

Stress, Support and Self-Esteem and the Event of  
Preterm Labor and Preterm Birth

By

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## DEDICATION

This project is dedicated to the love and support of family. Without their unwavering patience and prodding, this Master's Research Project would have never reached the end.

## ABSTRACT

TITLE: Stress, Support, Self-Esteem and the Event of Preterm Labor and Preterm Birth

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This descriptive, correlational pilot study examined the psychosocial variables of stress, social support from partner and other, self-esteem and abuse in relation to events of preterm labor and preterm birth. The convenience sample of 27 women were enrolled in Kaiser's preterm birth prevention program. Nurse case managers administered the Prenatal Psychosocial Profile (PPP) and sociodemographic survey tool one time during a prenatal visit or via telephone reviews. Outcome data regarding events of preterm contractions, preterm labor gestational age, and birth weight at delivery were obtained from medical record review. Sociodemographic characteristics, biomedical factors, and events of preterm contractions and preterm labor were reported using descriptive statistics. Abuse was defined as a positive response to any of the three abuse screening questions on the PPP. Mean scale scores were calculated for stress, social support from partner and other, and self-esteem. A T-test ( $p < .05$ ) compared biomedical risk factors, PPP scores, gestational age, and birth weight for abused vs. non-abused women. A T-test was also utilized to compare differences in PPP scores for women who did and did not experience preterm birth or low birth weight infants. Cross tabulation tables were used to evaluate differences

between abused and non-abused groups and the incidence of preterm contractions, preterm labor and low birth weight. A Pearson's  $r$  correlation was used to determine the association between the psychosocial variables. The data did demonstrate an inverse relationship between stress and partner support and stress and self-esteem. There was not a significant correlation between PPP scores and preterm birth. Abused women reported more stress and less support from their partners. The mean scores for self-esteem and mean birth weight were lower for the abused group but did not reach statistical significance.

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## Background

The event of preterm labor and delivery is considered the most significant problem in maternal and neonatal care. Preterm birth (PTB) has been the major contributor to infant morbidity and mortality for centuries (Creasy, 1994). There is currently not a single mechanism or etiology to explain or predict preterm labor (PTL) or preterm birth (PTB). Factors that are associated in the initiation of preterm labor include biomedical and obstetrical markers, limited prenatal care, acute and chronic stress, lack of social support, lifestyle, and sociodemographic status (Freda & Patterson, 1994; Wheeler, 1994).

Risk screening for biomedical and lifestyle factors is a routine part of prenatal care, although the relationship between these factors and preterm birth is not clearly established. Less often assessed are the psychosocial factors, which may influence and contribute to high risk status of preterm labor and other pregnancy complications (Pagel, Smilkstein, Regen, & Montano, 1990). Important risk factors associated with pregnancy and neonatal complications include life stress, low social support and negative attitudes relating to self (self-esteem) and/or pregnancy (Schmitz & Reif, 1994).

Domestic violence (abuse) has also been associated with complications of pregnancy including preterm labor (Christian, 1995). The objective of this research is to examine the relationship between the psychosocial variables of stress, social support, self-esteem, and abuse and events of preterm labor and



delivery in pregnant women with identified risk factors for preterm birth.

### Review of the Literature

#### Preterm Labor and Preterm Birth

Preterm labor is defined as the onset of contractions between 20 and 37 weeks gestation accompanied by progressive cervical changes (Cunningham, MacDonald, Leveno, Gant & Gilstrap, 1993; Wheeler, 1994). Multiple factors play a role in the onset of preterm labor. There is not a single mechanism or “common cause” of preterm labor. It appears that equal numbers of preterm births are caused by spontaneous preterm labor, premature rupture of membranes and/or medical, obstetrical, and fetal complications (Starr, Shannon, Sammons, Lommel & Gutierrez 1990; Papke, 1993).

The PTB rate in the United States is about 6-10% and accounts for 60% of perinatal morbidity and mortality (Herron, Katz & Creasy, 1982; Neal & Brockman, 1992). Approximately 75% of preterm infants require extended hospital stays with costs estimated at over 5 billion dollars annually (Murphy, 1993; Freston et al, 1997).

Although PTL/PTB cannot be predicted there are identified markers which are associated with this event. The most commonly identified risk factors are outlined in Table 1 (Neal & Bockman, 1992; Berkowitz & Kasl, 1993; Cunningham, et al, 1993; Creasy, 1994; Wheeler, 1994).

Table 1

Risk Factors

Reproductive History	Maternal/ Demographic	Current Pregnancy
Prior PTB or history PTL	Age (<17 or >35)	Hard physical work
Multiple abortions	Single	Long commutes
Cervical incompetence	Nonwhite	Inadequate prenatal care
Uterine anomalies	Education/economically Disadvantaged	Multiple gestation
Short pregnancy intervals		Psychological stress/ poor social support
Nutritional deprivation		Bleeding
		Uterine irritability
		Uterine trauma/abuse
		Infections

The literature suggests that early identification of risk factors, prenatal education and other interventions are an important aspect of prenatal care aimed at preventing preterm birth and reducing perinatal mortality and morbidity (Rathbone & Ramsey, 1994; Freston et al, 1997).

Stress

Life stress is described as situations or events with the “potential for taxing a person’s pattern of daily functioning” (Albrecht & Rankin, 1989).

Stress in pregnancy can be related to maternal or fetal health problems, unexpected events of pregnancy, and specific situations associated with career,

finances, or interpersonal and family relationships (Gorman, 1995). It is reported that being labeled a high risk pregnancy or being identified with “risk factors” is a stressful life event during pregnancy which may contribute to anxiety or a period of emotional instability (Kemp & Pond, 1986; Mercer & Ferketich, 1988; Westlander, 1991; Gorman, 1995).

Maternal stress has been associated with many complications of pregnancy including preterm labor and delivery, low birth weight, intrapartum and postpartum problems (Gorsch & Key, 1974; Smilkstein, Helsper-Lucus, Ashworth, Montano & Pagel, 1984). Adverse outcomes in pregnancy have also been associated in women experiencing high stress and lower social support ( Nuckolls, Cassel, & Kaplan, 1972; Williamson, LeFever, & Hector, 1989).

Studies indicate that stress, measured as life events, has been specifically linked to preterm birth (Smilkstein et al., 1984; Newton & Hunt, 1994). It is suspected that stress may play a role in the pathophysiology of preterm labor. Stress can cause the release of corticotropin-releasing hormones and prostaglandins and/or produce a reduced immunologic response resulting in susceptibility to infection and cytokines release (Freda & Patterson, 1994; Rathbone & Ramsey, 1994). Both physiological responses result in uterine contractions. The physical response to stress (coping behavior and catecholamine response); the emotional response (anxiety, altered locus of control); and individual response (personality) may all contribute to adverse outcomes in pregnancy, including preterm labor (Bryce, Stanley & Enkin, 1988).

### Social Support

Similar to other changes in health status, pregnancy is considered a time of transition and vulnerability and for some women may represent a period of acute stress or crisis (Brown, 1985). Support can have both a positive effect on health as well as buffering effect on stress associated with increased levels of coping.

Cobb (1977), suggested that social support mediates stress, major transitions, and crisis throughout the life cycle. Support may serve as a “buffer” or facilitate coping when one is faced with life events and adaptation. Cobb defined social support as information leading one to believe that he/she is cared for and loved, valued and esteemed, and a member of a network of mutual obligation (Cobb, 1977). Support is also defined as the contact with formal and informal groups in order to seek comfort, assistance and advice ( Bryce et al, 1988). Social support has been considered *protective* against pregnancy complications and low birth weight (Nuckolls et al, 1972; Norbeck 1981; Norbeck & Anderson, 1989).

Social support plays an important role in mediating the effect of stress and balancing health for both pregnant women and their partners (Brown, 1985). Women experience more stress during pregnancy and seek support from a larger network of people, activating resources to maximize coping during times of health changes and transitions of pregnancy. Partner support has been

found to reduce anxiety and has been associated with a significant stress buffering effect (Norbeck & Anderson, 1989). Social support other than partner may increase coping and adaptation to stressful life events when key support resources are not available (Norbeck & Anderson, 1989).

In a small sample (N=45) of women experiencing preterm labor, Richardson (1987) found that the preterm labor group reported significantly more unsatisfactory relationships with partners, parental figures and peers. Many of the women in the preterm labor group also stated worrisome relationships with their husbands at the onset of pregnancy that remained problematic or deteriorated. A sense of isolation and loneliness was more extreme for women experiencing preterm labor and problems in their relationships were long standing.

In contrast, Villar, Farnot, Barros, Victora, Langer, & Belizan (1992) concluded that intense formalized support for women identified with high levels of anxiety and low levels of social support did not significantly improve the outcomes of preterm delivery and low birth weight babies. However the authors did acknowledge that short-term intense support might not be sufficient to overcome a lifetime of disadvantages and health problems in a sample of low socioeconomic women.

### Self-Esteem

Self-esteem is defined as how one perceives or evaluates oneself in the environment. It can be considered the self-acceptance or self regard aspect of

self-concept or the degree to which one values himself or herself (Tilden, 1983; Kemp & Page, 1987). Self-esteem is inferred as high or low, depending on the person's behavior in a wide variety of circumstances (Stanwyck, 1983). The development of self-esteem is influenced by at least 4 experiences: (a) significant others; (b) social role expectations; (c) psychosocial development crisis; and (d) communication/coping style (Stanwyck, 1983).

Crouch & Straub (1993) described the characteristics of self-esteem as basic and functional. Basic self-esteem is established early in life and is connected to family interactions and relationships. Functional self-esteem refers to the ongoing process of evaluating interactions with others and the environment. Functional self-esteem can fluctuate moment to moment and usually transcends basic self-esteem. During times of acute or chronic stress functional self-esteem can regress to levels below basic self-esteem. Self-esteem is also comprised of the perceived self vs. the ideal self or how one views himself/herself and believes how others see him/her compared to what one believes they should be. The person with low self-esteem has a large discrepancy between perceived and ideal self and often evaluates one self much more negatively. During times of transitions and life cycle experiences, such as pregnancy, functional self-esteem changes as one adapts to new roles and identities. Individuals and families with low self-esteem and negative evaluations of perceived and ideal self tend not to adapt well to change. Functional self-esteem may plummet during acute stress, conflicts and difficult transitions,

predisposing to illness and other problems.

Decreased levels of self-esteem are associated with increased perceptions of illness. In a self-report study, women who reported health problems and illness were more likely to report low self-esteem than women with no health problems (Antonucci & Jackson, 1983).

Considering the theory that self-esteem is a learned phenomenon, involving a life long process and influenced by social relationships, Muhlenkamp & Sayles (1986) suggest that self-esteem is highly correlated with social support. Both lifestyle and health practices are influenced by self-esteem. Those with high self-esteem tend to perceive adequate support networks and maintain more positive health practices.

Low self-esteem is also associated with higher risk pregnancies ( Kemp & Page, 1987). The question remains whether women with high-risk pregnancies had lower self-esteem because of the pregnancy status or had lower self-esteem prior to pregnancy. Women with low self-esteem may not perceive control of the pregnancy event or a sense of competency in achieving successful outcomes thus increasing stress and anxiety levels during a high-risk pregnancy.

### Abuse

Domestic violence against women is estimated to range from 1- 12 million events per year (Bohn, 1990). The incidence of physical, psychological and/or sexual abuse during pregnancy has been estimated to range from 0.9% to 20%, with the most commonly cited prevalence rates reported between 3.9 to 8.3%

multifactorial and is conceptualized within a biopsychosocial model.

In this conceptual framework the biomedical, obstetrical, life style risk factors and abuse are considered to directly impact the event of preterm labor and preterm birth, either separately or simultaneously. The psychosocial variables of stress, support and self-esteem are viewed as indirectly contributing to the other elements by affecting the ability to cope with or alter the identified risk factors during pregnancy.

Stress is defined as situations or events that have the potential or are perceived to tax a person's resources or alter one's sense of well being.

Support is defined as the belief that one is cared for and about. Support has both an emotional and practical component. An individual perception of what constitutes support and who should give support will influence the effectiveness of support. Self-esteem is categorized into basic and functional and is delineated by the acceptance of the perceived self (how they see themselves) compared to the ideal self (how they believe they should be). This study focused on measuring the perception and impact of these concepts in a group of women identified with risk factors for preterm labor.

This study proposes that the assessment of psychosocial variables may lend information and improved understanding of factors related to the initiation of preterm labor. Therefore, within the context of this conceptual framework, this research project addressed the following research questions:

1. What are the relationships between perceived levels of stress, social



support, and self-esteem for pregnant women enrolled in a preterm birth prevention program?

2. What is the relationship between these variables and the incidence of preterm labor and preterm delivery for women with identified risk factors?

3. What is the relationship between abuse and the incidence of preterm labor and delivery for women with identified risk factors?

### Methods

This was a descriptive, correlational pilot study to investigate the association between stress, social support and self-esteem and the incidence of preterm labor and preterm birth. The relationship between abuse and the event of preterm labor, preterm delivery and low birth weight was also evaluated.

### Participants

Participants were pregnant women enrolled in a preterm birth prevention program at Kaiser Permanente, a Health Maintenance Organization in the Northwestern United States. All participants had one or more risk factors for preterm labor and received prenatal care at one the 8 outpatient Kaiser facilities. To be included in this study, women had to be greater than 17 years of age, between 15-34 weeks gestation and speak English. A convenience sample of 27 women was recruited between September and December 1996.

### Data Collection

All procedures were approved by Kaiser and OHSU Institutional Review Boards. Referral to the preterm birth prevention program (PTBP) was initiated

by obstetrical clinicians following the assessment of biomedical and lifestyle risk factors associated with preterm labor and delivery. An RN case manager introduced the study to eligible participants at the time of initial contact for enrollment in the PTBP. Informed consent was obtained by mail. After receiving the signed consent, the Prenatal Psychosocial Profile (Curry, Campbell, & Christian, 1994) was administered by 2 RN case managers in a private interview during a prenatal visit or by telephone. Interventions for the women enrolled in the study were conducted per PTBP protocols and not manipulated during data collection. Identified abuse issues were managed as directed by Kaiser's domestic violence protocol. A logbook of participant's health record numbers and coded Prenatal Psychosocial Profile (PPP) questionnaires was kept to facilitate outcome data collection. This logbook was destroyed once data collection was completed.

### Instruments

The PPP was utilized to collect data on the psychosocial variables of stress, support from partner, support from others, and self-esteem. The stress subscale lists 11 items identified as stressors or hassles that are rated and recorded on a Likert scale 1 = no stress to 4 = severe stress. The items in this subscale were selected from the Daily Hassles scale and reflect typical stressors identified in the literature (Affonso & Mayberry, 1990, Green, 1990). Reliability and validity for this subscale were established in a pilot study (Curry, Campbell & Christian, 1994). Internal consistency was adequate for research purposes with

an average Cronbach's alpha of 0.75. The mean stress score in the pilot studies was 18.84, with a standard deviation 5.02 and range 11-32.

Assessment of support is the 11 item Support Behavior Inventory (SBI) (Brown, 1986). The subscale is divided into two sections measuring perceived support from partner (if relevant) and support from others. Responses are recorded on a Likert scale ranging from 1 = very dissatisfied to 6 = very satisfied. Cronbach's alpha was 0.90 - 0.95 for this subscale during pilot studies. The mean partner support score was 51.95, standard deviation 12.80 and range 14-66. Other support mean score was 50.17, standard deviation 12.60 and range 11-66.

Self-esteem was measured by an 11-item subscale comprised of Rosenberg's Self-Esteem Scale (1965) and an additional item related to extent of perceived control. This scale measures the self-acceptance aspect of self-esteem (Curry, et al, 1994). The questions in this subscale are both positively worded to reflect a positive self attitude and negatively worded relating to feelings of low self-worth. The reported Cronbach's alpha for the 11 item self-esteem scale is 0.83 (Curry, et al, 1994). The pilot studies mean self-esteem score was 34.76 with a standard deviation of 5.10 and range 17-44.

The PPP concludes with 3 abuse screening questions from the Abuse Assessment Screen (Parker & McFarlane, 1991): 1) Within the last year, have you been hit, slapped, kicked or otherwise physically hurt by someone? 2) Since you've been pregnant have you been hit, slapped, kicked, or otherwise

physically hurt by someone? 3) Within the last year, has anyone forced you to have sexual activities? A positive response to any one or more of the 3 questions was coded as abuse for purposes of data analysis. An abused or non-abused variable was created to investigate the relationship with the incidence of preterm labor and preterm birth. The questions were also used as clinical indicators for interventions by the preterm birth prevention program case managers.

Sociodemographic information related to age, gravida, education and income was obtained at the start of the interview. The number of prenatal visits and gestational age was obtained from the medical record. Biomedical risk information was obtained by review of Risk Screen for Preterm Birth and participants medical records. The risk-screening tool was designed for prenatal assessment in the Kaiser system and has not been subjected to reliability or validity testing but is representative of risk factors that are well documented in the literature.

Data collection of outcome measures including events of preterm contractions, preterm labor and delivery information was obtained by a medical record review. Labor observation records were reviewed to determine if preterm contractions were observed, cervical change occurred, tocolytic therapy administered, or hospital admission occurred. It should be noted that the availability of information regarding labor observation/evaluation varied depending on the hospital location and the accuracy of this information is

uncertain and is probably under reported. Labor and delivery summaries were reviewed for gestational age at delivery and birth weight.

### Statistical Analysis

The CRUNCH statistical program was used for data analysis. Mean scores were calculated for the PPP scales, birth weight and gestational age. Frequency distributions were calculated for biomedical risk factors, abuse screening questions, events of preterm contractions, and preterm labor. Mean scale scores were established for the PPP responses. Pearson's  $r$  correlation were conducted to determine association between the psychosocial variables. Cross tabulation tables (7) statistically evaluated the association between reported abuse and events of preterm labor, preterm birth and low-birth weight. A student's T-test ( $p < .05$ ) was used to compare biomedical risk factors, PPP scores, birth weight, and gestational age for abused versus non-abused women. The T-test was also utilized to compare the mean scores of stress, social support, and self-esteem in association with preterm birth and low birth weight. Descriptive statistics were used to report sociodemographic characteristics of the sample.

## Results

### Sample Characteristics

Of the 82 consents that were mailed, 28 consents were returned for a 34 % response rate. One participant was unable to be located by telephone or at a clinic site for the initial interview, leaving 27 women who were interviewed.

Missing data included two responses for the PPP other support scale and outcome data on one participant lost to follow up. The two participants missing the other support data declined to respond to this scale secondary to a recent relocation to this area. Both participants felt they did not have a support network outside of their partner. Table 2 shows the mean, standard deviation and range for selected demographic characteristics. Of the 27 participants, 85% (23) were Caucasian, 7% (2) black, 4% (1) Asian American, and 4% (1) Pacific Islander. Eighty-one percent had attended some college, 96% (26) were partnered, and 52% (14) worked outside the home. Five participants were considered below federal poverty level. The sample included 2 sets of twins and 1 set of triplets.

Table 2

Demographic Characteristics

Characteristic	Mean	SD	Range
Age/yrs	28	5.2	18-38
Gravida	3.3	1.9	1-9
Education/yrs	14	2.7	10-22
Income/month	2302.	1471.9	277-6500
No. Prenatal visits	11	3.2	6-18
Gestational age at interview	26 wks	4.4	15-35

Biomedical Risk Factors

Table 3 shows the frequency distribution of risk factors for preterm birth used for enrollment in Kaiser's preterm birth prevention program. Risk factors are based on previous pregnancy history, current pregnancy status and are categorized into major and minor risk.

Table 3

Risk Factors

<u>Major Factors</u> (one or more = high risk)	<u>Frequency</u>
<u>Previous Pregnancies</u>	
History preterm birth < 37 weeks	6
History PTL (cervical change, PROM with term birth)	10
Two or more second trimester SABs or TABs	--
Prior cone biopsy or LEEP	3
DES or Uterine Anomaly	4
<u>Current Pregnancy</u>	
Incompetent cervix/cerclage	--
Twins or more	3
Polyhydramnios (AFI > 25)	--
Placenta Previa	--
Bleeding after 12 weeks	4
Uterine irritability without cervical change	9
PTL current pregnancy (cervical change)	6
PROM	--
Cervical dilation > 1 cm before 32 weeks	4
Cervical length < 1 cm before 32 weeks	4
Drug use this pregnancy (cocaine, amphetamines)	--
Abdominal surgery after 18 weeks	1

Risk FactorsMinor Risk Factors (two or more = high risk)

History of drug use	4
One second trimester SAB or TAB	1
Three or more first trimester SABs or TABs	2
Pyelonephritis (ever)	1
Smokes > 10 cigarettes/day	5
Physical or sexual abuse this pregnancy	5
Hard physical labor	3
Very underweight (< 100 lbs. or < 90% ideal weight for height)	2
Missed 2 or more consecutive prenatal visits	2
Other	
< 1 year since last birth to LMP	4
Vaginal infection current pregnancy	6

Note. -- indicates that there were no participants with this risk factor

Prenatal Psychosocial Profile Scale Scores

Table 4 shows the mean scale scores and standard deviation for the PPP.

Table 4

PPP Mean Scale scores

Variable	Mean	SD	Range
Stress	20.81	4.7	15-31
Partner Support	51.50	11.7	19-66
Other Support	44.44	12.1	25-66
Self-esteem	34.63	5.4	24-44

These scores are similar to another study utilizing the PPP on several sample populations, including 2 groups of women enrolled in preterm birth prevention



programs (Curry, Burton, & Fields, 1996). However, the other support score was lower for this sample compared to the other groups. Table 5 compares the mean PPP scores for this study to the mean PPP scores from the preterm birth prevention groups in previous studies.

Table 5

Comparison of PPP Mean Scale Scores, Standard Deviations

Variable	Kaiser (N=27)	North Carolina (N=234)	Eugene (N=349)
Stress	20.81 (4.7)	18.59 (4.5)	21.13 (5.3)
Partner Support	51.50 (11.7)	56.97 (10.5)	52.43 (12.5)
Other Support	44.44 (12.1)	52.74 (12.7)	51.04 (11.7)

The result of Pearson's  $r$  correlation between the psychosocial variables demonstrated a significant inverse relationship between stress and partner support and stress and self-esteem, as shown in Table 6.

Table 6

Pearson's  $r$  Correlation's of Stress, Support and Self-esteem scores

	Partner Support	Other Support	Self-esteem
Stress	- 0.68 **	-0.27	- 0.54 *
Partner Support	---	0.13	0.19
Other Support		---	0.34

Note. \*  $p < 0.01$   
 \*\*  $p < 0.001$

### Outcome Data

Women experienced a range of 0-5 events of preterm contractions and preterm labor. Sixty-two percent had at least one event of preterm contractions and 30% had at least one additional event of preterm contractions. Forty three percent required tocolytic therapy, 33 % had cervical change and 16 % required hospital admission. No association was found between abuse and number of preterm labor events among the 5 women who reported a positive response to the abuse screening questions.

The mean gestational age at delivery was 38 weeks, (SD 1.7, range 35-40 weeks). One set of twins and the triplets delivered at 35 weeks. Another participant was delivered at 36 weeks secondary to intrauterine growth restriction (IUGR). The mean birth weight was 3220 gms, (SD 22.9, range 1750-4005). Only 2 infants were <2500 grams, one was a triplet and the other was the IUGR infant delivered at 36 weeks. The mean birth weight for the abused group was 362 grams less than the mean weight for non-abused participants. Women reporting abuse had significantly higher mean stress scores, 26.4 vs. 19.5, ( $t=3.50$ ,  $df=25$ ,  $p<.001$ ) and lower partner support scores, 37.5 vs. 54.0, ( $t=3.0$ ,  $df=24$ ,  $p<.006$ ) than women not reporting abuse. The mean scores for self-esteem in the women that reported abuse were lower than the non-abused group but did not reach statistical significance.

## Findings

Research Question 1 asked : What are the relationships between perceived levels of stress, social support, and self-esteem for pregnant women enrolled in a preterm birth prevention program? This question examined the correlation between the mean scale scores of these psychosocial variables using Pearson's r statistics. An inverse relationship was found for stress and partner support and stress and self-esteem. This relationship is similar to findings in previous studies utilizing the PPP (Campbell & Christian, 1989).

Research Question 2 asked: What is the relationships between these variables and the incidence of preterm labor and preterm delivery for women with identified risk factors? As anticipated, with a small number of participants and a limited number of preterm births, a significant correlation between PPP scores and the event of PTB or LBW was not found. The mean scores of women delivering prior to 37 weeks, demonstrated higher stress, lower partner support, lower other support, and lower self-esteem than for women that delivered at term. Although this is the anticipated direction between the two groups the differences did not reach statistical significance.

Research Question 3 asked: What is the relationship between abuse and the incidence of preterm labor and delivery for women with identified risk factors? The study was not able to establish a relationship between abuse and preterm labor and delivery. Again, the lack of findings are likely to be, in part, attributed to the small sample size and relatively few preterm births. Women exposed to

violence during pregnancy have demonstrated a higher incidence of preterm labor and low birth weight infants (Schei, et al., 1991; Rathbone & Ramsey, 1994; Christian 1995). When comparing differences in birth weight between abused and non-abused women, the abused women had lower birth weight infants, but the difference was not statistically significant.

### Discussion

The intent of this study was to evaluate stress, support, self-esteem and abuse in a sample of women at risk for preterm labor and determine the association with subsequent events of PTL and PTB. Although this study does not demonstrate a significant relationship between the psychosocial variables and preterm birth, there is evidence that stress and abuse contribute to pregnancy complications. There was an inverse relationship between stress and partner support. This may imply that support serves as a buffer to stress during pregnancy as suggested by Nuckols et al. (1972) and Norbeck and Tilden (1983). Abused women tend to have more stress and less support from their partners. In the literature, abuse has been found to contribute to increased stress, anxiety, and substance abuse during pregnancy (Christian, 1995). Abused pregnant women are less likely to have strong social support network and are more likely to have a higher incidence of complications (Christian, 1995).

### Limitations

The small number of participants was the greatest limitation. The study was designed with the recognition that it was a biased sample, including only women at risk for preterm labor. Another consideration is the interventions by the PTBP, which included early recognition and medical treatment of premature contractions. The support and frequent contact by the nurse case managers, tocolytic therapy, and activity restriction may have contributed to the increased gestational age and were not measured as intervening variables. The interventions and support provided by the nurse case managers may have been guided by the participants responses to the PPP. Providing the needed support and resources elicited during the interview could have impacted birth outcomes. The sample was primarily white, well-educated, middle income, and partnered, which limits generalization.

### Implications

In order to effectively reduce the number of preterm births, it is important to understand the factors which increase the probability of an adverse outcome. Existing research supports a biopsychosocial assessment of pregnancy. All pregnant women should be assessed for physiologic, psychosocial and environmental factors, which may place them at increased risk for complications (Gorman, 1995). For women with risk factors for preterm birth, interventions provided by nurse case managers in an established program may provide social support and feedback that promote positive health behaviors and/or enhance

compliance with the prescribed plan of care. Nurses need to recognize and identify abuse during pregnancy. Screening for abuse during prenatal care is both feasible and effective. By assessing for abuse nurses may be able to break the cycle of abuse by providing education, resources, and referrals for the survivors (Christian, 1995).

### Continued Research

Continued research is necessary to increase our knowledge of contributing risk factors and prevention strategies for preterm birth. Further research is needed in the conceptualization of stress and support. Inconsistencies in the definition of the variables and outcome measures made it difficult to compare the psychosocial variables across studies and determine the correlation with other variables and the contribution to adverse pregnancy outcomes. Further research on preterm birth prevention programs would establish the effectiveness of structured social support and case management interventions in the prevention of preterm labor and delivery.

Continued research is required to determine the relationship of self-esteem in pregnancy and the contribution to high-risk pregnancies. It is also necessary to continue efforts in the development of interventions for low-self esteem women in order to promote a sense of mastery and control in achieving successful pregnancy outcomes. There are limited studies on the relationship of low self-esteem and the event of preterm labor and delivery.

Efforts must also continue in studying the association between abuse and

adverse outcomes in pregnancy, including preterm labor. Nurses may be in the best position to determine the most effective method of screening for abuse and which interventions are most advantageous during pregnancy. Promoting safety for women starts with screening for abuse and being prepared to provide prevention and intervention strategies.

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Appendix A

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Sociodemographic Survey

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A01. Today's Date: \_\_\_\_\_  
Month Day Year

A02. Date of Birth: \_\_\_\_\_ Age: \_\_\_\_\_  
Month Day Year

A03. What is your current partner status? Are you (read choices):  
1. Married or single and living with your partner?  
2. Married or single and living alone?

A04. How many years of education have you completed? (GED = 12 years) \_\_\_\_\_

A05. Did you drop out of high school?  
0. No 1. Yes

A06. What is your race?  
1. Caucasian or Hispanic  
2. African American  
3. Native American  
4. Other (please specify): \_\_\_\_\_

A07. What is your total family income each month? \_\_\_\_\_

A08. How many people currently reside in your household? \_\_\_\_\_

A09. Do you work outside the home?  
0. No 1. Yes  
(Go to question A13) (Go to question A10)

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**Asks ONLY if Question No. 9 was YES.**

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A10. Does the work involve heavy, physical labor?  
0. No 1. Yes

A.11 Is the work stressful?

0. No                      1. Yes

A12 Do you have to commute more than 30 minutes one way to work?

0. No                      1. Yes
- 

A13. How many times have you been pregnant, including this pregnancy? \_\_\_\_\_

A14. How many times have you given birth, including any stillbirths? \_\_\_\_\_

A15. How far along are you today? (*in weeks*) \_\_\_\_\_

A16. Record: Weeks gestation at first visit: \_\_\_\_\_

A17. Was this pregnancy planned? \_\_\_\_\_

0. No                      1. Yes

2. Yes and No (please explain): \_\_\_\_\_

## Appendix B

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**Prenatal Psychosocial Profile**


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**Assessment of Stress**

Ask women to what extent the following factors are current stressors/hassles. Circle the number corresponding to the appropriate response.

To what extent are (READ CHOICE BELOW) a current stressor/hassle for you?	No Stress 1	Some Stress 2	Moderate Stress 3	Severe Stress 4
A18A. Financial worries (e.g., food, shelter, health care, transportation).	1	2	3	4
A18B. Other money worries (e.g., bills, etc.).	1	2	3	4
A18C. Problems related to family (partner, children, etc.).	1	2	3	4
A18D. Having to move, either recently or in the future.	1	2	3	4
A18E. Recent loss of a loved one.	1	2	3	4
A18F. Current Pregnancy.	1	2	3	4
A18G. Current abuse, sexual, emotional, or physical.	1	2	3	4
A18H. Problems with alcohol and/or drugs.	1	2	3	4
A18I. Work problems (e.g., being laid off, etc.).	1	2	3	4
18J. Problems related to friends.	1	2	3	4
A18K. Feeling generally "overloaded."	1	2	3	4





- A19I. Takes me seriously when I have concerns, 1 2 3 4 5 6 1 2 3 4 5 6 1 2 3 4 5 6 1 2 3 4 5 6
- A19J. Says things that make my situation clearer and easier. 1 2 3 4 5 6 1 2 3 4 5 6 1 2 3 4 5 6 1 2 3 4 5 6
- A19K. Lets me know that he/she will be around if I need assistance. 1 2 3 4 5 6 1 2 3 4 5 6 1 2 3 4 5 6 1 2 3 4 5 6

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**Prenatal Psychosocial Profile**


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**Assessment of Self Esteem**

We all have some kind of “picture” of ourselves we carry with us. I’m going to read you a list of statements that people have used to describe themselves. I would like you to tell me how much you agree or disagree that this statement describes yourself.

	Strongly Agree	Agree	Disagree	Strongly Disagree
A20A. Feel that you’re a person of worth, at least on an equal basis with others.	1	2	3	4
A20B. Feel that you have a number of good qualities.	1	2	3	4
A20C. All in all, feel that you are a failure	1	2	3	4
A20D. Feel you are able to do things as well as most people.	1	2	3	4
A20E. Feel you do not have much to be proud of.	1	2	3	4
A20F. Take a positive attitude toward yourself.	1	2	3	4
A20G. On the whole, feel satisfied with yourself.	1	2	3	4
A20H. Wish you could have more respect for yourself.	1	2	3	4
A20I. Feel useless at times.	1	2	3	4
A20J. At times think you are no good at all.	1	2	3	4
A20K. Feel like you have control over your life.	1	2	3	4

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**Prenatal Psychosocial Profile**

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A21A. Within the last year, have you been hit, slapped, kicked, or otherwise physically hurt by someone?

0. No                      1. Yes

A21B. Since you've been pregnant, have you been hit, slapped, kicked, or otherwise physically hurt by someone?

0. No                      1. Yes

A21C. Within the last year, has anyone forced you to have sexual activities?

0. No                      1. Yes

A21D. Did this interview bring up any concerns or questions that you would like to discuss your prenatal care provider?

0. No                      1. Yes

A21E. Would you like me to approach your prenatal care provider with this concern or question for you?

0. No                      1. Yes

## Appendix C

## Chart Review

Study# \_\_\_\_\_

Date \_\_\_\_\_

## BioMedical Risk Tool

*Circle "Yes" for each risk factor noted in the chart*Previous Pregnancy

	No	Yes	DNA
A34B. Mother's weight <100	0	1	2
A34H. Three or more abortions <14 weeks.....	0	1	2
A34I. One second trimester abortion (spontaneous)	0	1	2
A34J. One second trimester abortion (induced)	0	1	2
A34K. Repeated second trimester abortion.....	0	1	2
A34L. Premature delivery (<35weeks).....	0	1	2
A34O. <1 year since last birth to LMP.....	0	1	2
A34X. DES exposure.....	0	1	2
A34Z. Uterine surgery (other than cesarean).....	0	1	2
A34AA. Uterine or cervical malformation.....	0	1	2
A34BB. Prior cervical conization.....	0	1	2
A34JJ. Pyelonephritis or >3 UTI's.....	0	1	2
A34RR. Previous Preterm/LBW infants.....	0	1	2
A34SS. Hx PTL with term birth.....	0	1	2
A34TT. Hx Drug Use.....	0	1	2

Current Pregnancy

B34D.	Pyelonephritis in this pregnancy.....	0	1	2
B34J.	Second trimester bleeding.....	0	1	2
B34K.	Engaged head at 26 weeks.....	0	1	2
B34T.	Premature Labor.....	0	1	2
B34U.	Premature ROM.....	0	1	2
B34V.	Cerclage.....	0	1	2
B34AA.	Effacement <2cm long at 32 weeks.....	0	1	2
B34BB.	Dilation of internal os.....	0	1	2
B34CC.	Uterine irritability.....	0	1	2
B34DD.	Placenta previa after 22 weeks confirmed by U/S	0	1	2
B34EE.	Polyhydramnios confirmed by U/S.....	0	1	2
B34GG.	Uterine fibroids >5 cm.....	0	1	2
B34HH.	Abdominal surgery this pregnancy.....	0	1	2
B34II.	Vaginal and/or cervical infection this pregnancy (excluding gonorrhea).....	0	1	2
B34KK	Hard physical work.....	0	1	2
B34LL	Physical/sexual abuse this pregnancy.....	0	1	2
B34MM	Missed 2 or more consecutive PNV's.....	0	1	2
B34NN	Multiple gestation.....	0	1	2

Life Style/Habits

A21	Smokes more than 10 cigarettes/day.....	0	1	2
A24	Cocaine, amphetamine use this pregnancy.....	0	1	2

Outcomes

- C35 Prenatal visits during pregnancy\_\_\_\_\_
- C36 Actual birth weight in grams\_\_\_\_\_
- C37 Low Birth weight (<2500 grams)  
0. No  
1. Yes
- C38 Actual weeks gestation\_\_\_\_\_
- C39 Preterm infant < 37 weeks  
0. No  
1. Yes
- C46 IUGR  
0. No  
1. Yes

Events of Preterm Labor

**Perceived uterine activity requiring observation/monitoring with:**

Positive uterine contractions with no cervical change, no tocolytics

Positive uterine contractions with no cervical change, tocolytics

Positive uterine contractions, cervical change, tocolytics

Positive uterine contractions, cervical change, conservative treatment  
(activity restriction, pelvic rest), no tocolytics

Positive uterine contractions, cervical change, tocolytics

Positive uterine contractions, cervical change, admission to hospital

Appendix D

KAISER PERMANENTE NORTHWEST REGION  
Consent Form

TITLE Stress, support and self-esteem and the event of preterm labor and delivery.

PRINCIPAL INVESTIGATORS Kate R. Beadle, RNC, WHCNP Graduate Student, Preterm Birth Prevention Program Case Manager, Kaiser Permanente, (503) 813-2694).

Research Advisor: Mary Ann Curry, RN, DNSc OSHU, (503) 494-3847.

PURPOSE You have been invited to participate in this research study because you have been identified with a potential risk factor associated with preterm labor and delivery. The preterm birth prevention program (PTBP) case managers are participating in a graduate research project to help identify factors that influence pregnancy, particularly preterm labor and early delivery. The purpose of this study is to find out how the factors of stress, support, self-esteem and abuse affect the incidence of preterm labor and delivery.

PROCEDURES If you agree to participate in the study, you will be asked some questions about the stress in your life, the people that support you, self-esteem and abuse during pregnancy. It will take about 10 minutes to answer the questions. The investigator will also take information from your medical records related to your pregnancy and delivery, such as pregnancy history, how far along you are in pregnancy when you deliver, how much your baby weighs.

RISKS AND DISCOMFORT The questions may give you some things to think about or be concerned with. If this happens, you can discuss the issues with your clinician or the nurse case manager. You can stop the interview at any time.

BENEFITS A possible benefit of participating in the study is the realization that you may have some issues that you would like to discuss today or at another time. By serving as a research participant, you may contribute new information which may benefit other pregnant women in the future. However, you may not personally benefit from this study.

CONFIDENTIALITY All questionnaires and your answers will be kept strictly confidential and your name or identity will not be used for publication or publicity purposes. The questionnaire with your responses is coded with an identification number and not your name or health record number. The questionnaire will be kept in a locked cabinet until after your baby is born. Your name, health record number, and questionnaire results will never be made



available to anyone but the investigators. If during the interview, information is revealed that abuse is an issue, the nurse case manager will follow Kaiser's established domestic violence protocol. According to Oregon law, suspected child abuse must be reported to the appropriate authorities.

VOLUNTARY PARTICIPATION Your participation is voluntary, you are not required to participate, nor will it affect your care or standing as a Kaiser member.

COSTS There are no costs to you for participating in this study.

FUNDING None

DURATION OF STUDY This study will continue until approximately February 24, 1997.

Kate Robert Beadle is available to answer any questions you might have and can be reached at (503) 813-2694. You may keep a copy of this consent form.

RESEARCH RIGHTS If you have any questions about this research, your rights and responsibilities as a research subject, or about research-related injuries, you may contact Mary Durham, Ph.D., Vice-President for Research, Kaiser Foundation Hospitals, 335-2400.

Your signature below indicates that you have read the foregoing and agree to participate in this study.

\_\_\_\_\_  
SIGNATURE OF THE PARTICIPANT

\_\_\_\_\_  
DATE

\_\_\_\_\_  
PRINTED NAME OF PARTICIPANT

\_\_\_\_\_  
DATE

\_\_\_\_\_  
INVESTIGATOR

\_\_\_\_\_  
DATE

## Appendix E

### DATA MANAGEMENT PROTOCOL FOR PRENATAL MEDICAL OFFICE SITES

This is the general protocol to follow. There may be times and/or circumstances where you will have to use common sense and modify the order or events. However, under no circumstances would you ever begin data collection without obtaining informed consent from a participant.

#### Identify potential new participants

All pregnant women determined eligible for enrollment in the PTBP program are potential participants. Plan to introduce the study during the initial telephone contact with the patient. The interview will follow at the scheduled educational visit in the medical offices or by telephone for the Salem patients and/or in circumstances where the educational visit is done by telephone.

#### Inducting new participants

After introducing the PTBP and have set up the time/date that you will meet with them in the clinic or initiate the next phone contact, use the following **SCRIPT** to present the study:

The PTBP case managers are involved in a nursing research project that is trying to find out more about factors which might be useful in predicting which women will deliver their babies early. When I meet with you (or talk to you again), I would like to ask you some questions about stress, the people that support you, self-esteem and abuse. It will take about 10 minutes to answer the questions. I will mail you the consent form that describes the study and you can read it prior to our (Ed visit) or (next telephone contact).

#### Verify the mailing address.

For the interviews that will be conducted via telephone, send two consents and a return envelope. Highlight Kate's name and phone number on the consent form that the participant will keep and request them to sign and return the other consent form. Include a copy of the response cards with the smile faces.

In the medical office, prior to the educational visit, ask if they have read the consent form and are interested in participating. After you have reviewed the consent, ask them if they have any questions and invite them to participate in the study. If yes, obtain signed consent. Ask them if they need a copy of the consent form. Point out Kate's name and phone number. Emphasize they can change their minds at any time without affecting their care at the clinic.

Explain that the interview needs to be confidential and ask that any support people (other than the participant's children) to wait in the lobby area until after the visit is over. You can offer to come and get them once the interview is completed. If the support person(s) refuse to leave, the interview can be conducted but make a note on the PPP after completing the interview.

If conducting the interview by telephone, verify that you have a signed consent. Ask the participant if she has any questions about the study. Quickly review the consent. Ask the participant if she has privacy and if it is a good time to answer questions prior to beginning the interview.

### Collect Data

- (1) Check all the study ID#s on the study packet materials. Be sure they match.

Study ID#s for medical office sites are:

Beaverton	100-199	Rockwood	500-599
Cascade Park	200-299	Salem	600-699
Mt. Talbert	300-399	West Interstate	700-799
Perinatology	400-499	Vancouver	800-899

(includes Longview/Kelso)

- (2) Administer the sociodemographic form. If pushed for time (or preference) the information for some of these questions can be obtained from the prenatal chart data. If the participant works outside of the home, include questions 10-12 in the interview. Always ask the monthly income question. This information is not available in any other records.
- (3) Administer the Prenatal Psychosocial Profile. Hand the woman the response cards with the smile faces and explain how to use. Orally administer the tool and record responses. For any patient that indicates she is currently in an abusive situation or has a history of abuse follow Kaiser's Domestic Violence protocol.

Thank her for her participation. Proceed with the PTBP educational visit gathering/documenting routine assessment data and establishing plan of care.

- (4) After completing the interview fill in any missing sociodemographic data from the prenatal record. Complete the sticker with the identifying information. This sticker will go into a separate confidential notebook at KPB.

- (5) Put forms into envelope marked "to be entered" and place in pocket of study folder for transfer to KPB.
- (6) If during the interview process the participant requests to stop the data collection or withdraws from the study, draw a line through the materials in the study packet and write declined on the front of the tools. Place the study materials in the envelope to be entered for transport to KPB.

## Appendix F

### DATA MANAGEMENT PROTOCOL FOR PRENATAL MEDICAL OFFICES AND KAISER PERMANENTE BUILDING

The study materials will be assembled into packets containing all of the materials for each interview. The packets will be sorted by medical office site and stored in the Preterm Birth Prevention office area at the Kaiser Permanente Building (KPB). The materials will be pre-numbered and printed on colored paper to correspond with a particular medical office site. The sociodemographic tool will have a removable sticker preprinted with the identifying information that will need to be completed after collecting the data.

A notebook folder will be provided to each interviewer and will include the study protocols and have pockets to place incomplete and completed study materials for transfer between the medical offices and KPB.

#### Preparation

Prior to PTBP educational visits take the appropriate number of study packets required to cover the number of patient visits scheduled at each medical office site. Check the ID#s on each instrument tool in the study packet to be the numbers match. Use the notebook folder to transport study packets.

#### Transport

After completing the data collection fill in the information on the removable sticker on the sociodemographic tool. This sticker will go in the confidential study notebook at KPB. Place completed study packet materials in the envelope marked "to be entered". The envelope should be placed in the pocket of notebook folder. Do not leave notebook unattended in medical office areas where it may be inadvertently accessed.

#### Storage

When returning to KPB place sticker with identification information in the study notebook in locked file drawer A. Note date of interview and initial. Place the "to be entered" envelope with the completed questionnaires in drawer B and lock the drawer.

All study packet materials need to be accounted for since they are pre-numbered. If a participant has withdrawn or does not complete the interview, a note on tools should indicate the reason for not being completed and placed in the "to be entered" envelope and stored in locked drawer B.

### Data Entry

The data will be entered at OSHU by the investigator. The outcome measures, chart review, and lifestyle and habits survey will be completed and entered by the investigator after the participant delivers.

### Data Verification

The printed data will be verified for accuracy by the principal investigator and another person. One person will sit with the actual data collection instruments and read the data entry code while the second person follows the entries on the printout. Errors will be circled on the printout and changes entered into the computer. When completed, the data collection forms will be marked with a "V" and initialed to indicate that the verification has been completed.