Psychosocial Factors

In Postpartum Depression

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ABSTRACT

This study examined 214 New Zealand women, both during pregnancy and in the postpartum, in order to determine the influence of infant-related stressors, unplanned pregnancy, social support and the role of the marital relationship in the development of postpartum depression. The relationship of demographic factors, the woman's feelings about having a new baby in the family and previous history of depression were also analyzed.

The prevalence of depressive symptomatology was 30.8% during pregnancy and 39.7% in the postpartum. Postpartum depression was predicted by depression during pregnancy, by poorer postpartum marital adjustment and by lower levels of postpartum social support. The strongest predictor of the change in depression scores over time was depression during pregnancy. The important role of depression during pregnancy in the etiology of postpartum depression, suggests that postpartum depression is a continuation of depression during pregnancy.

Women who were more depressed during pregnancy tended to be younger, of lower socio-economic status, and to have a reported history of depressive episodes prior to their pregnancies. Higher levels of prepartum depression were also related to women's feelings of being unhappier about having a new baby in the family, to poorer marital adjustment, and to lower levels of social support during pregnancy.

Depression during pregnancy was found to be more likely to have a negative effect on marital adjustment than poor marital adjustment on

depression. Similarly, depression during pregnancy was found to be more likely to have a negative effect on social support, than vice versa.

However, further regression analyses, showed that postpartum marital adjustment and postpartum social support had a strong relation to postpartum depression, irrespective of the levels of prepartum marital adjustment, prepartum social support, and prepartum depression.

Contrary to predictions, neither infant temperament, nor infant risk were related to postpartum depression.

CHAPTER ONE

INTRODUCTION

1.1 Background Of The Problem

The postpartum period, which is supposed to be a time of great joy, is also a time of unhappiness and depression for many women all over the world. Although most new parents are prepared and have received training in the form of antenatal classes for the experience of labour and delivery, few are prepared for the changes a new infant brings to a family. Thousands of women every year experience emotional disturbances of varying intensity following childbirth (Hopkins, Marcus & Campbell, 1984; Kumar & Robson, 1984; Paykel, Emms, Fletcher & Rassaby, 1980). Recent studies indicate that there is an increase in the rate of psychiatric contacts following the birth of a child in comparison with pregnancy and that this rise is mainly attributable to affective disorders (Murray & Gallahue, 1986; Paykel et al., 1980; Watson, Elliot, Rugg & Brough, 1984). This area of disturbance is loosely labelled post (after) partum (birth) depression (Ballard & Hackett, 1982). Postpartum depression has been found to be the most common psychiatric syndrome following childbirth (Vandenbergh, 1980).

More women than men suffer from depression, and the ratio of women to men has been reported as ranging from 5:1 to 2:1 (Hopkins et al., 1984; Paykel, 1991). Studies have found that postpartum depression affects 10-20% of mothers (Cox, Connor & Kendall, 1982; Cutrona, 1983; Kumar & Robson, 1984; O'Hara, Neunaber, & Zekoski, 1984; Paykel et al., 1980; Pitt, 1968), with

10%-15% of first-time mothers developing the disorder (Hopkins et al., 1984; O'Hara, 1987). Thus, postpartum depression is a fairly common syndrome. The extent of postpartum depression in New Zealand women is uncertain as there has been a lack of research in the area to date.

The high incidence of depression in the postpartum period renders this an important area for primary prevention. Well designed studies are needed to provide information that may contribute to our understanding concerning why women appear to have an increased vulnerability to depression in general, as well as in the postpartum period. The personal, family, and social consequences of this disorder are significant, as are the economic consequences, as many women are active in the work force (Hopkins et al., 1984).

Childbirth is accompanied by significant biological, psychological and social stresses, and besides the fact that women are an "at risk" group for emotional disturbance after the birth of a child, the influence on the psychological development of the infants cannot be ignored. That is, depression may affect the early mother-infant relationship (Field, Sandberg, Garcia, Vega-Lahr, Goldstein & Guy, 1985). The role of infant-related stressors in postpartum depression is as yet unclear in terms of the effect on the developing mother-infant relationship.

Both Ainsworth (1979, 1989), and Bowlby (1962, 1982), stress the development of a secure, reciprocal and mutually regulated mother-infant relationship and the formation of a strong emotional bond (attachment) to the primary caregiver (Ainsworth, 1985; Ainsworth & Bell, 1970; Ainsworth, Blehar,

Waters, & Wall, 1978; Bowlby, 1982). The formation of the nature of an infant's attachment bond depends on the interaction s/he has with his primary caregiver during his first year of life (Ainsworth, 1979, 1989). Children who develop from infancy to childhood with a secure attachment relationship will later exhibit competent, more autonomous functioning with regard to various aspects of later development (Ainsworth, 1979, 1989) such as affective involvement and problem solving style (Matas, Arend, & Sroufe, 1978). Searle (1987) states that an impediment to the mothering role could lead to a delay in the development of infant competencies, child abuse and family breakdown.

Postpartum depression is assumed to be a significant causal factor in the lack of maternal responsiveness in some mother-infant interactions. This can handicap the development of attachment, and may leave the mother less able to deal adequately with the demands of a maternal role (Livingood, Daen & Smith, 1983; Searle, 1987). Prevention (for example, by identifying "at risk" women during pregnancy) and the early detection of postpartum depression are essential to minimize the effects of this disorder on the infant and the family.

Despite the number of studies that have been conducted in overseas countries to investigate emotional disturbances in the puerperium, the etiology of postpartum depression remains unclear. This is in large part due to methodological problems in many studies and the conflicting results obtained. Research findings concerning postpartum depression vary due to differences in definition, the small samples studied and differing criteria for selection of subjects. There is also a lack of consensus regarding etiological factors in

postpartum depression. What can be safely said is that there is no single factor responsible for precipitating an episode of the disorder (Hopkins et al., 1984; Murray & Gallahue, 1986; True-Soderstrom et al., 1983). Paffenbarger, Steinmetz & Pooler (Buchwald & Unterman, 1982) refer to the multivaried symptoms and etiology of the syndrome as the "picture puzzle of postnatal depression". According to Wellburn (1980, p.40), postpartum depression is "like a stained glass window with varying sized fragments of different coloured glass joined together by lead".

The marital relationship, neonatal risk, infant temperament and social support are some of the most important psychosocial variables which have been implicated in the onset of postpartum depression (Atkinson & Rickel, 1984; Cutrona, 1983; Cutrona & Troutman, 1986; Hopkins et al., 1984; Hopkins, Campbell, & Marcus, 1987; O'Hara, Rehm, & Campbell, 1982). The current study aimed to explore the contribution of these variables to the development of postpartum depression while avoiding, where possible, methodological problems found in previous research.

1.2 A Brief Historical Overview

Postpartum disorders are not a new phenomenon and are not merely a function of modern-day living. The association between childbirth and depression has been recognised and described for centuries (Landy, Montgomery, & Walsh, 1989), and many studies have noted that postpartum psychiatric symptoms and syndromes are unique and have inferred a causal relationship between childbirth and depression (Hamilton, 1989; Landy et al.,

1989). As early as 460 B.C., Hippocrates described postpartum mental disorders as "puerperal fever" (Kerfoot & Buckwalter, 1981; Murray & Gallahue, 1986). Hippocrates postulated two causes for this disorder:

i) Suppressed lochial discharge that, when carried to the head, resulted in states of agitation, delirium and mania, and

ii) the collection of blood around the breasts which caused suppression of lactation and resultant madness.

Scientific observations of behavioural disturbances in the postpartum period resulting in suicide, infanticide, and institutionalisation, date from 1848 (McGowan, 1977). According to Marce in 1858 (Cooke, 1985), puerperal and lactational disturbances were specific entities, which occurred only after childbirth and were unlike other mental illnesses. He believed that puerperal mental problems were related to changes in the pelvic organs. In 1859, Marce published the first study in which the adverse emotional reactions of the postnatal period were described (Landy et al., 1989) and he called these disorders "morbid sympathy" (Hamilton, 1989).

During the first half of the 20th century, physicians and psychiatrists disagreed with regard to the etiology and nature of postpartum mental disorders, and these disorders were no longer regarded as unique to the postpartum period. In 1911, Bleuler (Cooke, 1985) maintained that schizophrenia in the postpartum period was not distinct from schizophrenia presented at other stages of a woman's life. Kraeplin, in 1913 (Cooke, 1985), stated that puerperal mania and depression were already latent and were only provoked by childbirth. In 1926, Strecker and Ebough (Cooke, 1985) studied a

series of 50 cases of mental disorder in the puerperium, and they concluded that there was no such disorder as "postpartum" psychosis, as all mental problems could be classified as manic-depressive psychosis, toxic-exhaustive psychosis, or schizophrenia. In the 1920's Zilboorg (McGowan, 1977) challenged the idea that physical problems or events are determinants of postpartum disturbances. This idea was then replaced with the view that physical problems are precipitating agents in psychological illness.

In 1952, the term postpartum was omitted from the Diagnostic and Statistical Manual (Hamilton, 1989). Mental disorders associated with childbearing were either to belong to manic-depressive illness, to dementia praecox, or to neurotic and organic states (Steiner, 1990). This resulted in the omission and denial of the unique nature of postpartum syndromes from teachings in obstetrics and psychiatry. However, a number of physicians and health professionals continued to see cases of depression relating specifically to the postpartum period. In 1980, Brockington called a conference dealing with postpartum mental disorders, and a scientific organization, the Marce Society, encompassing health specialists from all over the world, was organized (Hamilton, 1989).

Until recently, there has been little research on the etiology, treatment and prevention of postpartum depression. Doctors and psychiatrists tended to believe that postpartum depression was benign and that it would pass of its own accord, and was therefore unworthy of investigation (True-Soderstrom et al., 1983). Because of the tendency to equate postpartum disorders with corresponding non-postpartum disorders, little research was generated on

postpartum disturbances until the early 1960's. Pugh, Jerath, Schmidt, and Reed (1963) have shown that in women, the period following the birth of a child is a time of greater vulnerability to mental illness, especially to affective disorders.

Pitt (1968) was the first major contemporary researcher to investigate postpartum mental disorders. According to Pitt (1968), postpartum depression is a specific disorder which is distinguishable from classic depressive illness. He coined the term "atypical depression" and considered the disorder to be a response to a "nonspecific" stress arising at the time of childbirth. Pitt (1968) believed this disorder to be "atypical" for the following reasons: Firstly, he found that postpartum depression is milder than general depression. Secondly, he reported that the symptoms of postpartum depression are distinguished from those of general depression by late rather than early insomnia, worsening of moods in the evening rather than in the morning and the rareness of suicidal thoughts. Finally, women having postpartum depression were found to have greater levels of anxiety and irritability (Pitt, 1968).

However, there exists a controversy in the literature on postpartum depression regarding the nature and definition of this disorder, and the relationship between postpartum and nonpostpartum depression (Whiffen, 1991). Researchers are divided regarding whether postpartum depression is a unique syndrome, having a different etiology from general depression (Ussher, 1992).

The diagnosis "postpartum depression" does not appear in the Revised DSM-III, the DSM-IV, or in any major diagnostic classification of mental

disorders currently in use. The Revised Diagnostic and Statistical Manual of Mental Disorders III, of the American Psychiatric Association, 1987, did not provide a specific category for the diagnosis of postpartum depression. In the DSMIII-R, postpartum psychosis is only mentioned as an example for Psychotic Disorders Not Otherwise Specified (Steiner, 1990). This is a "residual category for individuals with depressive symptoms who cannot be diagnosed as having a Major or Other Specific Affective Disorder or Adjustment Disorder" (DSM III-R, 1980, p.223). In the latest classification system of mental disorders, the DSM IV (1994), postpartum depression is categorized under the "Atypical Affective Disorders" and is assigned the same symptoms as major depression. As the American Psychiatric Association has failed to delineate a classification system for postpartum mental disorders, there is a lack of definition and aetiology in this area. There is no official diagnosis of postpartum depression anywhere in the world, as in 1977, The World Health Organization, in its International Classification of Diseases, followed the example of the United States (Hamilton, 1989).

Research into the similarities and differences between postpartum and nonpostpartum depression has been limited (Whiffen, 1991). A study in which a sample of postpartum depressed women were compared with a matched sample of nonpostpartum depressed women, has been the only study to date to analyse these differences (O'Hara, Zekoski, & Phillips, 1990; O'Hara, Schlechte, Lewis, & Varner, 1991).

While some research has found that depression is more common after the birth of a child than at any other time of a woman's life (O'Hara, 1987; Steiner,

1990) and that there is an increase in psychiatric admissions after childbirth (Kendell, McGuire, Connor, & Cox, 1981), other researchers have found that rates of postpartum depression are no higher than rates of depression in the general population (Cooper, Campbell, Day & Kennerley, 1988; Watson et al., 1984). High rates of depression have been identified in nonpostpartum women as well (Brown & Harris, 1978; McBride, 1990; Ussher, 1991). However, recent studies have found that compared to other depressive syndromes, postpartum depression is milder (Gotlib, Whiffen, Mount, Milne, & Cordy, 1989; Whiffen, 1991), has a faster rate of remission (Whiffen, 1991), different symptoms are emphasized (Pfost, Stevens, & Matejcak, 1990; Whiffen, 1991), and, the rate of depression appears to be elevated in the postpartum period (O'Hara, 1987; Steiner, 1990).

In the last two decades, there has been renewed interest in postpartum depression for the following reasons: Firstly, recent studies have revealed a much higher incidence of postpartum depression than had been previously acknowledged (O'Hara et al., 1984; O'Hara et al., 1982; Paykel et al., 1980). Secondly, research findings have documented the adverse effects of postpartum depression on the early development of the infant and the mother-infant relationship (Downey & Coyne, 1990; Hoffman & Drotar, 1991; Murray, 1991; Scott, 1990). Finally, the interest of the public in postpartum depression has grown due to media coverage of certain cases in which postpartum depression may have contributed to neglect and abuse of the infant (Steele & Pollock, 1969) or even infanticide or suicide (Da Silva & Johnstone, 1981; Davidson & Robertson, 1985; Harder, 1967; Resnick, 1970). The interest of

physicians and health professionals has also increased as current research has highlighted the effects of this disorder on the women, their infants, their families and the economy (Pfost et al., 1990).

To conclude, there is some provisional evidence that postpartum depression is a distinct disorder. However, regardless of whether postpartum depression is a distinct disorder or not, the fact remains that the post-delivery period is a stressful time in a woman's life, which is associated with a high incidence of mental disturbance and an increase in psychiatric risk (Murray & Gallahue, 1986). As the postpartum represents a time when women may be vulnerable to depression, this area has great clinical relevance for further study.

1.3 Different Types Of Postpartum Reactions

Mild degrees of depression are experienced by many women after the birth of a child, including sadness, irritability, and loss of self-confidence, while some women may experience more serious depressions in which they may be psychologically and physically immobilized and unable to care for their infant. Postpartum disorders cover a range of disorders from sadness to suicide.

Within the broad range of depressive states found in the literature on postpartum depression, three different types of reactions have been distinguished: the maternity or postpartum blues, mild to moderate postpartum depression and postpartum psychosis (Gitlin & Pasnau, 1989; Hopkins et al., 1984; Kendell, 1985).

Although postpartum depression in the milder to moderate clinical range is the focus of this study, the maternity blues and postpartum psychosis will be briefly described in order to distinguish them from postpartum depression. Table 1 shows the different types of postpartum disorders, and includes time of onset, symptoms, prevalence, and risk factors.

Table 1

A comparison between the "blues", postpartum depression and postpartum psychosis

	POSTPARTUM BLUES	POSTPARTUM DEPRESSION	POSTPARTUM PSYCHOSIS
ONSET	3-5 days after delivery	10 days - 6 months after delivery	2 weeks - 1 month after delivery
SYMPTOMS	mild depression anxiety and tension irritability fatigue unpredictable tears hypochondriasis lability of mood	unrelenting depressed mood anxiety and tension irritability exhaustion persistent 'weepiness' hypochondriasis mild confusion poor concentration self-derogatory feelings excessive dependency guilt and self-blame appetite disturbance sleep disturbance decreased libido listlessness and apathy despair and hopelessness sadness	depression mania hallucinations disorientation delusions anger toward baby anger towards self infanticide suicide

Table 1 continued

A comparison between the "blues", postpartum depression and postpartum psychosis

	POSTPARTUM BLUES	POSTPARTUM DEPRESSION	POSTPARTUM PSYCHOSIS
SYMPTOMS continued		low self esteem inability to concentrate inadequacy and helplessness indecisiveness disinterest in personal appearance suicidal thoughts (less common) rejection of baby (rare)	
PREVALENCE	50 % - 80 %	15 % - 20 %	0.1 % - 0.2 %
RISK FACTORS	Minimal	Suicide (rare); Infanticide (rare); Adverse effects on marital/ partner relationship, infant development, mother-infant relationship, family, and economy.	Hospitalization; Suicide; Infanticide.

1.3.1 Normal Postpartum Adjustment

Immediately after delivery, a woman may have symptoms which could be mistaken for postpartum depression, resulting from the stress of labour, delivery and hospitalization (Hopkins et al., 1984; Inwood, 1985). The symptoms are sadness, fatigue, insomnia and worry, as well as concerns regarding the health of the infant, child-care demands, loss of income, life-style restrictions or added expenses (Grossman, Eichler, & Winickoff, 1980). These reactions last approximately two to three days and are perceived by health professionals and researchers to be a normal adjustment to childbirth (Pfost et al., 1990).

1.3.2 Postpartum Blues

Unlike normal postpartum adjustment, postpartum "blues", or "baby blues", occurs approximately three to five days after delivery at a time when the woman is expected to feel happy (Brockington & Kumar, 1982; Hopkins et al., 1984). The symptoms of the blues seldom appear before the third day postpartum. Instead of feeling joyful, the woman feels sad and she may experience episodes of crying, irritability, and emotional lability. The postpartum blues are a transient mood disturbance and have been described as self-limiting and benign (Ritchie, 1977; Yalom, Lunde, Moos, & Hamburg, 1968), usually lasting 24-48 hours, and generally abate by ten days. The fall in progesterone and oestrogen levels following childbirth are thought to be the major cause of this phenomenon (Dalton, 1980).

The postpartum blues may occur in 50-80% of all postpartum women (Dalton, 1980; Hamilton, 1989; Pitt, 1968). Due to their high incidence, it is

considered to be a normal reaction to childbirth and not a disease syndrome (Hamilton, 1989). Some researchers believe that the more severe the blues, the greater the chance of developing postpartum depression (Cox et al., 1982; Harding, 1989; Kendell, 1985; Pitt, 1968).

1.3.3 Postpartum Psychosis

Postpartum psychosis is an extremely rare, severe disorder which is similar to nonpuerperal psychotic depression and includes delusions, mania, disorientation, hallucinations and depression (Hamilton, 1989; Hopkins et al., 1984; Landy et al., 1989; O'Hara, 1987). The woman may deny or reject her role as a mother and feel indifferent or negative toward her infant (Hopkins et al., 1984; Murray & Gallahue, 1987). Infanticide or suicide may occur, and the woman is usually hospitalized (Hamilton, 1989; Landy et al., 1989). Although recovery with treatment is possible, relapse is common (Kendell, Rennie, Clarke, & Dean, 1981). The onset of postpartum psychosis is acute and it occurs suddenly within the first two months after birth (Hamilton, 1989; Inwood, 1985; Landy et al., 1989).

Postpartum psychosis is uncommon, and the incidence of this disorder is very low, with only two of every 1,000 women delivered experiencing these symptoms. The prevalence rates of postpartum psychosis range from 0.1% to 0.2% (Dalton, 1980; Hopkins et al., 1984; Ritchie, 1977). However, the risk of developing a psychotic depressive illness is greater during the first three months after delivery than at any other time of a woman's life (Harding, 1989).

1.3.4 Postpartum Depression

Time of onset. Intermediate between these prior conditions in severity is postpartum depression, which can begin between ten days and six months postpartum and may last a few weeks or months, to a year or more (Dalton, 1980; Kendall, 1985; Paykel et al., 1980; Pitt, 1968). Postpartum depression can occur either in the absence of the postpartum blues, or after they have ended.

Some researchers believe that depression begins during pregnancy (Atkins & Rickel, 1984; Cox et al., 1982; Rees & Lutkins, 1971; Saks, Frank, Lowe, Berman, Naftolin, & Cohen, 1985), while other studies suggest that pre- and postpartum depression are independent and have different causes (Hopkins et al., 1987; O'Hara et al., 1984) and maintain that postpartum depression occurs after childbirth among women who are otherwise emotionally stable (Kumar & Robson, 1984; O'Hara et al., 1984). There is also evidence that postpartum depression may be a continuation of nonpostpartum depression (Harding, 1989; Whiffen, 1991), and some researchers have found that those women who have a history of depressive episodes, or psychiatric illness in family members, are more likely to develop mental disturbances in the postpartum period (Braverman & Roux, 1978; Martin, 1977).

Clinical features. Postpartum depression is a more prolonged and severe disorder than the postpartum blues, and is partially disabling (Hamilton, 1989). The symptoms of postpartum depression include insomnia (which is rather difficult to detect due to the frequent waking of the infant at all hours of the day and night), or hypersomnia, loss of appetite or weight change,

listlessness, apathy, a sense of despair and hopelessness, mild confusion, forgetfulness, crying, feelings of inadequacy, irritability, sadness, guilt, self-derogatory feelings, indecisiveness, loss of sex drive, inability to concentrate, disinterest in personal appearance and ambivalent feelings toward the child (which can fluctuate between love and a desire to harm the child or a total lack of interest in the child) (Garvey & Tollefson, 1984; Harding, 1989; Scott, 1992; Searle, 1987). Women are sometimes likely to be labelled with the term "hypochondriasis" by their physicians as no specific cause for the symptoms can be found.

From Table 1 it is evident that the only symptoms which are common to both the blues and postpartum depression are, mood disturbance, anxiety, tension, hypochondriasis and fatigue (Cooke, 1985; Hamilton, 1989; Hopkins et al., 1984). In the event of the blues, rapid mood changes, and unpredictable tearfulness occurs, whereas for postpartum depression, an unrelenting depression and persistent tearful state is more common.

Suicide and infanticide are rare, but personality changes may lead to unsociable behaviour, isolation and divorce (Hamilton, 1989). The symptoms of postpartum depression may come and go during the first few weeks of the baby's life and then disappear completely, or they may become more intense and may last a year or longer. These feelings may vary in intensity from day to day, and may tend to become worse later in the day (Pitt, 1968; Searle, 1987).

Prevalence of postpartum depression. Epidemiological studies have indicated that the incidence of postpartum depression is quite extensive (True-Soderstrom et al., 1983), and is estimated by many researchers to be in

the range of one in ten births (Hamilton, 1989). The rates of postpartum depression from existing studies varies from 3.5% to 27% due to a lack of agreement regarding what constitutes the postpartum period, different times of measuring depression during the postpartum period, different rating scales employed and with the method used to define subjects as depressed (Harding, 1989; Hopkins et al., 1984; Whiffen, 1991). Studies in which the rate of referrals to medical practitioners and health professionals are used in order to determine the prevalence of depression, have revealed the lowest prevalence rates ranging from 3% to 5% of women in the postpartum period (Dalton, 1971; Tod & Edin, 1964), while studies in which self-rated depression scales have been used, have produced the highest rates. In the last two decades, several studies have confirmed Pitt's (1968) earlier finding that at least 10-20% of women experience postpartum depression (Cutrona & Troutman, 1986; Gotlib et al., 1989; Kumar & Robson, 1984; O'Hara et al., 1984; Whiffen,1988).

The estimates of the prevalence of postpartum depression tend to vary due to the researchers' definition of postpartum depression, the assessment strategy, and the method used to define subjects as depressed. Table 2 shows a history of some of the major studies in the field and the reported prevalence of postpartum depression. Sample size, measure used, and prevalence of depression are included.

Table 2

Major studies of pre- and postpartum depression, arranged in alphabetical order

Author & date	Measure	Subjects	Prevalence Prepartum	Prevalence Postpartum
Atkinson & Rickel (1984)	BDI	78 couples	8 weeks-29%	8 weeks-26%
Boyce, Hickie, & Parker (1990)	Edinburgh Post-natal Depression Scale (EDPS)	149		1 month-11.3% 3 months- 9.4% 6 months- 5.4%
Braverman & Roux (1978)	Their own Questionnaire	120		6 weeks-13%
Campbell, Cohn, Flanagan, Poppers, & Meyers (1992)	SADS Interview	129		6 months-24%
Campbell & Cohn (1991)	Research Diagnostic Criteria (RDC)	1,033		6-8 weeks-9.3%
Cox, Connor & Kendell, (1982)	Standardised Psychiatric Interview (SPI)	105	4%	3-5 months-13%
Cox, (1983)	Modification of SPI	178 (African) 89 (Scottish)		6-15 weeks-10% 6-15 weeks-13%
Cutrona, (1983)	i)Hamilton Rating Scale ii)BDI	85	3.5% 24.7%	8 weeks-3.5% 8 weeks-11.8%
Cutrona, & Troutman (1986)	BDI	55		3 months-20%
Dimitrovsky, Perez-, Hirshberg & Itskowitz (1987)	Zung Self-rating Depression Scale	54	27.78%	4-8 weeks-31%
Feggetter, Cooper, & Gath (1981)	General Health Questionnaire	820		1 year-19.7%
Gotlib, Whiffen, Mount, Milne, & Cordy (1989)	BDI RDC diagnosis	360	25% 10.2%	10 days-25% 10 days-6.8%
Hannah, Adams, Lee, Glover, & Sandler (1992)	EDPS	217		5 days-7.8% 6 weeks-11.5%

Table 2 continued

Major studies of pre- and postpartum depression, arranged in alphabetical order

Author & date	Measure	Subjects	Prevalence Prepartum	Prevalence Postpartum
Harris, Fung, Johns, Kologlu, Bhatti, McGregor, Richards, & Hall (1989)	DSM-III criteria	147		6-8 weeks-15%
Hayworth, Little, Bonham, Carter, Raptopoulos, Priest & Sandler (1980)	Self-rating Depression Scale	166		6 weeks-17%
House, Iriate, & Burns (1986)	BDI	27	15%	3 weeks-19%
Kumar & Robson (1984)	General Health Questionnaire	119	10%	3 months-14%
Martin (1977)	Interview	412	14%	5-6 weeks-14%
McIntosh (1993)	Women's own perception	38		1-3 months-23%
Meares, Grimwade, & Wood, (1975)	Visual Analogue Scales	129		6-18 months-16%
Nilsson & Almgren (1970)	Interview	152	17%	6 months-19%
O'Hara, Neunaber, & Zekoski (1984)	BDI RDC diagnosis	99	9%	6 months-12%
O'Hara, Zekoski, Phillips & Wright (1990)	BDI SCL-90-R RDC diagnosis	182 pregnant 179 non-childbearing	7.7% 5.6%	9 weeks-10.4% 9 weeks-7.8%
Paykel, Emms, Fletcher & Rassaby (1980)	Clinical Interview (Raskin Scale)	120		6 weeks-20%
Pfost, Stevens, & Lum (1990)	BDI	69		1 month-17%
Pitt (1968)	Pitt's depression questionnaire	305		6 weeks-10.8%

Table 2 continued

Major studies of pre- and postpartum depression, arranged in alphabetical order

Author & date	Measure	Subjects	Prevalence Prepartum	Prevalence Postpartum
Robinson & Young (1982)	Leeds Scale	280		6-8 weeks-6%
Saks, Frank, Lowe, Berman,Naftolin, & Cohen (1985)	BDI Hamilton Rating Scale	20		6 weeks-10%
Spangenberg & Pieters (1991)	BDI	81		1-6 months 27%
Uddenberg & Nilsson (1975)	Interviews	95	16%	4 months-24%
Whiffen (1988)	BDI RDC diagnosis	115		6-8 weeks-16%

Duration. There is no clear agreement on the duration and course of postpartum depression (Hopkins et al., 1984). Some studies have found that the average duration is six to eights weeks, whereas others suggest that the disorder may persist for a year or more (Ballinger, Buckley, Naylor, & Stansfield 1979; Pitt, 1968).

Prognosis. The transient postpartum blues which occurs in 50-80% of women, has come to be recognised by researchers as a normal reaction to childbirth (Hamilton, 1989), whereas postpartum depression is a more disabling syndrome (Landy et al., 1989). However, the prognosis for postpartum depression is generally good with psychotherapy and/or drug treatment, and many women recover completely (Cooke, 1985; Landy et al., 1989).

1.4 The Effects Of Postpartum Depression

Traditionally, postpartum depression has been viewed as a problem of the individual woman (Deutsch, 1974; Kerfoot & Buckwalter, 1981). However, this view is limited, as postpartum depression affects not only the mother, but her partner, her infant, her family and society in general. Although no firm conclusions can be reached regarding the effects of postpartum depression, in recent years, researchers have found evidence of an interaction between the depressed woman and her social context (Downey & Coyne, 1990). Research has revealed that depressed women in general have increased interpersonal difficulties, and a high rate of marital conflict (Weissman & Paykel, 1974). An association between marital problems and postpartum depression has been found in recent studies (Boyce, Hickie, & Parker, 1991; Schweitzer, Logan, & Strassberg, 1992; Whiffen, 1988).

A study by Nicolson (1989) revealed that the woman's subjective experience of depression entailed recurring feelings of negative self-evaluation, loss of control over personal and social aspects of life, panic, sadness, hopelessness and being trapped. According to Gruen (1990) the husband/partner and other family members may become confused and distraught by the mother's depressed symptoms. Her husband/partner may also feel fear, anger, and exhaustion when his partner suffers from postpartum depression (Gruen, 1990). Family upheaval and disruption may occur if the mother feels that she cannot cope with day to day living.

As well as the effects on the psychological well-being of the woman, researchers have found that postpartum depression can have adverse

psychological and social effects on children right through infancy (Brown & Harris, 1978; Downey & Coyne, 1990). Mother-infant interaction, attachment and bonding are recognized as being essential to the psychological development of children (Ainsworth, et al.,1978; Bowlby, 1982). A recent study found that mothers with postpartum depression rated significantly lower on overall positive interaction with their infants than nondepressed mothers, and that the infants of the postpartum depressed mothers were also rated significantly lower than infants of nondepressed mothers on corresponding positive interaction (Hoffman & Drotar, 1991). Mothers suffering from postpartum depression have also been found to be less affectionate and less vocally responsive to their infants (Fleming, Ruble, Flett and Shaul, 1988) and the infants of the depressed mothers who showed less responsiveness to them, had lower rates of activity and were fussier and less contented than controls (Field, 1984; Field et al., 1985).

Murray (1991), found that the infants of postpartum depressed mothers were more insecurely attached to their mothers and were more likely to have mild behavioural problems such as sleep disturbance, than the infants of nondepressed mothers. In comparison with the four-year old children of nondepressed mothers, four-year old children whose mothers had postpartum depression when they were infants, have been found to display poorer cognitive performance.

Scott (1990), maintains that the early identification of postpartum depression is essential in preventing child abuse and maltreatment. Postpartum depression has been found to contribute to neglect and in extreme

cases, to abuse of the infant (Steele & Pollock, 1968) and also to infanticide or suicide (Da Silva & Johnstone, 1981; Davidson & Robertson, 1985; Resnick, 1970).

From the emerging research on the effects of postpartum depression, it is clear that this disorder not only has devastating effects on the mother, but also has far reaching and enduring effects on her marriage, her infant and her family.

1.5 Aims And Study Objectives

This research aimed to investigate the influence of unplanned pregnancy, infant-related stressors, social support, and the role of the marital relationship in the development of postpartum depression. The relationship of background factors (for example age and parity) and previous history of depression was also analyzed as well as depression during pregnancy and the woman's feelings about having a new baby. A more complete description of this study is provided in the following chapter.

CHAPTER TWO

ETIOLOGY

Although depression is recognised as a common mental disorder in the postpartum, its etiology has always been the subject of debate and controversy, and there is no conclusive evidence on the cause of postpartum depression (Landy et al., 1987; Martin, Brown, Goldberg, & Brockington, 1989; Nicolson, 1989). However, theory and research on postpartum depression have enabled various high risk factors to be identified as having an etiological role in the development of this disorder (Landy et al., 1987).

Many potential etiological factors have been implicated in the development of postpartum depression, including biological, psychological, and psychosocial factors, as well as a history of depressive disorders and depression during pregnancy. Researchers have also examined the relationship between postpartum depression and various demographic factors in order to ascertain the frequency of the disorder and to identify whether any epidemiologic factors may predispose a women to develop postpartum depression.

2.1 Theories of Etiology

Research on the etiology of postpartum depression has followed three major theoretical perspectives: a physiological model, emphasizing the role of endocrine, hormonal and or genetic factors; a psychological model, in which women's psychological and personal characteristics are focused upon; and a psychosocial model which takes into account the interaction between

psychological, and social/environmental factors in the development of postpartum depression. Each theory will be discussed in turn.

2.1.1 Physiological Theories

Over the past few decades, researchers have found tentative support for the involvement of biological factors in the etiology of postpartum depression. During the 1950's, studies began to focus on the hormonal causes of postpartum depression, due to developments in psychopharmacology (Harkness, 1987). Physiological research has linked the influence of the endocrine system to the etiology of postpartum depression, including the sex hormones (Dalton, 1980; Hamburg, Moos, & Yalom, 1968; Melges, 1969; Yalom et al., 1968), low levels of thyroxine (Harris, Huckle, Thomas, Johns, & Fung, 1989), and an inactive pituitary (Gruen, 1990). Biochemical factors, such as a lack of tryptophan (Harris, 1980) and, genetic factors (Braverman & Roux, 1978; Inwood, 1985; O'Hara, 1987; True-Soderstrom et al., 1983), have also been associated with postpartum depression.

Endocrine Factors. There has been a great deal of research about the influence of the endocrine factors, particularly the female sex steroids, in the development of postpartum depression (Dalton, 1980; Hamburg et al., 1968; Melges, 1969; Yalom et al., 1968). Premenstrual tension and dysmenorrhoea (painful periods) have been associated with the onset of postpartum depression (Melges, 1968; Yalom et al., 1968), due to changes in the hormone prolactin during the premenstrual period.

During pregnancy, the woman's placenta produces very high levels of both oestrogen and progesterone. The rapid drop of oestrogen and

progesterone immediately after childbirth, and the increase in production of the hormone prolactin, which stimulates lactation, have been perceived as causes of postpartum depression (Dalton, 1980; McGowan, 1977; Yalom et al., 1968). According to McGowan (1977), those women who are more sensitive to the normal hormonal and endocrine fluctuations will be the ones who are more likely to develop postpartum depressive episodes.

Dalton (1980) maintains that postpartum depression can be effectively and successfully treated with progesterone therapy. However, Nott, Franklin, Armitage and Gelder (1976), found no clear pattern of differences on measures of progesterone, oestrogen or prolactin, and no clear relation between hormone changes and postpartum depression. These findings led these researchers to conclude that psychological and social factors may also influence the mood of women in the puerperium, as the effect of hormonal variables would only be most influential immediately after delivery, when the changes in hormone levels are most apparent (Nott et al., 1976). Hormonal factors are more likely to play a role in the development of the postpartum blues (Glover, 1992; Inwood, 1985; Murray & Gallahue, 1987), but little consistent evidence of a biochemical cause of postpartum depression has been found (Glover, 1992).

Hormonal factors do not explain why postpartum depression continues in spite of a return to normal hormonal levels, and recent studies of hormonal levels during pregnancy and the postpartum period have not been able to distinguish women who are depressed from those who are not (Cutrona, 1982; Fleming & Orpen, 1986; Glover, 1992; Harris et al., 1989).

However, Glover (1992), has suggested that postpartum depression may exist on a continuum from the blues to postnatal psychosis, as he maintains

that the shift in hormonal levels shortly after childbirth may cause certain biochemical changes, leading to the development of postpartum depression later on.

Thyroxine. A reduction in thyroxine is another endocrine factor which has been implicated as being influential in the development of postpartum depression. Some researchers have suggested that low levels of thyroxine are linked to symptoms of fatigue, confusion, delirium and depression during the postpartum period (Nixon, 1985). Harris et al. (1989), found an association between postpartum depression and thyroid dysfunction. Another researcher, Gruen 1990, linked postpartum depression to a "sluggish pituitary" (Hamilton, 1989).

Tryptophan. The role of another biochemical factor, tryptophan (an amino acid neurotransmitter in the brain), has also been investigated in the development of postpartum depression. Handley, Dunn, Waldron and Baker, 1980 (Nixon, 1985) have found an association between a lack of tryptophan in the first week postpartum and postpartum depression. However, in a well controlled empirical study by Harris, 1980 (Nixon, 1985), no significant differences between the two groups were found (Nixon,1985).

Genetic Factors. A link between genetic factors and postpartum depression has been identified in the etiology of this disorder in recent years (Inwood, 1985; O'Hara, 1987; True-Soderstrom et al., 1983). Women who have a history of psychiatric illness in family members have been found to be more likely to develop mental disturbances in the postpartum period (Braverman & Roux, 1978; Martin, 1977; Todd, 1964).

As in studies of women's depression in general (Nolen-Hoeksema, 1987), a direct link between a genetic predisposition or family history of psychiatric illness to postpartum depression has not been firmly established (Pfost et al., 1990). A criticism levelled at biological studies is that the researchers have focused primarily on psychotic reactions utilizing psychotic patients, and have ignored hormonal or genetic studies of the postpartum blues and milder depression disorders (Stern & Kruckman, 1983).

To summarize, research into the etiological significance of biological variables in postpartum depression has produced contradictory findings, and these variables have not been found to constitute a sufficient cause of postpartum depression (Hopkins et al., 1984; O'Hara, 1987). Steiner (1990) argues that although physiological variables may act as triggering factors, there is no evidence to support the view that physiological factors may cause postpartum depression. Furthermore, biological factors appear to play a major role in the early postpartum period (i.e. in the first few weeks when endocrine changes are more likely) and decrease in importance thereafter (Glover, 1992; Murray & Gallahue, 1986).

2.1.2 Psychological Theories

Psychological factors have been perceived by many researchers as playing a major role in postpartum depression. Psychological theories of postpartum depression have included psychodynamic, behavioural and cognitive models. Each of these models have tended to focus on different contributing factors.

Psychodynamic models. Until recently, the psychoanalytic view of personality development predominated in the literature concerning postpartum depression. Psychoanalytic theories have focused on the importance of childbearing in the emotional life of a woman, and, depending on the acceptance or rejection of her own womanhood, pregnancy has been perceived as a time when a woman may experience emotional regression or conflict (Cooke, 1985; Hopkins et al., 1984). Psychoanalysts have attributed the development of postpartum depression to distorted or hostile relationships towards a maternal figure, intense dependency needs, and inner conflict with phallic wishes (Deutsch, 1974; Kerfoot & Buckwalter, 1981). According to Zilboorg (Landy et al., p. 15, 1989), one of the first psychoanalysts to study postpartum depression, the depressed woman was "suffering from an unresolved castration complex seeing her child as having more the value of a lost male organ than anything else".

Vandenberg (1980) describes those women who are more likely to develop postpartum depression as unprepared for motherhood, and as having conflicts with the mothering role (role diffusion and loss of identity) and about femininity and loss of innocence. However, there have been few psychoanalytic empirical investigations of postpartum depression (Blum, 1978).

The relationship between anxiety during pregnancy, and postpartum depression, has been studied by a number of researchers (Dalton, 1971; Hayworth, Little, Bonham Carter, Raptopoulos, Priest, & Sandler, 1980; Meares et al., 1976). Dalton (1980) was the first researcher to note that anxiety during pregnancy was predictive of this disorder.

Problems in the woman's relationship with her own mother (Asch & Rubin, 1974; Melges, 1968; Roth, 1975) have been linked to the development of postpartum depression. However, Dimitrovsky, Perez-Hirshberg, & Itskowitz (1987) failed to find a significant relationship between women's evaluation of their relationship with their mothers and pre-and postpartum depression. The early death of the woman's mother, or having the mother spend a life-long stay in a mental institution (Cox, 1983; Schreuder-Hoekstra, 1983) has also been linked to postpartum depression.

There is also evidence of a relationship between personality disorders and postpartum depression (Meares et al., 1976; Pitt,1968; Tod, 1964). Tod (1964) reported that women experiencing postpartum depression had a previous inadequate personality disorder. An overidentification and rivalry with the baby, arising from an immature personality involving unfulfilled narcissistic and oral dependency needs has been associated with the development of postpartum depression (Asch & Rubin, 1974; Melges, 1968). Pitt (1968) found that women with postpartum depression were more neurotic and less extroverted than non-depressed women, and Mearse et al. (1976) found that neuroticism was associated with postpartum depression. There is also some evidence linking general hostility level with postpartum depression (Hayworth et al., 1980; Murrray & Gallahue, 1980; Nixon, 1985). Hayworth et al. (1980) found that high anxiety, high hostility during pregnancy, and the perception of the woman as being less in control of her life (an external locus of control), were predictors of postpartum depression. However, some researchers are uncertain whether specific personality traits may predispose women to depressive episodes following childbirth (Cutrona, 1982).

Sex role orientation has also been found to predict postpartum depression. Pfost et al. (1989), in a study of 69 pre- and postpartum women, found that women who are undifferentiated in sex role orientation (women who score low on both the masculine and feminine scales of the Bem Sex Role Inventory) are more likely to become depressed during the postpartum than women from other sex role groups.

Behavioural models. According to behavioural theories, depression results from a decline in activities which are perceived as positive and rewarding, due to a sudden change in the environment (Atkinson & Rickel, 1984). A reduction in positive reinforcement is linked to the onset of depression (Atkinson & Rickel, 1984, Cutrona, 1982). One reason for this lack of positive reinforcement is said to be due to a lack of skills in eliciting positive reinforcement from others (Cutrona, 1982). Behavioural theorists claim that individuals who are lacking in interpersonal social skills, are at greater risk of developing depression, as they do not receive positive reinforcers that occur normally in social interaction (Kerfoot & Buckwalter, 1981). O'Hara (1980) found that a lack of social skill was a predictor of postpartum depression.

According to Phillips (1986), before the birth of their infants, women experience reinforcement for social and/or recreational activities from their work and/or social networks, and that it is the lack of this reinforcement after childbirth which leads to postpartum depression. Atkinson & Rickel (1984) examined the association between self-reported positive and negative reinforcement and postpartum depression in a sample of 78 couples. They found that consistent with the behavioural perspective of postpartum depression, perceived positive reinforcement was inversely related to

postpartum depression. However, apart from the above-mentioned studies, very little research has been published with regard to behaviour therapy and postpartum depression. Therefore, the behavioural model has been largely untested.

Cognitive Models. Several cognitive models of depression have been proposed, which focus on the effects of self-critical, negative, or pessimistic thought patterns. The effects of attributional style, which refers to the characteristic way individuals perceive causes of events, has also been linked to postpartum depression (e.g. O'Hara et al., 1982). Depressive attributions occur when an individual's expectations or evaluations of an event or situation are negative, leading to stress, and, in turn, to depression (Cutrona, 1983; Inwood, 1985; O'Hara, 1987).

The reformulated learned helplessness model by Abrahamson, Seligman and Teasdale, 1978 (Manly, McMahon, Bradley, & Davidson, 1982; Pfost et al., 1990) has been applied to research on postpartum depression (Manly et al., 1982; O'Hara, Rehm, & Campbell, 1982). According to the reformulated learned helplessness model, when faced with negative events, individuals make attributions that stress the uncontrollability, globality, and stability of the putative causes. When related to postpartum depression, this model suggests that women who perceive themselves as helpless or who tend to blame themselves, are more likely to become depressed when they are faced with the stressors of pregnancy, delivery and child care (Carver & Gaines, 1987; O'Hara, 1987; Pfost et al., 1990). O'Hara et al. (1983) found that dysfunctional attributional styles were related to higher levels of postpartum depression. However, Manly et al. (1982), found that depressive attributional style, when

measured by the Attributional Style Questionnaire, had no association with depression in pregnancy or the postpartum.

According to Gruen (1990), those individuals who are anxious, controlling, perfectionistic, and compulsive are more likely to have unrealistic expectations of childbirth and parenting, leading to feelings of disappointment and failure from not being able to meet their own or other's expectations, and resulting in depression. Research has also shown that negative attitudes towards pregnancy, delivery, and child rearing are associated with postpartum depression (Grossman et al., 1980; Hopkins et al., 1984).

Although cognitive therapy has been shown to be an effective treatment for depression in general (Dobson, 1989), there has been a lack of research on the influence of cognitive therapy in the etiology and treatment of postpartum depression (Whiffen, 1991).

Brief Summary of Psychological Theories. There have been few consistent findings regarding the role of psychoanalytic and psychodynamic factors in postpartum depression, as the psychoanalytic viewpoint does not lend itself to empirical investigations. There has also been a lack of research on the influence of both cognitive and behavioural factors in the etiology and treatment of postpartum depression. However, there is some evidence to suggest that psychological factors such as the woman's previous psychiatric history, are related to emotional disorder in the postpartum period. Depression during pregnancy is also a factor that has fairly consistently been found to be associated with postpartum depression (Gotlib et al., 1989; O'Hara et al., 1984; Pfost et al., 1989; Whiffen, 1988). Although the findings have been inconsistent, there seems to be evidence to support the involvement of

psychological factors in postpartum depression. However, in recent years many researchers agree that instead of being purely an individual problem, depression can result from a dynamic interaction of physiological, psychological, social and environmental factors (Downey & Coyne, 1990). This view lends support for the psychosocial perspective of postpartum depression, which focuses on the interdependence between the individual and his/her social context.

2.1.3 Psychosocial Theories

A stress model has been proposed by some psychosocial theorists, who argue that the occurrence of stressful life events, such as loss of a loved one, marital or relationship difficulties, serious financial or housing difficulties, may precipitate the onset of depression (Hopkins et al., 1987). Stress has been defined by Arnold, 1960 as "any condition which disturbs normal functioning" (Ball, 1987, p.7). Individuals who find themselves in continuing stressful situations may be particularly susceptible to depression (Dowlatshahi & Paykel, 1990). According to social stress theorists, depression is more likely to arise with the occurrence of a major stressor (or stressors) or when the degree of stress experienced is extensive (Atkinson & Rickel, 1984; Cutrona, 1982).

Proponents of a psychosocial stress theory of postpartum depression perceive childbirth as a major stressor that disrupts the parent's usual living patterns, thereby forcing them to implement new behaviour patterns. These researchers advance the hypothesis that it is these disruptions during the postpartum which increase the woman's vulnerability to emotional disturbance (Atkinson & Rickel, 1984).

Although the birth of a child is a stressful event requiring a great deal of adaptation and readjustment, many new mothers do not become depressed. Paykel et al. (1980) found that a recent undesirable life event was the factor most strongly associated with the onset of this disorder, and they hypothesised that those women who become depressed during the postpartum have experienced additional stressful events around the time of pregnancy and childbirth. According to Paykel et al. (1980), the probability of becoming depressed after childbirth is about three times greater if a significant stressful event had recently occurred, than if no such event had occurred. They proposed an additive model of stress in which the birth of a child may add to existing tensions resulting in the woman's coping threshold being exceeded, thereby leading to depression. Support for this theory has come from many researchers who found that the most significant factor associated with postpartum depression was the occurrence of recent stressful events (Blumberg, 1980; O'Hara et al., 1983; Watson et al., 1984).

McGowan (1977) identifies three types of stressors in the puerperium:

i) physiologic stressors, which include metabolic readjustment of glandular function, physical exhaustion and sleep deprivation, drop in hormone levels, drug effects and obstetric history;

ii) psychic stressors, which are cultural, psychosexual and emotional; and,

iii) environmental stressors, such as financial problems, limited living space, death of family members and marital conflict.

In the last two decades, researchers have begun to examine the combined, interactional effects of social, environmental, and psychological variables. The psychosocial perspective in recent studies (Cicchetti & Aber,

1986; Cutrona & Troutman, 1986; Landy et al., 1989) focuses on the continuous interrelations between changing variables in the development of postpartum depression (Landy et al., 1989), in which social, environmental and psychological factors are perceived as exerting a mutual influence on each other (Cicchetti & Aber, 1986).

Others have proposed a diathesis-stress model of postpartum depression (O'Hara et al., 1984; O'Hara et al., 1991). In earlier research on postpartum depression, researchers tended to focus either on the stressor (e.g. Atkinson & Rickel, 1984; O'Hara et al., 1982), or the diathesis (Cutrona, 1983; Manly et al., 1982), but not both. Diatheses, or vulnerability variables, can include dysfunctional attributional style (Abramson, Seligman, & Teasdale, 1978; O'Hara et al., 1991), depression history (O'Hara et al., 1984), or cognitive vulnerability (O'Hara et al., 1984). Stressors include negative life events such as marital or relationship difficulties, lack of social support (Cutrona, 1984; O'Hara, 1987), childbirth (O'Hara et al., 1991), difficult infant temperament (Cutrona & Troutman, 1986; Whiffen, 1988), or infant risk status at birth (Hopkins et al., 1987; Gennaro, 1988). According to the diathesis-stress perspective, some individuals are more vulnerable to becoming depressed in the presence of stressful events, due to the interaction of certain biological, psychosocial and environmental factors (Pfost et al., 1990). The diathesis-stress model, when applied to studies of postpartum depression, perceives childbirth as comprising a number of stressful events which precipitate depression in vulnerable women (O'Hara et al., 1984).

Many psychosocial variables have been suggested as etiologic agents in postpartum depression. These include: marital problems (Braverman & Roux,

1978; Grossman et al., 1980; O'Hara et al., 1983); lack of social support, (Hopkins et al., 1984; O'Hara et al., 1983; Paykel et al., 1980); and unplanned pregnancy (Braverman & Roux, 1978; Kumar & Robson, 1978). Infant temperament and infant risk status at birth, which are major contributors to the stresses of the puerperium, have been largely ignored in the literature on postpartum depression (Cutrona & Troutman, 1986; Hopkins et al., 1987). Difficult deliveries (Ballinger, 1982; Dalton, 1980; Stewart, 1988), might also, from the psychosocial theory viewpoint, be expected to be implicated in the onset of postpartum depression, but, although Caesarian section deliveries were found to be related to postpartum depression in some studies (Ballinger, 1982; Kendell et al., 1981) in other research they were not (Cox et al., 1982, Cox, 1983; Hopkins et al., 1984; True-Soderstrom et al., 1983). Circumstances occurring at birth such as the type of delivery experienced, or hormonal changes, have been suggested as primary contributors to depression (e.g., Cutrona, 1982; Dean & Kendell, 1981). However, other research has shown that events surrounding the birth, such as long labours, the use of drugs, induced labour, epidural analgesia, instrument deliveries or Caesarean section have not been shown to play a part in the development of postpartum depression (e.g., Cox et al., 1982; Gennaro, 1988; Meares et al., 1976; Spangenberg & Pieters, 1991; Stein, Cooper, Campbell, Day, & Altham, 1989).

Recent studies have provided support for the involvement of psychosocial factors in the etiology of postpartum depression (Paykel et al., 1980; O'Hara, 1986; Manly et al., 1989; Spangenberg & Pieters, 1991). Feggetter, Cooper, & Gath (1981), found that postpartum depression was associated with a number of psychosocial factors, namely, an unsupportive marital relationship, and

reports of a difficult baby. According to Atkinson and Rickel (1984), the variables that were most strongly associated with postpartum depression were consistent with the social stress and behavioural theories of depression. In a study by House, Iriarte, & Burns (1986), a high significant positive correlation was found between stressful life events and both pre- and postpartum depression. Similarly, O'Hara et al. (1991) and Spangenberg and Pieters (1991) found that psychosocial factors played an important role in the development of this disorder.

According to Glover (1992), social factors are influential in the development of depression in general, in postpartum depression (Kendell, 1985; Kumar & Robson, 1984) and in cases where there is prenatal onset (Brockington, Martin, Brown, Goldberg, & Margison, 1990). However, Marks, Wieck, Checkley, & Kumar (1992) found that psychosocial variables (such as lack of a confidant, or unplanned pregnancy) did not contribute to the onset of postpartum depression (Marks et al., 1992).

To summarize, from the research on postpartum depression, there have been a growing number of studies which tentatively support a psychosocial etiology of postpartum depression (Schweitzer et al., 1992). These studies have demonstrated a relationship between a number of psychosocial variables and both pre- and postpartum depression (O'Hara et al., 1982; Paykel, 1978, 1979). From a psychosocial perspective, postpartum depression, unlike the "blues" and postpartum psychosis, is thought to result from an interaction of psychological and social/environmental factors (Inwood, 1985; Murray & Gallahue, 1987; O'Hara, 1987), and appears to be related to life events and social stress (Cooper & Stein, 1989; Paykel et al., 1980; Watson et al., 1984).

However, the causal nature of the psychosocial factors are not fully understood. Researchers have not adequately investigated whether psychosocial stressors cause depression or whether depression causes psychosocial stressors, as the causal pathways may go in both directions (House et al., 1986). Research regarding the role of psychosocial factors in the etiology of postpartum depression has produced contradictory results. Therefore, more studies on the psychosocial determinants of postpartum depression are needed (Cutrona, 1982). As there is no single factor that is responsible for precipitating postpartum depression, there may be a more complex causal pattern involved in the etiology of this disorder.

2.2 Etiological Factors in Postpartum Depression

Although numerous physiological, psychological and psychosocial factors have been investigated as potential causes of postpartum depression, the etiology of this disorder remains uncertain. Many psychosocial factors appear to play a role in the etiology of postpartum depression, including: poor marital adjustment (Boyce et al., 1991; Schweitzer et al., 1992; Whiffen, 1988), a lack of social support (Cutrona, 1984; Hopkins et al., 1984; O'Hara, 1987), unplanned pregnancy (Braverman & Roux, 1978; Kumar & Robson, 1978), difficult infant temperament (Cutrona & Troutman, 1986; Whiffen, 1988), and, infant risk status at birth (Gennaro, 1988; Hopkins et al., 1987).

Each psychosocial factor will be discussed in turn, as well as the impact of psychological factors on postpartum depression, such as the woman's feelings towards having a new baby in the family, depression history and

depression during pregnancy. The association between demographic factors and postpartum depression will also be discussed.

2.2.1 Psychosocial Factors

(a) Unplanned Pregnancy

Unplanned pregnancy has been found to be an influential psychosocial factor in predisposing a woman to postpartum mental illness (Braverman & Roux, 1978; Campbell, Cohn, Flanagan, Popper, & Meyers, 1992; Martin, 1977; Kumar & Robson, 1978).

(b) The Marital Relationship

The quality of the marital relationship as related to postpartum depression has received considerable attention (Dimitriovsky et al., 1987; Stemp, Turner & Noh, 1986; Leung, 1985; O'Hara, 1986). Most studies have found that marital problems may render the wife/partner more vulnerable to depression (e.g., Boyce et al., 1991; O'Hara, 1986; Schweitzer et al., 1992; Whiffen, 1988). Whiffen (1988) assessed 115 primiparous (first time) mothers for depressive symptomatology, and found that postpartum depression was predicted by low marital adjustment. However, Paykel et al. (1980) found that a poor marital relationship increased the wife's vulnerability to depression only when associated with other stressful life events.

Other studies have found a relationship between higher levels of depression and lower marital satisfaction to exist during pregnancy (Dimitrovsky et al., 1987; Kumar & Robson, 1984). Dimitrovsky et al. (1987) who assessed 54 primiparous mothers during pregnancy and again at 4-8

weeks postpartum, found that those subjects who rated a poor relationship with their husband during pregnancy tended to be depressed both during pregnancy and in the postpartum. A relationship was also found between marital problems during pregnancy and postpartum depression in several other studies (Grossman et al., 1980; Kumar & Robson, 1984; Watson et al., 1984), suggesting that a poor marital relationship might be influential in causing postpartum depression.

However, Kumar & Robson, (1984) in a study of 119 primiparous women, found that marital conflict was more strongly associated with depression during pregnancy than with postpartum depression. Similarly, Bagedahl-Strindlund (1986) found that marital problems tended to be reported by more women with an onset of depression during pregnancy than by women with an onset at other times. O'Hara et al. (1990) studied 182 women during pregnancy along with a matched sample of 182 nonchildbearing women, in order to determine the extent to which pregnancy and the postpartum are associated with an increased risk of depression and poor marital adjustment (assessed by the Dyadic Adjustment Scale). They found that the childbearing women reported a higher level of marital adjustment during pregnancy, but not after delivery, than did nonchildbearing subjects.

Although findings vary, most research supports the significant role played by marital partner relationship in pre- and/or postpartum adjustment. Further research seems necessary, however, in order to confirm the etiological importance of this variable in predicting both pre- and postpartum depression, and to determine whether a poor marital relationship plays a role in the development of pre- and postpartum depression in New Zealand women.

(c) Social Support

Social support has been shown to be an important variable in the stress-disorder relationship as a mediating or independent variable (Hopkins et al., 1984; O'Hara et al., 1983; Stemp et al., 1986). A lack of practical as well as emotional support by the husband/partner, family members and/or friends, probably plays a significant role in the development of postpartum emotional problems (Cutrona & Troutman, 1986, O'Hara et al., 1983). Social support may facilitate coping with the physical and emotional effects of childbirth as well with the demands of caring for a newborn infant (Bennett & Slade, 1991; Cutrona & Troutman, 1986). However, research on social support in the postpartum has produced conflicting results.

Many researchers have found that social support is important in postpartum adjustment, and that a lack of social support is a predictor of postpartum depression (Cutrona, 1984; Hopkins et al., 1984; Inwood, 1985; O'Hara, 1987). Cutrona & Troutman (1986) found that women who reported high levels of support from spouses, parents or friends before their babies were born, experienced less depression three months postpartum. However, Hopkins et al. (1987) studied 25 depressed and 24 non-depressed, married, middle-class, primiparous women and found that social support was not related to postpartum depression. Similarly, Kelly, & Deakin (1992) who evaluated 100 pregnant women from the 36th week of pregnancy to 2 months postpartum failed to find significant associations between social support and postpartum depression. These inconsistent findings could be due to the differences in the measures used to assess social support.

Some researchers maintain that social support is multidimensional (Stemp et al., 1986), and that it is both the type of social support, which can be either in the form of instrumental assistance, or emotional empathy and understanding, and the source of social support, including intimate relationships, friendships and neighbourhood or community contacts, which are important (Crnic, Greenberg, Ragozin, Robinson, & Basham, 1983; Stemp et al., 1986). Recent studies have indicated that it is important to measure social support not only objectively, in terms of the size and composition of the support network, but also subjectively, taking into account the woman's perceived satisfaction with her social support network (Cooke, 1985; Cutrona, 1986; Leavy, 1983; Stemp et al., 1986).

O'Hara et al. (1983) found that those women who were depressed during the postpartum, had less emotional and practical support than non-depressed women and that the depressed women were less satisfied with the social support they received. However, Stemp et al. (1986) assessed 280 new mothers for 1 year and found that social support had no impact on changes in psychological distress when indexed as the extent of the mother's social network, but that the woman's cognitive perception of being supported by others, was related to psychological distress.

In all the above-mentioned studies, the woman's perception of social support could have been negatively affected by depression as the studies to date have not considered the cause-effect relationship between social support and postpartum depression (Bennett & Slade, 1991; Spangenberg & Pieters, 1991). Overall, there is good evidence that social support plays an important role in postpartum adjustment, although clearly, further empirical research is

needed. The multidimensional nature of social support, including both social network size and perceived satisfaction with the network deserves further exploration.

(d) Infant Risk Status at Birth

Cutrona (1982) maintains that those women who give birth to premature infants or to infants with health problems, will find their coping resources more severely strained than mothers of full-term, healthy infants. Results tend to be mixed regarding whether giving birth to an "at risk" infant is a predictor of postpartum depression, perhaps due to differences in methods of measuring infant risk status at birth, in the size of the samples studied, and in the demographic characteristics of the subjects (often comprising only first-time mothers or middle class women).

Some researchers have found a significant relationship between postpartum depression and neonatal risk (Gennaro, 1988; Hopkins et al., 1987; Kumar & Robson, 1984). Braverman & Roux (1978) found that the incidence of prematurity as well as other neonatal complications were notably higher among depressed women. Similarly, Blumberg (1980) found that greater levels of neonatal risk were associated with higher levels of depression and anxiety, and to more negative perceptions of the newborn.

Hopkins et al. (1987), in a study of 25 depressed and 24 nondepressed women, 6 to 8 weeks postpartum, using the Postnatal Scale by Littman and Parmelee, 1974 (Hopkins et al., 1987), found that neonatal risk was a significant predictor of postpartum depression. Similarly, Bennett, & Slade

(1991) also found that those women whose infants were at greater risk reported higher levels of depressive symptomatology.

However, other researchers have found no association between postpartum depression and infant risk status (Davidson, 1972; Pitt, 1968; Yalom et al., 1968). Davidson (1972) found that there was no correlation between neonatal state and postpartum depression. Pitt's (1968) study revealed that there was no relationship between postpartum depression and premature babies or babies with any form of abnormality, and similarly, Yalom et al. (1968) found no correlation between the condition of the newborn and postpartum depression.

Kumar & Robson's (1984) investigation revealed that the only obstetric variable to associate significantly with postnatal psychiatric problems, was the birth of a premature baby. Gennaro (1988) found that mothers of preterm infants were significantly more depressed than mothers of term infants in the first postpartum week, but that this difference did not persist over time. Similarly, Hannah, Adams, Lee, Glover, & Sandler (1992) found that there was a highly significant relationship between the baby's low birth weight and depression at 5 days after childbirth, but not at 6 weeks postpartum.

Research in which infant risk status is used to predict postpartum depression has produced inconsistent and inconclusive results. However, infants who are at risk may impose an additional stress for a new mother, which could plausibly lead to depression during the postpartum, underlining the need for further research.

(e) Infant Temperament

Although recent studies have emphasised the contribution of infant characteristics in the development of postpartum depression, relatively little research has focused on the influence of the "difficult" infant on the mother. Vandershaf (1987) maintains that caring for a difficult infant is more stressful for the mother as temperamentally difficult infants tend to cry for longer periods of time and to be unresponsive to any attempts to comfort them. These infants also resist being introduced to any new foods, people, or routines into their lives and have fairly unpredictable sleep, hunger, and other patterns (Vandershaf, 1987).

Pitt (1968), Feggetter et al. (1981) and Hopkins et al. (1984) found that one of the factors associated with depression was reports of a difficult baby. Hopkins et al. (1987) assessed infant temperament (using the Infant Characteristics Questionnaire, (ICQ), by Bates, Freeland and Lounsbury, 1979) and found that difficult infant temperament was related to postpartum depression. Similarly, studies by Cutrona & Troutman (1986) and Whiffen (1988), revealed that postpartum depression was associated with the woman's perception of her infant as temperamentally difficult.

The research on the relationship between infant temperament and postpartum depression, suggests that there is a link between these variables, underlining the need to place more emphasis on the role of infant-related stressors as factors in the development of postpartum depression. Infant-related stressors may have important roles in postpartum maternal adjustment and in the development of the mother-infant relationship. However, the results of these studies need to be replicated as the samples used have been

relatively small (Cutrona & Troutman, 1986; Hopkins et al., 1987; Whiffen & Gotlib, 1989).

2.2.2 Psychological Factors

(a) Feelings about having a new baby in the family

Kumar & Robson (1984) and Campbell et al. (1992), found that women who had severe doubts about having the baby were more likely to be depressed both during pregnancy and postpartum.

(b) History of depression

The majority of studies of postpartum depression suggest that there is a direct relationship between postpartum depression and previous non-postpartum depressive episodes (Lewinsohn, Hoberman, & Rosenbaum, 1988; O'Hara et al., 1984; O'Hara & Zekoski, 1988; True-Soderstrom et al., 1983).

A recent longitudinal study by Campbell et al. (1992) in which 70 depressed women and 59 demographically matched nondepressed women who were delivering their first child, were followed for 24 months, found that depressed women with a history of depressive disorders were at greater risk of developing postpartum depression.

However, some researchers suggest that pre- and postpartum depression are independent and have different causes (Hopkins et al., 1987), while others maintain that those women who have a history of depression and/or emotional problems, are most at risk of developing postpartum depression, and argue that there is a continuity between episodes of postpartum and nonpostpartum depression (Whiffen, 1991). Further research is required in order to determine

the relationship between a previous history of depression and both pre- and postpartum depression.

(c) Depression During Pregnancy

There have been contradictory findings regarding whether depression during pregnancy is influential in determining postpartum depression. Many researchers have found a significant relationship between depression during pregnancy and postpartum depression (e.g., O'Hara et al., 1990; Pfost & Stevens, 1990; Saks et al., 1985; Whiffen, 1988), and some studies have found that depression during pregnancy was the only significant predictor of postpartum depression (Atkinson & Rickel, 1984; Manly et al., 1982).

Recent studies by Whiffen (1988) and Kelly and Deakin (1992), revealed that prepartum depression was significantly predictive of postpartum depression. O'Hara et al. (1991), in a controlled study of 182 childbearing and 179 nonchildbearing women found that in the childbearing group, depression level during pregnancy showed the strongest association with postpartum depressive symptomatology.

Other researchers have found depression in pregnancy to be less common and more likely in the postpartum (e.g., Dimitrovsky et al., 1987; Hayworth et al., 1980; Meares et al., 1976). Kumar and Robson (1984) found that in a sample of primiparous women who were interviewed repeatedly at fixed intervals during their pregnancies and until their babies were a year old, that subjects either suffered from antenatal or postnatal depression, not both. Frank, Kupfer, Jacob, Blumenthal, & Jarrett (1987), studied 52 women with recurrent depression and found that contrary to their expectations, there were

no differences between women with and without histories of pregnancy related episodes.

The causes of depression during pregnancy have not been identified (Pfost et al., 1990). Several researchers have found a drop in depression after delivery (e.g., Cutrona, 1983; Pfost, Lum, & Stevens, 1989; O'Hara et al., 1984), which suggests that the long physical strain of pregnancy contributes to depression during pregnancy (Inwood, 1985). Gotlib et al. (1989) examined the incidence of depression in a heterogeneous sample of 360 pregnant women during pregnancy and in the postpartum and found that depression during pregnancy was related to different sociodemographic variables than was postpartum depression. They concluded that depression at these two times may be associated with different psychological or etiological factors. However, Kelly and Deakin (1992) found that antepartum depression scores were significantly predictive of postpartum depression, leading them to infer that postpartum depression is a continuation of depression during pregnancy, a conclusion suggested by some earlier studies (Tod, 1964; Watson et al., 1984).

Further research seems necessary in order to confirm the etiological importance of this variable in predicting postpartum depression, and to determine whether a depression in pregnancy plays a role in the development of this disorder in New Zealand women.

2.2.3 Demographic Factors

Researchers have studied the demographic characteristics of women in order to identify the incidence of postpartum depression and also to study factors which may predict this disorder. However, as in studies of women's

depression in general (Pfost et al., 1990), inconsistent epidemiological patterns have been revealed in studies of the association between demographic variables and postpartum depression (Hopkins et al., 1984; O'Hara, 1987). Among the demographic variables which have been analysed in association with postpartum depression are, age, parity (the number of children that a woman has), marital status, race, social class, income, religion and employment status.

(a) Age

Results in respect of maternal age at delivery and incidence of postpartum depression have been varied. Most studies have found that depressives did not differ significantly from nondepressives with regard to age (e.g., Bagedahl-Strindlund, 1986; Marks et al., 1992; McNeil, 1987; Pitt, 1968; Spangenberg & Pieters, 1991).

However, some studies have found a higher rate of depression among young mothers (e.g., Garvey, Tuason, Lumney & Hoffman, 1983; Hayworth et al., 1980; Paykel et al., 1980). Kumar and Robson (1984), found that older mothers were significantly more depressed, and Vandenberg (1980) also identified a trend amongst older women, who experienced role change factors due to the loss of their careers and who have long periods between their pregnancies, to develop postpartum depression.

(b) Number of children

Research findings with regard to the association between postpartum depression and the number of children that a women has, have been

contradictory. Most studies indicate that parity does not affect the incidence of postpartum depression (e.g., Marks et al., 1992; McNeil, 1987; Spangenberg & Pieters, 1991; True-Soderstrom et al., 1983). However, Kendell, Rennie Clark and Dean (1981) found a significant positive relationship between primiparae (first-time mothers) and postpartum depression.

(c) Marital Status

Most research has failed to indicate that there are significant differences in the relationship between marital status and postpartum depression (e.g., Bagedahl-Strindlund, 1986; Marks et al., 1992; McNeil, 1987). In a random sample of women, Cox et al. (1982) found that unmarried women were more likely to report psychiatric symptoms during pregnancy, but that these women did not report any depressive symptoms during the postpartum.

However, in a study of 820 women, Feggetter et al. (1981) found a significant association between high depression scores, and the status of being unmarried, and O'Hara, 1980 (Hopkins et al., 1984) found a relationship between divorce and postpartum depression.

(d) Ethnicity

No differences have been found between race or ethnic origin and the incidence of postpartum depression (e.g., Hayworth et al., 1980), although very few multiracial studies have been conducted.

(e) Religion and Socio-economic Factors

Previous research has shown that there are no significant association between postpartum depression and religion (e.g., Blumberg, 1980; Braverman & Roux, 1978), employment status (e.g., Bagedahl-Strindlund, 1986; Kumar & Robson, 1984; Marks et al., 1992), financial problems (e.g., Kumar & Robson, 1984), and income (e.g., O'Hara et al., 1982). Some researchers have found, however, that those women who are committed to a career and who have intentions to work after the birth of their infants, are more likely to experience postpartum depression (e.g., Jiminez, 1978; Tauber, 1974). However, Paykel et al. (1980) and Pfost et al. (1989) found that women who have employment plans are less vulnerable to postpartum depression.

Most studies have found no relationship between social class and postpartum depression (e.g., Kumar & Robsen, 1984; Marks et al., 1992; McNeil, 1980), although Feggetter et al. (1981) found a significant association between lower social class and postpartum depression.

2.3 The Present Study

From the literature review, no completely clear picture has emerged of the social, demographic or biological factors which might be associated with a postpartum depressive breakdown. However, several demographic, psychosocial, and psychological factors have emerged that appear to be related to postpartum depression. These variables have not been evaluated simultaneously in a prospective study. Moreover, previous research has been hindered by the use of nonspecific instruments, unstandardized measures in the assessment of the disorder, and small samples. Subjects are also

frequently recruited from a single hospital or clinic (e.g., Hayworth et al., 1980; Kumar & Robson, 1984), which may produce samples that are relatively homogeneous with respect to variables such as socio-economic status, therefore restricting the generalizability of the results. Another limitation of many previous studies (e.g. Cox et al., 1982; Paykel et al., 1980; Spangenberg & Pieters, 1991) is the use of cross-sectional designs, and a failure to evaluate depression during pregnancy. Clearly, there is a need for longitudinal designs that avoid (as far as possible) the methodological problems encountered in previous research. In particular, a local study is required to isolate variables that may influence the development of postpartum depression in New Zealand.

The aim of the present study was twofold: firstly, to examine the prevalence of pre- and postpartum depression in a large New Zealand sample and secondly to examine, in a prospective study, the role of psychosocial factors, such as unplanned pregnancy, marital relationship, social support (both social network size and perceived satisfaction with the support network), infant risk status at birth, and infant temperament, in the development of postpartum depression. The contribution of various psychological factors, such as previous history of depression, the woman's feelings about having a new baby, and depression during pregnancy, as well as several demographic and background factors (for example age and parity), were also studied.

2.3.1 The Hypotheses

From a review of the literature of postpartum depression, several predictions were made.

Prevalence of depression. It was hypothesized that the prevalence of postpartum depressive symptoms in a large heterogenous sample of New Zealand women would be consistent with the 10% to 20% prevalence found in previous overseas research on postpartum depression. It was also expected that the rate of depression would increase from the pregnancy to the postpartum assessment, and that there would be a higher prevalence of depression in the postpartum.

Demographic characteristics. Demographic studies yielded very inconsistent findings regarding epidemiologic variables as risk factors for postpartum depression including maternal age at delivery, social class, parity, marital status, history of depression, religion, employment status and financial problems. Therefore, no specific hypotheses were postulated concerning the role of these demographic variables.

Psychological factors. It was hypothesized that higher levels of depression during pregnancy would be predictive of higher levels of postpartum depression. Higher pre- and postpartum depression scores were also expected to be predicted from a reported history of previous depressive episodes. It was also expected that those women who felt unhappier about having a new baby in the family would experience greater pre-and postpartum depression.

Psychosocial factors. Woman who did not plan their pregnancies were expected to have higher levels of both pre- and postpartum depressive

symptomatology. It was hypothesized that a poorer marital adjustment during pregnancy would be associated with higher levels of depression during pregnancy and in the postpartum. It was also expected that those women who had less marital adjustment at three months postpartum would be more likely to be depressed in the postpartum.

With regard to social support, it was expected that women receiving less social support during pregnancy would be more depressed both during pregnancy and in the postpartum. Lower levels of postpartum social support was also hypothesized as being predictive of more depression during the postpartum period. Of particular interest was the multidimensional nature of social support, including the relationship between both social network size and perceived satisfaction with the social support network, and the role of each of these variables as sole predictors of pre-and postpartum depression. Specifically, it was expected that both social network size and the woman's perceived satisfaction with the social network would both be related to pre- and postpartum depressive symptomatology.

Finally, it was hypothesized that infant-related stressors (infant risk status at birth and infant temperament) would be influential in predicting postpartum depression. It was predicted that giving birth to an infant at higher risk, would precipitate the development of postpartum depressive symptomatology. Similarly, it was expected that mothers whose infants had more difficult temperaments would be more likely to be depressed in the postpartum than mothers of less temperamentally difficult babies.

CHAPTER THREE

METHOD OF INVESTIGATION

3.1 Subjects

The sample consisted of 214 of 244 primiparous (first-time mothers) and multiparous (mothers of more than one child) pregnant women, residing in New Zealand. The subjects came from many different ethnic backgrounds, belonged to different religious groups, and had varying incomes, occupations and levels of education. The women were eligible for participation in the study if they were in the third trimester of pregnancy, between the ages of 17 and 45 and could read, write and understand the English language. The demographic characteristics of the sample are displayed in Table 3 (Chapter 4).

3.2 Procedure

3.2.1 Procedure for Enlisting Subjects

Women were recruited when they visited antenatal clinics at Wellington Women's Hospital, Kenepuru Hospital and the Hutt Hospital where they were handed prepartum questionnaires by their midwives. Approval to conduct the research and recruit pregnant women from these hospitals was sought and obtained from the Wellington Area Health Board Ethics Committee. A copy of the Ethics Committee's approval can be found in Appendix K. Some general practitioners and gynaecologists in the Wellington area also agreed to distribute the questionnaires to their pregnant patients. The distribution of the questionnaire booklets did not require much time or explanation on the part of the midwives or doctors. A letter to the subject, explaining the nature and

duration of the research was attached to the booklet, as well as telephone numbers to contact the researcher if required.

Three hundred women who were between 4 and 8 months pregnant, received prepartum questionnaires and consent forms from their doctor, midwife, antenatal clinic or by volunteering to participate in the research from reading newspaper advertisements and magazine articles dealing with the study. The women completed the questionnaires during their third trimester of pregnancy, even though many of the women had received the questionnaires before this time. The women lived mainly in the Wellington area, as well as in other parts of New Zealand, such as Auckland, Christchurch, Nelson, Queenstown and Whakatane.

Of these 300 women, 244 (81.3%) returned their prepartum questionnaires and signed their consent forms agreeing to participate in the research. The attrition rate was low. Fifty-six women did not return their questionnaires and did not wish to participate in the study for the following reasons: Some women felt that after reading the questionnaires they were not interested in the study; others felt that they were too busy and would not have sufficient time; and 4 of the women miscarried. All the subjects had a basic understanding of English and were able to read and write proficiently. Women whose English was inadequate were excluded from participating in the research.

Two hundred and forty four of these women were followed up at 3-6 months postpartum. Subjects were excluded from the postpartum assessment if they miscarried, gave birth to a stillborn child, gave birth to twins, or moved away. Three women returned their questionnaires uncompleted, stating that

they were too depressed to complete them; 1 woman died a few days after childbirth; 2 babies were stillborn; 3 women moved overseas and 21 women did not return the postpartum questionnaire, even after numerous reminder letters and telephone calls.

The final sample of subjects was composed of 214 women for whom prepartum and postpartum information was obtainable, as well as hospital records of their infant's risk status at birth.

3.2.2 Procedure for Collection of Data

The pregnant women, who agreed to participate in the study, signed a consent form in the presence of a witness, either the midwife, doctor, partner or friend. These women were given a prepartum questionnaire booklet by their midwife, doctor or gynaecologist or by the researcher. Women were excluded if they had insufficient knowledge of the English language. On the first page of the questionnaire booklet was a letter briefly explaining the aims of the study. The letter also provided assurances that the information obtained would be kept private and confidential and informed the subjects that they would be expected to take part in a postpartum assessment by completing another questionnaire booklet 3-6 months after the birth of their infants. Subjects were requested to complete the questionnaires and to return them, along with the consent forms by mail, to the researcher using the stamped addressed envelope provided.

The following questionnaires were contained in the prepartum questionnaire booklet: the Personal History & Demographic Information

Questionnaire, the Beck Depression Inventory, the Brief Social Support Questionnaire, and the Dyadic Adjustment Scale.

When the subjects returned their completed prepartum questionnaires, they were sent a letter thanking them for participating in the research, and reminding them that a postpartum questionnaire booklet would be sent to them 3 months after the birth of their infants.

Infant risk status at birth was measured between 1 and 3 months after the birth of the infants using the Postnatal Complications Scale. The information for the scale was obtained by retrieving hospital records from the maternity hospitals at which the women had delivered their babies. Permission to access the mothers' and infants' birth records was obtained from the Wellington Area Health Board Ethics Committee. Temporary staff status at the maternity hospitals for the duration of the study was obtained from the Wellington District Manager. The permission of the subject was not required in this regard, as the mother and infant birth records were regarded as the property of the hospitals concerned. However, the subject was notified that information from her delivery records would be used to assess the association between infant risk status at birth and postpartum depression. This information was conveyed to the subject in a letter thanking her for participating in the study.

Three months after the birth of their infants, the same group of subjects were posted a letter congratulating them on the birth of their infant, as well as the postpartum questionnaire booklet containing the following questionnaires: the Beck Depression Inventory, the depression subscale of the Hopkins Symptom Checklist, the Infant Characteristics Questionnaire, the Dyadic Adjustment Scale and the Brief Social Support Questionnaire. The

questionnaires were returned by post using a stamped addressed envelope which was provided.

Those subjects who completed and returned the postpartum questionnaire booklet were written letters thanking them for taking part in the research and informing them that they would receive a brief report of the results of the research when they were available. Subjects who did not return their questionnaires were reminded to do so by telephone calls and by letters. The consent form, prepartum and postpartum questionnaires, as well as the letters to the subjects can be found in Appendices A-J.

3.3. Measures

3.3.1 Demographic Information

The Personal History and Demographic Information Questionnaire (Appendix D)

During her pregnancy each subject was first requested to complete a Personal History and Demographic Information Questionnaire which was based on the Personal Questionnaire of the New Zealand Census of Population and Dwellings, 1991, by the Department of Statistics. The questionnaire included:

i) General information such as the date the questionnaire was completed, name, address, telephone number, and the infant's expected delivery date. This latter information was required to fix the time at which to send out the postpartum questionnaire.

ii) Information relating to the subject's date of birth, and whether this infant would be the subject's first, or how many other children the subject had.

iii) Marital status and history.

iv) Ethnicity, which was determined by questions relating to ethnic origin, country of birth, and home language.

v) Educational qualifications, which was determined by questions relating to the subject's highest school qualification, as well as to educational or job qualifications obtained since leaving school.

vii) History of depression before pregnancy. The subject was asked to reply either "yes" or "no" to whether she had previously consulted a doctor or health professional for depression, and to state the length of time that she required professional assistance.

viii) Planned or unplanned pregnancy.

ix) Feelings about having a new baby in the family. The subject was asked to rate both her feelings about having a new baby in the family, and those feelings that she perceived her partner to have, on a Likert five-point scale from "very happy"(1), to "very unhappy" (5).

x) Relatives living with the subject. The subject was asked to reply either "yes" or "no" to whether she had any relatives living with her. She was also required to state who they were (e.g., mother, brother etc.).

xi) Antenatal attendance. The subject was asked to reply either "yes" or "no" to whether she was attending, or planning to attend, antenatal classes. She was also asked to state whether her partner was accompanying her to these classes.

xii) Socio-economic status, which was determined by the questions ascertaining subject's occupation, partner's occupation, family's income per year.

xiii) Questions relating to the subject's past, present and future employment status. The subject was asked to state whether she was employed during her pregnancy, whether she was employed before her pregnancy, and whether she intended to return to work after the birth of her baby. She was also asked to state in months, the length of time, after the birth of her baby, when she intended to return to work.

Classification of occupations. R. Johnston's (1983) "A revision of socio-economic indices for New Zealand" which is based on a revision of the Elley-Irving socio-economic index of male and female occupations, was used to classify the occupations of the subjects and their partners. This scale is published by the New Zealand Council for Educational Research. The International Standard Classification of Occupations of the index is used by the New Zealand Department of Statistics. The scale classifies occupations according to nine major groups, starting with group 1, but for data analysis purposes in this study, in which standard scores for income and occupation were used in order to obtain one socio-economic score, the group classification numbers were assigned in reverse order. Group 6 denotes professional workers who perform tasks requiring specialized training in a specific scientific or other professional field; group 5 refers to workers such as directors, managers, administrators and proprietors; group 4 incorporates workers who perform clerical tasks; group 3 denotes sales workers, engaged in selling and trading all kinds of goods, property and services; group 2 relates to service workers who perform housekeeping tasks relating to the daily needs of families (housewives were classified as belonging to this group); group 1 refers to a

category of agricultural animal husbandry and forestry workers, fishermen and hunters. The subject's occupations were coded using the socio-economic index for female occupations and are listed in Table 3. The subject's partner's occupations were coded in a similar fashion using the index of male occupations and are also listed in Table 3.

3.3.2 Depression Measures

The Beck Depression Inventory (Appendix E)[1]

The Beck Depression Inventory (BDI: Beck, Ward, Mendelson, Mock & Ergaugh, 1961) was used as the primary measure of depressive symptomatology during pregnancy and the postpartum. The BDI is the most widely used test specifically designed to assess symptoms of depression (Schweitzer et al., 1992). Its psychometric properties are well established (O'Hara et al., 1990; Schweitzer et al., 1992) and it has been used frequently in general depression research (Rehm, 1982). The BDI has also been used in several recent studies of postpartum depression (e.g., O'Hara et al., 1991; Pfost et al., 1990; Spangenberg, 1991; Schweitzer et al., 1992).

There has been controversy in recent years regarding the use of the BDI in the assessment of postpartum depression, especially in screening for major depression (Harris et al., 1989). Some researchers have concluded that prevalence rates of depression during pregnancy and the postpartum period

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[1]In this study, the BDI was used to assess depressive symptoms, and not to make diagnoses of depression. Thus, the term "depression" in this study refers to dysphoric mood and depressive symptomatology.

may be biased and inflated in self-report questionnaires by high rates of normal physiological changes that are reflected as symptoms of depression (Hopkins et al., 1989; O'Hara et al., 1984). Other researchers (Harris et al., 1989; Whiffen, 1988), however, have found that self-report measures such as the BDI are not sensitive enough in detecting postpartum depression, especially mild depression. Thus, there seems to be a lack of consensus regarding the sensitivity of the BDI, and whether it is more suitable for use in mild to moderate or major depression. However, many researchers agree that although the BDI may not be an accurate measure for making diagnoses, it is very satisfactory in determining symptomatology (Cutrona, 1983; O'Hara et al., 1990; Spangenberg & Pieters, 1991; Whiffen, 1988).

While acknowledging recent criticisms of the BDI (Harris et al., 1989; Hopkins et al., 1989; O' Hara et al., 1984), it was used in this study as a screening device to select women with depressive symptomatology and to detect changes in mood, rather than as a device to make diagnoses. Clinical interviews, structured interviews, and observer-rated scales all require specialized training in their use, as well as a great deal of time in their application, and are impractical in the assessment of a large sample (Harris et al., 1989) especially when the subjects do not all reside in the same city, such as in this study. The period after the birth of a child is also an extremely busy time for women and the minimum amount of intrusion was required so as not to deter women from participating. Depression in the mild to moderate clinical range was the focal point of this study and making diagnoses of major depression was not the aim of this research.

The BDI is a 21-item multiple choice questionnaire that is normally completed in a few minutes, assessing the following symptoms and attitudes: 1) Mood; 2) Pessimism; 3) Sense of failure; 4) Self-dissatisfaction; 5) Guilt; 6) Punishment; 7) Self-dislike; 8) Self-consciousness; 9) Suicidal ideation; 10) Crying; 11) Irritability; 12) Social Withdrawal; 13) Indecisiveness; 14) Body Image Change; 15) Work Difficulty; 16) Insomnia; 17) Fatigability; 18) Loss of appetite; 19) Weight loss; 20) Somatic preoccupation; and 21) Loss of Libido (Beck & Steer, 1987).

Each item is rated on a 4-point scale ranging from 0 to 3. The BDI is scored by summing the ratings given by the subject for each of the 21 items. The maximum score is 63. If a subject chose more than one statement within a group, the statement with the highest rating was used to calculate the score. Only the weight loss item, (Item 19), received special attention in scoring, in that if the subject indicated that she was consciously attempting to lose weight, that rating was not added to the total score (Beck & Steer, 1987).

According to Beck (Beck & Steer, 1987), cut-off scores for the BDI should be based on the clinical decisions for which the instrument is being administered. For assessment outside a psychiatric service, Beck (Beck & Steer, 1987) suggests the following cut-off points: scores from 0 to 9 are considered within the normal range or asymptomatic; scores of 10 to 18 indicate mild to moderate depression; scores of 19-29 indicate moderate-severe depression; and scores of 30-63 indicate extremely severe depression (Beck & Steer, 1987). Beck (Beck & Steer, 1987; Rees & Lutkins, 1971) considered that a score of 15 can be used to determine a diagnosis of

depression, although he maintains that an interview by a trained clinician is necessary to confirm the diagnosis.

The Hopkins Symptom Checklist (HSCL) (Appendix F)

In the postpartum period, a number of somatic changes such as appetite changes, sleep disturbances, fatigue, and loss of sexual interest, which are considered to be normal in the immediate postpartum period, are often confused with symptoms of depression (O'Hara et al.,1984; Hopkins, Campbell, & Marcus, 1989). The postpartum is a time when somatic distress might be high due to normal physiological adjustments and factors other than depression. Seven of the 21 items in the BDI reflect somatic disturbances that normally accompany pregnancy and the postpartum.

The depression subscale of the Hopkins Symptom Checklist (HSCL: Parloff, Kelman, & Frank, 1954) was administered in the postpartum assessment (in conjunction with the BDI) as it has very few somatic items. It was included to confirm the results obtained by the BDI.

The Hopkins Symptom Checklist (HSCL) is a self-report symptom rating scale. The total score provides assessment of overall emotional distress. The HSCL can also be divided into 5 subscales which measure emotional distress in terms of the following symptom dimensions: Somatization, Obsessive Compulsive (Performance Difficulty), Interpersonal Sensitivity, Depression, and Anxiety. The Depression subscale comprises the following 13 items: Loss of sexual interest or pleasure; thoughts of ending your life; feeling low in energy or slowed down; crying easily; feelings of being trapped or caught; blaming yourself for things; poor appetite; feeling lonely; feeling blue; worrying or

stewing about things; feeling no interest in things; difficulty in falling or staying asleep; feeling hopelessness about the future. The subject rates each item on a 4-point scale ranging from "not at all" (1) to "extremely" (4), with higher ratings indicating greater emotional distress (Parloff et al., 1954; Rickels, Garcia, Lipman, Derogatis and Fisher, 1976).

The Hopkins Symptom Checklist is a reliable measure for detecting differences in emotional symptomatology (Rickels et al., 1976). Rickels et al., (1976) used the HSCL in a study of emotional symptoms of postpartum patients receiving lactation suppression agents or electing to breastfeed, in a study of the emotional consequences of therapeutic abortion, and in a study of emotional change in patients receiving oral contraceptives. They found that the HSCL was reliable in clinical studies focusing on the emotional disturbances accompanying obstetric-gynaecologic symptoms and treatment, and that the HSCL may also be useful in the early detection of patients requiring emotional support or psychiatric intervention (Rickels et al., 1976).

3.3.3 Assessment of Marital Relationship

The Dyadic Adjustment Scale (DAS) (Appendix G)[2]

The Dyadic Adjustment Scale (DAS: Spanier, 1976) has been widely used in studies of postpartum depression (Hopkins et al., 1987; O'Hara, 1986; O'Hara et al., 1991). This scale assesses the quality of the marital relationship and is a self-report measure consisting of 32 items (Spanier, 1976). The DAS

[2]In this study, the terms "marital relationship" and "marital adjustment" refer to both de facto (common law) relationships, as well as relationships in which partners are married.

can be used by researchers to determine marital adjustment among married couples and also among de-facto and unmarried co-habiting couples (Spanier, 1976).

The DAS can be used as an overall measure of marital adjustment or one of the subscales of the DAS may be used alone. This scale has 4 empirically verified subscales: Dyadic Satisfaction (10 items), Dyadic Consensus (13 items), Dyadic Cohesion (5 items) and Affectional Expression (4 items). A total score is yielded in which a high score reflects either a well adjusted relationship and a low score reflects a maladjusted relationship. The DAS has been found to be internally consistent (Hopkins et al., 1987; O'Hara et al., 1991) and according to Spanier (1976) it has an internal reliability of .96 (Cronbach's coefficient alpha).

3.3.4 Measure of Social Support

The Brief Social Support Questionnaire (Brief SSQ) (Appendix H)

The Brief Social Support Questionnaire (Siegert, Pattern, & Walkey, 1987), which was developed from the Social Support Questionnaire (SSQ: Sarason, Levine, Basham, & Sarason, 1983) was used as the measure of subjective and objective social support during pregnancy and the postpartum.

The Brief SSQ (Siegert et al., 1987) consists of 24 items. Twelve items comprise questions dealing with the subject's network size where the subject is instructed to supply the initials of those persons providing them with social support on a particular dimension/aspect of social support, (for example, "Who can you rely on to take your mind off your worries when you are under stress?"). The mean number of supporters listed by the subject determines the

Network Size or SSQ-N score. After each network size question, the subject is asked to rate, on a 6-point scale, the degree to which she is satisfied with the support provided for that particular item, ranging from "very satisfied" (6) to "very dissatisfied"(1). When these 12 perceived satisfaction scores are averaged, the Satisfaction or SSQ-S score is produced.

The Brief SSQ has been used on a sample of New Zealand students and also in a study of unemployment in New Zealand, and both the Network and Satisfaction subscales were found to be reliable and valid and to compare favourably with the reliability coefficients reported by the 54 item SSQ (Siegert et al., 1987). For the unemployed subjects, the split-half reliability coefficients were found to be .96 and .92 for the Network and Satisfaction subscales respectively, and for the student group the split-half reliability coefficients were .94 and .93 for the Network and Satisfaction subscales respectively (Siegert et al., 1987).

3.3.5 Measures of Infant-Related Stressors

The Postnatal Complications Scale (Appendix I)

The Postnatal Complications Scale (PCS: Littman & Parmelee, 1974) was used to assess infant risk status at birth. This scale has been used in other studies on postpartum depression (Cooke, 1985; Hopkins et al., 1987) to assess infant medical status. Littman & Parmelee (Hopkins et al., 1987) found that the scale discriminates healthy from impaired newborn infants' and that it is a good predictor of later neonatal functioning in premature and mature infants.

The PCS is a 10-item questionnaire that was completed from the infants birth records. The 10 items comprise clusters of certain events which often

occur postnatally in newborn infants, rather than isolating single occurrences (Littman & Parmelee, 1974). The scoring is based on the Prechtl (1968) system of optimal scoring, where each category is associated with increased risk of infant mortality and which might have an effect on development if the infant survived (Cooke, 1985). The PCS yields one total score, produced by subtracting the total number of abnormal responses from the total number of items on the scale. All items are equally weighted. The raw scores are then converted to another scale derived from a study on pilot infants (Littman & Parmelee, 1974), thereby adjusting the means to 100 and the standard deviation to 20. Higher scores represent more optimal medical status and lower birth risk.

The 10 items comprise respiratory distress; positive or suspected infection; ventilatory assistance; noninfectious illness or anomaly; metabolic disturbance; convulsion; hyperbilirubinemia or exchange transfusion; temperature disturbance; feeding within 48 hours; and surgery (Littman & Parmelee, 1974).

Other research (Bennett, & Slade, 1991; Blumberg, 1980; Gennaro, 1988) has distinguished those infants at risk from normal newborn infants by determining gestational age, birth weight, apgar scores as well as the birth complications designated in the PCS. In addition to the 10 item Postnatal Complications Scale, the infants birth weight (neonatal risk if less than 2.5 kg), gestational age (neonatal risk if less than 38 weeks) and apgar score at 1, 5 and/or 10 minutes after birth (neonatal risk if 6 or more) were also recorded.

The Infant Characteristics Questionnaire (Appendix J)

The Infant Characteristics Questionnaire (ICQ: Bates, Bennett, Freeland, & Lounsburg, 1979), based on the conceptualization of temperament developed by Thomas, Chess, & Birch (Bates, 1987), was used to determine infant temperament at 3-6 months postpartum.

The infant Characteristics Questionnaire is a 28-item self-report measure of temperamental difficulty which measures the parent's perception of the infant's difficultness. This questionnaire can be used for parents of infants 3-7 months of age. The ICQ yields one score of infant difficultness. The mother rates specific infant behaviours according to how her baby compares to her perception of the "average infant". Each item is rated by the mother on a 7-point scale ranging from "very easy" (1) to "about average" (4) to "difficult" (7). The ICQ has shown adequate correlations with other measures of temperamental difficulty and with in-home ratings made by independent observers (Bates et al., 1979; Gotlib et al., 1989).

The ICQ has been used in research on postpartum depression by Whiffen and Gotlib (1989) and Hopkins et al. (1987) but as this scale has not been used in a New Zealand sample before, a separate study was conducted to help validate this measure (Siegert, Scannell, & Parr, 1994).

In this study, 102 mothers of babies aged 3-6 months, who were not participating in the postpartum depression study, were sent two copies of the infant temperament questionnaire which they completed one week apart, along with an infant crying record which the subject was required to complete on a daily basis during the week. Bates (1987, p.1121) maintains that "amount of crying is central to the ICQ definition of difficult temperament". The ICQ was

found to have a high internal consistency of 0.88, which was calculated according to the Kuder-Richardson (KR20) formula, and the test-retest correlation of the ICQ at one week's test-retest interval was 0.91 ($p < .0001$). Some support for the criterion validity of the ICQ was found as the ICQ was found to correlate at 0.28 ($p < .01$) with frequency of crying, and at 0.46 ($p < .0001$) with duration of crying. This suggests that duration of crying is related more strongly to temperament than is frequency of crying, as those babies who cry frequently, but who are easily soothed are perceived by their mothers as being less temperamentally difficult than those babies who cry less often but for longer periods.

3.4 Ethical Issues

3.4.1 Consent Form for Participation in the Study (Appendix K)

Each subject was required to sign a consent form in the presence of a witness agreeing to participate in the study. The consent form briefly outlined the aims of the study, informing the subject how her participation in the research would be of benefit to women's mental health. The subject was also informed that this was a longitudinal study and that she would be expected to participate in a postpartum assessment by completing questionnaires 3-6 months after the birth of her infant. However, she was also assured that she could withdraw from the research at any time and that withdrawing from the study would not affect her treatment at the hospital.

The consent form stated all questionnaires would be kept in the strictest confidence and the subject was assured that the questionnaires would be used for the purposes of the research only, and that their name and address would

not be used in any way except to post them the postpartum questionnaire booklet. The subject was notified in a thank you letter that infant risk status at birth would be assessed from her delivery records. The subject was also informed that the research had been approved by the Wellington Area Health Board Ethics Committee.

3.4.2 Ethical approval

Before the study could commence, approval to interview pregnant women and to access infant birth records at the hospitals had to be obtained from The Wellington Area Health Board Ethics Committee which was granted on 5 July 1991.

CHAPTER FOUR

RESULTS

The analysis of the data focuses on the following issues: First, the characteristics of the subjects are discussed and the demographic characteristics presented in Table 3; second, the extent to which there is evidence of prepartum and postpartum depression in the sample is analysed and summarized in Table 4; third, the zero order correlations between the predictor variables and prepartum and postpartum depression are discussed and shown in Table 5; fourth, the longitudinal analyses, using multiple regression analysis, are shown in Tables 6, 7, 8 and 9. Finally, the analysis of the association between depression scores and marital adjustment and social support over time was analysed using a cross-lagged design, and are depicted in Figure 1 and Figure 2 respectively.

4.1 Subject Characteristics

Eight New Zealand Maori women from the initial sample of 244 women, dropped out from participating in the postpartum assessment. Three women with a history of depression from the initial sample of 244 women also dropped out from the study before completing the postpartum questionnaires.

The demographic characteristics of the remaining 214 subjects are presented in Table 3. The women were aged between 17 and 43, with a mean age of 30 (SD = 4.6). The number of children that the women already had living with them ranged from no children at all to 4 children, with a mean of 1 child (SD = 0.9).

One hundred and fifty (70.1%) women said that their pregnancies were planned. In the Demographic Questionnaire, the subjects were asked to rate how they felt about having a new baby in the family. One hundred and twenty women (56.1%) were very happy about having a new baby in the family, 52 (24.3%) stated that they were happy, 41 (19.2%) said they were uncertain and had mixed feelings, and 1 (0.5%) was unhappy.

Eighteen (8.4%) of the subjects had relatives (other than their partner and child(ren)) living with them. One hundred and thirty five (63.1%) attended antenatal classes and 117 (54.7%) of their partners' were attending antenatal classes as well. One hundred and seventy five (81.8%) of the women stated that this was their partner's first marriage or similar relationship.

One hundred and sixty-three (76.2%) women were employed before their pregnancy. One hundred and two (47.7%) were employed during their pregnancy and 117 (54.7%) intended to work after the birth of their babies. With regard to the length of time after the birth of their babies that the women would return to work, 17.3% stated that they would return to work 1-3 months after the birth, 12.6% said that they would return to work 4-6 months after the birth, 16.3% said they would return 7-12 months after the birth and 7.1% 2 years or more after the birth.

To summarize, 73% of the women were aged between 26 and 35 years, and 94% were either married or living with a de facto partner. The sample generally comprised women who were born in New Zealand, who were New Zealand European, and whose home language was English. With regard to religion, the women ranged from Catholics, Protestants, Hindu and Buddhists, to having no religion at all. The woman had varying levels of education from no

school qualification or tertiary education, to postgraduate degrees and professional qualifications. Most of the women (76.1%) had a 6th form certificate, higher certificate, or overseas qualification. With regard to qualifications obtained since leaving school, 41.5% of the woman had obtained Diplomas or University degrees, and 58.4% had either no qualification, or had obtained other qualifications, such as hairdressing. According to the socio-economic index, the subjects ranged predominantly from professional workers such as lawyers and doctors to service workers, with 21% classifying themselves as housewives, and mainly earning annual family incomes ranging from $30,000-$70,000. Finally, the sample was heterogeneous with regard to parity, with 41.1% of the sample being primiparous (first-time mothers) and 58.9% multiparous. Male and female babies were equally represented in the sample as were healthy and at risk infants.

Table 3
Demographic characteristics of the sample

Variable	N	%
Age (years)		
% aged 17-25	26	12
% aged 26-35	156	73
% aged 35-43	32	15
No. children at home		
0	88	41.1
1	78	36.4
2	36	16.8
3 or more	12	5.6
Marital Status		
Married	170	79.4
De facto	31	14.5
Single	13	6.1
Country of birth		
New Zealand	178	83.2
Ethnic Background		
New Zealand European	173	80.8
Maori or Samoan	13	6
Other (Chinese, Dutch, Indian, English, Australian)	28	13.1
Home language		
English	205	95.8
Religion		
Catholic	47	22.0
Protestant	76	35.5
No religion	59	27.6
Other (Hindu, Buddhist)	32	15.0
Education - School		
no school qualification	20	9.3
school certificate	31	14.5
6th form or higher certificate	134	62.6
overseas or other qualification	29	13.5

Table 3 continued
Demographic characteristics of the sample

Variable	N	%
Education - Tertiary		
no qualification	57	26.6
Teachers or Nursing Diploma	24	11.2
Diploma or University degree	65	30.3
other qualifications	68	31.8
Family Income		
$5,000-$10,000	3	1.4
$10,001-$20,000	10	4.7
$20,001-$30,000	28	13.1
$30,001-$50,000	79	37.0
$50,001-$70,000	39	18.2
$70,000+	55	25.7
Subject's occupation		
Professional workers-1	26	12.1
Managerial workers-2	59	27.6
Clerical workers-3	60	28.0
Sales workers-4	23	10.7
Service workers-5	45	21.0
Agricultural worker- 6	1	0.5
Partner's occupation		
Professional workers-1	37	17.3
Managerial workers-2	47	22
Clerical workers- 3	80	37.4
Sales workers-4	23	10.7
Service workers-5	8	3.7
Agricultural workers-6	1	0.5
Unemployed	18	8.4
The infant		
Male	105	49.1
Female	109	50.9
Healthy	128	59.8
High risk	86	40.2
*Premature	20	9.3

Note.
*Measured on dichotomous scales with "no" scored as 0, and "yes" scored as 1;
Occupations were measured on the Johnston scale (based on the Elley and Irving scale).

4.2 Prevalence of Pre- and Postpartum Depression

Using a cutoff score of 10 or above as suggested by Beck (Beck & Steer, 1987), 30.8% (n=66, M=15, SD=5.8) of the women in pregnancy were classified as mild to severely depressed, and 39.7% (n=85, M=16, SD=7.1) as mildly to severely depressed postpartum. A t test showed that women were significantly more depressed postpartum than at prepartum according to the BDI scores ($t(213)=4.09$, $p < 0.001$).

One hundred and ten women (51.4%) were not depressed in pregnancy and did not report any depression postpartum. Nineteen (8.9%) of the women were depressed in pregnancy and not depressed postpartum. Forty-seven (21.96%) were depressed in pregnancy and depressed postpartum. Only 38 (17.76%) were depressed postpartum and not depressed in pregnancy. Table 4 shows the prevalence of prepartum and postpartum depression based on Beck's (Beck & Steer, 1987) cutoff scores.

Forty-three (20.1%) of the subjects had previously consulted a doctor or other health professional for depression. Thirty five (16.4%) required assistance for less than 6 months, 3 women (1.5%) required assistance for less than 1 year, and 4 women (1.9%) required assistance between 1 and 4 years.

A significant relationship was also found to exist between the BDI postpartum and the Hopkins Symptom Checklist ($r = .9$, $p < 0.0001$), suggesting that the BDI was reliable in its assessment of postpartum depression regardless of the number of somatic items.

Table 4

Prevalence of pre- and postpartum depression

	Prepartum				Postpartum			
	n	%	M	SD	n	%	M	SD
No depression	148	69.2	4.9	2.5	129	60.3	5.4	2.3
Mild-moderate depression	51	23.8	12.7	2.3	61	28.5	12.6	2.5
Moderate-severe depression	14	6.5	23.1	3.3	20	9.3	23.6	3.2
Severe depression	1	0.5	39	.	4	1.9	37	6.1
Total	214	100	8.1	6.2	214	100	9.7	7.2

4.3 Correlational Analyses

The associations between depression, both during pregnancy and the postpartum, and all the demographic variables and pre- and postpartum measures (social support, marital satisfaction, infants' risk status, infants' temperament), were examined using correlations. Selected findings are presented in Table 5. A complete table of intercorrelations can be found in Appendix L.

4.3.1 Demographic Variables

Younger women were significantly more depressed during pregnancy than older women. However, this association was not found to exist during the postpartum. Similarly, women who had one or more relatives (other than their

partner and child(ren)) living with them tended to be significantly less depressed during pregnancy than those women who had no relatives living with them, but no significant relationship between having relatives residing with the woman and postpartum depression was found.

Women having lower incomes were significantly more depressed during pregnancy than women with higher incomes, but this association did not persist during the postpartum. Those women who were classified on the Elley and Irving socio-economic index as having lower occupational status were significantly more depressed both during pregnancy and in the postpartum. A total socio-economic status score for the subjects was obtained by summing the standard scores of the subject's family income and the subject's occupation level. A lower socio-economic status, was significantly associated with higher levels of depression, both during pregnancy and in the postpartum. Women who planned to return to work soon after the birth of their babies were significantly more depressed during pregnancy, but again, during the postpartum, no relationship between postpartum depression and the woman's intention to return to work was found to exist.

Several variables were not significantly related to higher levels of depression either during pregnancy or in the postpartum. These included the number of children in the family, whether this was the subject's first baby, the subject's antenatal attendance, her partner's antenatal attendance, educational qualifications, ethnic origin, religion, marital status and whether this was the partner's first marital relationship.

4.3.2 Self-report Psychological Variables

History of depression. Consistent with predictions, a reported history of depression was significantly associated with higher levels of both prepartum and postpartum depression.

Depression during pregnancy. As expected, those women who were more depressed during pregnancy, compared to the less depressed women, were also significantly more depressed during the postpartum.

Feelings about having a new baby in the family. Those woman who felt unhappier during pregnancy about having a new baby in the family were, as predicted, significantly more depressed both during pregnancy and in the postpartum period.

4.3.3 Psychosocial Variables

Unplanned pregnancy. As expected, unplanned pregnancy was significantly associated with higher levels of both prepartum and postpartum depression.

Marital adjustment. Those women who reported having more marital adjustment problems during pregnancy were, as predicted, significantly more depressed both during pregnancy and in the postpartum. Similarly, as expected, reported lower levels of marital adjustment during the postpartum, were significantly associated with higher levels of depression at this time.

Social support. When social support was measured in terms of social network size, those women who had smaller social networks during pregnancy were found to have higher levels of depression, both during pregnancy and the

postpartum, than women who had larger social support networks during pregnancy. As expected, when social support was assessed by measuring the woman's perceived satisfaction with her social support network during pregnancy, women who reported that they were less satisfied with their social support networks during pregnancy were significantly more depressed both during pregnancy and the postpartum. These same relationships were evident in the postpartum period.

As both the network size score and the satisfaction score were significantly associated with pre- and postpartum depression (and these two measures are heavily correlated), a total prepartum social support score and a total postpartum social support score, for use with later regressions, was obtained by summing standard scores for network size and perceived support during pregnancy and the postpartum respectively. The hypothesized relationship between pre- and postpartum depression and lower levels of social support during pregnancy was supported. Similarly, woman who reported lower levels of postpartum social support were significantly more depressed during the postpartum.

Infant characteristics. Contrary to what was hypothesised, women whose infants had higher infant risk status at birth were not more depressed during the postpartum. No significant association was found between apgar at 5 minutes, birth weight, premature birth, or sex of the baby. However, as predicted, women who reported their infants as being more difficult, had significantly higher levels of postpartum depression.

Table 5

Correlations between prepartum and postpartum depression scores with demographic, prepartum and postpartum measures

	Prepartum BDI		Postpartum BDI	
Prepartum variables	**r**	**p**	**r**	**p**
Age	-.2	<.01	-.1	ns
*Primiparous (first baby)	-.06	ns	-.001	ns
Number of children	.12	ns	.02	ns
*Planned pregnancy	-.26	<.001	-.16	<.05
Woman's feelings about baby	-.36	<.001	-.29	<.001
*History of depression	.30	<.001	.21	<.001
Depression during pregnancy			.63	<.001
*Relatives residing with subject	.13	.05	.03	ns
**Education	-.05	ns	.002	ns
Ethnic origin	-.01	ns	-.02	ns
Religion	-.11	ns	-.13	ns
Marital status	.06	ns	.01	ns
*Partner's first relationship	-.18	ns	-.11	ns
Occupation	-.28	<.001	-.14	<.05
Income	-.27	<.001	-.11	ns
***Socio-economic status	-.34	<.001	-.15	<.05
*Intention to work after birth	-.18	<.05	-.1	ns
*Antenatal attendance	-.04	ns	.03	ns

Table 5 continued

Correlations between prepartum and postpartum depression scores with demographic, prepartum and postpartum measures

	Prepartum BDI		Postpartum BDI	
Prepartum variables	**r**	**p**	**r**	**p**
*Partner's antenatal attendance	-.13	ns	.04	ns
Marital adjustment	-.37	<.001	-.25	<.001
Social support	-.38	<.001	-.33	<.001
Social network size	-.21	<.01	-.15	<.05
Perceived network satisfaction	-.43	<.001	-.41	<.001
Postpartum variables				
Marital adjustment			-.48	<.001
Social support			-.5	<.001
Social network size			-.22	<.01
Perceived network satisfaction			-.58	<.001
Infant temperament			-.21	<.01
Infant risk status at birth			-.08	ns
Sex of baby			-.00	ns
Birth weight			-.01	ns
Apgar at 5 minutes			-.08	ns
*Premature birth			.06	ns

Note.
* were coded such that 1=yes and 0=no.
**Obtained by summing standard scores for school and tertiary qualifications.
***Determined by summing standard scores for income and occupation.

4.4 Multiple Regression Analyses

A problem in interpreting correlations is that many of the variables share variance with each other. In this study, multiple regression analyses were used to statistically control for variables in order to find the best predictors of the dependent variables.

Four separate analyses were carried out. The first analysis examined the cross-sectional relationship between depression scores during pregnancy and various demographic and prepartum variables. The second regression analysis examined the relationship between the prepartum variables and the change in depression scores from prepartum to postpartum. The third regression analysis analysed the cross-sectional relationship between postpartum depression scores and demographic and postpartum variables. The fourth regression analysis repeated the cross-sectional analysis at the postpartum level, but covaried out all the prepartum variables. This allowed the examination of factors (such as depression and relationship satisfaction) that were associated specifically with the postpartum context, regardless of the prepartum precursors.

Finally, cross-lagged multiple regression analyses were used in order to determine whether poor marital adjustment and low levels of social support were associated with increased depression, or vice versa.

4.4.1 Hierarchical Multiple Regression of Depression Scores During Pregnancy on Demographic and Prepartum Variables

This analysis focused on the contribution of the prepartum measures to depression during pregnancy. Those variables which had significant positive or negative correlations with depression during pregnancy, at the $p < .05$ level, were selected for the multiple regression analysis. Two sets of variables were entered into the hierarchical multiple regression, in an order based on assumed causal priority (Cohen & Cohen, 1983). The first set comprised the subject's age, a history of depression, the subject's intention to work after the birth of her infant, and socio-economic status (determined by summing standard scores for income and occupation). The second set consisted of the subject's feelings about having a new baby in the family, whether the pregnancy was planned or not, prepartum marital adjustment and prepartum social support. The social support score was obtained by summing the standard scores of network size and perceived satisfaction with social support network. Prepartum depression was the dependent variable. The results are shown in Table 6.

Each of the two sets of predictor variables entered, with the exception of working after the birth in Set 1, and planned pregnancy in Set 2, were significant in the multiple regression. The significant variables uniquely accounted for variance in depression, after the remaining variables were statistically controlled. Women who were more depressed during pregnancy, compared to those who were less depressed, tended to be younger, to have lower socio-economic status, and to have a history of depression. Those women who felt unhappier about having a new baby in the family, who had

poorer marital adjustment or lower levels of social support, also tended to be more depressed during pregnancy.

Table 6

Hierarchical multiple regression of depression scores during pregnancy on demographic and prepartum variables

Variables	r	B	t	p
Set 1 variables				
Age	-.2	-.15	2.29	<.05
Depression History	.3	.30	4.85	<.001
Working after birth	-.18	-.1	0.94	ns
*Socio-economic status	-.34	-.26	3.72	<.001
Set 1 R^2 = .22	F(4, 209) = 14.39			p<.001
Set 2 variables	r	B	t	p
Feelings about having baby	-.36	-.21	3.47	<.001
Planned pregnancy	-.26	-.1	1.69	ns
Marital adjustment	-.37	-.2	3.03	<.01
Social Support	-.38	-.16	2.56	<.05
R^2 increase in Set 2 = .19	F(4, 209) = 15.95			p <.001
Total R^2 = .40	F(8, 205) = 17.23			p <.001

Note.
All significant tests on the multiple R's were based on the adjusted R^2 which corrects for the number of independent variables.
Planned pregnancy, depression history, and working after birth, were coded such that 1=yes and 0=no.
*Determined by summing standard scores for income and occupation respectively.

4.4.2 Hierarchical Multiple Regression of Depression Scores Postpartum on Demographic and Prepartum Variables

The second hierarchical multiple regression analysis was performed in order to examine the relationship between the prepartum variables and the change in depression scores from prepartum to postpartum (Cohen & Cohen, 1983). The results are summarized in table 7.

Two sets of variables were entered into the hierarchical multiple regression. These sets of variables were entered in an order determined by an assumed a priori causal relationship (Cohen & Cohen, 1983). The first set comprised the prepartum BDI score, the subject's age, a history of depression, the subject's intention to work after the birth of her infant, and socio-economic status (determined by summing standard scores for income and occupation). The second set consisted of the subject's feelings about having a new baby in the family, whether the pregnancy was planned or not, prepartum marital adjustment and prepartum social support (obtained by summing the standard scores of network size and perceived satisfaction with the social support network). Postpartum depression was the dependent variable.

The overall regression equation was significant (see table 7). However, depression level during pregnancy in Set 1, was the only variable that was significantly related to postpartum depression. The other variables in Set 1 and in Set 2 did not significantly account for any shift in depression from pre- to postpartum in the variance. As predicted, and similar to findings from previous studies (Atkinson & Rickel, 1984; O'Hara et al, 1982; O'Hara et al., 1984; O'Hara et al., 1991; Pfost & Stevens, 1990), prepartum depression showed a strong association with postpartum depression and made a substantial

contribution to the level of postpartum depressive symptomatology, accounting for 40% of the variance.

Table 7

Longitudinal hierarchical multiple regression of depression scores postpartum on demographic and prepartum variables

Variables	r	B	t	p
Set 1 variables				
Prepartum depression	.63	.65	10.75	<.001
Age	-.1	.01	.12	ns
Depression History	.21	.02	.31	ns
Working after birth	-.1	-.003	.05	ns
*Socio-economic status	-.15	.07	1.1	ns
Set 1 R^2 = .4	F(5, 208) = 28.15			p<.001
Set 2 variables	**r**	**B**	**t**	**p**
Feelings about having baby	-.29	-.07	1.16	ns
Planned pregnancy	-.16	.02	.41	ns
Marital adjustment	-.25	.02	.25	ns
Social support	-.33	-.11	1.78	ns
R^2 increase in Set 2 = .01	F(4, 209) = 1.3			ns
Total R^2 = .42	F(9, 204) = 16.31			p <.001

Note.
All significant tests on the multiple R's were based on the adjusted R^2, which corrects for the number of independent variables.
Planned pregnancy, depression history, and working after birth, were coded such that 1=yes and 0=no.
*Determined by summing standard scores for income and occupation respectively.

4.4.3 Hierarchical Multiple Regression of Postpartum Depression Scores on Demographic and Postpartum Variables

This second cross-sectional analysis focussed on the contribution of prepartum and postpartum variables to postpartum depression. The Set 2 variables incorporated some variables that were assessed only at the postpartum stage, e.g., infant temperament, infant risk status, postpartum social support, and postpartum marital adjustment. Two sets of variables were entered into the hierarchical multiple regression. Again, these sets of variables were entered in an order based on assumed causal priority (Cohen & Cohen, 1983). The first set comprised the subject's age, a history of depression, the subject's intention to work after the birth of her infant, and the subject's socio-economic status. The second set consisted of the subject's feelings about having a new baby in the family, whether the pregnancy was planned or not, postpartum marital adjustment, postpartum social support (obtained by summing the standard scores of network size and perceived satisfaction with the social support network), infant temperament and infant risk status at birth. Postpartum depression was the dependent variable. The results are presented in table 8.

In Set 1, only reports of a depression history was significantly related to increases in postpartum depression, while age, intention to work after the birth and socio-economic status were not, differing from the cross-sectional regression analysis of prepartum depression, in which age and socio-economic status were significantly associated with prepartum depression. However, the Set 2 variables, accounted for an additional 31% of the variance. As in the previous cross-sectional regression analysis of prepartum depression, and in

support of the hypotheses, those women who were more depressed postpartum tended to feel unhappier about having a new baby in the family, had poorer postpartum marital adjustment, and had lower levels of social support. Again, consistent with the prepartum cross-sectional regression analysis, and failing to support the hypotheses, whether the pregnancy was planned or not, was not significantly related to postpartum depression. Finally, contrary to what was hypothesized, neither infant temperament nor infant birth risk was significantly related to postpartum depression.

Table 8

Hierarchical multiple regression of postpartum depression scores on demographic and postpartum variables

Variables	r	B	t	p
Set 1 variables				
Age	-.1	-.09	1.27	ns
Depression History	.21	.21	3.17	<.005
Working after birth	-.1	-.04	.61	ns
*Socio-economic status	-.15	-.1	1.31	ns
Set 1 R^2 = .07	F(4, 209) = 4.06			p <.005
Set 2 variables	r	B	t	p
Feelings about having baby	-.29	-.14	2.37	<.05
Planned pregnancy	-.16	.03	.55	ns
Marital adjustment	-.48	-.3	4.6	<.001
Social Support	-.5	-.28	4.4	<.001
Infant temperament	-.21	.10	1.86	ns
Infant Risk at birth	-.08	-.03	.51	ns
R^2 increase in Set 2 = .31	F(6, 207) = 17.36			p <.001
Total R^2 = .39	F(10, 203) = 12.80			p <.001

Note.
All significant tests on the multiple R's were based on the adjusted R^2, which corrects for the number of independent variables.
Planned pregnancy, depression history, and working after birth, were coded such that 1=yes and 0=no.
*Determined by summing standard scores for income and occupation respectively.

4.4.4 Multiple Regression of The Incremental Contribution of Marital Adjustment and Social Support Scores

This multiple regression analysis was performed in order to examine postpartum variables in the explanation of the postpartum depression (Atkinson & Rickel, 1984) when controlling for all the other prepartum and postpartum variables. At the dependent variable level this analysis represents the levels of depression at postpartum that are not a function of prepartum depression. At the independent variable level, this analysis represents variables measured only at the postpartum assessment, such as infant temperament and infant risk status at birth, or variables measured at both times, namely marital adjustment and social support. The correlation between prepartum and postpartum marital adjustment was substantial ($r = 0.8$, $p < .001$), as was the correlation between prepartum social support and postpartum social support ($r = 0.7$, $p < .001$). For these latter two variables, then, the regression weights represent the degree to which each two factors are related to postpartum depression, but only at the postpartum context.

The results for the postpartum variables only are shown in Table 9. The remaining regression weights from the prepartum variables are omitted as they are either uninterpretable (e.g., time one variables with time two variables removed), or have been reported in previous analyses.

As can be seen, when controlling for prepartum depression and all the other prepartum and postpartum variables, poorer postpartum marital partner adjustment was significantly related to higher levels of postpartum depression, and those women having lower levels of postpartum social support were

significantly more depressed in the postpartum period. Contrary to predictions, neither infant temperament nor infant birth risk was significantly related to postpartum depression.

Table 9

Multiple regression of the incremental contribution of marital adjustment and social support scores

Variables	r	B	t	p
Postpartum variables				
Marital adjustment	-.48	-.48	5.3	<.001
Social Support	-.5	-.25	3.26	<.005
Infant temperament	-.21	.1	1.89	ns
Infant risk status at birth	-.08	-.01	.3	ns
R^2 increase = .14		F(4, 209) = 15.26		p <.001
Total R^2 = .55		F(13, 200) = 19.15		p <.001

Note.
All significant tests on the multiple R's were based on the adjusted R^2, which corrects for the number of independent variables.

4.4.5 Cross-Lagged Analysis

Finally, cross-lagged regression analyses were used in order to disentangle the possible cause-effect relationship over time, between poor marital adjustment and postpartum depression, and also between social support and postpartum depression. In previous studies on marital adjustment, (e.g., O'Hara et al., 1990; Spangenberg & Pieters, 1991; Whiffen, 1988), and

social support, (e.g., Richman, Raskin, & Gaines, 1991; Stemp et al., 1986), significant correlations were also found between depression and both marital adjustment and social support. However, the causal direction could plausibly go in either direction. That is, levels of depression could influence marital adjustment and social support, or marital adjustment and social support could affect levels of depression.

In order to determine to what extent postpartum depression was associated with a change in marital adjustment over time (approximately 6 months, comprising the period between the pregnancy assessment and the postpartum assessment), or vice-versa, a cross-lagged design was used (Cohen & Cohen, 1983) which is depicted in Figure 1. Two sets of regression analyses were performed. In the first set, the dependent variable was the postpartum BDI score, and in the second set, the dependent variable was the postpartum marital adjustment score. The independent variables for both sets were the prepartum marital adjustment score and the prepartum BDI score. The regression coefficients are shown in the diagonal arrows in figure 1. The single-headed arrows represent standardized regression coefficients and double-headed arrows depict correlations which are shown in brackets.

As Figure 1 shows, marital adjustment at time 1 did not have a significant association with changes in the depression scores. However, depression at time 1 had a significant influence on the change in marital adjustment scores at time 2. This indicates that depression during pregnancy is more likely to have had a negative effect on marital adjustment, than vice-versa.

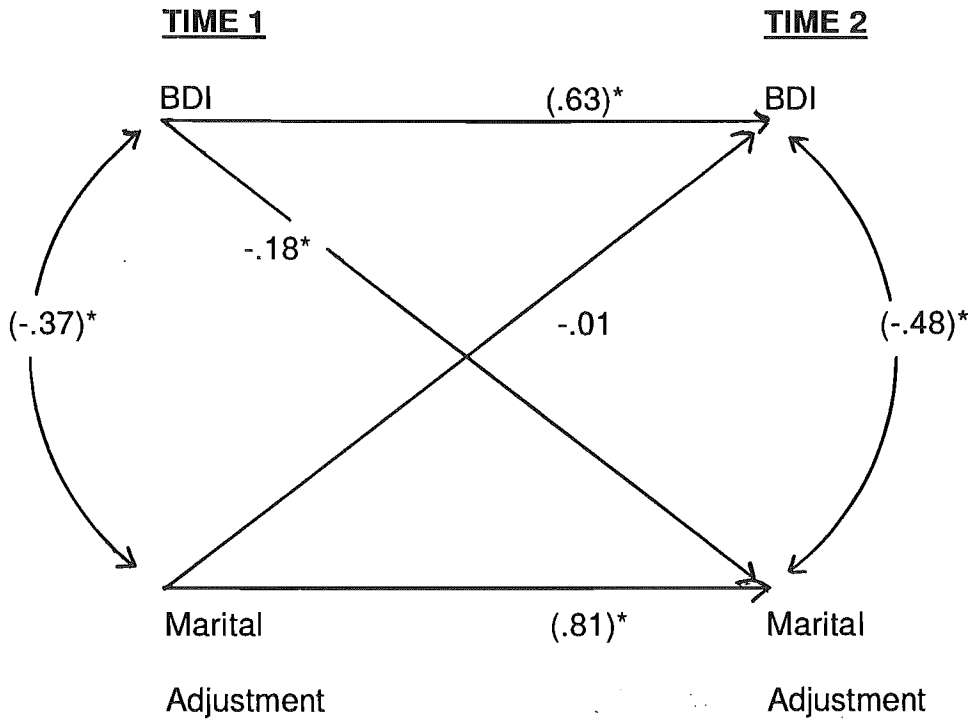
Similarly, a cross-lagged multiple analysis was used in order to determine to what extent postpartum depression was associated with a change in social

support over time. Two sets of regression analyses were again performed. The dependent variables were the postpartum BDI score and the postpartum social support score respectively. The predictor variables for both sets were the prepartum social support score and the prepartum BDI score. The regression coefficients are shown in the diagonal arrows in figure 2. The single-headed arrows represent standardized regression coefficients and double-headed arrows depict correlations which are shown in brackets.

As Figure 2 shows, social support at time 1 did not have a significant association with changes in the depression scores. However, depression at time 1 had a significant influence on the change in social support scores at time 2. This indicates that depression during pregnancy is more likely to have a negative effect on social support, than a lack of social support has on depression.

Figure 1

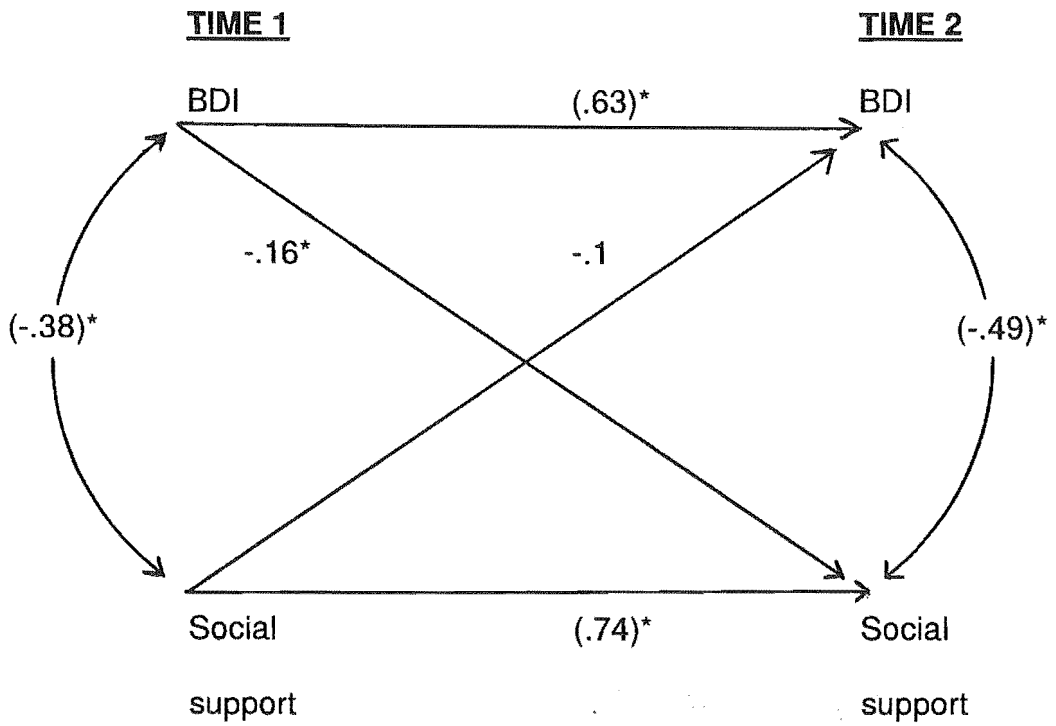
Standardized regression coefficients from regression analysis with postpartum depression and postpartum marital adjustment as dependent variables.



*p < .001

Figure 2

Standardized regression coefficients from regression analysis with postpartum depression and postpartum social support as dependent variables.



*p < .001

CHAPTER FIVE

DISCUSSION

This chapter commences with a summary of objectives and results of the present study. The prevalence of pre- and postpartum depressive symptoms are examined, followed by a discussion of the variables implicated in predicting pre- and postpartum depression. The role of demographic, psychological, and psychosocial variables in the development of pre- and postpartum depression are discussed in turn. Next, support for a psychosocial model of postpartum depression is presented. Implications for health professionals are then delineated, followed by a summary of research limitations. Finally, the chapter concludes with a discussion of recommendations for future research.

5.1 Summary

This research investigated the influence of infant-related stressors, unplanned pregnancy, social support and the role of the marital relationship in the development of pre- and postpartum depression. The relationship of background and demographic factors, the woman's feelings about having a new baby in the family, and previous history of depression were also analyzed. The study accomplished the following objectives: One objective was to examine the prevalence of pre- and postpartum depressive symptoms in a large heterogenous sample of New Zealand women. Another goal was to determine the influence of a number of background, demographic and psychosocial variables on pre- and postpartum depression.

The results were generally consistent with the hypotheses. Of the 214 women who were assessed both during pregnancy and in the postpartum, 30.8% were found to be depressed during pregnancy and 39.7% were found to be depressed postpartum. Thus, there was a significant increase in depression from pre- to postpartum.

Women who were more depressed during pregnancy tended to be younger, of lower socio-economic status, and to have a reported history of depressive episodes prior to their pregnancies. Higher levels of prepartum depression were also related to women's feelings of being unhappier about having a new baby in the family, to poorer marital adjustment, and to lower levels of social support during pregnancy.

The postpartum cross-sectional analysis of postpartum depression revealed that those women who had higher levels of depression in the postpartum period, tended to feel unhappier about having a new baby in the family, and to have had a reported history of depressive disorders. Those women who had higher levels of postpartum depression also had poorer postpartum marital adjustment, and lower levels of postpartum social support. Contrary to what was hypothesized, neither infant temperament nor infant birth risk was significantly related to postpartum depression. Again, consistent with the prepartum cross-sectional analysis, whether the pregnancy was planned or not, was not significantly related to postpartum depression.

When the change in depression scores from prepartum to postpartum were assessed, the strongest predictor of postpartum depression was depression during pregnancy. Depression during pregnancy was found to be more likely to have a negative effect on marital adjustment than poor marital

adjustment on depression. Similarly, depression during pregnancy was found to be more likely to have a negative effect on social support, than a lack of social support on depression.

Further regression analyses, however, showed that postpartum marital adjustment and postpartum social support had a strong relation to postpartum depression, irrespective of the levels of prepartum marital adjustment, prepartum social support, and prepartum depression.

5.2 Prevalence of Pre- and Postpartum Depression

As childbirth and depression are experienced universally, it was expected that the prevalence of depressive symptomatology in the present study would be similar to the findings reported in recent overseas studies. Contrary to most other recent research, the prevalence of depression during pregnancy in this study of 30.8% was higher than in other studies in overseas countries, in which the BDI and the same standard cut-off points were used (e.g., 9%, O'Hara et al., 1984; 25%, Whiffen, 1988). However, the prevalence of depression during pregnancy in this study was similar to the results reported by some studies in the United States (e.g., 29%, Atkinson & Rickel, 1984; 33%, House et al., 1986).

The rate of postpartum depression in this study of 39.7%, contrary to other research on postpartum women (using the BDI and the same standard cut-off points), was also higher than that of studies in overseas countries (e.g., 26 %, Atkinson & Rickel, 1984; 20%, Cutrona & Troutman, 1986; 19%, House et al., 1986; 25%, Gotlib et al., 1989; 12%, O'Hara et al., 1984).

Consistent with expectations, BDI scores showed an increase in the postpartum. In contrast, some studies (Cooper et al., 1988; O'Hara et al., 1990) have revealed that the postpartum is not characterized by an increased risk for depressive symptomatology.

There is difficulty in comparing the results of different studies, especially as low levels of prevalence could be attributed to sampling variability (O'Hara et al., 1990; Whiffen, 1988). Some studies have employed samples of less than 100 women (e.g., Cutrona & Troutman, 1986; Dimitrovsky et al., 1987; House et al., 1986; Spangenberg & Pieters, 1991). The subjects in these studies also differ with regard to demographic and background variables. Large representative samples are required in order to determine the prevalence of this disorder (Whiffen, 1988).

Some researchers (Hopkins et al., 1989; O'Hara et al., 1984) maintain that prevalence rates of depression during pregnancy and the postpartum may be biased and inflated in self-report questionnaires, such as the BDI, by high rates of normal physiological changes that might be reflected as symptoms of depression. Many normal physiological changes, such as appetite changes, sleep disturbances, fatigue, and loss of sexual interest, accompany pregnancy and the postpartum period, which could be mistaken for symptoms of depression (Hopkins et al., 1989; O'Hara et al., 1984).

In this study, however, the high significant association between the BDI and the Depression sub-scale of the Hopkins Symptom Checklist, which has very few somatic items, revealed that the BDI was reliable in its assessment of postpartum depressive symptomatology, regardless of the number of somatic items. Many other researchers agree that the BDI is satisfactory in determining

depressive symptomatology (e.g., Cutrona, 1984; Spangenberg & Pieters, 1991; Whiffen, 1988).

Some researchers (e.g., Harris, et al., 1989; Hopkins et al., 1989; Whiffen, 1988), maintain that the use of both diagnostic interviews (clinical interviews, structured interviews, and observer-rated scales) as well as self-report questionnaires should be used in the assessment of pre- and postpartum depression. O'Hara et al. (1991) argue that researchers must investigate both symptom levels and diagnostic status as outcomes in prospective studies of depression. Diagnostic interviews have resulted in lower pre- and postpartum estimates of depression, ranging from 3.5% to 10% (e.g., Cutrona, 1983; Gotlib et al., 1989), when used in studies of depression in the puerperium. According to O'Hara et al. (1990), the low scores produced by diagnostic interviews could be attributed to the frequent contact that the subjects have with interviewers, compared with women who are assessed by means of self-report measures, who have relatively little contact with researchers. Diagnostic interviews have also been criticized as being dichotomous variables, and therefore more likely to be skewed, and more difficult to use in predictive analyses, compared to self-report measures which are continuous variables (O'Hara et al., 1991).

However, many women report elevated levels of depressive symptomatology during the postpartum period (Gotlib et al., 1989; O'Hara et al., 1991). According to Whiffen (1988), those women who experience high depressive symptomatology in the postpartum tend to be distressed, even if they are not diagnosed as being "depressed" using diagnostic interviews, and postpartum depression symptom levels reflect the amount of stress experienced by women, more than the diagnosis of depression. Further

research on postpartum depression in New Zealand should perhaps employ the use of both self-report measures and diagnostic interviews to confirm the high rates of pre- and postpartum depressive symptomatology found in this study.

5.3 Predictors of Pre- and Postpartum Depression

Depression during pregnancy was the only predictor of postpartum depression, when the change in depression scores from prepartum to postpartum were examined. This result replicated the results of earlier studies (e.g., O'Hara et al., 1984; Pfost et al., 1989; Whiffen, 1988).

The strong association between depression during pregnancy and postpartum depression suggests a continuity of depressive symptomatology between pregnancy and the postpartum. Therefore, women who are depressed during pregnancy constitute a high risk group for developing postpartum depression.

The demographic, psychological, and psychosocial variables that were influential in predicting both pre- and postpartum depression will each be discussed in turn. The results of this study indicate that these variables play a crucial role in a woman's pre- and postpartum emotional well-being and adjustment.

5.3.1 Demographic Factors

There was no significant relationship between postpartum depression and any of the demographic variables that were examined in this study. In line with other studies (e.g., Gotlib et al., 1989; O'Hara et al., 1982; Spangenberg &

Pieters, 1991), postpartum depression was not significantly associated with parity, i.e. primiparae (first-time mothers) were no more likely to suffer from postpartum depression than mothers who had other children as well, nor were mothers who had many children more likely to be more depressed than women with fewer children.

Those women who intended to work soon after the birth of their infants were not more likely to develop higher levels of depressive symptomatology either during pregnancy or in the postpartum compared to those women who intended to be full-time housewives and mothers.

Other demographic variables that were examined in this study which revealed no significant association with depression during pregnancy or the postpartum, were education, ethnic origin, marital status, religion, and attendance at antenatal classes.

The only demographic variables that were significantly related to depression during pregnancy were age and socio-economic status (determined by summing standard scores for occupation and income). Younger women were more likely to have higher levels of depression during pregnancy than older women, suggesting that younger women are more at risk of developing prepartum depression than older women. No significant association was found between age and postpartum depression. Lower socio-economic status, consistent with research by Martin et al. (1989), was also associated with higher levels of depression during pregnancy. This result suggests that women of lower socio-economic status are more likely to be at risk for developing prepartum depression than women of higher socio-economic status. However,

socio-economic status had no significant effect on depression levels during the postpartum.

Although depression during pregnancy was related to some demographic variables in this study, postpartum depression, in contrast, was not. However, depression during pregnancy was the only predictor in the change in depression scores over time. Therefore, these results are consistent with a causal model in which younger age and lower socio-economic status causally influence depression during pregnancy, which in turn influences postpartum depression.

The reasons why younger women are more at risk for developing depressive symptomatology during pregnancy compared to older women have not been investigated. Perhaps younger women are more uncertain, immature or inexperienced with the mothering role. The pursuit of further educational qualifications may have to be delayed or curtailed, and the woman's own personal aspirations may have to be set aside. Younger women may also be less likely to have pursued or established their own occupations and may have no other work experience apart from being housewives and mothers. These additional stresses may lead to feelings of frustration, dissatisfaction, and to feelings of being trapped by the baby, resulting in depression. Future research should focus on why certain factors appear to predispose younger women to be more at risk for developing depression during pregnancy than older women.

An important question is why women of lower socio-economic status are more prone to depression during pregnancy. Unfortunately, this area has been largely unresearched, and one can only speculate regarding plausible causes of the link between lower socio-economic status and prepartum depression.

Economic and environmental stressors, such as lower income, poverty, and cramped living space, may contribute to emotional problems during pregnancy. Playfair and Gowers (Kerfoot et al., 1981) identified housing problems, and low employment status of the partner as external stresses that may lead to the development of depression. Another possible reason is that the additional expenses associated with pregnancy and childbirth may place constraints on the finances of the family. Some families may already be experiencing financial difficulties as the woman may have given up her occupation in order to become a full-time housewife and mother. This factor may constitute an additional stressor and may predispose the woman to becoming depressed during pregnancy. Future research needs to be directed at examining the factors which contribute to depression in woman of lower socio-economic status.

Studies of general depression have found an association between a lack of occupational status and prestige, and depression (McGrath, Keita, Strickland, & Russo, 1992). Perhaps women's roles and status in relation to depression should be examined. Moreover, the housewife role in particular is associated with low social status (Paykel, 1991). In recent years, there has been an increase in the number of working and career women. There has also been a trend in society for women to put off having children until they have pursued their own interests, established careers or attained financial security. As these roles tend to be more valued by our society, the devalued mothering role could constitute a stressor which may contribute to the development of postpartum depression (Kraus & Redman, 1986). Thus, younger women and women of lower socio-economic status may face social discrimination, which may lead to feelings of low self-esteem and depression. Further research is

required in order to determine whether the social and environmental context associated with the mothering role constitutes a risk factor for the development of depression.

5.3.2 Psychological Factors

(a) Depression History

The link between postpartum depression and a history of previous depressive episodes is well established (Pfost et al., 1990). In the present study, women who reported that they had a history of depressive episodes had higher levels of depression, both during pregnancy and in the postpartum. This finding is consistent with most previous research (e.g., Campbell et al., 1992; O'Hara et al., 1984; O'Hara & Zekoski, 1988).

A history of depressive disorders places women at risk for depression at times of major life stresses (Campbell et al., 1992). Childbirth and the puerperium constitute a major stressor in the lives of women, requiring reorganisation of their lives and relationships in order to care for a demanding new infant. Thus, the emotional well-being of some women during pregnancy may be diminished by existing emotional problems. Women who report a history of depression constitute a high risk group for developing depression during pregnancy, and as this study has shown, depression during pregnancy was the only variable that significantly accounted for changes in postpartum depression scores from pregnancy to the postpartum. Therefore, women with a history of depressive disorders are more vulnerable to developing postpartum depression.

The identification of biological, psychological and social factors which may be associated with precipitating previous depressive episodes would provide a greater understanding of why certain women are more vulnerable to depression in general. Previous depressive episodes could be associated with a significant loss, such as the death of a parent, a miscarriage, an abortion etc., or other life changes, such as moving house, loss of employment or even promotion (Uddenberg & Nilsson, 1975). Further research is required to evaluate the onset (whether in childhood, adolescence or adulthood) and etiology of previous depressive episodes, in order to determine why some women are more vulnerable than others, to develop depressive episodes in the presence of stressful life events and to prevent these depressive episodes from continuing throughout women's lives.

The identification of women with a history of depressive disorders during pregnancy is important in order to minimize the likelihood of depression continuing from pregnancy into the postpartum. Thus, a routine psychological assessment during prenatal medical evaluations would help in determining both the woman's emotional history and in ascertaining if she is suffering from depression during pregnancy.

(b) Feelings About Having a New Baby in the Family

In line with research by Kumar and Robson (1984), those women who felt unhappier about having a new baby in the family tended to have higher levels of depression both during pregnancy and in the postpartum.

However, in the longitudinal assessment of postpartum depression, in which the change in depression scores from prepartum to postpartum was

examined, the mother's feelings about having a new baby in the family were not significantly associated with postpartum depression. It should be stressed, however, that this finding does not negate the importance of this variable in the development of postpartum depression. These results are consistent with a causal model in which feelings about having the baby causally influence depression during pregnancy, which in turn influences postpartum depression. In general, this finding suggests that attitudes towards the baby may play a crucial role in postpartum depression.

While the mother's feelings towards having the baby were associated with an increase in depressive symptomatology in this study, unplanned pregnancy, on the other hand, was not. Those women whose pregnancies were "accidental" and unexpected were not more depressed than woman who had planned their pregnancies. Therefore, the attitude of the pregnant woman towards her unborn child is important in determining maternal pre- and postpartum adjustment.

5.3.3 Psychosocial Factors

(a) Marital Relationship

In accordance with expectations, women who had poorer marital adjustment during pregnancy were more likely to become depressed during pregnancy and in the postpartum, a conclusion also reached by other researchers (e.g., Dimitrovsky et al., 1987; Martin et al., 1989; Whiffen, 1988).

However, in many previous studies (e.g., Cox et al., 1982; Paykel et al., 1980; Spangenberg & Pieters, 1991) reports on marital adjustment were obtained after childbirth, when poor marital adjustment may have been

produced by levels of depression. Indeed, it is impossible to assess possible causal relationships between marital adjustment and depression in cross-sectional studies. This study hoped to overcome this problem by assessing marital adjustment both during pregnancy and in the postpartum.

When the change in depression scores over time was assessed in the present study, prepartum marital adjustment was not related to changes in depression from pre- to postpartum. In order to disentangle the possible cause-effect relationship over time between marital adjustment and postpartum depression, further cross-lagged regression analyses revealed that depression during pregnancy had a significant influence on the change in marital adjustment scores (from pre- to postpartum), but not vice-versa. This suggests that depression during pregnancy is more likely to have a negative effect on marital adjustment than vice versa, lending further support to the notion that depression has adverse effects on the woman and the marital relationship.

Further regression analyses, however, showed that postpartum marital adjustment had a strong relation to postpartum depression, irrespective of the levels of prepartum marital adjustment and prepartum depression. This result suggests that the quality of the marital relationship, specifically in the postpartum context, has a strong impact on how the woman copes emotionally, and on the development of postpartum depression.

In most Western cultures today, families are nuclear, geographically mobile, and therefore, do not have extended family support (Paykel, 1991). Accordingly, the woman and her partner often have only each other to rely on for emotional and instrumental support. After the birth of a baby, the new mother's dependency needs probably increase, placing greater pressure on the

father and the marital relationship. The emotional and physical stresses in caring for an infant often place strain on the marital relationship, particularly when the marital relationships may already be troubled (Campbell et al., 1992). The support of a good marital relationship appears to reduce the stresses associated with the postpartum, and help prevent the woman from developing depression (Dimitrovsky et al., 1987). The first postpartum year represents a time of stress and crisis for a marriage when marital adjustment problems often develop, or when previous adjustment problems are exacerbated (Handford, 1985).

Clearly, it is important to determine the factors that may facilitate good versus poor marital adjustment. An important question is whether poor marital adjustment is precipitated by the woman, her partner, or by the interaction between partners. Braverman & Roux (1978) found that the woman's persistent feeling of being unloved by her husband, whether the cause or effect of marital discord, is one of the main predictors of postpartum depression. Kaplan & Blackman (1969) (True-Soderstrom, Buckwalter & Kerfoot, 1983) found that women with postpartum depression had husbands who were neglectful, ineffectual and cruel, and Boyce et al. (1991) found that a current dysfunctional partner contributed to the onset of postpartum depression. According to Schweitzer et al. (1992), those women whose marriages are characterised by high levels of control and low levels of care are more likely to develop postpartum depression. All these studies provide some clues.

Another possibility is that the redefinition and renegotiation in relationships and roles after the birth result in maladjustment. The woman's relationship with her partner and other members of her family change as each

member assumes new roles and obligations in order to accommodate the new baby. Some women or their partners may find the transition to parenthood difficult, and not change their existing lifestyles, resulting in conflict and disharmony. Marital partners need to agree on the division of labour and readjustment in roles. Failure to negotiate differences and conflicts may also result in marital maladjustment. Further speculative causes of marital problems could be a lack of communication and intimacy between the partners, particularly during the postpartum, when the demands of housework and childcare may leaving the mother feeling tired and resentful. Factors relating to low socio-economic status such as a lack of finances, may also promote marital discord, which in turn, could lead to poor marital adjustment. There appear to be many potential areas of stress and conflict which may arise during the puerperium.

The results of the present study point towards the need for a greater understanding of how marital partners interact and redefine their relationships during the postpartum period. Further research is required in order to determine which factors are central in maintaining positive marital relationships during the pre- and postpartum periods.

(b) Social Support

In this study the multidimensional nature of social support was explored and social support was measured both objectively, in terms of the size of the woman's social network and the source of support, and also subjectively, in terms of the woman's perception of her satisfaction with her social support

network. The pattern of findings obtained was similar to those found for marital adjustment.

There are contradictory findings in the literature regarding the influence of social network size on postpartum depression. Some researchers have found that network size is not significantly associated with postpartum depression and that it is rather the perceived satisfaction with the network that is important (Stemp et al., 1986; Spangenberg & Pieters, 1991). However, in accordance with the results reported by other researchers, (Cutrona, 1984; O'Hara et al., 1983; Paykel et al., 1980). In the present study, an association was found between smaller sized social networks during the postpartum and postpartum depression. Similarly, those women who were more depressed in pregnancy perceived significantly fewer support persons in their social support network during pregnancy than less depressed women.

Consistent with previous research, (O'Hara et al., 1983; Spangenberg & Pieters, 1991; Stemp et al., 1986), an association was found between perceived dissatisfaction with the postpartum social network and postpartum depression. Women with higher prepartum depression levels perceived themselves as being less satisfied with the support that they were receiving during pregnancy.

In the present study, lower levels of total prepartum social support were associated with greater levels of depression during pregnancy and in the postpartum. When the change in depression scores over time were assessed, the only variable that had a significant association with postpartum depression was depression during pregnancy. Depression during pregnancy was also found to be more likely to have a negative effect on social support than vice

versa, suggesting that women who are depressed might, as a result of their depressive symptoms, seek less contact with their social environment. The dysphoric mood and pessimistic cognitions which accompany depression during pregnancy could lead to a loss of emotional involvement in other people or activities, resulting in a reduction in social support.

Further regression analyses showed that postpartum social support had a strong association with postpartum depression, regardless of the levels of prepartum social support and prepartum depression. This result and those showing the importance of postpartum marital adjustment, suggests that both poor postpartum marital adjustment and lower levels of postpartum social support independently influence the development of postpartum depression.

Social support has been shown to be an important variable in the stress-disorder relation (Hopkins et al., 1987; Leavy, 1983) and has been interpreted as protection against psychological disorder (O'Hara et al., 1983). The findings in this study support the view of Brown and Harris (1978) that social support can have a buffering effect against the development of depression and may lesson the impact of a major psychosocial stressor such as pregnancy and childbirth.

A lack of support by the husband/partner, family members and/or friends, can play a significant role in the development of postpartum emotional problems. Further research could be directed at ascertaining which individuals or groups are perceived by the woman as significant in providing her with support. Some previous research points to the significant role of the partner in providing support (e.g., Crnic et al., 1983; Stemp et al., 1986). Women who have young babies to care for, may rely on the support from the marital

relationship as they may often be housebound and tired because of the demands of the new baby, making it more difficult for them to make new contacts outside the home in order to obtain support from other social network members (Belsky, 1981; Crnic et al., 1983; Mueller, 1980).

However, the findings of the present study stress that although a positive marital relationship is a crucial variable in pre- and postpartum adjustment, support from others is independently related to levels of pre- and postpartum depression. Social support may be particularly important in the postpartum due to the increased demands placed on the mother in caring for a new-born infant. Caring for young children places restrictions on the social involvements of mothers, placing limitations on their friendships, social activities and social supports. Young mothers who are at home alone all day with their infants may well feel isolated and depressed. Those women who are depressed during pregnancy are also presumably more vulnerable to loss of contact with their supportive social networks. Thus, interventions such as support groups for pregnant women and new mothers are likely to be beneficial for depressed women who become aversive to family and friends (O'Hara et al, 1983),.

(c) Infant Risk

This study did not confirm the hypothesized relationship between postpartum depression and neonatal risk. The present study also found no association between postpartum depression and the infant's sex, birth weight, apgar score at five minutes after birth, or prematurity. However, other researchers (e.g., Bennett & Slade, 1991; Blumberg, 1980; Hannah et al., 1992; Hopkins et al., 1987) have found a significant relationship between infant

risk status at birth, low birth weight of the baby, premature, abnormal or ill babies and postpartum depression.

The findings of these previous studies could have varied from those of the present study due to the time that the subjects were assessed after childbirth. According to Gennaro (1988), although the mothers of premature infants may experience heightened depression during the first postpartum week, this emotional lability did not persist over time, implying that mothers of premature or otherwise at risk infants recover spontaneously with time. The assessments by those researchers who found infant risk status to be a predictor of postpartum depression (Bennett and Slade, 1991; Blumberg, 1980; Hannah et al., 1992; Hopkins et al., 1987) were made between the first and sixth week postpartum, a time when mothers of babies at risk might have experienced increased emotional upset and depression due to the stress of giving birth to an infant at risk.

The subjects in the present study were assessed for depressive symptomatology between 3 and 6 months postpartum, when the stress of giving birth to an infant at risk might have abated with time, as the infant recovers and approaches normal development. Therefore, this feature may have accounted for the failure to find an association between infant risk status at birth and postpartum depression.

(c) Infant Temperament

In the present study, contrary to previous research, (e.g., Cutrona, 1983; Cutrona & Troutman, 1986; O'Hara et al., 1984), no significant association was found between infant characteristics and postpartum depression.

One reason for the contradictory results between this study and those of other researchers is highlighted by the findings of Whiffen and Gotlib (1989). In a sample of 25 depressed and 25 nondepressed women, Whiffen and Gotlib (1989) obtained objective observer ratings, as well as subjective parent-report measures (using the Infant Characteristics Questionnaire), of infant temperament. Consistent with the findings of the present study, they also found that no significant differences existed between postpartum depression and maternal reports of infant difficulty. However, their results revealed that although the depressed women did not perceive their infant's temperament as difficult, objective ratings by examiners showed that the infants of the depressed women were observed to express more negative emotions during testing (Whiffen & Gotlib, 1989). They concluded that the depressed women did not attribute their infant's difficult behaviour to the temperament of their infants, but to their own inadequacies as caretaker (Whiffen & Gotlib, 1989).

In the present study, the only measure used to assess infant temperament was the Infant Characteristics Questionnaire, which is a parent-report measure. The failure to find a relationship between infant temperament and postpartum depression could be due to the self-report methodology. The women in this study may also have made attributions of self-blame similar to those of the women in the study by Whiffen and Gotlib, (1989).

In summary, the role of infant temperament requires the use of both objective ratings (by an examiner) of infant behaviour and maternal abilities as well as parent-report ratings (by both the mother and father of the infant) of perceived infant temperament.

5.4 Support for a Psychosocial Model of Postpartum Depression

The present study has attempted to examine the etiology of postpartum depression from a psychosocial perspective, in which postpartum depression is perceived to evolve from the interaction of psychological, social and environmental factors.

The birth of a child and the transition to parenthood inevitably results in change and stress in the lives of family members (Crnic et al., 1983). Childbirth is a major stressor which disrupts parent's usual patterns of living requiring substantial reorganisations and adjustments for the woman and her partner. The loss of personal freedom, coupled with the increased demands relating to baby care, makes psychological and social stress an intrinsic part of motherhood (Wellburn, 1980). The postpartum is therefore a particularly stressful time in a woman's life, a time when stressful events might cause depression in vulnerable women.

The results of this study lend support for a psychosocial model of postpartum depression. Postpartum depression was predicted by depression during pregnancy, by poorer postpartum marital adjustment and by lower levels of postpartum social support. Women who were vulnerable to depression were more likely, in the presence of certain stressors (such as a lack of social support, poor marital adjustment), to develop postpartum depression.

The failure of epidemiologic variables to predict postpartum depression suggests that the psychosocial stresses associated with the postpartum period are more important predictors of postpartum depression. A poor marital relationship and a lower level of adequate social support systems, appear to place women at greater risk for the development of depressive

symptomatology, regardless of epidemiologic factors such as age and socio-economic status. This result suggests that women suffering from postpartum depression might be helped by factors such as self-help groups, or support from health visitors, as well as therapy and counselling.

5.5 Implications for Health Professionals

The present results have important implications for the identification of women who are at risk for developing pre- and postpartum depression and for the implementation of primary intervention strategies. Health care workers, midwives and physicians should be aware of the high prevalence of depressive symptoms during pregnancy, and the significant association between depression during pregnancy and postpartum depression. The identification and treatment of women who are at risk for developing depressive symptomatology during pregnancy, might prevent depressive symptoms from continuing into the postpartum. Women who are younger, from lower socio-economic backgrounds, who feel unhappier about having their baby, and who have a history of depressive episodes, may benefit from a combination of counselling and support groups during pregnancy.

Poor marital adjustment and lower levels of social support, both during pregnancy and in the postpartum, are important variables in predicting pre- and postpartum depression. Health care workers should also be aware of the significant role of postpartum marital adjustment and postpartum social support in the development of postpartum depression. The results of this study signal the importance of assessing women during pregnancy and in the postpartum for possible depressive symptomatology and primary relationship problems.

Suitable treatment strategies should be made available to these women and their partners in the form of therapy, support groups and marriage counselling.

The relationship between lower levels of social support and pre- and postpartum depression highlights the importance of social support groups for pregnant women, and for women with infants. According to Cutrona and Troutman (1986), social contacts may help individuals maintain a sense of self-worth in times of stress. Therefore participation in social support groups should be encouraged by health care workers.

To summarize, this study highlights the need for early assessment and intervention strategies which could be employed during pregnancy and in the postpartum in order to minimize the effects of pre- and postpartum depression on the woman and her family. Mental health care workers, midwives and physicians should be made aware of the relationship between pre- and postpartum depression, and the high-risk variables which predict both depression during pregnancy and postpartum depression. Counselling, either in the form of individual or group therapy, may be of assistance to women suffering from depression. Depressed women could also be assisted through educational programs, learning strategies for the prevention of depression or ways to mitigate the effects of depressive symptomatology.

5.6 Summary of Research Limitations

Although women of many cultural backgrounds took part in this study, Maori women were under-represented, as the sample consisted primarily of New Zealand European women. The attrition rate among Maori women was also fairly high, as some Maori women dropped out of the study after the

prepartum assessment. This could have been due to the fact that these women were suffering from depression and lacked the inclination to complete the questionnaires, or to difficulties in interpreting the questionnaires due to cultural and language barriers. Cross-cultural studies would be influential in determining whether cultural differences play a role in the development of pre- and postpartum emotional disorders.

Another limitation of this study was the lack of success in detecting a relationship between difficult infant temperament and postpartum depression. This may be attributed to the failure to obtain both objective ratings and parent report measures in the assessment of difficult infant temperament.

5.7 Conclusion

The high prevalence of depressive symptomatology during pregnancy (30.8%) and in the postpartum (39.7%), in this study of New Zealand women, and the important role of depression during pregnancy in the etiology of postpartum depression, suggests that postpartum depression is a continuation of depression during pregnancy.

Pregnancy and childbirth are times of biological, social and psychological change for women. An understanding of the risk factors involved in predicting high levels of depressive symptomatology both during pregnancy and in the postpartum is critical in providing suitable intervention strategies, as well as in understanding the psychological processes involved. The present results have important implications for the identification of women who are at risk for developing depression during pregnancy and in the postpartum. Women who are younger, from lower socio-economic backgrounds, who feel unhappier

about having their baby, and who have a history of depressive episodes, should be closely monitored for the development of depressive symptoms. Poor marital adjustment and lower levels of social support, both during pregnancy and in the postpartum, are also important variables in predicting pre- and postpartum depression. In particular, mental health workers, doctors and midwives should be alerted to those women who are depressed during pregnancy, as this depression may continue and get worse during the postpartum.

Education programs providing information to health-care professionals as well as to the general public are possible measures to deal with postpartum depression. Participation in support groups both during pregnancy and in the postpartum may be beneficial, as well as the provision of psychotherapy and marriage counselling. Antenatal classes can prepare women for the negative effects of depression and the change and upheaval accompanying pregnancy. These classes could also educate women regarding methods of preventing or overcoming the adverse effects of the disorder.

There are several issues which should be considered in future research. The high prevalence of depressive symptomatology, both pre- and postpartum, in the present study highlights the need to replicate these results in New Zealand and to assess depression during pregnancy and in the postpartum using both diagnostic interviews and self-report measures. Future research should focus on the identification of those factors which may predispose younger women and women of lower socio-economic status to be more at risk for developing depression during pregnancy. Further research is also required in order to determine whether the devalued roles of women in society, in

particular mothering and housewife roles, are associated with depression. When investigating infant temperament in future studies, both parent-report and objective ratings of infant temperament should also, ideally, be obtained.

More research is required in order to determine the extent to which childbirth is merely a precipitating factor in women who are already vulnerable to emotional stress. A more detailed exploration of the woman's history of depressive disorders is required in order to define the etiological background of this disorder. Further research should perhaps determine whether a pattern exists in the lives of vulnerable woman, which may be associated with the development of depressive disorders at previous developmental milestones, such as adolescence.

The present findings point to the need for continued investigation of the impact of postpartum depression on women, their partners and their infants. Obtaining multiple assessments of depression at various times during pregnancy and in the postpartum year, would allow the identification of the onset, course and duration of both pre- and postpartum depression.

In view of the influence of the postpartum marital relationship on the development of postpartum depression, further research is also required to assess how marital partners interact and how the marital relationships change and readjust within the first postpartum year.

Previous research suggests that depressive symptoms may persist for a year or more (Hapgood, Elkind & Wright, 1988; Nott, 1987; Pitt, 1968). If left untreated, postpartum depression can have severe effects not only on the woman herself, but also on her husband, her infant, and the marital relationship.

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APPENDICES

APPENDIX A

Consent Form For Participation in Study of Postpartum Depression

TITLE OF STUDY: Psychosocial Factors in Postpartum Depression.

INVESTIGATOR: Claire Scannell
Psychology Ph.D. student
Victoria University of Wellington.

SUPERVISED BY: Dr Wendy Parr, Dr Richard Siegert
Lecturers in Psychology
Victoria University of Wellington

AIM OF STUDY:

The birth of a child is not only a time of great joy in the life of a family, but also of change and upheaval. This study is an attempt to gain a deeper understanding of the way in which women feel during pregnancy and in the months following childbirth.

By participating in this study, you will be assisting in acquiring knowledge about depression following childbirth. It is hoped that this research will lead to additional ways of helping women during this period of their lives.

VENUE OF THE STUDY:

Should you agree to participate in this study you will be asked to complete some questionnaires during your third trimester of pregnancy at the antenatal clinic at Wellington Women's Hospital. You will also be required to complete questionnaires three months after the birth of your baby.

CONFIDENTIALITY:

All questionnaires will be kept in the strictest confidence and will be used for the purposes of this research only. Your name and address are only required in order to send you additional questionnaires and will not be used in any way. All questionnaires will be securely kept for the duration of the research and will be destroyed on completion of the study.

Statement by Patient (to be signed in the presence of a witness):

"I have read the consent form and have had the opportunity for discussion with.....

"I understand that the procedures have been approved by the Wellington Area Health Board Ethics Committee.

"I know that I may withdraw my agreement to participate in this study at any time and I understand that this withdrawal will in no way interfere with my treatment at the hospital.

"I agree to participate in this study."

Signature of patient.....Date.....

Name of patient.....

Address.....

.....

Telephone number (Home).....(Work).....

Statement by Witness:

"I have discussed this consent form with the patient and am satisfied that she fully understands it and that her consent is freely given."

Signature of Witness.....Date.....

APPENDIX B

Letter to Subject During Pregnancy

Dear Mother-to-be

The birth of a child is not only a time of great joy in the life of a family, but also of change and upheaval. This study is an attempt to gain a deeper understanding of the way in which women feel during pregnancy and in the months following childbirth.

By participating in this study, you will be assisting in acquiring knowledge about depression following childbirth. It is hoped that this research will lead to additional ways of helping women during this period of their lives.

Instructions:

Please read the following questionnaires carefully and then complete them as honestly as you can. Don't spend too much time on any one question, but please don't miss any out. When you reach the end, please mail this booklet, using the stamped envelope provided, to the following address:

Mrs Claire Scannell
Department of Psychology
Victoria University of Wellington
P. O. Box 600
Wellington

Confidentiality:

All questionnaires will be kept in the strictest confidence and will be used for the purposes of this research only. Your name and address are only required in order to send you additional questionnaires, and will not be used in any way. All questionnaires will be kept securely for the duration of the research and will be destroyed on completion of the study.

Thank you very much for participating in this research project.

Yours sincerely

Claire Scannell

APPENDIX C

Letter to Subject 3-6 Months Postpartum

Dear

Congratulations on the birth of your baby and thank you for participating in this research on postpartum depression. This is the final phase of the study.

Please read the following questionnaires carefully and then complete them as honestly as you can. Don't spend too much time on any one question, but please don't miss any out.

When you reach the end, please mail this booklet, using the stamped envelope provided, to the following address:

Mrs Claire Scannell
Department of Psychology
Victoria University of Wellington
P.O. Box 600
Wellington

Confidentiality:
All questionnaires will be kept in the strictest confidence and will be used for the purposes of this research only. The questionnaires will be kept securely for the duration of the research and will be destroyed on completion of the study.

Yours sincerely

Claire Scannell

APPENDIX D

The Personal History and Demographic Information Questionnaire

PLEASE COMPLETE THE FOLLOWING:
- CONFIDENTIAL -

DATE.....

SURNAME OR FAMILY NAME.....

FIRST OR CHRISTIAN NAMES.....

ADDRESS.....

.....

.....

TELEPHONE NUMBER (HOME).....(WORK).....

DATE OF BIRTH: ....

day month year

1. What is the expected delivery date of your baby?

   ....

   day month year

2. Is this your first baby? (Please tick appropriate choice)

   .....yes .....no

3. If not, how many other children do you have?.....

4. Was your baby planned? (Please tick appropriate choice)

   .....yes .....no

5. How you feel about having a new baby in the family? (Please tick appropriate choice).

   .....very happy .....mixed feelings/ .....unhappy

   .....happy uncertain .....very unhappy

6. How do you think your partner feels about having a new baby in the family? (Please tick appropriate choice).

   .....very happy .....mixed feelings/ .....unhappy

   .....happy uncertain .....very unhappy

7. What country were you born in? (Please tick appropriate choice)

.....New Zealand .....The Netherlands

.....Australia .....Western Samoa

.....England .....Cook Islands

.....Scotland

.....Other (such as Eire, India, Fiji). Please state:

.....

8. What is your home language?.....

9. What is your ethnic background? (Please tick appropriate choice)

.....New Zealand European .....Tongan

.....New Zealand Maori .....Niuean

.....Samoan .....Chinese

.....Cook Island Maori .....Indian

.....Other (such as Dutch, Japanese, Tokelauan). Please state:

.....

10. What is your religion? (Please tick appropriate choice)

.....Anglican .....Baptist

.....Presbyterian .....Ratana

.....Catholic .....Latter Day Saints / Mormon

.....Methodist .....No religion

.....Other religion (such as Salvation Army, Hindu). Please state:

.....

11. What is your present marital status? (Please tick appropriate choice).

.....Single / never married

.....Now Married for the first time

.....Remarried

.....De facto relationship

.....Separated from legal husband

.....Divorced or marriage dissolved

12. If married / de facto, is this your partner's first such relationship?

(Please tick appropriate choice).

.....yes .....no

13. What is your highest school qualification? (Please tick choice)

.....No school qualification

.....School Certificate in one or more subjects

.....Sixth Form Certificate or University Entrance in one or more subjects

.....Higher School Certificate or Higher Leaving Certificate

.....University Bursary or Scholarship

.....Overseas qualification (such as United Kingdom GCE)

.....Other school qualification.

Please state:.....

14. What educational or job qualifications have you obtained since leaving school? (Please tick appropriate choice)

.....No qualification since leaving school

.....Nursing Certificate or Diploma

.....Teachers Certificate or Diploma

.....University Certificate or Diploma below Bachelor level

.....Bachelors Degree

.....Postgraduate Degree, Certificate or Diploma

.....Other qualifications (such as Local Polytechnic Certificate or Diploma).

Please state:.....

15. Have you ever consulted a doctor or other professional for depression? (Please tick appropriate choice)

.....yes .....no

If so, for how long did you require professional assistance?

Please state:.....

.....

16. Do you have any relatives living with you? (Please tick choice)

.....yes .....no

If yes, who are they? (eg. mother, father, aunt...) Please state:

.....

17. Are you currently employed? (Please tick appropriate choice)

.....yes .....no

Or, did you work before your pregnancy?

.....yes .....no

If yes, what is/was your occupation? Please state:.....

.....

Do you intend to go back to work after the birth of your baby?

.....yes .....no

If yes, how long after the birth of your baby? Please state:

.....

18. What is your partner's present occupation?

Please state:.....

19. What is your family's approximate income, including income support, before tax, per year? (Please tick appropriate choice).

.....$2,500 or less per year (less than $48 per week)

.....$2,501 - $5000 per year ($48 and less than $96 per week)

.....$5,001 - $7,500 per year ($96 and less than $144 per week)

.....$7,501 - $10,000 per year ($144 and less than $192 per week)

.....$10,0001 - $15,000 per year ($192 and less than $288 per week)

.....$15,001 - $20,000 per year ($288 and less than $385 per week)

.....$20,001 - $25,000 per year ($385 and less than $481 per week)

.....$25,001 - $30,000 per year ($481 and less than $577 per week)

.....$30,001 - $40,000 per year ($577 and less than $769 per week)

.....$40,001 - $50,000 per year ($769 and less than $962 per week)

.....$50,001 - $70,000 per year ($962 and less than $1,346 per week)

.....$70,001 and over per year ($1,346 and over per week)

20. Are you attending, or planning to attend antenatal classes?

.....yes .....no

Does your partner go with you, or plan to go with you to the classes?

.....yes .....no

APPENDIX E

B D I Questionnaire

This questionnaire consists of 21 groups of statements. After reading each group of statements carefully, circle the number (0,1,2,or 3) next to the one statement in each group which best describes the way you have been **best** feeling the **past week**, including today. If several statements within a group seem to apply equally well, circle each one. **Be sure to read all the statements in each group before making your choice.**

1. 0 I do not feel sad.
   1 I feel sad.
   2 I am sad all the time and I can't snap out of it.
   3 I am so sad or unhappy that I can't stand it.

2. 0 I am not particularly discouraged about the future.
   1 I feel discouraged about the future.
   2 I feel I have nothing to look forward to.
   3 I feel that the future is hopeless and that things cannot improve.

3. 0 I do not feel like a failure.
   1 I feel I have failed more than the average person.
   2 I look back on my life, all I can see is a lot of failures.
   3 I feel I am a complete failure as a person.

4. 0 I get as much satisfaction out of things as I used to.
   1 I don't enjoy things the way as I used to.
   2 I don't get real satisfaction out of anything any more.
   3 I am dissatisfied or bored with everything.

5. 0 I don't feel particularly guilty.
   1 I feel guilty a good part of the time.
   2 I feel quite guilty most of the time.
   3 I feel guilty all of the time.

6. 0 I don't feel I am being punished.
   1 I feel I may be punished.
   2 I expect to be punished.
   3 I feel I am being punished.

7. 0 I don't feel disappointed in myself.
   1 I am disappointed in myself.
   2 I am disgusted with myself.
   3 I hate myself.

8. 0 I don't feel I am any worse than anybody else.
   1 I am critical of myself for my weaknesses or mistakes.
   2 I blame myself all the time for my faults.
   3 I blame myself for everything bad that happens.

9. 0 I don't have any thoughts of killing myself.
   1 I have thoughts of killing myself, but I would not carry them out.
   2 I would like to kill myself.
   3 I would kill myself if I had the chance.

10. 0 I don't cry any more than usual.
    1 I cry more now than I used to.
    2 I cry all the time now.
    3 I used to be able to cry, but now I can't cry even though I want to.

11. 0 I am no more irritated now than I ever am.
    1 I get annoyed or irritated more easily than I used to.
    2 I feel irritated all the time now.
    3 I don't get irritated at all by the things that used to irritate me.

12. 0 I have not lost interest in other people.
    1 I am less interested in other people than I used to be.
    2 I have lost most of my interest in other people.
    3 I have lost all of my interest in other people.

13. 0 I make decisions about as well as I ever could.
    1 I put off making decisions more than I used to.
    2 I have greater difficulty in making decisions than before.
    3 I can't make decisions at all any more.

14. 0 I don't feel I look any worse than I used to.
    1 I am worried that I am looking old or unattractive.
    2 I feel that there are permanent changes in my appearance that make me look unattractive.
    3 I believe that I look ugly.

15. 0 I can work about as well as before.
    1 It takes an extra effort to get started at doing something.
    2 I have to push myself very hard to do anything.
    3 I can't do any work at all.

16. 0 I can sleep as well as usual.
    1 I don't sleep as well as I used to.
    2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
    3 I wake up several hours earlier than I used to and cannot get back to sleep.

17. 0 I don't get more tired than usual.
    1 I get tired more easily than I used to.
    2 I get tired from doing almost anything.
    3 I am too tired to do anything.

18. 0 My appetite is no worse than usual.
    1 My appetite is not as good as it used to be.
    2 My appetite is much worse now.
    3 I have no appetite at all any more.

19. 0 I haven't lost much weight, if any, lately.
    1 I have lost more than 5 pounds.
    2 I have lost more than 10 pounds.
    3 I have lost more than 15 pounds.

    I am purposely trying to lose weight by eating less. Yes..... No.....

20. 0 I am no more worried about my health than usual.
    1 I am worried about physical problems such as aches and pains; or upset stomach; or constipation.
    2 I am very worried about physical problems and it's hard to think of much else.
    3 I am so worried about my physical problems that I cannot think about anything else.

21. 0 I have not noticed any recent change in my interest in sex.
    1 I am less interested in sex than I used to be.
    2 I am much less interested in sex now.
    3 I have lost interest in sex completely.

APPENDIX F

The Hopkins Symptom Checklist

CONFIDENTIAL

Please read each symptom carefully and decide how much the complaint bothered or distressed you during the past week, including today. Then, circle the response that you feel is most applicable. **Do not leave out any items.**

1. Loss of sexual interest or pleasure
1-not at all 2-a little 3-quite a bit 4-extremely

2. Thoughts of ending your life
1-not at all 2-a little 3-quite a bit 4-extremely

3. Feeling low in energy or slowed down
1-not at all 2-a little 3-quite a bit 4-extremely

4. Crying easily
1-not at all 2-a little 3-quite a bit 4-extremely

5. A feeling of being trapped or caught
1-not at all 2-a little 3-quite a bit 4-extremely

6. Blaming yourself for things
1-not at all 2-a little 3-quite a bit 4-extremely

7. Poor appetite
1-not at all 2-a little 3-quite a bit 4-extremely

8. Feeling lonely
1-not at all 2-a little 3-quite a bit 4-extremely

9. Feeling blue
1-not at all 2-a little 3-quite a bit 4-extremely

10. Worrying or stewing about things
1-not at all 2-a little 3-quite a bit 4-extremely

11. Feeling no interest in things
1-not at all 2-a little 3-quite a bit 4-extremely

12. Difficulty in falling asleep or staying asleep
1-not at all 2-a little 3-quite a bit 4-extremely

13. Feeling hopeless about the future
1-not at all 2-a little 3-quite a bit 4-extremely

APPENDIX G

Dyadic Adjustment Scale

Most persons have disagreements in their relationships. Please indicate below the approximate extent of agreement or disagreement between you and your partner for each item on the following list. Circle the response that you feel is most applicable. There are no right or wrong answers. All your answers will be kept private.

1. **Handling family finances.**

5-Always Agree	4-Almost Always Agree	3-Occasionally Disagree	2-Frequently Disagree	1-Almost Always Disagree	0-Always Disagree

2. **Matters of recreation.**

5-Always Agree	4-Almost Always Agree	3-Occasionally Disagree	2-Frequently Disagree	1-Almost Always Disagree	0-Always Disagree

3. **Religious matters.**

5-Always Agree	4-Almost Always Agree	3-Occasionally Disagree	2-Frequently Disagree	1-Almost Always Disagree	0-Always Disagree

4. **Demonstrations of affection.**

5-Always Agree	4-Almost Always Agree	3-Occasionally Disagree	2-Frequently Disagree	1-Almost Always Disagree	0-Always Disagree

5. **Friends.**

5-Always Agree	4-Almost Always Agree	3-Occasionally Disagree	2-Frequently Disagree	1-Almost Always Disagree	0-Always Disagree

6. **Sex relations.**

5-Always Agree	4-Almost Always Agree	3-Occasionally Disagree	2-Frequently Disagree	1-Almost Always Disagree	0-Always Disagree

7. **Conventionality (correct or proper behaviour).**

5-Always Agree	4-Almost Always Agree	3-Occasionally Disagree	2-Frequently Disagree	1-Almost Always Disagree	0-Always Disagree

8. **Philosophy of life.**

5-Always Agree	4-Almost Always Agree	3-Occasionally Disagree	2-Frequently Disagree	1-Almost Always Disagree	0-Always Disagree

9. **Ways of dealing with parents or in-laws.**

5-Always Agree	4-Almost Always Agree	3-Occasionally Disagree	2-Frequently Disagree	1-Almost Always Disagree	0-Always Disagree

10. **Aims, goals, and things believed important.**

5-Always Agree	4-Almost Always Agree	3-Occasionally Disagree	2-Frequently Disagree	1-Almost Always Disagree	0-Always Disagree

11. **Amount of time spent together.**

5-Always Agree	4-Almost Always Agree	3-Occasionally Disagree	2-Frequently Disagree	1-Almost Always Disagree	0-Always Disagree

12. **Making major decisions.**

5-Always Agree	4-Almost Always Agree	3-Occasionally Disagree	2-Frequently Disagree	1-Almost Always Disagree	0-Always Disagree

13. **Household tasks.**

5-Always Agree	4-Almost Always Agree	3-Occasionally Disagree	2-Frequently Disagree	1-Almost Always Disagree	0-Always Disagree

14. **Leisure time interests and activities.**

5-Always Agree	4-Almost Always Agree	3-Occasionally Disagree	2-Frequently Disagree	1-Almost Always Disagree	0-Always Disagree

15. **Career decisions.**

5-Always Agree	4-Almost Always Agree	3-Occasionally Disagree	2-Frequently Disagree	1-Almost Always Disagree	0-Always Disagree

16. **How often do you discuss or have you considered divorce, separation, or terminating your relationship?**

0-All the time	1-Most of the time	2-More often than not	3-Occasionally	4-Rarely	5-Never

17. **How often do you or your mate leave the house after a fight?**

0-All the time	1-Most of the time	2-More often than not	3-Occasionally	4-Rarely	5-Never

18. **In general, how often do you think that things between you and your partner are going well?**

0-All the time	1-Most of the time	2-More often than not	3-Occasionally	4-Rarely	5-Never

19. **Do you confide in your mate?**

0-All the time	1-Most of the time	2-More often than not	3-Occasionally	4-Rarely	5-Never

20. **Do you ever regret that you married? (or lived together)**

0-All the time	1-Most of the time	2-More often than not	3-Occasionally	4-Rarely	5-Never

21. **How often do you and your partner quarrel?**

0-All the time	1-Most of the time	2-More often than not	3-Occasionally	4-Rarely	5-Never

22. **How often do you and your mate "get on each other's nerves"?**

0-All the time	1-Most of the time	2-More often than not	3-Occasionally	4-Rarely	5-Never

23. **Do you kiss your mate?**

4-Every day	3-Almost every day	2-Occasionally	1-Rarely	0-Never

24. **Do you and your mate engage in outside interests together?**

4-All of them	3-Most of them	2-Some of of them	1-Very few them	0-None of them

How often would you say the following events occur between you and your mate?

25. **Have a stimulating exchange of ideas.**

0-Never	1-Less than once a month	2-Once or twice a month	3-Once or twice a week	4-Once a day	5-More often

26. **Laugh together.**

0-Never	1-Less than once a month	2-Once or twice a month	3-Once or twice a week	4-Once a day	5-More often

27. **Calmly discuss something.**

0-Never	1-Less than once a month	2-Once or twice a month	3-Once or twice a week	4-Once a day	5-More often

28. **Work together on a project.**

0-Never	1-Less than once a month	2-Once or twice a month	3-Once or twice a week	4-Once a day	5-More often

These are some things about which couples sometimes agree and sometimes disagree. Indicate if either item below caused differences of opinions or were problems in your relationship during the past few weeks. (Circle yes or no).

29. **Being too tired for sex.**

0-Yes 1-No

30. **Not showing love.**

0-Yes 1-No

31. **The dots on the following line represent different degrees of happiness in your relationship. The middle point, "happy", represents the degree of happiness of most relationships. Please circle the dot which best describes the degree of happiness, all things considered, of your relationship.**

. . . . . .

0-Extremely unhappy	1-Fairly unhappy	2-A little unhappy	3-Happy	4-Very happy	5-Extremely happy	6-Perfect

32. **Which of the following statements best describes how you feel about the future of your relationship?**

5 - I want desperately for my relationship to succeed, and **would go to almost any length** to see that it does.

4 - I want desperately for my relationship to succeed, and **will do all I can** to see that it does.

3 - I want desperately for my relationship to succeed, and **will do my fair share** to see that it does.

2 - It would be nice if my relationship succeeded, but **I can't do much more than I'm doing** now to help it succeed.

1 - It would be nice if it succeeded, but I **refuse to do any more than I'm doing** now to help it succeed.

0 - My relationship can never succeed, and **there is no more that I can do** to keep the relationship going.

APPENDIX H

Brief Social Support Questionnaire

INSTRUCTIONS:

The following questions ask about people in your life who give you help or support. Each question has two parts. For the first part, list all the people you know, but not yourself, who you can count on for help or support in the way described. Give the person's initials and their relationship to you (see example). Do not list more than one person next to each of the numbers beneath the question.

For the second part, circle how satisfied you are with the overall support you have.

If you have no support for a question, put a tick beside the words "No one", but still rate your level of satisfaction. Do not list more than nine people per question.

All your answers will be kept private.

EXAMPLE

i)Who do you know who you can trust with information that could get you in trouble?

No one	1) M.H. (partner)	4) F.D. (sister)	7)
	2) B.G (mother)	5)	8)
	3) T.J. (aunt)	6)	9)

ii) How satisfied?

6-very satisfied	5-fairly satisfied	4-a little satisfied	3-a little dissatisfied	2-fairly dissatisfied	1-very dissatisfied

PLEASE TURN THE PAGE AND ANSWER ALL QUESTIONS AS BEST YOU CAN.

1. **Who can you really count on to take your mind off your worries when you are under stress?**

No one	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

2. **How satisfied?**

6-very satisfied	5-fairly satisfied	4-a little satisfied	3-a little dissatisfied	2-fairly dissatisfied	1-very dissatisfied

3. **Who can you rely on when you need help?**

No one	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

4. **How satisfied?**

6-very satisfied	5-fairly satisfied	4-a little satisfied	3-a little dissatisfied	2-fairly dissatisfied	1-very dissatisfied

5. **With whom can you totally be yourself?**

No one	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

6. **How satisfied?**

6-very satisfied	5-fairly satisfied	4-a little satisfied	3-a little dissatisfied	2-fairly dissatisfied	1-very dissatisfied

7. **Who do you feel really appreciates you as a person?**

No one	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

8. **How satisfied?**

6-very satisfied	5-fairly satisfied	4-a little satisfied	3-a little dissatisfied	2-fairly dissatisfied	1-very dissatisfied

9. **Who can you really count on to give you advice or ideas that help you to avoid making mistakes?**

No one	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

10. **How satisfied?**

6-very satisfied	5-fairly satisfied	4-a little satisfied	3-a little dissatisfied	2-fairly dissatisfied	1-very dissatisfied

11. **Who will comfort you when you need it by holding you in their arms?**

No one	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

12. **How satisfied?**

6-very satisfied	5-fairly satisfied	4-a little satisfied	3-a little dissatisfied	2-fairly dissatisfied	1-very dissatisfied

13. **Who can you really count on to help you feel more relaxed when you are under pressure or tense?**

No one	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

14. **How satisfied?**

6-very satisfied	5-fairly satisfied	4-a little satisfied	3-a little dissatisfied	2-fairly dissatisfied	1-very dissatisfied

15. **Who accepts you totally, including both your worst and best points?**

No one	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

16. **How satisfied?**

6-very satisfied	5-fairly satisfied	4-a little satisfied	3-a little dissatisfied	2-fairly dissatisfied	1-very dissatisfied

17. **Who can you really count on to help you feel better when you are feeling generally down in the dumps?**

No one	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

18. **How satisfied?**

6-very satisfied	5-fairly satisfied	4-a little satisfied	3-a little dissatisfied	2-fairly dissatisfied	1-very dissatisfied

19. **Who can you really count on to care about you, regardless of what is happening to you?**

No one	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

20. **How satisfied?**

6-very satisfied	5-fairly satisfied	4-a little satisfied	3-a little dissatisfied	2-fairly dissatisfied	1-very dissatisfied

21. **Who can you really count on to help you feel better when you are very upset?**

No one	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

22. **How satisfied?**

6-very satisfied	5-fairly satisfied	4-a little satisfied	3-a little dissatisfied	2-fairly dissatisfied	1-very dissatisfied

23. **Who can you really count on to support you in major decisions you make?**

No one	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

24. **How satisfied?**

6-very satisfied	5-fairly satisfied	4-a little satisfied	3-a little dissatisfied	2-fairly dissatisfied	1-very dissatisfied

APPENDIX I

Postnatal Complication Scale

Infants Name : ..... Sex : M ... F ...

Hospital Number : .....

Birth Date : .....

Expected Delivery Date : .....

Date Form Completed : .....

ITEM		
1.	Respiratory Distress	No ..... Yes .....
2.	Positive or Suspected Infection	No ..... Yes .....
3.	Ventilatory Assistance	No ..... Yes .....
4.	Noninfectious Illness or Anomaly	No ..... Yes .....
5.	Metabolic Disturbance	No ..... Yes .....
6.	Convulsion	No ..... Yes .....
7.	Hyperbilirubinemia or Exchange Transfusion	No ..... Yes .....
8.	Temperature Disturbance	No ..... Yes .....
9.	Feeding Within 48 Hours	Yes..... No .....
10.	Surgery	No ..... Yes .....

TOTAL .....
(Raw Score)

CONVERSION TABLE

Raw Score		Converted Score
10	-	160
9	-	104
8	-	87
7	-	81
6	-	77
5	-	72
4	-	67
3	-	55
2	-	55
1	-	50
0	-	-

Converted .....
Score

ITEM	COMMENT
1. Respiratory Distress	The occurrence of respiratory distress in any form would elicit a positive response in this item. Distress is defined as at least one or more of the following: (1) grunting, (2) retractions, (3) respiratory rate greater than 60, or (4) nasal flaring. The distress in any form must be present for more than an hour. Normal Response : No respiratory distress.
2. Positive or suspected infection	This refers to the occurrence of any infectious illness affecting any part of the body. The site may be as superficial as the skin or as widespread as sepsis. Similarly the degree may be from very mild to very serious. The term suspected refers to the point that the infection need not be proven by culture techniques but merely suspected by the physician. Thus treatment of suspected sepsis would be scored affirmatively. Normal Response : No infection.
3. Ventilatory Assistance	This item is intended to define further complications of respiratory distress. It entails the use of any of the following methods in the support of respiration: (1) intermittent positive pressure breathing, (2) continuous positive pressure breathing, (3) continuous positive airway pressure, or (4) negative chest wall pressure. These methods may be administered by mask or endotracheal intubation. Normal Response : No ventilatory assistance.
4. Noninfectious Illness or Anomaly	In an attempt to describe all other major illnesses or congenital anomalies that might be brought to bear upon the infant, this item is scored affirmatively if that should occur. It specifically excludes any type of infection. Anomaly refers to any structural abnormality whether congenital or acquired. Minor skin anomalies are not included. Some examples are: (1) CNS-haemorrhage hydrocephalus, (2) GU-hypospadias, ambiguous genitalia, (3) GI-umbilical

hernia, intestinal obstruction, (4) CV-PDA, other CHD, shock (BP less than 30), Tachycardia (AP greater than 180) bradycardia (AP less than 100).

Normal Response : No illness or anomalies.

5. Metabolic Disturbance

Metabolic disturbances are those problems usually diagnosed by examinations of bodily fluids. Inborn errors of metabolism are also covered in this item. The most common disturbances with their physiologic limits are defined below :

Hypoglycaemia	Premature Terms	20mg% 30mg%
Hypocalcaemia	Premature Terms	7 meq/1 8 meq/1
Hypomagnesemia	All	1.27 meq/1
Hypermagnesemia	All	1.75 meq/1
Acid-Base	All	pH 7.3 pH 7.45
Sodium	All	130 meq/1 150 meq/1
Potassium	All	3.0 meq/1 5.5 meq/1

Normal Response : No metabolic disturbance.

6. Convulsion

Here a convulsion is defined as any clonic, tonic, or repetitive activity of a tremorous nature felt to be a seizure by the medical staff. Because of the frequent non-convulsive seizure-like activity so often seen by nursery personnel in order for a positive response to be scored the activity must be witnessed by a physician.

Normal Response : No convulsion.

7. Hyperbilirubinemia or Exchange Transfusion

A bilirubin level greater than 14 mg% is defined as Hyperbilirubinemia. Although exchange transfusion may be used for other purposes such as haemolytic disease of the newborn or other causes of hyperbilirubinemia.

Normal Response : No hyperbilirubinemia or exchange transfusion.

8. Temperature Disturbance

A disturbance is defined as any temperature outside the zone of 36-37.5 degrees Centigrade. Because of the common occurrences of hypothermic temperatures in the delivery room after birth, a positive response refers only to those situations arising at least one hour postnatally.

Normal Response : No temperature disturbance.

9. Feeding Within 48 Hours

This item is intended to be an assessment of the infant's general state of health around the time of birth. If feedings are begun normally but then discontinued at a later date the item is still scored optimally.

Normal Response : The beginning of feeding within 48 hours of birth.

10. Surgery

Surgery refers to (1) any procedure done under general anaesthesia by a surgeon and would include all endoscopic techniques, (2) any procedure requiring incision through the skin. However certain things are not to be included here and spinal taps, circumcisions, cutdowns, subdural taps, ventricular taps and other non-anethetic radiologic studies are not to be given positive responses.

Normal Response : No surgery.

APPENDIX J

IinfantCharacteristics Questionnaire

Part I

Please complete the following.

Your baby's sex_____Birth Date_____

Birth weight_____Length at birth_____

Present weight _____Apgar Score_____

Part II

On the following questions please circle the number that is most typical of your baby. "about average" means how you think the typical baby would be scored.

1 How easy or difficult is it for you to calm or soothe your baby when he/she is upset?

1	2	3	4	5	6	7
very easy			about average		difficult	

2 How easy or difficult is it for you to predict when your baby will go to sleep and wake up?

1	2	3	4	5	6	7
very easy			about average		difficult	

3 How easy or difficult is it for you to predict when your baby will be become hungry?

1	2	3	4	5	6	7
very easy			about average		difficult	

4 How easy or difficult is it for you to know what's bothering your baby when he/she cries or fusses?

1	2	3	4	5	6	7
very easy			about average		difficult	

5 How many times per day, on the average, does your baby get fussy and irritable--for either short or long periods of time?

1	2	3	4	5	6	7
never	1-2 times per day	3-4 times per day	5-6 times per day	7-9 times per day	10-14 times per day	more than 15

6 How much does your baby cry and fuss in general?

1	2	3	4	5	6	7
very little: much less than the average baby			average amount: about as much as the average baby		a lot: much more than the average baby	

7 How did your baby respond to his/her first bath?

1	2	3	4	5	6	7
very well-- baby loved it			neither liked nor disliked it		terribly-- didn't like it	

8 How did your baby respond to his/her first solid food?

1	2	3	4	5	6	7
very favourably-- liked it immediately			neither liked nor disliked it		very negatively-- did not like it at all	

9 How does your baby typically respond to a new person?

1	2	3	4	5	6	7
almost always responds favourably			responds favourably about half the time		almost always responds negatively at first	

10 How does your baby typically respond to be being in a new place?

1	2	3	4	5	6	7
almost always responds favourably			responds favourably about half the time		almost always responds negatively at first	

11 How well does your baby adapt to things (such as in items 7-10) eventually?

1	2	3	4	5	6	7
very well, always likes it eventually			ends up liking it about half the time		almost always dislikes it in the end	

12 How easily does your infant get upset?

1	2	3	4	5	6	7
very hard to upset--even by things that upset most babies			about average		very easily upset by things that wouldn't bother most babies	

13 When your baby gets upset (e.g. before feeding, during nappy changes, etc), how vigorously or loudly does he/she cry and fuss?

1	2	3	4	5	6	7
very mild intensity or loudness			moderate intensity or loudness		very loud or intense, really cuts loose	

14 How does your baby react when you are dressing him/her?

1	2	3	4	5	6	7
very well-- likes it			about average-- doesn't mind it		doesn't like it at all	

15 How active is your baby in general?

1	2	3	4	5	6	7
very calm and quiet			average		very active and vigorous	

16 How much does your baby smile and make happy sounds?

1	2	3	4	5	6	7
a great deal, much more than most infants			an average amount		very little, much less than most infants	

17 What kind of mood is your baby generally in?

1	2	3	4	5	6	7
very happy and cheerful			neither serious nor cheerful		serious	

18 How much does your baby enjoy playing little games with you?

1	2	3	4	5	6	7
a great deal, really loves it			about average		very little, doesn't like it very much	

19 How much does your baby want to be held?

1	2	3	4	5	6	7
wants to be free most of the time			sometimes wants to be held; sometimes not		a great deal-- wants to be held almost all the time	

20 How does your baby respond to disruptions and changes in the everyday routine, such as when you go to church or a meeting, on trips, etc ?

1	2	3	4	5	6	7
very favourably, doesn't get upset			about average		very unfavourably, gets quite upset	

21 How easy is it for you to predict when your baby will need a nappy change?

1	2	3	4	5	6	7
very easy			about average		very difficult	

22 How changeable is your baby's mood?

1	2	3	4	5	6	7
changes seldom, and changes slowly when he/she does change			about average		changes often and rapidly	

23 How excited does your baby become when people play with or talk to him/her?

1	2	3	4	5	6	7
very excited			about average		not at all	

24 Please rate the overall degree of difficulty your baby would present for the average mother?

1	2	3	4	5	6	7
super easy			ordinary, some problems		highly difficult to deal with	

25 On the average, how much attention does your baby require, other than for caregiving (feeding, nappy changes, etc.)?

1	2	3	4	5	6	7
very little-- much less than average			average amount		a lot--much more than the average baby	

26 When left alone, your baby plays well by him/herself.

1	2	3	4	5	6	7
almost always			about half the time		almost never--won't play by self	

27 How does your baby react to being confined (as in a car seat, infant seat, playpen, etc.)?

1	2	3	4	5	6	7
very well-- likes it			minds a little or protests once in a while		doesn't like it at all	

28 How much does your baby cuddle and snuggle when held?

1	2	3	4	5	6	7
a great deal-- almost every time			average; sometimes does and sometimes doesn't		very little; seldom cuddles	

APPENDIX K

Consent from Ethics Committee

(Copies of originals on the following 2 pages)

Wellhealth

ETHICS COMMITTEE

Chairperson:
The Rev Owen S Robinson
Room 48, Ground Floor
Seddon Block
Wellington Hospital

Phone: 855-999 x 5185

All correspondence to:
Secretary
Room 48, Ground Floor
Seddon Block
Wellington Hospital
Private Bag
Wellington 6002

17 December 1990.

Clair Scannell
119 Akaroa Drive
Mapuia
Wellington

Dear Ms Scannell,

Re your research protocol 90/118 : The influence of psychological factors in the development of postpartum depression.

Your research has Ethics Committee approval.

In November 1991 you will be required to furnish the Committee with a brief report on the process and results of your research.

Every good wish for your project.

Yours sincerely

Owen S Robinson

Owen S Robinson

Wellhealth

ETHICS COMMITTEE

Chairperson:
The Rev Owen S Robinson
Room 48, Ground Floor
Seddon Block
Wellington Hospital

Phone: 855-999 x 5185

All correspondence to:
Secretary
Room 48, Ground Floor
Seddon Block
Wellington Hospital
Private Bag
Wellington 6002

5 July 1991

Miss C. Scannell,
21 Staithes Drive North,
Whitby,
Wellington.

Dear Miss Scannell,

Re application 90/118 The influences of psychosocial factors in the development of postpartum depression.

Thank you for sending the changes to your protocol and the questionnaire. The questionnaire seems to be a little long and I wonder whether in fact you will get complete compliance but that is a matter for you as a researcher to work through. However, in the letter headed "Dear Mother-to-be" there is an important error under the heading of Confidentiality. You have a sentence which ends "and will not be used in any way." I think you need to say "and will not be used in any other way." You are going to use the names in order to send out further questionnaires. It is a small point but I think rather important.

Subject to that alteration you have Ethics Committee approval for the project. Congratulations on having it up-graded to a doctoral project. Every good wish for your work.

Yours sincerely,

Owen Robinson

Owen S. Robinson,
CHAIRPERSON

APPENDIX L

Correlation Coefficients

	BDI TIME 1	BDI TIME 2	AGE	PRIMI-PAROUS	NUMBER CHILDREN	PLANNED PREGNANCY
BDI TIME 1	1.0000 (214) P= .	.6314 (214) P= .000	-.2007 (214) P= .003	-.0688 (214) P= .316	.1163 (214) P= .090	-.2614 (214) P= .000
BDI TIME 2	.6314 (214) P= .000	1.0000 (214) P= .	-.0967 (214) P= .159	.0045 (214) P= .947	.0294 (214) P= .669	-.1601 (214) P= .019
AGE	-.2007 (214) P= .003	-.0967 (214) P= .159	1.0000 (214) P= .	-.3136 (214) P= .000	.3118 (214) P= .000	.1669 (214) P= .014
PRIMI-PAROUS	-.0688 (214) P= .316	.0045 (214) P= .947	-.3136 (214) P= .000	1.0000 (214) P= .	-.7889 (214) P= .000	-.0764 (214) P= .266
NUMBER CHILDREN	.1163 (214) P= .090	.0294 (214) P= .669	.3118 (214) P= .000	-.7889 (214) P= .000	1.0000 (214) P= .	-.0128 (214) P= .853
PLANNED PREGNANCY	-.2614 (214) P= .000	-.1601 (214) P= .019	.1669 (214) P= .014	-.0764 (214) P= .266	-.0128 (214) P= .853	1.0000 (214) P= .
FEELINGS ABOUT HAVING THE BABY	-.3559 (214) P= .000	-.2911 (214) P= .000	-.0682 (214) P= .320	.0870 (214) P= .205	-.1635 (214) P= .017	.2934 (214) P= .000
DEPRESSION HISTORY	.2897 (214) P= .000	.2063 (214) P= .002	.1498 (214) P= .028	-.0399 (214) P= .562	.1094 (214) P= .111	-.0545 (214) P= .428
RELATIVES LIVING WITH SUBJECT	.1346 (214) P= .049	.0346 (214) P= .615	-.4035 (214) P= .000	.1231 (214) P= .072	-.1250 (214) P= .068	-.2065 (214) P= .002
EDUCATION	-.0516 (214) P= .453	.0023 (214) P= .973	.2100 (214) P= .002	.0243 (214) P= .724	-.0624 (214) P= .363	.1063 (214) P= .121
ETHNIC ORIGIN	-.0074 (214) P= .915	-.0241 (214) P= .726	.0311 (214) P= .651	-.0140 (214) P= .839	.0099 (214) P= .886	-.0052 (214) P= .940
RELIGION	-.1145 (214) P= .095	-.1276 (214) P= .062	.0634 (214) P= .356	.0799 (214) P= .245	-.0529 (214) P= .441	.0751 (214) P= .274

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

APPENDIX L continued

Correlation Coefficients

	BDI TIME 1	BDI TIME 2	AGE	PRIMI-PAROUS	NUMBER CHILDREN	PLANNED PREGNANCY
MARITAL STATUS	.0591 (214) P= .390	.0099 (214) P= .885	.1867 (214) P= .006	.0203 (214) P= .768	.0137 (214) P= .842	-.1018 (214) P= .138
PARTNER'S FIRST MARRIAGE	-.1831 (214) P= .007	-.1149 (214) P= .094	.0353 (214) P= .607	-.0975 (214) P= .155	.0467 (214) P= .497	.0618 (214) P= .369
OCCUPATION	-.2759 (214) P= .000	-.1423 (214) P= .038	.2428 (214) P= .000	.1009 (214) P= .141	-.1898 (214) P= .005	.0270 (214) P= .694
INCOME	-.2708 (214) P= .000	-.0998 (214) P= .146	.3294 (214) P= .000	.0797 (214) P= .246	-.1012 (214) P= .140	.0717 (214) P= .297
SOCIO-ECONOMIC STATUS	-.3375 (214) P= .000	-.1494 (214) P= .029	.3532 (214) P= .000	.1114 (214) P= .104	-.1796 (214) P= .008	.0609 (214) P= .375
WORKING AFTER BIRTH	-.1753 (214) P= .010	-.0962 (214) P= .161	.0435 (214) P= .527	.2077 (214) P= .002	-.1784 (214) P= .009	-.0822 (214) P= .231
ANTENATAL ATTENDANCE (SUBJECT)	-.0403 (214) P= .558	.0322 (214) P= .640	-.1766 (214) P= .010	.6196 (214) P= .000	-.5545 (214) P= .000	-.0555 (214) P= .419
ANTENATAL ATTENDANCE PARTNER	-.1263 (214) P= .065	-.0428 (214) P= .534	-.0822 (214) P= .231	.5702 (214) P= .000	-.5178 (214) P= .000	.0408 (214) P= .553
MARITAL ADJUSTMENT TIME 1	-.3704 (214) P= .000	-.2450 (214) P= .000	.0116 (214) P= .866	.1095 (214) P= .110	-.0907 (214) P= .186	.1957 (214) P= .004
MARITAL ADJUSTMENT TIME 2	-.4522 (214) P= .000	-.4768 (214) P= .000	.0122 (214) P= .860	.0370 (214) P= .590	-.0445 (214) P= .517	.2629 (214) P= .000
SOCIAL SUPPORT TIME 1	-.3797 (214) P= .000	-.3261 (214) P= .000	.0348 (214) P= .612	.0990 (214) P= .149	-.1071 (214) P= .118	.0998 (214) P= .146
NETWORK SIZE TIME 1	-.2082 (214) P= .002	-.1453 (214) P= .034	.0430 (214) P= .532	.0714 (214) P= .298	-.0927 (214) P= .177	.0464 (214) P= .500

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

APPENDIX L continued

Correlation Coefficients

	BDI TIME 1	BDI TIME 2	AGE	PRIMI-PAROUS	NUMBER CHILDREN	PLANNED PREGNANCY
SUPPORT SATISFACTION TIME 1	-.4341 (214) P= .000	-.4063 (214) P= .000	.0159 (214) P= .817	.0960 (214) P= .162	-.0885 (214) P= .197	.1225 (214) P= .074
SOCIAL SUPPORT TIME 2	-.4190 (214) P= .000	-.4865 (214) P= .000	.1065 (214) P= .121	.0205 (214) P= .766	-.0577 (214) P= .401	.1509 (214) P= .027
NETWORK SIZE TIME 2	-.2264 (214) P= .001	-.2164 (214) P= .001	.1362 (214) P= .047	.0060 (214) P= .930	-.0574 (214) P= .404	.1176 (214) P= .086
SUPPORT SATISFACTION TIME 2	-.4563 (214) P= .000	-.5763 (214) P= .000	.0373 (214) P= .588	.0274 (214) P= .690	-.0367 (214) P= .594	.1283 (214) P= .061
INFANT TEMPERAMENT	.1427 (214) P= .037	.2122 (214) P= .002	.0222 (214) P= .747	.1286 (214) P= .060	-.1115 (214) P= .104	-.0214 (214) P= .755
INFANT RISK	-.0284 (214) P= .680	-.0818 (214) P= .233	-.0326 (214) P= .635	.0332 (214) P= .629	.0176 (214) P= .798	.0669 (214) P= .330
SEX OF BABY	.0233 (214) P= .735	-.0038 (214) P= .955	-.0340 (214) P= .621	.1933 (214) P= .005	-.1667 (214) P= .015	.0326 (214) P= .635
WEIGHT	.0944 (214) P= .169	.0114 (214) P= .869	.0114 (214) P= .868	-.1020 (214) P= .137	.0924 (214) P= .178	.0132 (214) P= .848
PREMATURE BIRTH	.0127 (214) P= .854	.0587 (214) P= .393	-.0627 (214) P= .361	.1232 (214) P= .072	-.0300 (214) P= .663	-.0708 (214) P= .303
APGAR AT 5 MINUTES	.0020 (214) P= .977	-.0795 (214) P= .247	.0713 (214) P= .299	.0370 (214) P= .590	.0207 (214) P= .763	.0889 (214) P= .195

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

APPENDIX L continued

Correlation Coefficients

	FEELINGS ABOUT BABY	DEPRESSION HISTORY	RELATIVES LIVING WITH SUBJECT	EDUCATION	ETHNIC ORIGIN	RELIGION
BDI TIME 1	-.3559 (214) P= .000	.2897 (214) P= .000	.1346 (214) P= .049	-.0516 (214) P= .453	-.0074 (214) P= .915	-.1145 (214) P= .095
BDI TIME 2	-.2911 (214) P= .000	.2063 (214) P= .002	.0346 (214) P= .615	.0023 (214) P= .973	-.0241 (214) P= .726	-.1276 (214) P= .062
AGE	-.0682 (214) P= .320	.1498 (214) P= .028	-.4035 (214) P= .000	.2100 (214) P= .002	.0311 (214) P= .651	.0634 (214) P= .356
PRIMI-PAROUS	.0870 (214) P= .205	-.0399 (214) P= .562	.1231 (214) P= .072	.0243 (214) P= .724	-.0140 (214) P= .839	.0799 (214) P= .245
NUMBER OF CHILDREN	-.1635 (214) P= .017	.1094 (214) P= .111	-.1250 (214) P= .068	-.0624 (214) P= .363	.0099 (214) P= .886	-.0529 (214) P= .441
PLANNED	.2934 (214) P= .000	-.0545 (214) P= .428	-.2065 (214) P= .002	.1063 (214) P= .121	-.0052 (214) P= .940	.0751 (214) P= .274
FEELINGS ABOUT BABY	1.0000 (214) P= .	-.0942 (214) P= .170	.0110 (214) P= .873	.0408 (214) P= .553	.0568 (214) P= .408	.0667 (214) P= .332
DEPRESSION HISTORY	-.0942 (214) P= .170	1.0000 (214) P= .	-.1099 (214) P= .109	.1461 (214) P= .033	-.0398 (214) P= .563	.0597 (214) P= .385
RELATIVES LIVING WITH SUBJECT	.0110 (214) P= .873	-.1099 (214) P= .109	1.0000 (214) P= .	-.2205 (214) P= .001	.0352 (214) P= .609	-.0456 (214) P= .507
EDUCATION	.0408 (214) P= .553	.1461 (214) P= .033	-.2205 (214) P= .001	1.0000 (214) P= .	.2292 (214) P= .001	.0354 (214) P= .606
ETHNIC ORIGIN	.0568 (214) P= .408	-.0398 (214) P= .563	.0352 (214) P= .609	.2292 (214) P= .001	1.0000 (214) P= .	-.0377 (214) P= .583

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

APPENDIX L continued

Correlation Coefficients

	FEELINGS ABOUT BABY	DEPRESSION HISTORY	RELATIVES LIVING WITH SUBJECT	EDUCATION ORIGIN	ETHNIC	RELIGION
RELIGION	.0667 (214) P= .332	.0597 (214) P= .385	-.0456 (214) P= .507	.0354 (214) P= .606	-.0377 (214) P= .583	1.0000 (214) P= .
MARITAL STATUS	.0146 (214) P= .832	.1501 (214) P= .028	-.1150 (214) P= .093	.0970 (214) P= .157	-.0016 (214) P= .982	.1098 (214) P= .109
PARTNERS FIRST MARRIAGE	.0307 (214) P= .655	-.1258 (214) P= .066	-.0314 (214) P= .648	.0088 (214) P= .898	.0115 (214) P= .867	.0098 (214) P= .887
OCCUPATION	.1269 (214) P= .064	-.1145 (214) P= .095	-.1346 (214) P= .049	.3439 (214) P= .000	.1222 (214) P= .074	.0522 (214) P= .447
INCOME	.0476 (214) P= .488	.0819 (214) P= .233	-.1769 (214) P= .010	.2858 (214) P= .000	.0818 (214) P= .233	.0750 (214) P= .275
SOCIO-ECONOMIC STATUS	.1078 (214) P= .116	-.0201 (214) P= .770	-.1923 (214) P= .005	.3887 (214) P= .000	.1259 (214) P= .066	.0785 (214) P= .253
WORKING AFTER BIRTH	-.0129 (214) P= .852	-.0822 (214) P= .231	.0392 (214) P= .569	.1427 (214) P= .037	.1148 (214) P= .094	.0162 (214) P= .814
ANTENATAL ATTENDANCE	.0656 (214) P= .340	-.0997 (214) P= .146	.1272 (214) P= .063	.0390 (214) P= .571	.0188 (214) P= .785	.0029 (214) P= .967
PARTNER'S ANTENATAL ATTENDANCE	.0574 (214) P= .403	-.0119 (214) P= .862	-.0623 (214) P= .365	.0582 (214) P= .397	-.0741 (214) P= .281	.0971 (214) P= .157
MARITAL ADJUSTMENT TIME 1	.2798 (214) P= .000	.0218 (214) P= .751	-.1324 (214) P= .053	.0839 (214) P= .221	-.0737 (214) P= .283	.1176 (214) P= .086
MARITAL ADJUSTMENT TIME 2	.2752 (214) P= .000	-.0380 (214) P= .580	-.0463 (214) P= .500	.0403 (214) P= .558	-.1065 (214) P= .120	.1712 (214) P= .012

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

APPENDIX L continued

Correlation Coefficients

	FEELINGS ABOUT BABY	DEPRESSION HISTORY	RELATIVES LIVING WITH SUBJECT	EDUCATION	ETHNIC ORIGIN	RELIGION
SOCIAL SUPPORT TIME 1	.2498 (214) P= .000	-.0878 (214) P= .201	-.1432 (214) P= .036	.1336 (214) P= .051	-.0257 (214) P= .708	-.0049 (214) P= .943
NETWORK SIZE TIME 1	.1727 (214) P= .011	-.0267 (214) P= .698	-.1155 (214) P= .092	.1818 (214) P= .008	-.0650 (214) P= .344	-.0170 (214) P= .805
SOCIAL SATISFACT-ION TIME 1	.2498 (214) P= .000	-.1219 (214) P= .075	-.1267 (214) P= .064	.0441 (214) P= .521	.0215 (214) P= .755	.0087 (214) P= .899
SOCIAL SUPPORT TIME 2	.2091 (214) P= .002	-.0643 (214) P= .349	-.1090 (214) P= .112	.1037 (214) P= .131	-.0691 (214) P= .314	-.0038 (214) P= .955
NETWORK SIZE TIME 2	.0893 (214) P= .193	-.0095 (214) P= .890	-.1265 (214) P= .065	.1731 (214) P= .011	-.0981 (214) P= .153	.0373 (214) P= .587
SOCIAL SATISFACT-ION TIME 2	.2514 (214) P= .000	-.0952 (214) P= .165	-.0511 (214) P= .457	-.0041 (214) P= .952	-.0145 (214) P= .833	-.0436 (214) P= .526
INFANT TEMP.	-.1229 (214) P= .073	.0586 (214) P= .393	.0020 (214) P= .977	-.0041 (214) P= .952	.0046 (214) P= .947	-.0518 (214) P= .451
INFANT RISK	-.0134 (214) P= .846	.0236 (214) P= .731	.0353 (214) P= .608	-.0341 (214) P= .620	.0033 (214) P= .961	.0131 (214) P= .849
SEX OF BABY	.1141 (214) P= .096	-.0677 (214) P= .324	.0280 (214) P= .684	-.0599 (214) P= .383	.0048 (214) P= .945	.0635 (214) P= .355
BABY'S BIRTH WEIGHT	.0177 (214) P= .797	.0087 (214) P= .899	.0280 (214) P= .684	.1324 (214) P= .053	.0150 (214) P= .827	.0141 (214) P= .838
PREMATURE BIRTH	-.0841 (214) P= .220	-.0408 (214) P= .553	-.0395 (214) P= .566	.0468 (214) P= .496	-.0359 (214) P= .602	-.0164 (214) P= .812
APGAR AT 5 MINUTES	-.0325 (214) P= .636	.0178 (214) P= .796	.0079 (214) P= .908	-.0344 (214) P= .617	.0060 (214) P= .931	.0024 (214) P= .972

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

APPENDIX L continued

Correlation Coefficients

	MARITAL STATUS	PARTNER'S FIRST MARRIAGE	OCCU-PATION	INCOME	SOCIO-ECONOMIC STATUS	WORKING AFTER BIRTH
BDI TIME 1	.0591 (214) P= .390	-.1831 (214) P= .007	-.2759 (214) P= .000	-.2708 (214) P= .000	-.3375 (214) P= .000	-.1753 (214) P= .010
BDI TIME 2	.0099 (214) P= .885	-.1149 (214) P= .094	-.1423 (214) P= .038	-.0998 (214) P= .146	-.1494 (214) P= .029	-.0962 (214) P= .161
AGE	.1867 (214) P= .006	.0353 (214) P= .607	.2428 (214) P= .000	.3294 (214) P= .000	.3532 (214) P= .000	.0435 (214) P= .527
PRIMI-PAROUS	.0203 (214) P= .768	-.0975 (214) P= .155	.1009 (214) P= .141	.0797 (214) P= .246	.1114 (214) P= .104	.2077 (214) P= .002
NUMBER OF CHILDREN	.0137 (214) P= .842	.0467 (214) P= .497	-.1898 (214) P= .005	-.1012 (214) P= .140	-.1796 (214) P= .008	-.1784 (214) P= .009
PLANNED PREGNANCY	-.1018 (214) P= .138	.0618 (214) P= .369	.0270 (214) P= .694	.0717 (214) P= .297	.0609 (214) P= .375	-.0822 (214) P= .231
FEELINGS ABOUT BABY	.0146 (214) P= .832	.0307 (214) P= .655	.1269 (214) P= .064	.0476 (214) P= .488	.1078 (214) P= .116	-.0129 (214) P= .852
DEPRESSION HISTORY	.1501 (214) P= .028	-.1258 (214) P= .066	-.1145 (214) P= .095	.0819 (214) P= .233	-.0201 (214) P= .770	-.0822 (214) P= .231
RELATIVES LIVING WITH SUBJECT	-.1150 (214) P= .093	-.0314 (214) P= .648	-.1346 (214) P= .049	-.1769 (214) P= .010	-.1923 (214) P= .005	.0392 (214) P= .569
EDUCATION	.0970 (214) P= .157	.0088 (214) P= .898	.3439 (214) P= .000	.2858 (214) P= .000	.3887 (214) P= .000	.1427 (214) P= .037
ETHNIC ORIGIN	-.0016 (214) P= .982	.0115 (214) P= .867	.1222 (214) P= .074	.0818 (214) P= .233	.1259 (214) P= .066	.1148 (214) P= .094

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

APPENDIX L continued

Correlation Coefficients

	MARITAL STATUS	PARTNER'S FIRST MARRIAGE	OCCU-PATION	INCOME	SOCIO-ECONOMIC STATUS	WORKING AFTER BIRTH
RELIGION	.1098 (214) P= .109	.0098 (214) P= .887	.0522 (214) P= .447	.0750 (214) P= .275	.0785 (214) P= .253	.0162 (214) P= .814
MARITAL STATUS	1.0000 (214) P= .	-.1127 (214) P= .100	.0425 (214) P= .536	.1932 (214) P= .005	.1455 (214) P= .033	.1431 (214) P= .036
PARTNER'S FIRST MARRIAGE	-.1127 (214) P= .100	1.0000 (214) P= .	.0831 (214) P= .226	-.0323 (214) P= .639	.0314 (214) P= .648	.0078 (214) P= .909
OCCUPATION	.0425 (214) P= .536	.0831 (214) P= .226	1.0000 (214) P= .	.3121 (214) P= .000	.8100 (214) P= .000	.3740 (214) P= .000
INCOME	.1932 (214) P= .005	-.0323 (214) P= .639	.3121 (214) P= .000	1.0000 (214) P= .	.8100 (214) P= .000	.1448 (214) P= .034
SOCIO-ECONOMIC STATUS	.1455 (214) P= .033	.0314 (214) P= .648	.8100 (214) P= .000	.8100 (214) P= .000	1.0000 (214) P= .	.3203 (214) P= .000
WORKING AFTER BIRTH	.1431 (214) P= .036	.0078 (214) P= .909	.3740 (214) P= .000	.1448 (214) P= .034	.3203 (214) P= .000	1.0000 (214) P= .
ANTENATAL ATTENDANCE	.0446 (214) P= .517	-.1103 (214) P= .108	.1694 (214) P= .013	.1834 (214) P= .007	.2178 (214) P= .001	.2371 (214) P= .000
PARTNER'S ANTENATAL ATTENDANCE	.1073 (214) P= .117	-.0408 (214) P= .553	.1825 (214) P= .007	.2377 (214) P= .000	.2594 (214) P= .000	.2269 (214) P= .001
MARITAL ADJUSTMENT TIME 1	-.0016 (214) P= .981	.1327 (214) P= .053	.1954 (214) P= .004	.2199 (214) P= .001	.2564 (214) P= .000	.0801 (214) P= .243
MARITAL ADJUSTMENT TIME 2	-.0312 (214) P= .650	.1399 (214) P= .041	.1548 (214) P= .024	.1851 (214) P= .007	.2098 (214) P= .002	.0395 (214) P= .565

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

APPENDIX L continued

Correlation Coefficients

	MARITAL STATUS	PARTNER'S FIRST MARRIAGE	OCCU-PATION	INCOME	SOCIO-ECONOMIC STATUS	WORKING AFTER BIRTH
SOCIAL SUPPORT TIME 1	.1128 (214) P= .100	-.0384 (214) P= .577	.1668 (214) P= .015	.2377 (214) P= .000	.2497 (214) P= .000	.2211 (214) P= .001
NETWORK SIZE TIME 1	.1496 (214) P= .029	-.0579 (214) P= .399	.2414 (214) P= .000	.1456 (214) P= .033	.2389 (214) P= .000	.2376 (214) P= .000
SOCIAL SATISFACT-ION TIME 1	.0413 (214) P= .548	-.0070 (214) P= .919	.0407 (214) P= .554	.2565 (214) P= .000	.1835 (214) P= .007	.1364 (214) P= .046
SOCIAL SUPPORT TIME 2	.0635 (214) P= .355	.0374 (214) P= .586	.2158 (214) P= .001	.1521 (214) P= .026	.2271 (214) P= .001	.1531 (214) P= .025
NETWORK SIZE TIME 2	.0817 (214) P= .234	.0338 (214) P= .623	.2979 (214) P= .000	.1184 (214) P= .084	.2570 (214) P= .000	.1559 (214) P= .022
SOCIAL SATISFACT-ION TIME 2	.0219 (214) P= .750	.0272 (214) P= .693	.0538 (214) P= .434	.1294 (214) P= .059	.1131 (214) P= .099	.0936 (214) P= .173
INFANT TEMP.	-.1487 (214) P= .030	-.0555 (214) P= .419	-.0196 (214) P= .776	-.0062 (214) P= .928	-.0159 (214) P= .817	-.1174 (214) P= .087
INFANT RISK	-.0345 (214) P= .616	.0485 (214) P= .480	-.1251 (214) P= .068	-.0253 (214) P= .713	-.0928 (214) P= .176	-.0641 (214) P= .350
SEX OF BABY	.0522 (214) P= .447	-.0275 (214) P= .689	.0392 (214) P= .569	.1245 (214) P= .069	.1010 (214) P= .141	.1391 (214) P= .042
BABY'S BIRTH WEIGHT	.0772 (214) P= .261	-.1391 (214) P= .042	.0196 (214) P= .775	-.0090 (214) P= .896	.0066 (214) P= .924	-.0745 (214) P= .278
PREMATURE BIRTH	.0615 (214) P= .371	.0268 (214) P= .696	-.0307 (214) P= .655	.0583 (214) P= .396	.0170 (214) P= .804	.0666 (214) P= .332
APGAR AT 5 MINUTES	-.1227 (214) P= .073	.0312 (214) P= .650	-.0075 (214) P= .913	-.0061 (214) P= .929	-.0084 (214) P= .903	.0624 (214) P= .363

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

APPENDIX L continued

Correlation Coefficients

	ANTE-NATAL ATTEND.	PARTNER'S ANTENATAL ATTEND.	MARITAL ADJUST. TIME 1	MARITAL ADJUST TIME 2	SOCIAL SUPPORT TIME 1	NETWORK SIZE TIME 1
BDI TIME 1	-.0403 (214) P= .558	-.1263 (214) P= .065	-.3704 (214) P= .000	-.4522 (214) P= .000	-.3797 (214) P= .000	-.2082 (214) P= .002
BDI TIME 2	.0322 (214) P= .640	-.0428 (214) P= .534	-.2450 (214) P= .000	-.4768 (214) P= .000	-.3261 (214) P= .000	-.1453 (214) P= .034
AGE	-.1766 (214) P= .010	-.0822 (214) P= .231	.0116 (214) P= .866	.0122 (214) P= .860	.0348 (214) P= .612	.0430 (214) P= .532
PRIMI-PAROUS	.6196 (214) P= .000	.5702 (214) P= .000	.1095 (214) P= .110	.0370 (214) P= .590	.0990 (214) P= .149	.0714 (214) P= .298
NUMBER CHILDREN	-.5545 (214) P= .000	-.5178 (214) P= .000	-.0907 (214) P= .186	-.0445 (214) P= .517	-.1071 (214) P= .118	-.0927 (214) P= .177
PLANNED PREGNANCY	-.0555 (214) P= .419	.0408 (214) P= .553	.1957 (214) P= .004	.2629 (214) P= .000	.0998 (214) P= .146	.0464 (214) P= .500
FEELINGS ABOUT BABY	.0656 (214) P= .340	.0574 (214) P= .403	.2798 (214) P= .000	.2752 (214) P= .000	.2498 (214) P= .000	.1727 (214) P= .011
DEPRESSION HISTORY	-.0997 (214) P= .146	-.0119 (214) P= .862	.0218 (214) P= .751	-.0380 (214) P= .580	-.0878 (214) P= .201	-.0267 (214) P= .698
RELATIVES LIVING WITH SUBJECT	.1272 (214) P= .063	-.0623 (214) P= .365	-.1324 (214) P= .053	-.0463 (214) P= .500	-.1432 (214) P= .036	-.1155 (214) P= .092
EDUCATION	.0390 (214) P= .571	.0582 (214) P= .397	.0839 (214) P= .221	.0403 (214) P= .558	.1336 (214) P= .051	.1818 (214) P= .008
ETHNIC ORIGIN	.0188 (214) P= .785	-.0741 (214) P= .281	-.0737 (214) P= .283	-.1065 (214) P= .120	-.0257 (214) P= .708	-.0650 (214) P= .344

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

APPENDIX L continued

Correlation Coefficients

	ANTE-NATAL ATTEND.	PARTNER'S ANTENATAL ATTEND.	MARITAL ADJUST. TIME 1	MARITAL ADJUST TIME 2	SOCIAL SUPPORT TIME 1	NETWORK SIZE TIME 1
RELIGION	.0029 (214) P= .967	.0971 (214) P= .157	.1176 (214) P= .086	.1712 (214) P= .012	-.0049 (214) P= .943	-.0170 (214) P= .805
MARITAL STATUS	.0446 (214) P= .517	.1073 (214) P= .117	-.0016 (214) P= .981	-.0312 (214) P= .650	.1128 (214) P= .100	.1496 (214) P= .029
PARTNER'S FIRST MARRIAGE	-.1103 (214) P= .108	-.0408 (214) P= .553	.1327 (214) P= .053	.1399 (214) P= .041	-.0384 (214) P= .577	-.0579 (214) P= .399
OCCUPATION	.1694 (214) P= .013	.1825 (214) P= .007	.1954 (214) P= .004	.1548 (214) P= .024	.1668 (214) P= .015	.2414 (214) P= .000
INCOME	.1834 (214) P= .007	.2377 (214) P= .000	.2199 (214) P= .001	.1851 (214) P= .007	.2377 (214) P= .000	.1456 (214) P= .033
SOCIO-ECONOMIC STATUS	.2178 (214) P= .001	.2594 (214) P= .000	.2564 (214) P= .000	.2098 (214) P= .002	.2497 (214) P= .000	.2389 (214) P= .000
WORKING AFTER BIRTH	.2371 (214) P= .000	.2269 (214) P= .001	.0801 (214) P= .243	.0395 (214) P= .565	.2211 (214) P= .001	.2376 (214) P= .000
ANTENATAL ATTENDANCE	1.0000 (214) P= .	.7234 (214) P= .000	.0988 (214) P= .150	.0202 (214) P= .769	.1539 (214) P= .024	.1857 (214) P= .006
PARTNER'S ANTENATAL ATTENDANCE	.7234 (214) P= .000	1.0000 (214) P= .	.2685 (214) P= .000	.2079 (214) P= .002	.2331 (214) P= .001	.2196 (214) P= .001
MARITAL ADJUSTMENT TIME 1	.0988 (214) P= .150	.2685 (214) P= .000	1.0000 (214) P= .	.8059 (214) P= .000	.4270 (214) P= .000	.1975 (214) P= .004
MARITAL ADJUSTMENT TIME 2	.0202 (214) P= .769	.2079 (214) P= .002	.8059 (214) P= .000	1.0000 (214) P= .	.4236 (214) P= .000	.1915 (214) P= .005

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

APPENDIX L continued

Correlation Coefficients

	ANTE-NATAL ATTEND.	PARTNER'S ANTENATAL ATTEND.	MARITAL ADJUST. TIME 1	MARITAL ADJUST TIME 2	SOCIAL SUPPORT TIME 1	NETWORK SIZE TIME 1
SOCIAL SUPPORT TIME 1	.1539 (214) P= .024	.2331 (214) P= .001	.4270 (214) P= .000	.4236 (214) P= .000	1.0000 (214) P= .	.8457 (214) P= .000
NETWORK SIZE TIME 1	.1857 (214) P= .006	.2196 (214) P= .001	.1975 (214) P= .004	.1915 (214) P= .005	.8457 (214) P= .000	1.0000 (214) P= .
SOCIAL SATISFACT. TIME 1	.0746 (214) P= .277	.1746 (214) P= .010	.5247 (214) P= .000	.5250 (214) P= .000	.8457 (214) P= .000	.4304 (214) P= .000
SOCIAL SUPPORT TIME 2	.0982 (214) P= .152	.1845 (214) P= .007	.3300 (214) P= .000	.4616 (214) P= .000	.7393 (214) P= .000	.6684 (214) P= .000
NETWORK SIZE TIME 2	.1208 (214) P= .078	.1603 (214) P= .019	.1610 (214) P= .018	.2060 (214) P= .002	.6313 (214) P= .000	.7826 (214) P= .000
SOCIAL SATISFACT. TIME 2	.0393 (214) P= .567	.1403 (214) P= .040	.3767 (214) P= .000	.5462 (214) P= .000	.5733 (214) P= .000	.3064 (214) P= .000
INFANT TEMP.	.0892 (214) P= .194	.0813 (214) P= .236	-.1049 (214) P= .126	-.1068 (214) P= .119	-.1206 (214) P= .078	-.1026 (214) P= .135
INFANT RISK	.0009 (214) P= .990	-.1089 (214) P= .112	.0294 (214) P= .669	.1059 (214) P= .123	.1042 (214) P= .129	.0950 (214) P= .166
SEX OF BABY	.0821 (214) P= .232	.0827 (214) P= .228	.0141 (214) P= .838	.0263 (214) P= .702	-.0075 (214) P= .913	-.0339 (214) P= .621
BABY'S BIRTH WEIGHT	.0151 (214) P= .826	-.0260 (214) P= .706	.0198 (214) P= .773	.0296 (214) P= .667	.0401 (214) P= .560	.0818 (214) P= .233
PREMATURE BIRTH	.0460 (214) P= .503	.0666 (214) P= .332	.0231 (214) P= .737	-.0534 (214) P= .437	-.0170 (214) P= .805	-.0341 (214) P= .620
APGAR AT 5 MINUTES	.1386 (214) P= .043	-.0050 (214) P= .941	-.0137 (214) P= .842	.0473 (214) P= .492	.0329 (214) P= .632	.0155 (214) P= .822

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

APPENDIX L continued

Correlation Coefficients

	NETWORK SIZE TIME 1	SOCIAL SUPPORT TIME 2	NETWORK SIZE TIME 2	SOCIAL SATISFACT. TIME 2	INFANT TEMP.	INFANT RISK
BDI TIME 1	-.4341 (214) P= .000	-.4190 (214) P= .000	-.2264 (214) P= .001	-.4563 (214) P= .000	.1427 (214) P= .037	-.0284 (214) P= .680
BDI TIME 2	-.4063 (214) P= .000	-.4865 (214) P= .000	-.2164 (214) P= .001	-.5763 (214) P= .000	.2122 (214) P= .002	-.0818 (214) P= .233
AGE	.0159 (214) P= .817	.1065 (214) P= .121	.1362 (214) P= .047	.0373 (214) P= .588	.0222 (214) P= .747	-.0326 (214) P= .635
PRIMI-PAROUS	.0960 (214) P= .162	.0205 (214) P= .766	.0060 (214) P= .930	.0274 (214) P= .690	.1286 (214) P= .060	.0332 (214) P= .629
NUMBER CHILDREN	-.0885 (214) P= .197	-.0577 (214) P= .401	-.0574 (214) P= .404	-.0367 (214) P= .594	-.1115 (214) P= .104	.0176 (214) P= .798
PLANNED PREGNANCY	.1225 (214) P= .074	.1509 (214) P= .027	.1176 (214) P= .086	.1283 (214) P= .061	-.0214 (214) P= .755	.0669 (214) P= .330
FEELINGS ABOUT BABY	.2498 (214) P= .000	.2091 (214) P= .002	.0893 (214) P= .193	.2514 (214) P= .000	-.1229 (214) P= .073	-.0134 (214) P= .846
DEPRESSION HISTORY	-.1219 (214) P= .075	-.0643 (214) P= .349	-.0095 (214) P= .890	-.0952 (214) P= .165	.0586 (214) P= .393	.0236 (214) P= .731
RELATIVES LIVING WITH SUBJECT	-.1267 (214) P= .064	-.1090 (214) P= .112	-.1265 (214) P= .065	-.0511 (214) P= .457	.0020 (214) P= .977	.0353 (214) P= .608
EDUCATION	.0441 (214) P= .521	.1037 (214) P= .131	.1731 (214) P= .011	-.0041 (214) P= .952	-.0041 (214) P= .952	-.0341 (214) P= .620
ETHNIC ORIGIN	.0215 (214) P= .755	-.0691 (214) P= .314	-.0981 (214) P= .153	-.0145 (214) P= .833	.0046 (214) P= .947	.0033 (214) P= .961

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

APPENDIX L continued

Correlation Coefficients

	NETWORK SIZE TIME 1	SOCIAL SUPPORT TIME 2	NETWORK SIZE TIME 2	SOCIAL SATISFACT. TIME 2	INFANT TEMP.	INFANT RISK
RELIGION	.0087	-.0038	.0373	-.0436	-.0518	.0131
	(214)	(214)	(214)	(214)	(214)	(214)
	P= .899	P= .955	P= .587	P= .526	P= .451	P= .849
MARITAL STATUS	.0413	.0635	.0817	.0219	-.1487	-.0345
	(214)	(214)	(214)	(214)	(214)	(214)
	P= .548	P= .355	P= .234	P= .750	P= .030	P= .616
PARTNER'S FIRST MARRIAGE	-.0070	.0374	.0338	.0272	-.0555	.0485
	(214)	(214)	(214)	(214)	(214)	(214)
	P= .919	P= .586	P= .623	P= .693	P= .419	P= .480
OCCUPATION	.0407	.2158	.2979	.0538	-.0196	-.1251
	(214)	(214)	(214)	(214)	(214)	(214)
	P= .554	P= .001	P= .000	P= .434	P= .776	P= .068
INCOME	.2565	.1521	.1184	.1294	-.0062	-.0253
	(214)	(214)	(214)	(214)	(214)	(214)
	P= .000	P= .026	P= .084	P= .059	P= .928	P= .713
SOCIO-ECONOMIC STATUS	.1835	.2271	.2570	.1131	-.0159	-.0928
	(214)	(214)	(214)	(214)	(214)	(214)
	P= .007	P= .001	P= .000	P= .099	P= .817	P= .176
WORKING AFTER BIRTH	.1364	.1531	.1559	.0936	-.1174	-.0641
	(214)	(214)	(214)	(214)	(214)	(214)
	P= .046	P= .025	P= .022	P= .173	P= .087	P= .350
ANTENATAL ATTENDANCE	.0746	.0982	.1208	.0393	.0892	.0009
	(214)	(214)	(214)	(214)	(214)	(214)
	P= .277	P= .152	P= .078	P= .567	P= .194	P= .990
PARTNER'S ANTENATAL ATTENDANCE	.1746	.1845	.1603	.1403	.0813	-.1089
	(214)	(214)	(214)	(214)	(214)	(214)
	P= .010	P= .007	P= .019	P= .040	P= .236	P= .112
MARITAL ADJUSTMENT TIME 1	.5247	.3300	.1610	.3767	-.1049	.0294
	(214)	(214)	(214)	(214)	(214)	(214)
	P= .000	P= .000	P= .018	P= .000	P= .126	P= .669
MARITAL ADJUSTMENT TIME 2	.5250	.4616	.2060	.5462	-.1068	.1059
	(214)	(214)	(214)	(214)	(214)	(214)
	P= .000	P= .000	P= .002	P= .000	P= .119	P= .123

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

APPENDIX L continued

Correlation Coefficients

	NETWORK SIZE TIME 1	SOCIAL SUPPORT TIME 2	NETWORK SIZE TIME 2	SOCIAL SATISFACT. TIME 2	INFANT TEMP.	INFANT RISK
SOCIAL SUPPORT TIME 1	.8457 (214) P= .000	.7393 (214) P= .000	.6313 (214) P= .000	.5733 (214) P= .000	-.1206 (214) P= .078	.1042 (214) P= .129
NETWORK SIZE TIME 1	.4304 (214) P= .000	.6684 (214) P= .000	.7826 (214) P= .000	.3064 (214) P= .000	-.1026 (214) P= .135	.0950 (214) P= .166
SOCIAL SATISFACT. TIME 1	1.0000 (214) P= .	.5821 (214) P= .000	.2851 (214) P= .000	.6633 (214) P= .000	-.1014 (214) P= .139	.0813 (214) P= .237
SOCIAL SUPPORT TIME 2	.5821 (214) P= .000	1.0000 (214) P= .	.8147 (214) P= .000	.8147 (214) P= .000	-.1661 (214) P= .015	.0909 (214) P= .185
NETWORK SIZE TIME 2	.2851 (214) P= .000	.8147 (214) P= .000	1.0000 (214) P= .	.3275 (214) P= .000	-.1300 (214) P= .058	.0963 (214) P= .160
SOCIAL SATISFACT. TIME 2	.6633 (214) P= .000	.8147 (214) P= .000	.3275 (214) P= .000	1.0000 (214) P= .	-.1406 (214) P= .040	.0518 (214) P= .451
INFANT TEMP.	-.1014 (214) P= .139	-.1661 (214) P= .015	-.1300 (214) P= .058	-.1406 (214) P= .040	1.0000 (214) P= .	-.0468 (214) P= .496
INFANT RISK	.0813 (214) P= .237	.0909 (214) P= .185	.0963 (214) P= .160	.0518 (214) P= .451	-.0468 (214) P= .496	1.0000 (214) P= .
SEX OF BABY	.0213 (214) P= .757	-.0843 (214) P= .219	-.1004 (214) P= .143	-.0370 (214) P= .591	-.0360 (214) P= .600	.0860 (214) P= .210
BABY'S BIRTH WEIGHT	-.0141 (214) P= .838	.0966 (214) P= .159	.0892 (214) P= .194	.0682 (214) P= .321	-.0197 (214) P= .774	.0672 (214) P= .328
PREMATURE BIRTH	.0054 (214) P= .937	-.0894 (214) P= .193	-.0219 (214) P= .750	-.1238 (214) P= .071	.0071 (214) P= .917	-.0973 (214) P= .156
APGAR AT 5 MINUTES	.0401 (214) P= .559	.0743 (214) P= .279	.0417 (214) P= .544	.0795 (214) P= .247	.0933 (214) P= .174	.4214 (214) P= .000

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

APPENDIX L continued

Correlation Coefficients

	SEX OF BABY	BABY'S BIRTH WEIGHT	PREM. BIRTH	APGAR AT 5 MINUTES
BDI TIME 1	.0233 (214) P= .735	.0944 (214) P= .169	.0127 (214) P= .854	.0020 (214) P= .977
BDI TIME 2	-.0038 (214) P= .955	.0114 (214) P= .869	.0587 (214) P= .393	-.0795 (214) P= .247
AGE	-.0340 (214) P= .621	.0114 (214) P= .868	-.0627 (214) P= .361	.0713 (214) P= .299
PRIMI-PAROUS	.1933 (214) P= .005	-.1020 (214) P= .137	.1232 (214) P= .072	.0370 (214) P= .590
NUMBER OF CHILDREN	-.1667 (214) P= .015	.0924 (214) P= .178	-.0300 (214) P= .663	.0207 (214) P= .763
PLANNED PREGNANCY	.0326 (214) P= .635	.0132 (214) P= .848	-.0708 (214) P= .303	.0889 (214) P= .195
FEELINGS ABOUT BABY	.1141 (214) P= .096	.0177 (214) P= .797	-.0841 (214) P= .220	-.0325 (214) P= .636
DEPRESSION HISTORY	-.0677 (214) P= .324	.0087 (214) P= .899	-.0408 (214) P= .553	.0178 (214) P= .796
RELATIVES LIVING WITH SUBJECT	.0280 (214) P= .684	.0280 (214) P= .684	-.0395 (214) P= .566	.0079 (214) P= .908
EDUCATION	-.0599 (214) P= .383	.1324 (214) P= .053	.0468 (214) P= .496	-.0344 (214) P= .617
ETHNIC ORIGIN	.0048 (214) P= .945	.0150 (214) P= .827	-.0359 (214) P= .602	.0060 (214) P= .931

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

APPENDIX L continued

Correlation Coefficients

	SEX OF BABY	BABY'S BIRTH WEIGHT	PREM. BIRTH	APGAR AT 5 MINUTES
RELIGION	.0635 (214) P= .355	.0141 (214) P= .838	-.0164 (214) P= .812	.0024 (214) P= .972
MARITAL STATUS	.0522 (214) P= .447	.0772 (214) P= .261	.0615 (214) P= .371	-.1227 (214) P= .073
PARTNER'S FIRST MARRIAGE	-.0275 (214) P= .689	-.1391 (214) P= .042	.0268 (214) P= .696	.0312 (214) P= .650
OCCUPATION	.0392 (214) P= .569	.0196 (214) P= .775	-.0307 (214) P= .655	-.0075 (214) P= .913
INCOME	.1245 (214) P= .069	-.0090 (214) P= .896	.0583 (214) P= .396	-.0061 (214) P= .929
SOCIO-ECONOMIC STATUS	.1010 (214) P= .141	.0066 (214) P= .924	.0170 (214) P= .804	-.0084 (214) P= .903
WORKING AFTER BIRTH	.1391 (214) P= .042	-.0745 (214) P= .278	.0666 (214) P= .332	.0624 (214) P= .363
ANTENATAL ATTENDANCE	.0821 (214) P= .232	.0151 (214) P= .826	.0460 (214) P= .503	.1386 (214) P= .043
PARTNER'S ANTENATAL ATTENDANCE	.0827 (214) P= .228	-.0260 (214) P= .706	.0666 (214) P= .332	-.0050 (214) P= .941
MARITAL ADJUSTMENT TIME 1	.0141 (214) P= .838	.0198 (214) P= .773	.0231 (214) P= .737	-.0137 (214) P= .842
MARITAL ADJUSTMENT TIME 2	.0263 (214) P= .702	.0296 (214) P= .667	-.0534 (214) P= .437	.0473 (214) P= .492

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

APPENDIX L continued

Correlation Coefficients

	SEX OF BABY	BABY'S BIRTH WEIGHT	PREM. BIRTH	APGAR AT 5 MINUTES
SOCIAL SUPPORT TIME 1	-.0075 (214) P= .913	.0401 (214) P= .560	-.0170 (214) P= .805	.0329 (214) P= .632
NETWORK SIZE TIME 1	-.0339 (214) P= .621	.0818 (214) P= .233	-.0341 (214) P= .620	.0155 (214) P= .822
SOCIAL SATISFACT. TIME 1	.0213 (214) P= .757	-.0141 (214) P= .838	.0054 (214) P= .937	.0401 (214) P= .559
SOCIAL SUPPORT TIME 2	-.0843 (214) P= .219	.0966 (214) P= .159	-.0894 (214) P= .193	.0743 (214) P= .279
NETWORK SIZE TIME 2	-.1004 (214) P= .143	.0892 (214) P= .194	-.0219 (214) P= .750	.0417 (214) P= .544
SOCIAL SATISFACT. TIME 2	-.0370 (214) P= .591	.0682 (214) P= .321	-.1238 (214) P= .071	.0795 (214) P= .247
INFANT TEMP.	-.0360 (214) P= .600	-.0197 (214) P= .774	.0071 (214) P= .917	.0933 (214) P= .174
INFANT RISK	.0860 (214) P= .210	.0672 (214) P= .328	-.0973 (214) P= .156	.4214 (214) P= .000
SEX OF BABY	1.0000 (214) P= .	-.0318 (214) P= .644	-.1666 (214) P= .015	-.0817 (214) P= .234
BABY'S BIRTH WEIGHT	-.0318 (214) P= .644	1.0000 (214) P= .	-.2816 (214) P= .000	-.0732 (214) P= .286
PREMATURE BIRTH	-.1666 (214) P= .015	-.2816 (214) P= .000	1.0000 (214) P= .	-.0173 (214) P= .802
APGAR AT 5 MINUTES	-.0817 (214) P= .234	-.0732 (214) P= .286	-.0173 (214) P= .802	1.0000 (214) P= .

(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed