. Maternal Fetal Medicine (specialist) physician	1	2	3	4	5
n. Religious or spiritual support person	1	2	3	4	5
o. Social worker or family support worker	1	2	3	4	5
p. Prenatal/parenting instructor	1	2	3	4	5
q. Psychologist or Counselor	1	2	3	4	5
r. Occupational Therapist	1	2	3	4	5
s. Hospital or clinic nurse	1	2	3	4	5
Other: please list	1	2	3	4	5
	1	2	3	4	5
	1	2	3	4	5
	1	2	3	4	5
	1	2	3	4	5
	1	2	3	4	5

ANY ADDITIONAL NEEDS?
Did you have any other issues or needs that have not been included in this questionnaire? Please list them in the space below.

	MY LEVEL OF NEED FOR HELP WAS:		
Issue or Need	**Low Need**	**Moderate Need**	**High Need**
	3	4	5
	3	4	5
	3	4	5
	3	4	5
	3	4	5
	3	4	5

General Information

The next questions are about your pregnancy and your background. Please fill in the blank or check the box beside the answer that best describes you now.

1. How old are you? _____

2. What is the language you speak most of the time at home?
   - ☐ English
   - ☐ French
   - ☐ Other please specify: _____

3. Is this your first pregnancy?
   - ☐ Yes
   - ☐ No I have been pregnant _____ times

4. If you have been pregnant before, have you had problems in any other pregnancy?
   - ☐ No
   - ☐ Yes. What was the problem?

   _____

5. How many children do you have? _____

6. Did you work outside the home with this pregnancy?
   - ☐ Yes
   - ☐ No

7. If you worked outside the home, what did you do?
   _____

8. How physically active were you before you discovered you had problems with this pregnancy?
   - ☐ Sat most of the day
   - ☐ Did some exercise but did not have a regular exercise plan
   - ☐ Exercised/walked for more than 20 minutes 3 times per week
   - ☐ Exercised/walked briskly for more than 20 minutes 4-7 times a week

9. How many weeks pregnant were you when you were admitted to Antenatal Home Care?
   _____ Weeks and _____ Days

10. Did you go to prenatal classes?
    - ☐ Yes
      - ☐ With this pregnancy?
      - ☐ With another pregnancy?
    - ☐ No

11. What is the main reason the AHCP nurses are seeing you at home?
    - ☐ Preterm labour
    - ☐ Ruptured membranes (your water broke early)
    - ☐ High blood pressure
    - ☐ Bleeding in the last months of pregnancy
    - ☐ Other Please specify _____

12. Who do you live with? Please check all that apply.
    - ☐ Husband/Partner
    - ☐ Your Mother
    - ☐ Your Father
    - ☐ Mother-in-law
    - ☐ Father-in-law
    - ☐ Children 2 years or under ___number
    - ☐ Children 3-5 years ___ number
    - ☐ Children 6 years and older ___ number
    - ☐ Other _____

13. What is your highest level of schooling?
    - ☐ Grade 8 or less
    - ☐ Some High school
    - ☐ High school graduate
    - ☐ Some College or university
    - ☐ College or University graduate

14. There are about 5 different ways women can be involved in making decisions about their health. Please choose the sentence that best describes how involved you **prefer** to be in making decisions about your health during this pregnancy.

    - ☐ I prefer to leave all my decisions about my care to my doctor.
    - ☐ I prefer that my doctor makes the final decision about my care but seriously considers my opinion.
    - ☐ I prefer that my doctor and I share responsibility for deciding what care is best for me.
    - ☐ I prefer to make the final decision about my care after seriously considering my doctor's opinion.
    - ☐ I prefer to make the final decision about the care I will receive.

15. Now please choose the sentence that best describes how decisions **have been made** about your health care during this pregnancy.

    - ☐ The doctor made the decisions about my care.
    - ☐ The doctor made the final decision about my care but seriously considered my opinion.
    - ☐ The doctor and I shared the responsibility for deciding what care was best for me.
    - ☐ I made the final decision about my care after seriously considering the doctor's opinion.
    - ☐ I made the final decision about my care.

16. Is there anything else you would like to tell me? Please use the back of this page if you need more room to write.

_____

_____

_____

PLEASE RETURN THIS QUESTIONNAIRE TO THE RESEARCH ASSISTANT AT THE START OF YOUR INTERVIEW

THANK YOU FOR YOUR VALUABLE CONTRIBUTION

Appendix G

Pregnancy Perception of Risk Questionnaire

UNIVERSITY OF MANITOBA | Faculty of Nursing

Office of Dr. Maureen Heaman
Helen Glass Centre for Nursing
Winnipeg, Manitoba
Canada R3T 2N2
Telephone: (204) 474-6222
Fax: (204) 474-7682
maureen_heaman@umanitoba.ca

July 20, 2006

Dear _____:

Thank you for your interest in the Perception of Pregnancy Risk Questionnaire (PPRQ). I am enclosing a copy of the PPRQ for your use in a research project, as requested. The instrument consists of 9 visual analogues scales. Each item is scored by measuring the distance from the start of the 100 mm line to the vertical mark placed through the line by the participant (score for each item ranges from 0 to 100). You then add the score for each of the 9 items, and divide the total score by 9, to obtain an overall score out of 100. Permission for use of the revised 9-item PPRQ is given with the understanding that the instrument will be administered in its complete form with all scales intact, and that the source of the questionnaire (Heaman & Gupton) will be appropriately referenced in all documents and publications pertaining to the study. I am also requesting that you share your results with me upon completion of the project.

I am currently preparing an article describing the psychometric testing of the revised 9-item version of the PPRQ, and I will send you a copy once it is published. Other references related to the PPRQ are as follows:

Heaman, M., Gupton, A., & Gregory, D. (2004). Factors influencing pregnant women's perception of risk. MCN The American Journal of Maternal Child Nursing, 29(2), 111-116.

Gupton, A., Heaman, M., & Cheung, L. (2001). Complicated and uncomplicated pregnancies: Women's perception of risk. Journal of Obstetric, Gynecologic, and Neonatal Nursing, 30(2), 192-201. (Note that this study used the former 11-item version of the PPRQ)

A brief summary of the psychometric testing for the 9-item PPRQ is as follows:
Reliability and validity were assessed using a sample of 199 women in the third trimester of pregnancy. Item means ranged from 15.6 to 48.6. Exploratory factor analysis resulted in a two-factor solution: "risk for self" (4 items) and "risk for baby" (5 items). Evidence of construct validity was demonstrated using the known-groups technique (women with complicated pregnancies had a significantly higher mean PPRQ score than women with uncomplicated pregnancies) and through convergent validity (positive correlation with a biomedical prenatal risk scoring form). A high rating of pregnancy risk predicted a high state anxiety level (Pearson $r = 0.46$, $p<0.001$), providing evidence of concurrent validity. The PPRQ had high internal consistency reliability (Cronbach's alpha 0.87) and also demonstrated acceptable test-retest reliability over one week ($r = 0.88$, $p <.001$).

Please feel free to contact me if you have any questions. Good luck with your project.

Sincerely,

Maureen Heaman, RN, PhD
Associate Professor

PERCEPTION OF PREGNANCY RISK QUESTIONNAIRE

The following questions ask you to rate your perception of personal risk during this pregnancy, and your perception of risk for your unborn child. There are no right or wrong answers. We are only seeking your opinion. Make your "best guess" of your risk and your unborn child's risk for a poor health outcome. Do not put your name on the form.

On each of the following rating scales, please put a vertical mark through the line to indicate your assessment of risk for each item (see example).

EXAMPLE:
My chances of winning the lottery are:

No Chance At All _____ Extremely High Chance

If you thought your chances of winning the lottery were very high, you might place your vertical mark through the line as follows:

No Chance At All _____ Extremely High Chance

---

1. The risk for myself during this pregnancy is:

   No Risk At All _____ Extremely High Risk

2. The risk for my unborn baby during this pregnancy is:

   No Risk At All _____ Extremely High Risk

3. My risk of hemorrhaging (losing too much blood) during this pregnancy is:

   No Risk At All _____ Extremely High Risk

4. My risk of having a caesarean section is:

No Risk At All _____ Extremely High Risk

5. My risk of dying during this pregnancy is:

No Risk At All _____ Extremely High Risk

6. My baby's risk of being born prematurely is:

No Risk At All _____ Extremely High Risk

7. My baby's risk of having a birth defect is:

No Risk At All _____ Extremely High Risk

8. My baby's risk of needing to go to the Neonatal Intensive Care Unit is:

No Risk At All _____ Extremely High Risk

9. My baby's risk of dying during this pregnancy is:

No Risk At All _____ Extremely High Risk

Thank you for your cooperation in answering these questions.

Faculty of Nursing, University of Manitoba, Winnipeg, MB, Canada R3T 2N2

Appendix H

Ethics Certificates

Université d'Ottawa University of Ottawa
Service de subventions de recherche et déontologie Research Grants and Ethics Services

HEALTH SCIENCES AND SCIENCE RESEARCH ETHICS BOARD

CERTIFICATION OF ETHICS APPROVAL

This is to certify that the University of Ottawa Health Sciences and Science Research Ethics Board (REB) examined the application for extension of ethics approval for the research project **The Perceived Needs of Women Diagnosed with High Risk Pregnancies and Their Experiences with Telephone Nursing Visits within an Antenatal Home Care Program. (file H 03-05-12)** submitted by Ms. Debra Kaye and supervised by Dr. Ian Graham of the School of Nursing, Faculty of Health Sciences. This project received initial ethics approval on April 8, 2005 by the REB as meeting appropriate ethical standards set out in the Tri-Council Policy Statement and in the Procedures of the University of Ottawa Research Ethics Boards. The University of Ottawa REB members accordingly gave it an extension of ethics approval. This ethics renewal certification is retroactive to June 8, 2005 and valid until April 8, 2006.

Rita D'Alessandro
Protocol Officer for Ethics in Research
For Dr. Daniel Lagarec, Chair of the
Health Sciences and Science REB

June 29, 2005
Date

550, rue Cumberland 550 Cumberland Street
Ottawa (Ontario) K1N 6N5 Canada Ottawa, Ontario K1N 6N5 Canada
(613) 562-5841 • Téléc. / Fax (613) 562-5338

The Ottawa Hospital | L'Hôpital d'Ottawa

Research Ethics Board
Conseil d'éthique en recherches
798-5555 ext 14146, 14902 or 15072
Fax No. ~ 761-4311
http://www.ohri.ca/ohreb/

Tuesday, June 07, 2005

Ms. Debra Kaye
Ottawa Hospital - General Campus
Division of Maternal and Newborn Care
501 Smyth Road
Ottawa, ON
K1H 8L6

Dear Ms. Kaye:

Re: Protocol # 2005124-01H **The Perceived Needs of Women Diagnosed with High Risk Pregnancies and Their Experiences with Telephone Nursing Visits within an Antenatal Home Care Program**

Thank you for the revised English Client Information Sheet, the new French Client Information Sheet, the revised English Focus Group Information Sheet, the revised English Stakeholder Information Sheet, and the new Pregnancy Perception of Risk Questionnaire. They are all approved. The protocol has now been extended to include the recruitment of French-speaking participants.

The study expiry date has now been extended to March 15, 2006.

Yours sincerely,

Raphael Saginur, M.D.
Chairman
Ottawa Hospital Research Ethics Board

Encl.

cb

Appendix I

Table 5: Infant Data

Table 5 *Description of the Eligible Study Population and Sample: Infant Data*						
	All Eligible Clients (May - Sept 2005) *n=41***			**Study Sample *n=16***		
Birth	**Singleton/ TWIN A**	**TWIN B**	**Percent A + B**	**Singleton/ TWIN A**	**TWIN B**	**Percent A + B**
Spontaneous vaginal	17	4	51.2%	5	1	37.5%
Assisted vaginal	4	0	9.8%	0	0	0.0%
Caesarean birth	13	3	39.0%	8	2	62.5%
Birth Weight	**Singleton/ TWIN A**	**TWIN B**	**Percent A + B**	**Singleton/ TWIN A**	**TWIN B**	**Percent A + B**
1500-2000	5	0	12.2%	0	0	0.0%
2000-2500	8	5	31.7%	5	2	43.8%
2500-3000	9	1	24.4%	3	1	25.0%
3000-3500	8	1	22.0%	4	0	25.0%
> 3500	4	0	9.8%	1	0	6.3%
Apgar @ 1	**Singleton/ TWIN A**	**TWIN B**	**Percent A + B**	**Singleton/ TWIN A**	**TWIN B**	**Percent**
≤ 3	1	2	7.3%	0	2	12.5%
4-5	1	0	2.4%	0	0	0.0%
6-7	5	0	12.2%	3	0	18.8%
8-10	26	5	75.8%	9	1	62.5%
Not Available	1	0	2.4%	1	0	6.3%
Apgar @ 5	**Singleton/ TWIN A**	**TWIN B**	**Percent A + B**	**Singleton/ TWIN A**	**TWIN B**	**Percent A + B**
≤ 3	1	1	4.9%	1	1	12.5%
4-5	0	0	0.0%	0	0	0.0%
6-7	4	1	12.2%	0	1	6.3%
8-10	28	5	80.5%	11	1	75.0%
Not Available	1	0	2.4%	1	0	6.3%
Neonatal Care	**Singleton/ TWIN A**	**TWIN B**	**Percent A + B**	**Singleton/ TWIN A**	**TWIN B**	**Percent A + B**
Mother Baby Unit	13	2	36.6%	6	1	43.8%
Special OBS	11	3	34.1%	5	1	37.5%
NICU	9	2	26.8%	1	1	12.5%
Home*	1	0	2.4%	1	0	6.3%

* One home birth
** Eligible population included the study sample i.e. 25 eligible but did not participate + 16 participants

Appendix J

Table 6 Sample Population Characteristics

Table 6 *Sample Population Characteristics*		
Decision Making Preference *n* = 12*	**Number**	**Percent**
I prefer to leave all my decisions about my care to my doctor.	0	0.00%
I prefer that my doctor makes the final decision about my care but seriously considers my opinion.	3	25.00%
I prefer that my doctor and I share responsibility for deciding what care is best for me.	5	41.67%
I prefer to make the final decision about my care after seriously considering my doctor's opinion.	4	33.33%
I prefer to make the final decision about the care I will receive.	0	0.00%
Now please choose the sentence that best describes how decisions <u>have been made</u> about your health care during this pregnancy.		
The doctor made the decisions about my care.	4	33.33%
The doctor made the final decision about my care but seriously considered my opinion.	5	41.67%
The doctor and I shared the responsibility for deciding what care was best for me.	3	25.00%
I made the final decision about my care after seriously considering the doctor's opinion.	0	0.00%
I made the final decision about my care.	0	0.00%
* One participant marked multiple answers for these questions		
How physically active were you before you discovered you had problems with this pregnancy?	**Number**	**Percent**
Sat most of the day	0	0
Did some exercise but did not have a regular exercise plan	5	38.5
Exercised/walked for more than 20 minutes 3 times per week	3	23.1
Exercised/walked briskly for more than 20 minutes 4-7 times a week	5	38.5

Table 6 *Sample Population Characteristics*		
Number of children		
None	5	38.5
1 Child	7	53.8
2 Children	0	0
3 or more Children	1	7.7
Language (first)		
English	11	84.6
French	2	15.4

Appendix K

Table 10 Chart of Documented Telephone Nursing Activities

Table 10 *Chart Of Documented Telephone Nursing Activities*

Participant	Home visits	Phone visits with client (nurse initiated)	Client initiated contacts	Phone assessment	Phone support	Phone intervention	Phone plan	Comments: Includes additional calls where the participant was not contacted
1 PTL	17	23	5	40	1	5	7	5 calls no contact 3 pages after clinic
2 PTL	9	24	1	25	0	5	8	1 no contact
3 PTL	17	29	12	44	3	7	7	6 calls no contact 4 pages in response to message from nurse to page
4 PTL	8	7	2	9	0	0	0	1 call no contact Pt initiated calls – 1 response to message and 1 after return from clinic
5 PTL Twins	10	8	4	12	0	1	1	4 not answered by patient. All pages were in response to messages left when nurse did not reach patient. 1 call the nurse spoke with the partner as patient was sleeping
6 PTL Twins	13	38	12	50	0	4	12	6 no contact 1 spoke with participant's relative
7 PTL Twins	9	5	6	11	3	2	4	No missed calls
8 APH	10	15	4	19	3	2 teaching 1 sent to OAU 1 discharge teaching	2	1 call spoke to relative 1 contact with partner

Table 10 *Chart Of Documented Telephone Nursing Activities*

Participant	Home visits	Phone visits with client (nurse initiated)	Client initiated contacts	Phone assessment	Phone support	Phone intervention	Phone plan	Comments: Includes additional calls where the participant was not contacted
9 APH	13	16	4	20	5	6	9	2 calls no contact. 1 page in response to phone message 1page after clinic
10 APH	9	12	2	12	0	4	6	5 calls no contact 1 day no documentation client initiated contacts – 1 response to phone message, 1 page after clinic
11 APH admission #1	6	2	5	7	1	4	4	No missed contacts
11 APH admission #2	7	8	2	10	2	5	2	1 call not answered 1 page in response to nurse's message to call
12 PPROM	16	2	6	7	4	4	5	1 call spoke with partner and not participant
13 Oligo-hydramnios	8	9	5	14				1 call no contact 3 pages after clinic 1 page in response to phone message

Appendix L

Interview Guide

Interview Guide

Women's' Experiences with Telephone Mediated Nursing Care in high Risk Pregnancy

Interview Questions	Probes
1. Many of the visits from your nurse are over the phone. Tell me what this is like.	[ ] What do you talk about during the telephone visits with the nurse?
2. How is this different from when the nurse visits you at home?	[ ] What are the differences between face to face visits and telephone visits?
3. Are there any of the needs that you have talked about that you prefer to talk about over the phone? Tell me about that.	[ ] What do you think of the telephone visits? [ ] What do you like best about telephone visits? [ ] What do you like least about telephone visits?
4. Are there any needs you have told me about that you feel you cannot talk about or understand in a telephone visit from your nurse? Tell me more about that.	[ ] What is the most difficult for you about telephone visits? [ ] What would have been the right balance of phone calls to home visits for you? [ ] Are there things you wish they would talk about or not talk about?
5. Do you have any suggestions for improving the antenatal home care telephone visits?	
6. Is there anything else about participating in the Antenatal Home Care Program you would like to share?	[ ] From your experience with antenatal home care, what would you tell other women just coming into the program??
7. Is there anything else you would like to tell me?	

Appendix M

Qualitative Interview Code Book

Telephone Nursing Care Code Book

1. Describing the Experience of Being at Home

Isolation/boredom

- Isolation is the sense of being alone whether perceived or physical. This may refer to social isolation such as not having someone come to visit you, experiential/situational isolation such as when someone feels that no-one understands or has experience with something they are dealing with or may relate to being removed from a person or place such as when a patient is at home nd does not have access to nurses or other health care providers.
- Boredom is a state of mind that can be generated by isolation or disinterest in an activity.

Uncertainty/anxiety

- The state of not knowing, or not being able to plan or predict a course of events or outcome.
- This may cause a state of anxiety or discomfort or distress due to the unpredictable future.

Transition

- A move from one point to another in ability, confidence or physical state, or a passage of time in pregnancy.

Home versus Hospital

- A comparison between being at home and being in the hospital. Comments may be positive or negative.

2. "Just a Call"

"Just a call"

- A lack of importance or value or discounting importance of the telephone call from or to the nurse. The participant may use words such as just, only, basic.

3. More than "Just a Call"

Monitoring

- Determine signs or symptoms of disease or concern or those physical sensations or changes that occur due to some event such as bed rest, contractions. This may be assessing the client by self report for presence of such things as contractions, presence/absence of fetal movement, status of vaginal discharge, signs of infection, signs of increasing blood pressure or symptoms requiring medical attention

Support

- Provision of care by the health care providers i.e. nurse, doctor, dietician etc. Activities or actions by health care providers that give help to, enable, encourage the client or patient.

Information /teaching/education

- Something told; knowledge

Reassurance

- This may be answering questions, confirming self assessment that may mean encouraging to seek further medical help or confirming that she is indeed able to remain home longer and continue to monitor condition

Expertise

- Expert skill, knowledge or judgment

Trust

- Faith or confidence in the veracity, reliability or strength of a person

Caring

- Actions of the nurse, perceived or actual, that indicate to the client that she is important to the health care providers. This may include her opinion, physical or mental state, family, financial burden etc.

Confidence

- Ability to self assess is improved. The client feels capable of identifying worrisome signs or symptoms and reporting them appropriately. Confident that she can read her body and act in the manner required.

Connecting

- This may include checking-in, providing a lifeline for the client, accessibility to the client, creating a link between the client and the nurse or health care provider or health care system.

Information transfer

- Transfer of information regarding patient care from one member of the professional team to another, i.e. nurse to nurse, physician to nurse etc
- or treatment or information about the patient that may influence care

Knowing the patient

- Have regular contact with the same person or persons. Have information about the person either from charts or from previous conversations, information shared between health professionals.

Convenience

- accessibility considerations for decreasing family disruption or improving ability of patients to access care without increasing travel time or inconvenience

Partnership

- Doing something together or a joint venture

Concerns

Visit Frequency

- The frequency of the home or telephone visits were perceived as being different from what the woman wanted

Tied to the phone

- Impression that the client cannot miss phone calls from the nurse or expressed distress at not being present/answering the telephone when the nurse calls

4. Perceived Health System Resource Use

Telephone versus home visit

- A comparison between home and telephone visits or a stated preference.

Consistency

- The same nurse or group of nurses or other health professionals care for the client. Nursing actions or care are similar or consistent between nurses.

Availability

- At one's disposal, obtainable; can be readily reached or used.

Patient initiated contact

- Contact that is initiated by the client paging the nurse or requesting that a family member or other health care provider page the nurse for her or to relay a message.

Service use

- Health care services that the women mention using. Could be such things as triage, increased frequency of clinic visits etc.

Appendix N

Data Saturation Table

Table 13 Data Saturation Table

Themes, Categories and Sub-Categories

Themes are in uppercase bold lettering, the categories are written in italics and any sub categories are identified by sentence case, normal script. The gray highlight is the third time a category is mentioned and indicates saturation.

Themes & Codes	Participant ID Number												
	1	2	3	4	5	6	7	8	9	10	11	12	13
EXPERIENCE OF BEING AT HOME													
Isolation/ boredom	1	1	1	1	2	4	1	2	1	1	2	1	3
Uncertainty/ Anxiety	6	2	2	1	1		4	3			3		
Transition				2			6	7	1		1	2	
Home vs. Hospital						1	2	1			1	1	
"JUST A CALL"	2	2	3	1	5	4	2	1	3		3	2	2
MORE THAN "JUST A CALL"													
Monitoring	1	4	4	6	8	7	4	4	2	2	4	6	6
Support	2	2	2	4	11	6	2	2	1	1	1	1	3
Caring			1	1	1	2	1	1	1	3	2	4	1
Knowing the person					1	2	3			1	3	1	
Information	5	2		4	2	3	3	5	5	4	4	5	4
Reassurance													
"Just a call away"	1		3	2			3	3	2	1	7	3	1
Confidence				2			1	4	1		1	3	
Expertise	4	4	4	2	2	3	2	3	5		4	3	1
Trust											3	2	2
Connecting	7	2	5	4	12	9	3	2	4	2	7	4	4
Convenience						1		3	1		1	3	
Continuity of Information						1	1			1	2		1
Partnership							1				1	1	
Concerns													
Difficulties assessing					1	4	1						2
Tied to the phone				2		1					1	2	

Table 13 Data Saturation Table

Themes, Categories and Sub-Categories

Themes are in uppercase bold lettering, the categories are written in italics and any sub categories are identified by sentence case, normal script. The gray highlight is the third time a category is mentioned and indicates saturation.

Themes & Codes	Participant ID Number												
	1	2	3	4	5	6	7	8	9	10	11	12	13
PERCEIVED HEALTH SYSTEM RESOURCE USE													
Telephone vs. home visit	4	1	2		3	5	2	4	2	2	4	3	2
Availability													
Patient initiated contact	2	1			1	8	2	4	2	1	5	1	2
Services													
Efficiency						2					1		1
Consistency						1		2	1		1	1	1
Appropriate service use	3					1					3	2	