

***Prevalence, antecedents and perceptions of
efficacy of treatments of postnatal depression
in Australia***

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BA (Psych) Hons

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Statement of originality

The thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to the final version of my thesis being made available worldwide when deposited in the University's Digital Repository, subject to the provisions of the Copyright Act 1968.

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Relevant publications/presentations

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Abstract

While new motherhood is socially perceived to be a time of great elation and joy, this life stage is also a time of great risk for mental health problems and emotional difficulties. For women, these problems can have long-term impacts including putting them at risk for ongoing mental health problems and dissatisfaction with motherhood. This in turn may reduce infant-mother bonding which can have impacts on the infant's mental health and intelligence even into childhood. The most common form of mental health morbidity in the perinatal period is postnatal depression, affecting between 10-20% of mothers in Australia (National Health and Medical Research Council 2000).

This thesis fills a gap in the current literature by examining both the proximal and distal factors related to postnatal depression in Australia by using longitudinal data collected on a national, broadly representative, sample of women. A longitudinal, multi-methods design was employed to examine the complex associations between risk factors and to also explore the lived experience of new mothers who have experienced postnatal depression.

Prior history of mental health conditions were particularly evident as having a significant impact on risk of postnatal depression, as was long-term experience of stressful life events and lack of social support. In addition health and stressful life events in pregnancy and postpartum such as breastfeeding, emotional distress during labour and sleep deprivation had an impact on the occurrence of postnatal depression. The results indicated that understanding a woman's mental health history is very

important in the detection of those who are most vulnerable to postnatal depression.

These findings also indicate that treatment and management of depression and anxiety earlier in life may have a positive impact on the incidence of postnatal depression.

The findings of this project can direct future mental health clinical guidelines regarding postnatal depression and support the premise of early intervention for mental health problems. By preventing first incidences of mental health problems, recurrences such as those in the perinatal period should be reduced, which in turn will have a positive impact on mother-infant bonding, and on maternal health outcomes and infant outcomes.

Chapter 1. Introduction

While new motherhood is widely perceived to be a time associated with feelings of elation and joy, this life stage is also a time of great risk for mental health problems and emotional difficulties. These problems can have long-term impacts including ongoing mental health problems and dissatisfaction with motherhood. For infants, associations have been made between perinatal mental health problems in the mother and reduced infant-mother bonding, which can have impacts on mental health and intelligence, even into childhood.

The most common perinatal mental health condition is postnatal depression which is defined by DSM-IV and ICD-10 diagnostic criteria where the symptoms presented match the criteria for major or minor depressive disorder and where they occur within either six (ICD-10) or four (DSM-IV) weeks of childbirth. Typically the symptoms experienced are low energy, irritability, difficulty concentrating and feelings of guilt (Najman, Andersen et al. 2000, National Health and Medical Research Council 2000).

The most recently reported birth rate in Australia is 63.6 per 1000 women of childbearing age, a slightly lower rate than the peak in 2007 (Australian Institute of Health and Welfare, Li et al. 2012). The estimated rate of postnatal depression in this population is between 10-20% (National Health and Medical Research Council 2000), indicating the large scope of the problem.

This thesis explores both the proximal and distal factors related to postnatal depression in Australia in order to better understand those women who are at greater risk for

experiencing postnatal depression. A longitudinal, multi-methods design was employed to examine the complex associations between risk factors for postnatal depression and to explore the lived experience of new mothers who have experienced postnatal depression.

1.1 Contextualising the research question

Numerous studies have examined the risk factors for postnatal depression but there has been very little consensus on a clear set of determinants. Those studies that have examined risk factors for postnatal depression have focused on those events and experiences closely tied to pregnancy and postpartum, with little consideration of the long-term predictors of postnatal depression. Further, those studies that have examined long-term risk factors have most commonly used retrospective data collection in order to measure risk, which is likely to be confounded by recall bias. This project aimed to minimise the deficits of previous research by utilising data collected longitudinally over a sixteen year period.

1.1.1 Perinatal Mental Health Policy in Australia

The definition of ‘perinatal period’ that is commonly adopted in Australian research (eg *beyondblue* Clinical Practice Guidelines) is pregnancy, birth and the first postnatal year. (Austin, Highet et al. 2011). The perinatal period is a time of significant change for women and their families and represents a time of great risk for poor mental health.

Perinatal mental health has been recognised by policy-makers, practitioners and consumer groups as a critical health issue (Wisner, Chambers et al. 2006). Detection,

diagnosis and treatment of perinatal mental health problems are widely debated topics. What is agreed upon is the need for suitable universal screening for problems, with adequate support and treatment options available for women who are in most need and at greatest risk.

During the course of preparing this thesis, the perinatal mental health policy landscape in Australia has changed significantly. In 2008, the *beyondblue* National Action Plan for Perinatal Mental Health (*beyondblue: the national depression initiative and Perinatal Mental Health Consortium* 2008) was released. This resulted in the establishment of the National Perinatal Depression Initiative by Federal and State governments. The \$85 million budget was for the establishment of a universal perinatal psychosocial assessment program (at the State level) for training of staff to undertake the assessments and to develop structures to ensure that suitable treatment services were available to women. A further recommendation of the National Perinatal Depression Initiative was the development of Clinical Practice guidelines. The *beyondblue* Clinical Practice Guidelines for Depression and Related Disorders in the Perinatal Period were released in 2011 and endorsed by National Health and Medical Research Council (Austin, Highet et al. 2011) . The guidelines recommend the use of the Edinburgh Postnatal Depression Scale (EPDS) (Cox, Holden et al. 1987) to detect current mood problems and also recommended that key psychosocial issues are evaluated by health professionals both in pregnancy and postnatally. Psychosocial issues recommended for evaluation were; past or family history of mental health disorder, history of abuse,

emotional and practical support, relationship with mother, drugs and alcohol and major stressors (Austin, Highet et al. 2011).

As the national guidelines recommended the screening of women by not only mental health practitioners, but also by those in primary care settings (eg midwives, GPs and obstetricians), it is critical that screening protocols are simple to follow, systematic and are inclusive of clear referral pathways. It is imperative that the tools employed can be administered within a clinical setting as expediently as possible while still being thorough. Coupled with this is the need to adequately identify those at greatest risk, to ensure that interventions and treatment options are strategically allocated. The use of psychosocial risk screening is particularly important as current mood can potentially be masked by what could be considered as ‘normal’ problems in early motherhood, such as sleep disturbance and changes in appetite (Marcus 2009). The current project fills this gap by enriching the understanding of risk for postnatal depression so that services and interventions can be more adequately targeted.

1.2 Multi-Methods Design

The current project employed a multi-methods design in order to take advantage of the inherent strengths of longitudinal quantitative data, combined with the rich insights provided by qualitative data. The research question itself suits a multi-method approach as population data is available to inform policy and individual data is suitable to inform practice (eg treatment, intervention and screening).

In broad terms, multi-methods studies collect both qualitative and quantitative data in one study – this can be concurrent or sequential and data is integrated at one or more stages (Creswell, Plano Clark et al. 2003). This type of design allows the researcher to explore qualitative insights into the lived experiences of postnatal depression as well as the experiences of predictors of postnatal depression, while also utilising a large longitudinal dataset. Multi-methods research also allows for both components to weigh equally at the point of interpretation and discussion of results (Flick 2003).

In order to integrate qualitative and quantitative results, a theoretical framework was selected to thematically organise results. The Brown and Harris (1978) psychosocial model of depression is described in more detail in Section 2.4. By utilising an appropriate theoretical framework, the multi-methods results can be evaluated and incorporated into an updated framework.

1.3 Research Design

This project utilises data collected via the Australian Longitudinal Study on Women's Health (ALSWH). ALSWH was designed in 1995 to track the health and wellbeing of women in Australia at a population level utilising a longitudinal research design, and self-report postal surveys. ALSWH provides both qualitative and quantitative data, as well as an opportunity to access participants for additional projects (eg in-depth interviews), and is therefore ideally suited to explore postnatal depression with a life-course perspective. Further details on ALSWH can be found in Section 3.1.

1.4 Thesis outline

Following this introduction, **Chapter 2** reviews key previous literature to date on the predictors and antecedents of postnatal depression. The predictors and antecedents of postnatal depression have been conceptually divided across the life course – pre-pregnancy, pregnancy, childbirth and postnatal period, as well as a section on the cross-cutting predictors (ie those that may appear at any time over the life course) of postnatal depression. Also contained in this section is a detailed examination of the Brown and Harris Psychosocial Model of Depression (1978) which is the theoretical underpinning of the thesis.

Chapter 3 details the research methods used throughout the thesis. An introduction to the Australian Longitudinal Study on Women's Health orientates the reader to the nature of the participant sample, as well as the strengths and limitations of the dataset. Each of the methods employed for the four main studies is then detailed in this chapter, including an explanation of the sample composition for each study.

The results of the four studies are contained in the following chapters. **Chapter 4** examines the relationship between postnatal depression and a number of key factors identified in previous literature; social support, previous mental health, stressful life events and demographic factors. This study employed a quantitative research design to examine these factors.

Chapter 5 contains a qualitative component, where the free-text comments from the ALSWH, collected over five surveys for all women who ever reported being diagnosed

or treated for postnatal depression, were examined. Any predictive events or factors were identified and examined.

The results of a detailed quantitative longitudinal analysis are reported in **Chapter 6**. Longitudinal data was utilised in order to examine both long and short term predictors of postnatal depression. In this multivariate analysis, the inter-correlation of family units was taken into account, so that the events of previous pregnancies and births were accounted for in the history of subsequent births. This powerful statistical technique provided a rich dataset of both long and term risk factors for women over multiple births.

The results of in-depth qualitative interviews are reported in **Chapter 7**. The interviews explored predictors of postnatal depression over the life course, as well as previous experiences of depression and other mental health problems. The experience of screening and diagnosis, as well as treatment efficacy, was also explored.

A detailed discussion of the empirical results is contained in **Chapter 8**. A summary of each of the thematic areas explored throughout the thesis is included as well as implications of the results for policy and practice. Considerations for future research are also discussed.

The findings of the literature review identified the major risk factors for postnatal depression to be examined in Study 1. Once an understanding of the major risk factors had been established, Study 2 aimed to explore the types of prior experiences described

by women who had experienced postnatal depression. These prior experiences were considered in the light of the literature and the results of Study 1. Study 3 was developed to incorporate the major factors identified in Study 1, and any additional factors identified in the literature review or in the results of Study 2. At this time, when a holistic understanding of the risk factors for postnatal depression had been developed from the literature review and Studies 1-3, the interview protocol for Study 4 was developed and interviews conducted. This approach ensured that those risk factors already known could be explored in depth in the interviews while also allowing new concepts to emerge.

Chapter 2. Critical review of the prevalence, antecedents and efficacy of treatments of postnatal depression in Australia

The following critical review has focused on several key areas of postnatal depression research. The first area is the diagnosis of postnatal depression and the current estimations of the severity of the problem. The next area describes the theoretical underpinnings of the current thesis – the psychosocial model of depression. This model has already been applied to postnatal depression, however there is ample scope to test and integrate additional factors into the model or confirm the model as it stands. The remainder of the critical review describes the key additional factors that will be tested in the model and contextualises the proposed project within the current literature.

2.1 Literature Search Strategy

A comprehensive literature search was conducted in February – August 2007. Searched databases were Scopus, Web of Science, PubMed and PsychInfo. Search criteria included keywords such as ‘postnatal depression’ and ‘postpartum depression’, and all animal studies were excluded. Only those papers published in the 10 years prior were included in the original search. An additional search was conducted in Scopus and Web of Science using the same search criteria without the limit on publication years and then references were sorted by number of citations. Those references with greater than 20 citations in other publications were also retrieved to ensure that seminal, highly referenced papers were incorporated into the literature review. These searches were annually updated for only those publications in the previous year in January 2008 to

2013. Retrieved references were stored in Endnote (Thomson Reuters 2010) and electronic copies of papers linked to each reference. Additional references were added as they were found opportunistically throughout the project.

2.2 Definition and diagnosis of postnatal depression

Depression is predicted to be the second greatest burden of disease by 2020 (Murray and Lopez 1996). Depression is the most commonly treated mental illness in Australia, and is more common among women across all ages. In particular, high rates of depression are experienced in women aged 18-24, with up to one in ten women suffering from an episode of depression in the past twelve months, and commonly with a more chronic course when compared to men (Andrews, Hall et al. 1999, Essau, Lewinsohn et al. 2010). Women of this age may experience many new and unique life events, with the birth of a child being one of the most life-changing (Evans, Heron et al. 2001, Boyce 2003). The ability to cope with life transitions is an important determinant in the development of depression at any life stage (Brown and Harris 1978), but it is particularly important at a time such as the birth of a child, which is associated with many physical, mental, social, and financial changes (Fetling 2002, Brockington 2004, Redshaw and Martin 2011). These changes in lifestyle, along with several other risk factors such as obstetric complications, a history of depression and anxiety and adverse life events, contribute toward susceptibility to postnatal depression within the first twelve months after childbirth.

Depressive episodes are the most common form of morbidity in the period after childbirth (Dennis and Chung-Lee 2006). There are three main depressive mood

disorders associated with pregnancy – baby blues, puerperal psychosis and postnatal depression (World Health Organization 1992, American Psychiatric Association 1994). The baby blues or maternity blues are terms used to describe the ‘teary’ episodes that occur between three and ten days after birth for around 80% of women (Brockington 1996). This is a mild and transient form of depression that begins and ends within the first two weeks after childbirth (Glangaud-Freudenthal and Boyce 2003). Puerperal psychosis is a far more severe, but less common disorder, affecting 0.2% of all mothers (National Health and Medical Research Council 2000). Puerperal psychosis typically presents in the same way as bipolar depressive episodes and has an onset usually within six weeks of the birth (Kendell, Chalmers et al. 1987, Gregoire 1995). While it is the least common of the postnatal mood disorders, puerperal psychosis is potentially the most harmful to both mother and baby, with an increased risk of suicide and infanticide (National Health and Medical Research Council 2000). DSM-IV and ICD-10 diagnostic criteria identify postnatal depression where the symptoms presented match the criteria for major or minor depressive disorder and where they occur within either six (ICD-10) or four (DSM-IV) weeks of childbirth. The symptoms must have continued for at least two weeks, in contrast to the baby blues which begins and ends within two weeks. Typically the symptoms experienced are low energy, irritability, difficulty concentrating and feelings of guilt (Najman, Andersen et al. 2000, National Health and Medical Research Council 2000).

The reported prevalence of postnatal depression varies depending on the manner of data collection, but estimates put the percentage of mothers who are affected by postnatal

depression at between 10-20% in Australia (National Health and Medical Research Council 2000). In a recent national survey of postpartum women, the Edinburgh Postnatal Depression Scale (EPDS) was administered, and a cut-off score of 12 was used to indicate current depression. The authors reported that 7.5% of women had a score over 12 at 6-8 weeks postpartum, indicating a lower than previous reported prevalence of postnatal depression (Buist, Austin et al. 2008). However, this lower prevalence may have been due to the restricted time frame, as many more cases may have been detected beyond eight weeks postpartum.

The consequences of postnatal depression to the mother include decreased quality of life (Da Costa, Dritsa et al. 2006), relationship breakdown, increased risk of suicidal ideation and self harm (Evans, Heron et al. 2001). Postnatal depression has adverse effects on both the mother and her children. Murray (1999) found in a five year follow-up observational study of over 600 families that children of mothers who suffered postnatal depression were more likely to experience behavioural problems at age five, such as poor behaviour at home and problems associated with social play. Forman, O'Hara et al (2007) found in their longitudinal controlled trial of treatment for postnatal depression that mother-infant bond was still compromised in the treatment group that only received intervention for depressive symptoms, and highlighted the need for parenting interventions to be incorporated into treatment protocols. Surkan, Ettinger et al (2012) found in their analysis of longitudinal birth cohort data in the US that maternal depressive symptoms in the postpartum period were associated with low infant height-for-age at ages 4 and 5.

There has been considerable debate in the literature as to the need for a stand-alone diagnosis of postnatal depression as opposed to an episode of major depressive disorder (Brockington 1996, 2003). Current evidence suggests that postnatal depression is a form of major depressive disorder and that this phase of life for women brings with it more risk factors for depression than at other times (Boyce 2003, Brockington 2004, Wisner, Moses-Kolko et al. 2010). Possible biological bases for postnatal depression, including hormonal causes, are the subject of current investigations, although no clear biological basis has been identified (Bloch, Schmidt et al. 2000, Huang and Mathers 2001). At the same time, some psychosocial risks for postnatal depression have been identified. Boyce (2003) uses the psychosocial model of depression as proposed by Brown and Harris (1978) to support the risks associated with childbirth and early motherhood in developing postnatal depression. In this way Boyce was able to demonstrate that, in keeping with DSM-IV and ICD-10 diagnostic guidelines, postnatal depression is a form of major depressive disorder preceded by a range of different risk factors that occur with pregnancy, childbirth and the early stages of motherhood. This model is described in Section 2.4.

2.3 Context and rationale

There have been several important Australian research projects that have contributed to shaping the direction of postnatal depression research. Firstly, the NHMRC was commissioned by the Department of Health and Aged Care in 1997 to complete a review of current literature in order to prepare documentation on best practice management for postnatal depression. This report focused on the adequate measurement

and treatment of postnatal depression in a community setting. The *beyondblue* National Postnatal depression Program was established in 2001 and completed in 2005. The aim of the project was to measure the prevalence of postnatal depression in Australia and to establish the Edinburgh Postnatal Depression Scale (EPDS) as a routine screening tool (Buist and Bilszta 2006). In an earlier summary of the *beyondblue* initiative, Buist et al (2002) found that adequate screening for postnatal depression symptoms was necessary to facilitate early intervention. In turn, long-term problems such as low self-esteem and problems with close relationships can be alleviated. The full report of the Perinatal Mental Health Action Plan (*beyondblue*: the national depression initiative and Perinatal Mental Health Consortium 2008) was released in 2008, for implementation over a three year period across all Australian states and territories. The plan had three broad components; the screening for postnatal depression and the expert detection of known risk factors, improved workforce training in assessment and early intervention and improved networks for care in a local setting.

It is clear from the national initiatives described above, along with numerous state-based initiatives, that postnatal depression is high on the social policy agenda. There is a need to fill in the current gaps in knowledge and to develop a clear model of the antecedents of postnatal depression for women in Australia. Furthermore, better understanding is required as to the efficacy of treatment for postnatal depression, especially taking into consideration the health services accessed. Longitudinal data analysis, using a national data source; the Australian Longitudinal Study on Women's Health (ALSWH), was used to create a clear picture of the pathway prior to development, suffering and

recovery of postnatal depression. In particular, the detection of risk factors is relevant to the current direction of Australian health policy and analysis of ALSWH data will add to the existing knowledge of the predictors and antecedents of postnatal depression.

2.4 Theories of predictors of postnatal depression

Beck (2002) reviewed a series of theories that have been applied to postnatal depression and considered the treatment outcomes of each perspective. They were the medical model, feminist theory, attachment theory, interpersonal theory, and self-labelling theory.

The medical model considered postnatal depression to be an illness, and therefore establishes it as a pathological condition and does not consider the influence of social or environmental situations. As biological factors are considered primary in the development of the illness, the treatment approach in this model is primarily psychopharmacogenics. In Nicolson's (1990) review of theoretical perspectives of postnatal depression she concluded that while the medical model acknowledged the contribution of some pre-disposing factors in the development of postnatal depression, such as a history of mental health problems, much of the emphasis was on a hormonal basis for postnatal depression. This approach therefore disregards the influences of external factors such as social support and perceptions of motherhood from society and from the mother herself.

Feminist theory is in direct opposition to the medical model, and suggests that postnatal depression is a result of the social and cultural context placed on motherhood.

Treatment under this theory is therefore focused on empowering the individual to develop a new perspective after debriefing about their childbearing experience. In particular, feminist theory can be seen to be the basis for peer group counselling as treatment for postnatal depression (Abrams and Curran 2007). While in contrast to the medical model, the feminist model also excludes several potential causes of postnatal depression such as prior mental health. Like the medical model, this approach neglects other important aspects that may influence risk of postnatal depression, and therefore inadequately reflects the full extent of the risk factors for postnatal depression that have been reported in previous literature.

Bowlby (1969) originally described attachment theory in terms of the relationship between mother and infant, however this concept has since been extended to focus on adult behaviours. In terms of postnatal depression, attachment theory focuses on a lack of social support provided by the mother's partner (Whiffen and Johnson 1998). Ainsworth et al (1978) determined three styles of attachment – secure, avoidant and ambivalent attachment. Bowlby determined that avoidant attachment, such as fearful and dismissing attachment was problematic in adult relationships. For example, fearful-avoidant adults would have a desire to be close to their partner but in turn would be fearful of rejection by them. Those that were dismissing-avoidant would not seek closeness with their partner. In terms of development and course of postnatal depression, a relationship with a partner where either partner were avoidant would result in a decrease in relationship satisfaction and an increase in depressive symptoms. In turn, attachment principles can be utilised in therapy by focusing on strengthening this

relationship by using therapy such as Emotionally Focused Marital Therapy. While particularly useful for therapy, attachment theory does not acknowledge other origins of stressors, or risk factors for postnatal depression outside of the relationship between mother and partner and mother and infant. This approach neglects to include those factors that were found to be significant in both the medical model and the feminist model.

Interpersonal theory has also been suggested as a theoretical underpinning to explain postnatal depression. Originally proposed by Sullivan (1953), people are seen as social beings and are influenced by social experiences. These concepts are similar to those described in feminist theory, where society was an influence on both the origin and treatment for postnatal depression, however interpersonal theory suggest that it is the experiences rather than conventions and contexts that are important as in the feminist approach. Interpersonal theory also borrows in part from attachment theory, where relationships are seen to be important in formation and treatment for postnatal depression. A treatment approach based on both Sullivans' work and Bowlby's Attachment Theory (Bowlby 1969) called Interpersonal Psychotherapy (IPT) has been developed in order to address deficits in interpersonal relationships. The therapy is used to modify relationships and expectations about relationships in the mother's life and in turn alleviate the origins of depressive symptoms. Like attachment theory, this approach neglects to acknowledge the contribution made by prior life experiences, history of mental health problems, and other individual factors that have been identified in previous literature in relation to risk of postnatal depression.

Self-labelling theory suggests that mental illness is emotional deviance, where emotional norms are broken (Thoits 1985). This theory explains short term episodes of mental illness, and strives to alter them with behavioural or cognitive techniques. Self-labelling processes are based on societal norms but are practiced at the individual level. This means that if norms are violated, the individual must be personally motivated to change. In terms of an episode of postnatal depression, self-labelling theory determines that the episode is transient, and is the result of a mother's expectations of motherhood being incongruent with her actual experience. Like feminist theory, treatment can be in the form of peer group therapy in order to allow women to re-adjust their own expectations of motherhood and the meaning they have placed on themselves. While this theoretical approach is valid, like the other approaches, a limited range of risk factors for postnatal depression have been identified, and are not reflective of current literature on the topic.

In Beck's review of these theoretical perspectives, she suggests that the theoretical lens employed by the clinician can have important implications on the treatment outcomes suggested for mothers who are experiencing postnatal depression. She further suggests that multiple treatment approaches may be most effective. Indeed, each of the five major theories suggested in this review focus on a uni-dimensional aspect of depression, whether it is based on pathology (medical model), social context (feminist model, attachment model, interpersonal model), or the individual's own schema (self-labelling theory). By extension, a multi-dimensional theory of the origins of depression is also necessary in order to explore the multi-faceted origins of postnatal depression.

2.5 Psychosocial Model of Depression

In order to theoretically test a more holistic range of predictors of postnatal depression, the Psychosocial Model of Depression was suggested. Brown and Harris (1978) proposed the Psychosocial Model of Depression after studying predictors of depression in London women in the 1970's.

Brown and Harris developed their theoretical model under the premise that depression is an “understandable response to adversity” (p 46). This stance was the basis of the development of series of hypotheses that they developed. To begin, they considered life events that could typically lead to depression such as unemployment of their husband. They then extended this premise by considering if certain past and present social factors could also leave a person vulnerable to depression. Figure 1 shows the three key features of their model – *vulnerability factors* which are defined as “life circumstances”, *provoking agents* such as life events, and *symptom-formation factors* which do not influence the risk, but determine the severity of depression.

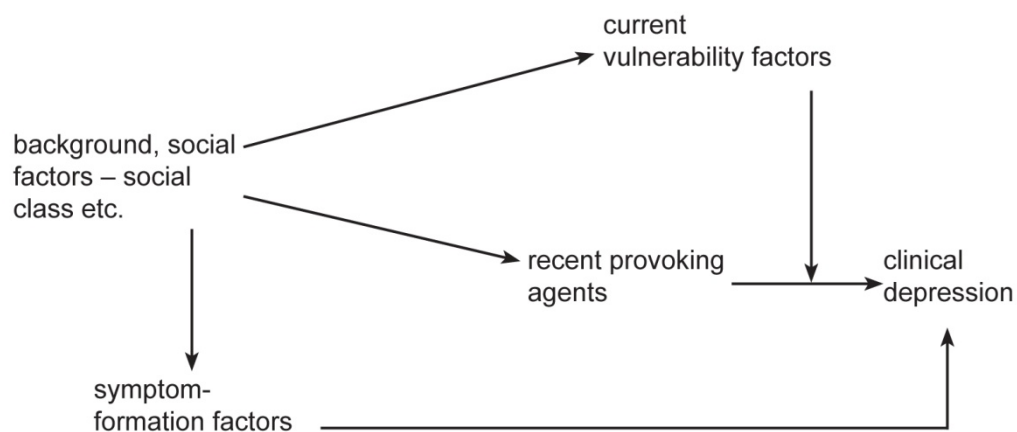


Figure 1 Brown and Harris' (1978) causal model of depression

Brown and Harris' schematic outline of their model in Figure 1 shows the proposed causal relationship between key features. Four key vulnerability factors emerged from their analysis; having three or more children at home, having no outside employment, having low intimacy with their husband, and losing their mother before age 11. These factors alone did not determine the presence or absence of depression, but when combined with recent provoking agents such as life events and difficulties, including problems with living arrangements, problems with health and loss of a loved one, depression was more likely. Key symptom-formation factors included age and history of depression, which determined the severity of symptoms.

Provoking agents or stressful life events were common with the sample studied by Brown and Harris, with almost half of the group reporting a recent life-event. They categorised the life events reported in their sample into eight categories; changes in roles, changes in roles of a close relative, major changes in health, major changes in health of a relative, residence changes, forecasts of change, goal fulfilments or disappointments and other dramatic events. Such events were determined to have a medium or long term impact on an individual and therefore capable of having a causal role in the development of depression.

Vulnerability factors, such as lack of social support and those specific factors described above were significantly associated with depression in the sample. However, for those women who did not experience a provoking agent, vulnerability factors were not significantly related to depression.

Symptom-formation factors that determined the severity of depression included age, history of depression and major loss in the past. In particular, the authors report that a history of depression, particularly with psychotic symptoms, greatly increases the severity of a recurrence of depression. Age was also found to have an interaction with severity and a history of depression, with distinctions made between patterns of severity for early versus late onset of depression.

The Brown and Harris model has been generalised across an entire life course of women's health, although they note that family formation and childbirth are key events and that women are particularly vulnerable at that time in their lives.

When comparing the theory suggested by Brown and Harris to other theories of origins of depression (such as the medical model, feminist theory, attachment theory, interpersonal theory and self-labelling theory), a number of strengths are apparent. In terms of medical origins of depression, the Brown and Harris model acknowledges that a history of mental health problems is a major determinant in the development of depression. Like the medical model, provoking agents in the Brown and Harris model included recent changes in health. However, the medical model does not acknowledge other provoking agents as are included in the Brown and Harris concept. The medical model also neglects to acknowledge the impact of background factors on the development of recent health, and how this may in turn exacerbate depressive symptoms.

The Brown and Harris model also incorporates social factors and the role of societal influences on development of depression. Feminist theory, attachment theory and interpersonal theory all primarily base the origin of postnatal depression in social factors, both in development and treatment of the condition. In addition however, the Brown and Harris model also acknowledges the role of lack of social support in magnifying the severity of depression. While social support is in part acknowledged in attachment theory, where the focus of therapy is on improving the mother's relationship with her partner, the Brown and Harris model defines social support more broadly. The Brown and Harris model not only incorporates peer group in to the definition of social support, like the feminist approach and interpersonal therapy, but also strives to understand the impacts of these close relationships on the development of postnatal depression for those women who also experienced a provoking agent.

Unlike self-labelling theory, little attention is given to interpersonal schemas in the Brown and Harris model. Personality factors have not been incorporated into this theory, and therefore can be seen as a limitation. However, while self-labelling theory posits that mental health is a transient deficit, the Brown and Harris model acknowledges that mental health problems are pervasive and not transient, with history of mental health problems being the most significant risk factor for later depression.

The Brown and Harris model incorporates many of the alternate popular theoretical frameworks for the origins of postnatal depression with the expectation of including personality factors. While this limitation must be acknowledged, the holistic nature of the model outweighs this omission, as the model not only includes medical and social

origins, but also considers how these factors impact on risk and severity of depression. Further, as Beck suggested, the use of such an all-encompassing theory encourages a multi-dimensional approach to treatment (Beck 2002). The Brown and Harris model has therefore been selected as the framework for the following project, and the applicability to postnatal depression in an Australian setting will be discussed in detail.

2.5.1 Applying the psychosocial model of depression to the postnatal phase

The Brown and Harris psychosocial model has been applied to postnatal depression (Boyce 2003, Boyce and Hickey 2005). Boyce asserted that childbirth can be considered a provoking agent (as a significant life event) and can trigger postnatal depression in vulnerable women. Boyce applied the theory in his Australian study of over 400 mothers recruited through a maternity hospital in western Sydney on discharge after giving birth. In his application of the model, Boyce examined a range of vulnerability factors such as; socio-demographics, life events, social environment factors, psychopathology and obstetric factors. He found significant results for three vulnerability factors; life events, social environment, and psychopathology. However, Boyce did not modify the Brown and Harris model after applying it to his sample, therefore the model has not yet been empirically evaluated for applicability in the postnatal period. The current project will fill this gap by not only using the model as the theoretical underpinning of the project, but also by evaluating the model for utility in this setting.

2.5.2 Limitations of the psychosocial model of depression

While Brown and Harris' psychosocial model of depression is a useful tool in understanding the precursors and triggers of depression, Boyce has shown that there are particular vulnerability factors relevant to the postnatal period that should be further examined. Boyce has shown that Brown's model can be applied to postnatal depression by using childbirth as a key provoking agent; however the authors did not evaluate the model for use during this period. The current project proposes to expand the range of predictors, including vulnerability factors and provoking agents and to test a modified model.

A further limitation to the existing theories is the data collection methods utilised. As Brown and Harris used cross-sectional data collected in a region of London these data are susceptible to being geographically biased, and furthermore are not able to demonstrate a causal or temporal pathway to depression. By contrast, Boyce employed a longitudinal research design, although baseline measures were only taken from 2 days postpartum. As Boyce's study recruited participants in the postpartum period, the potential exists for participants to make causal attributions about the antecedents of their mood, also resulting in recall biases. The proposed study will use data collected over a 13 year period in a nationally representative health survey, which will allow for long term predictors to be assessed. It is proposed in the current project to not only examine additional vulnerability factors, particularly relevant to postnatal depression, but to also expand and develop Brown and Harris' psychosocial model of depression.

Brown and Harris specified the experience of particular life events as recent provoking agents, however there is growing evidence that the accumulation of events, not the type of life events, is the important predictor (Boyce and Hickey 2005). The proposed study includes a wider range of life events than those tested by Brown and Harris and Boyce, and in addition, can also test for the effect of cumulative life events by using longitudinal data collected on a cohort of women.

A further improvement in the application of Brown's model is to apply the model to more situations than previous applied to by Boyce. The application of life events is just one suitable situation, however other vulnerability factors and provoking agents such as demographics, health behaviours and social support are suitable for the model and are worthy of further investigation.

The remainder of this section describes the various vulnerability factors and provoking agents that will be studied in the proposed project. These factors have been divided into several sections. The first themes are cross-cutting and changeable across the life course such as; demographics, health behaviours, previous life events and social support. The other themes are divided into life stages; pre-pregnancy, pregnancy, childbirth and the postnatal period. A final section discusses the efficacy of treatment in the postpartum period.

2.6 Predictors of postnatal depression

Several predictors of postnatal depression have been identified within the literature.

Both psychosocial risk factors and childbirth experiences have been found to precede the onset of postnatal depression.

2.6.1 Psychosocial and demographic predictors of postnatal depression

2.6.1.1 Demographics

Several socio-demographic risk factors have been investigated within previous literature such as; living without a partner, coming from a non-English speaking background (NESB), living in rural/regional area and financial status. Findings for socioeconomic status (SES) were unclear. While Leigh and Milgrom's (2008) Australian study of 367 women recruited to take part in a survey from two hospitals found that low income was associated with an increased risk of postnatal depression, Johnstone et al (2001) found no such association in their study of 504 women also recruited in a hospital setting.

Null findings have also been reported in a longitudinal South Korean study where 239 women were recruited in pregnancy and followed up in postpartum (Kim, Hur et al. 2008). In a US study, Zlotnick et al (2006) emphasised the link between socioeconomic status and postnatal depression, finding in their randomised controlled trial of an intervention for health service that low SES was a barrier to appropriate postpartum health care and therefore related to postnatal depression.

Abbott and Williams (2006) compared the risk factors relative to ethnicity in a New Zealand sample of Pacific Island mothers and found that apart from ethnicity, income

stress was predictive of postpartum mood. However, the results of study of 1376 mothers at six weeks postpartum may not be generalised to the wider population as the sample was restricted to only mothers of Pacific Island children. Rich-Edwards, Kleinman et al (2006) also found that income stress was more predictive than ethnicity in their USA cohort study of 1662 women. Segre, O'Hara, Arndt and Stuart (2007) also reported that poverty was a significant factor in their examination of 4332 mothers who gave birth in Iowa, USA. In an Australian study, Buist et al (2008) found that income was a significant predictor for postnatal depression, especially in relation to health insurance, as low income was a barrier to private health insurance, an issue that will be explored further in the current study.

Several Australian studies have investigated the link between relationship status and postnatal depression. Brown et al (1994) found that women who lived without a partner were more likely to develop postnatal depression, however Eastwood, Phung and Barnett (2011) found no such association. Boyce (2003) reported that it was the strength of close relationships that was important in the risk for postnatal depression. The strength of relationships may also be an indication of social support, which is an important factor in preventing the development of postnatal depression and will be discussed later in Section 2.5.1.4. The association between relationship status and postnatal depression warrants further investigation because past research has not found established a consensus on whether relationship quality and stability is a mediating factor or if the presence or absence of a partner is the determining factor (Brown,

Lumley et al. 1994, National Health and Medical Research Council 2000, Boyce 2003, Brockington 2004, Akincigil, Munch et al. 2010).

2.6.1.2 Health behaviours

In a US study, LaCoursiere, Baksh et al (2006) investigated the relationship between maternal body mass index (BMI) and postnatal depression and found that obese women were more than two times as likely as healthy weight women to experience depressive symptoms in their analysis of data from the Pregnancy Risk Assessment Monitoring System (PRAMS) study. These findings were again replicated by LaCoursiere et al (2010) using the EPDS as the measure of mood. In contrast, Krause, Ostbye and Swamy (2009) found in their cross-sectional analysis of 491 mothers at six weeks postpartum that there was no independent association between postnatal depression and overweight. These contradictory results may have been due to the measurement of depression, where depressive symptoms were measured LaCoursiere's 2006 study, and where a score on the EPDS of 12 or higher was used in the LaCoursiere 2010 study and where a score of 13 or higher was used in the Krause et al study. Therefore the relationship between body weight and postnatal depression is worthy of further exploration.

Boury, Larkin et al (2004) investigated smoking in overweight mothers. They found that in their sample smoking was significantly related to depressive mood in pregnancy. They also examined physical activity and found no significant effect. Dagher and Shenassa (2012) also found in their longitudinal follow-up of 526 women in a north-eastern US city that prenatal smoking was related to depressive symptomatology in postpartum.

Homish, Cornelius, Richardson and Day (2004) similarly found that binge drinking during pregnancy was related to postpartum depressive symptomatology at eight months postpartum. Wilton, Moberg and Fleming (2009) reported in analysis of randomised clinical data that women who were binge drinking in the postpartum period were more likely to also experience depression in the postpartum. In contrast, Davey, Tough, Adair and Benzies (Davey, Tough et al. 2011) found that there was no association between drinking in pregnancy and postpartum depressive symptoms. The authors also reported no association between illicit drug use during pregnancy and postpartum depressive symptoms. Le Strat, Dubertret and Le Foll (2011) however, reported that there was a relationship between postpartum illicit drug use and postpartum depressive symptoms, indicating that further investigation into this relationship is warranted.

While pregnancy health behaviours have been examined, little is known about the long-term associations between health behaviours and postnatal depression, and whether those women who have taken part in poor health behaviours at any time prior to having children are more likely to experience postnatal depression. Therefore a longitudinal perspective on health behaviours will be incorporated in to the current project in order to examine this association in more detail.

2.6.1.3 Life events, social experience

Earlier life experiences that women encounter could be considered as risk factors for postnatal depression. Experiences such as poor parenting, child abuse and domestic violence have been highlighted as potential risk factors for postnatal depression (Boyce

2003). In Boyce's Australian study, participants were asked whether they had experienced a number of life events since conceiving. This limits the scope of experiences to a short time frame and does not take into account experiences prior to conceiving. In their later study, Boyce and Hickey (2005) investigated a diverse range of predictors for postnatal depression and found that experiencing one or more major life events prior to pregnancy was significantly related to postnatal depression. O'Hara and Gorman (2004) also found that the experience of stressful life events was related to postnatal depression in their US study, however they did not specify a temporal relationship.

In a US study, Certain, Mueller et al (2008) found that domestic violence in the year before the postpartum phase was significantly related to postnatal depression. Results are difficult to generalise due to a small sample size, and limited details about the recency of abuse, however findings indicate there may be a relationship between domestic abuse and postnatal depression. Similar results were found in a Canadian study by Dennis, Heaman et al (2012) for experiences of recent stressful life events and recent experiences of domestic abuse. However, the authors used a narrow definition of life events using a list modified from the Newton and Hunt scale (Newton and Hunt 1984) of only 13 different events.

In their review paper, Swendsen and Mazure (2000) noted the contradictory evidence supporting the relationship between life events at the time of pregnancy and postnatal depression. They found that although several studies have found no relationship, most papers have found a significant relationship, especially for life events around the time of

pregnancy. The authors also recommend that multivariate models be used in future examinations of the risk factors of postnatal depression due to the large number of factors that have been reported to contribute to risk of postnatal depression.

Not only do prior life experiences have an impact on the development of postnatal depression, but also the events surrounding pregnancy and childbirth birth such as changes to employment and finances and lifestyle (Cox 1988). This lends further strength to the work of Boyce (2003) in developing a psychosocial model of postnatal depression by examining both long and short term risk factors and understanding how these events might be interrelated.

No studies were found that examined the relationship between life events measured over the life course and postnatal depression. The current project will measure life events and social experience for up to ten years prior to the birth of the first child, thus extending past research and illustrating the long term effect of life events on younger women.

2.6.1.4 Social support

Social support has emerged from the literature as a significant predictor of postnatal depression. The change in support over time is also an important factor worthy of investigation. In their US analysis, Collins, Dunkelschetter et al (1993) examined prenatal social support and found a weak positive relationship, although participants were asked to retrospectively rate their current social support and therefore recall biases were possible. They also found that high quality antenatal social support was protective against postnatal depression. Surprisingly, in Haslam, Pakenham et al's (2006)

Australian study, partner support was not related to postpartum mood, however parental support was significantly related. These results may be due to the fact that only primiparous women were included in the sample, and that the postnatal follow-up was at four weeks, where social support may be unusual while the infant is very young.

Kanotra, D'Angelo et al (2007) conducted a qualitative follow up of US mothers enrolled in the PRAMS study and found that changes in social contact emerged as a critical factor in the changes in mood in the postpartum in order to help them adjust to the life changes associated with motherhood. Indeed, Dennis, Janssen et al (2004) noted that in their Canadian study, analysis of free text responses to a survey indicated that change in social support experienced by new mothers was an important issue. They found that women were not prepared for the changes to their routine, and often reported feeling isolated, however they did not examine the relationship between isolation and postnatal depression. The relationship between such feelings of isolation and the changes in existing peer relationships is worthy of further investigation as a potential predictor of postnatal depression.

In a recent study of women who have birth at a hospital in Norwegian hospital in an 18 month period, Haga, Ulleberg et al (2012) found that social support was related to depressive symptoms (as measured by the EPDS) and in particular perceived social support was identified as a key issue for intervention and reduction of symptoms. The current project will examine the effect of different types of social support on the development of postnatal depression.

2.6.1.5 Health service use

This literature review has not found any previous studies that have examined long-term patterns of health service use as a predictor of postnatal depression. However, in their systematic review of qualitative analyses, Dennis and Chung-Lee (2006) found that a common help-seeking barrier was women's inability to disclose their feelings and emotions, including to health professionals. Further, ongoing health service use may also be related to relationship quality and trust with health practitioners, which may have an impact on reliability of screening for perinatal mental health problems (Bilszta, Ericksen et al. 2010).

These findings are particularly relevant in the current policy context, as screening for perinatal mental health conditions is a key factor in the detection of postnatal depression and other related conditions. The current project will explore this issue, not only examining ongoing health service use by child-bearing women, but also the issues of screening and disclosure for perinatal mental health conditions.

2.6.1.6 Physical health

Several studies have discussed the relationship between physical health and postnatal depression; however few studies have evaluated general physical health as a predictor of postnatal depression. Among those that have, consensus has not been reached. Previous research (Howell, Mora et al. 2006, Turner, Piazzini et al. 2006) found that poor quality of life was a reliable predictor of postnatal depression, however Da Costa, Dritsa et al (2006) found in their study of UK mothers, that other factors such as social support and type of childbirth were more reliable predictors of postnatal depression and quality of

life was not significantly independent when these variables were accounted for in the model. The current project will therefore explore the relationship between physical well-being and postnatal depression in more detail.

2.6.2 Pre-pregnancy predictors of postnatal depression

The relationship between pre-pregnancy factors and the development of postnatal depression is unclear as few studies have investigated such factors and those that have generally use retrospective data collection methods.

2.6.2.1 Mental health

An important prior life experience highlighted in the literature is the experience of mental health problems, especially previous experiences of depression. In Beck's (1996) meta-analysis there was a moderate relationship between postnatal depression and previous episodes of depression. However, in each of the eight studies in this meta-analysis, depression was measured by a single questionnaire item, when the strength of the relationship may be better detected with a more robust multi-item measure of depression. Robertson, Grace et al (2004) also found in their synthesis of literature that a history of depression was a reliable predictor of postnatal depression.

Mazzeo, Landt et al (2006) found in their US study that women who have suffered from an eating disorder were more likely to experience postnatal depression. Further, Morgan, Lacey et al (2006) found in their UK study, an association between active bulimia nervosa in pregnancy and postnatal depression. This effect was also present

when controlled for by obstetric complications that are also more prevalent in eating disorders.

Davey, Tough, Adair and Benzies (2011) found in their examination of a cohort of over 1400 women that previous history of depression and anxiety was significantly related to postnatal depression at eight weeks postpartum. These results may have been strengthened, however by using a broader time period in the postpartum, which may have in turn identified a larger number of positive cases.

In a recent longitudinal United Kingdom study, antenatal generalised anxiety disorder was significantly related to depression after delivery, even when other factors were taken into account (Coelho, Murray et al. 2011). The authors also reported that antenatal social phobia significantly predicted postnatal depression, but only after 10 months postpartum. However, this study did not examine mental health prior to pregnancy as a predictor of postnatal depression, which has been identified as an important point as identified by previous literature (Beck 1996, Robertson, Grace et al. 2004, Davey, Tough et al. 2011). The current study will extend past research by examining the relationship between a history of diagnosed depression and a diagnosis of postnatal depression. Furthermore, the data allow for the investigation of previous general mental health and previous anxiety to be examined as potential predictors of postnatal depression.

2.6.3 *Pregnancy-related predictors of postnatal depression*

Numerous studies have investigated the relationship between antenatal health and postnatal mental health. Some of the strongest associations have been found between antenatal depression and postnatal depression; however other aspects of general health during pregnancy have also been investigated and are reviewed below.

2.6.3.1 *Pregnancy health*

Bloch, Rotenberg et al (2006) found in their Israeli sample, that mood symptoms (as measured in the Edinburgh Postnatal Depression Scale) in the third trimester were strongly predictive of postpartum mood. Chabrol and Teissedre (2004) also discussed the importance of mood in the immediate postpartum and found that mothers in their French sample who were anxious in the days after birth were more likely to experience postnatal depression. Indeed, Evans, Heron et al (2001) stressed the relationship between antenatal depression and postnatal depression. They found that in their UK cohort study that the predictors of antenatal mood (as measured with the EPDS) did not differ from those of postnatal mood and recommended that future research should focus attention on the antenatal period to better detect potential problems. This study, however did not suggest those factors that were predictive of postnatal mood before the antenatal phase and is therefore limited in scope. Leigh and Milgrom (2008) replicated these findings with an Australian sample, finding that postnatal depression was a reliable predictor of parental stress. They suggested that interventions targeted in the antenatal phase would be more advantageous if targeted at the prevention of parental stress and postnatal depression than interventions in the postnatal phase.

Dennis, Janssen et al (2004) found in their Canadian study that, among other factors investigated, antenatal health was an important factor when predicting postpartum mood. In particular, they suggested that gestational hypertension should be investigated in future research. In their international, Internet-based study, Tuohy and McVey (2008) also found that difficulties (such as hypertension and diabetes) and poor physical health during pregnancy were predictive of postpartum mood. Both of these studies neglected to assess health prior to pregnancy, an issue that will be resolved by using longitudinal data in the current project.

2.6.3.2 Pregnancy and reproductive history

The relationship between postnatal depression and past reproductive health issues, such as miscarriage and termination, have been the subject of limited investigation. In their study conducted in the Netherlands and Belgium, Janssen, Cuisinier et al (1996) suggested that women who experienced a pregnancy loss were more likely to suffer from a mental illness and were most commonly depressed in the following six months, but that within twelve months the deficits were no longer evident. In contrast, Cryan, Keogh et al (2001) found in their Irish study, that women with a history of miscarriage were almost twice as likely to experience postnatal depression with a subsequent birth, indicating that prior reproductive events might have a persistent effect on the mother. In a recent study, Blackmore, Cote-Arsenault et al (2011) found that women who had experienced a pregnancy or infant loss were significantly more likely to experience a mental health problem, not only during a subsequent pregnancy, but also postnatally.

following the birth of a healthy child. These results, while inconsistent, indicate that adverse birth and pregnancy outcomes are a key factor for further investigation.

2.6.4 Childbirth

Several studies have incorporated a measure of childbirth stress into their models of the predictors of postnatal depression. In particular, obstetric interventions such as caesarean birth have been assessed; however there is little agreement as to the strength or direction of relationships between birth interventions and postnatal depression.

2.6.4.1 Proximal childbirth issues

Brown, Lumley, Small & Astbury (1994) suggested that obstetric complications such as emergency caesarean delivery or assisted vaginal delivery may have been a contributing risk factor in the development of postnatal depression. In their study, around 30% of women had an assisted delivery, emphasising the importance of further investigating this relationship. This finding was supported by White et al's (2006) study, where caesarean birth was highlighted as a risk factor for developing postnatal depression. A major limitation of these two studies was the limited recruitment method to only one state in Australia. As health care in Australia is provided at a state government level, the differences between state-provided assistance may have impacted on the results of each study. Brown et al's study focused on Victorian residents and White's on New South Wales mothers. Contradictory to Australian findings, Carter, Frampton et al (2006) reviewed current literature from several other countries and found little or no evidence of a relationship between caesarean delivery and postnatal depression. Johnstone, Boyce et al (2001) also found no significant relationship in their study of obstetric

interventions and postnatal depression in Australia. In contrast, Nelson, Freeman et al (2013) found a significant relationship between obstetric outcomes such as caesarean delivery and postpartum mood in their examination of 17000 mothers in Texas, United States. This possible association warrants further exploration and will be the subject of investigation in the proposed project.

2.6.5 Postnatal period

Few studies have examined the effect of postnatal health and wellbeing on the mental health of mothers. Further, there is a lack of agreement as to the relationship between these factors and postnatal depression. This relationship, however is worthy of further investigation in order to better understand the context of postnatal depression with other postpartum events (such as poor sleep and breastfeeding issues).

2.6.5.1 Stress and coping

Page and Wilhelm (2007) investigated the relationship between daily stress and postnatal depression in US women. They found that stress, especially related to relationship quality, was predictive of postnatal depression, however the sample size was small (N=51) and therefore interpretation of results is limited. Boury, Larkin et al (2004) also found that in US mothers, stress was a reliable predictor of postnatal depression and indicated that stress management might be an effective intervention. In their qualitative follow-up of mothers at six weeks postpartum in Switzerland, Razurel, Bruchon-Schweitzer et al (2011) found that coping strategies employed by mothers to overcome stress in postpartum were most commonly social support. These findings add

increasing importance to the need to explore early stressful events and coping in mothers in postpartum.

2.6.5.2 Sleeping patterns

It is difficult to assess the changes in sleeping patterns in the postpartum as it is common for mothers to experience affected sleep due to the demands of a new infant. However, previous studies conducted with women who are not new parents have found a clear relationship between sleep and depressed mood. Very little research has examined the relationship between disturbed sleep and postpartum mood, however Field, Diego et al (2007) found in their US study, that sleeping patterns during second and third trimester were related to mood in the postpartum. The authors, however did not look at changes during postpartum that were not related to pregnancy-related patterns and this difference warrants further investigation via qualitative investigation to understand the context of poor sleep in the postpartum.

2.6.5.3 Infant health and breastfeeding

Infant health is often omitted from many studies as mothers of ill infants are considered already burdened and therefore are excluded from the sample. Therefore the impact of infant health on postnatal depression is difficult to assess. Ueda, Yamishita et al (2006) found a significant relationship between infant health and postnatal depression in their Japanese sample, however the study was small in sample size and therefore results are difficult to interpret.

The relationship between breastfeeding and postnatal depression is not clear. Thome, Alder et al (2006) examined the relationship between exclusive breastfeeding and postnatal depression in Iceland and found that mothers who were depressed were less likely to exclusively breastfeed, although they concluded that breastfeeding habits were predicted by mood. Pippins, Brawarsky et al (2006) also found that depressed mothers in their US sample were less likely to breastfeed for greater than one month postpartum. Brown, Lumley, Small & Astbury (1994) found that Australian mothers who were depressed at eight months after birth were less likely to breastfeed. Of these women, 19% had bottle-fed from birth onwards, compared to 11% in the non-depressed mothers. Brown et al suggest that breastfeeding offers a unique way to make a mother-baby bond and that a lack of this bond may be associated with depression. From this study it is unclear whether breastfeeding contributed to the prevention of postnatal depression or whether those women prone to postnatal depression were less likely to breastfeed. Recent longitudinal data also found a relationship between breastfeeding self-efficacy and postnatal depressive symptoms (Haga, Ulleberg et al. 2012), however a causal relationship was not clear from this analysis.

2.6.6 Experience of diagnosis and treatment efficacy of postnatal depression

While numerous studies have assessed the validity of measures of postnatal depression such as the EPDS, very few studies have examined the feelings associated with the diagnosis of postnatal depression and in turn how these feelings may affect help-seeking. Furthermore, while there is a wealth of information from clinical trials on the

efficacy of treatment, little is known about how women perceive the treatment options available to them and how they rate their efficacy.

2.6.6.1 *Experience of diagnosis*

Very little is known about how women feel during the experience of being diagnosed with postnatal depression. Extensive research has focused on the stigma attached to a diagnosis of depression, however little is known about stigma attached to postnatal depression. Edwards and Timmons (2005) found in their qualitative study of UK mothers that those who were diagnosed with postnatal depression and admitted to a mother and baby unit experienced stigma across several dimensions – disclosure, access to services, feelings of being a bad mother and label/diagnosis. Pinto-Foltz and Logsdon (2008) found in their US qualitative study that the stigma attached to the diagnosis of postnatal depression was a barrier to treatment and the authors emphasised the role of mental health nurses in alleviating this problem. In her meta-synthesis of qualitative results, Beck (2002) found 18 qualitative studies where the focus was postnatal depression. She found that women typically reported a discrepancy between their expectations and the reality of motherhood, resulting in feelings of failure and depressed mood. She also found commonality across the studies in regards to the severity of mood, where many women described changing emotions, including anxiety and anger. Beck synthesised the findings from the 18 studies into four main themes – ‘incongruity between expectations and reality of motherhood’, ‘spiralling downward’, ‘pervasive loss’ and ‘making gains’. The first theme consisted of eight studies where the myth of motherhood was a key feature in the development of postpartum depression. For

example Mauthner's (1995) study found that women viewed themselves as 'bad mothers' for having negative reactions to birth and motherhood and feared being labelled as 'failed mothers' for experiencing these feelings. Cultural context was also included in this theme, where Beck cited the findings of an Australian study of Jordanian women living in Australia who reported that feelings of isolation and being away from their home country magnified their feelings of shame regarding negative experiences of motherhood (Nahas, Hillege et al. 1999). While cultural context cannot be explored within this thesis, feelings of isolation and their impact on expectations of motherhood is an important theme that will be addressed by this project. In the second major theme, 'spiralling downward', Beck reported that all 18 studies addressed aspects of this theme. She describes the concept of spiralling downward as the range of distressing emotions experienced by women in conjunction with depression and sadness such as anger, anxiety, guilt and loneliness. Importantly, a number of studies found that many women may also be experiencing anxiety with depression (Beck 1992, Beck 1993, Semprevivo 1996, Wood, Thomas et al. 1997). As discussed earlier, the comorbid relationship between anxiety and depression is an important issue, and will be explored further throughout this project. The third major theme 'pervasive loss' was found in 15 of the studies. This theme contained concepts such as 'loss of control' and 'loss of identity' but also loss of relationships such as between their partners. For example, participants in a number of studies reported experiencing a loss of self- identity (Nicolson 1990, Wood, Thomas et al. 1997, Nicolson 1999), which Nicolson (1999) found was magnified if women had previously worked outside of the home. These issues of loss of identity, control and relationships will be explored in more detail in this

project. In the final major theme, ‘making gains’ Beck describes aspects of mothers’ recovery from postnatal depression. These themes included ‘surrendering’ which involved seeking treatment. Importantly, barriers to help-seeking were identified in a number of studies including the stigma associated with needing help (Berggren-Clive 1998). The issue of stigma will be expanded on in the current study.

In a more recent meta-data-analysis, Knudson-Martin and Silverstein (2009) developed a process model to explain how different factors impact on postnatal depression. The authors found that a central theme was women’s feelings that they did not meet the cultural standards of being a “good mother”. For many women this resulted in an inability to express their negative feelings regarding motherhood. Social constructs of motherhood played an important role in the incongruence between reality and expectations, and participants reported fear of judgement from others. Mauthner (1999) described the theme of the perception of the ‘perfect mother’ and how these internal constructs impacted on women’s ability to seek help. The authors concluded that treatment should focus on changing how women perceive the construct of motherhood and enabling women to voice their feelings and opinions.

The findings from the above meta-analysis and meta-synthesis indicate that qualitative exploration of the experiences of postnatal depression have previously been rare, with only 18 and 9 publications retrieved for each analysis. Therefore further investigation is therefore vital to examine the effect of stigma of diagnosis not only on the help-seeking of mothers, but also on the efficacy of treatment for postnatal depression.

2.7 Conclusion

A major failing of many of the past studies into postnatal depression is the inability to incorporate a wide spectrum of risk factors in one analysis. A multivariate approach is therefore required to examine the interaction of the psychosocial risk factors for postnatal depression in order to lead to a clearer picture of the predictors of postnatal depression (Swendsen and Mazure 2000). While it is important to understand the individual risk factors of postnatal depression, it is also important to understand the interactions between these factors. To date, this has not been successfully achieved in other studies. It is also important to understand the longitudinal interactions between such risk factors and this has also not been achieved to date. The proposed study intends to address both of these shortcomings of previous studies by utilising a longitudinal methodology to investigate these interactions. The psychosocial model of depression will be modified and tested across several vulnerability factors, ranging across a life course perspective. The efficacy of treatments for postnatal depression will also be examined, filling a clear gap in existing knowledge in the rehabilitation of postnatal depression sufferers.

This project will be the first to use longitudinal data collected in the years prior to, during and after pregnancy to construct a model of the predictors of postnatal depression as the literature review in contained in this chapter did not uncover any other studies to have achieved this. Although several studies have identified predictors of postnatal depression, most have focused on the events immediately prior to pregnancy and birth (Beck 1996, Henshaw, Foreman et al. 2004, Bloch, Rotenberg et al. 2006,

Milgrom, Gemmill et al. 2008) and have not incorporated earlier life events and experiences, although some studies that have attempted to estimate early life experiences by using retrospective data collection methods (Collins, Dunkelschetter et al. 1993). Therefore the current project utilises an ideal dataset for such an analysis, collected by the Australian Longitudinal Study on Women's Health, to test and expand upon the psychosocial model of depression (Brown and Harris 1978, Boyce 2003). These data will be supplemented with targeted qualitative interviews with longitudinal study participants in order to better inform the construction of a model of the predictors and antecedents of postnatal depression across the life course. The perceptions of efficacy of treatment of postnatal depression will also be investigated in the qualitative study.

The aims of this project are:

- To measure the prevalence of postnatal depression among Australian women using longitudinal data collected by the Australian Longitudinal Study on Women's Health (ALSWH) over a 13 year period
- To validate and extend an existing psychosocial model of the antecedents of postnatal depression across the life course
- To examine women's experiences and assessments of postnatal depression treatment.

The aims will be met by examining themes across four broad time spans: pre-pregnancy, pregnancy, childbirth, and the postnatal phase. The following chapter provides details on how these aims will be achieved.

Chapter 3. Methods

The aims described in Chapter 2 will be achieved by thematically examining four broad time spans. These themes are conceptualised in Figure 2. Four cross-cutting themes will also be examined across all stages; demographics, health behaviours, life events and social support. A fifth life stage will be qualitatively examined only and will focus on the diagnosis and treatment of postnatal depression.

The project has been divided into four studies:

1. To undertake preliminary quantitative data analyses, in order to identify the predictors of postnatal depression using ALSWH data collected in 1996, 2000, 2003 and 2006 (Study 1).
2. To explore the experiences of women suffering from postnatal depression by analysing existing longitudinal qualitative data collected by the ALSWH from 1996 to 2006 (Study 2).
3. To extend and validate the psychosocial model of postnatal depression by incorporating ALSWH survey data collected in 2009 (Study 3).
4. To explore the experience of living with postnatal depression and treatment efficacy using qualitative interview methods in a sample of ALSWH participants (Study 4).

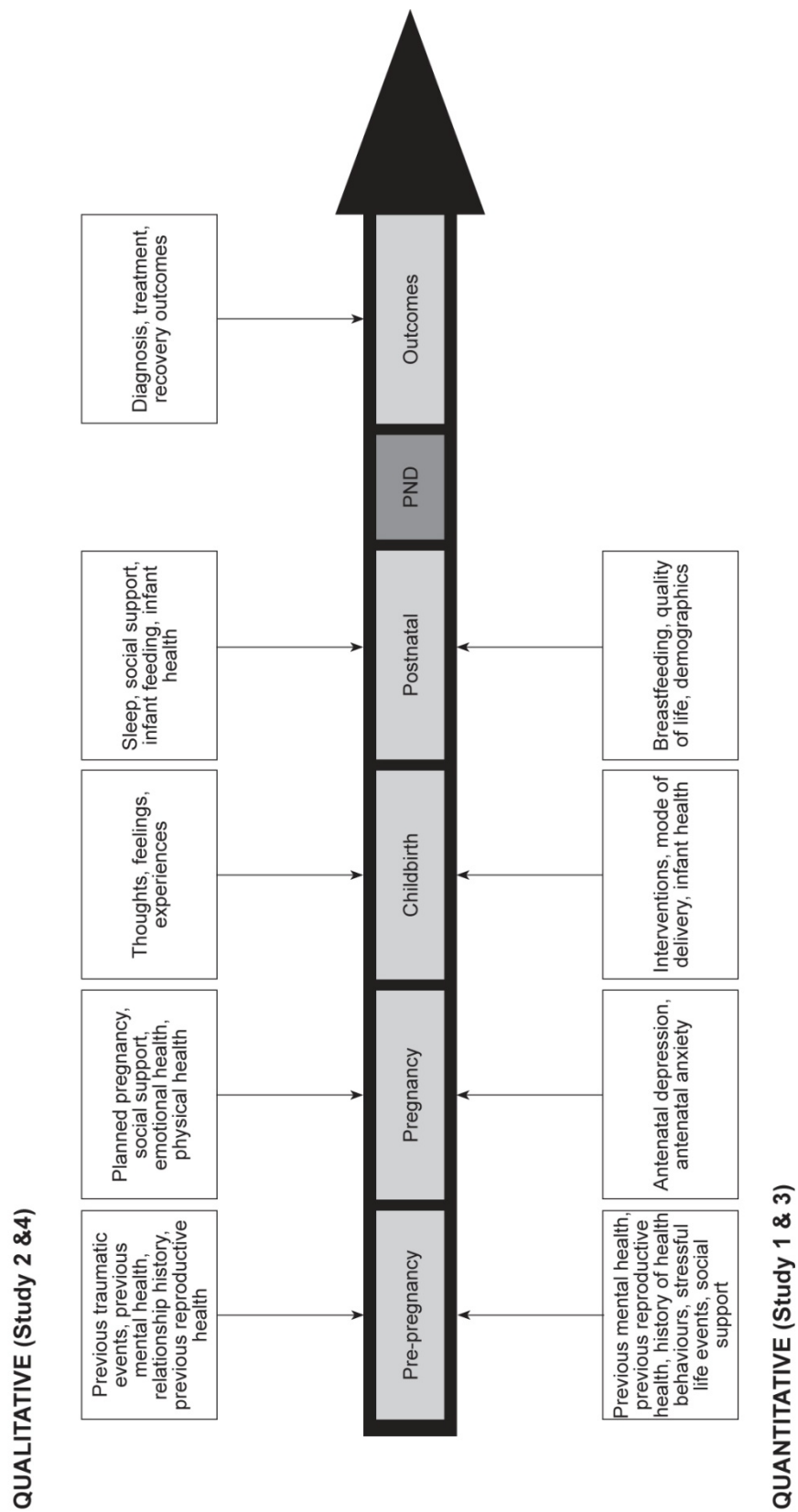


Figure 2 Themes (in white boxes) under investigation across the life course phases (in grey boxes)

This chapter includes an overview of the ALSWH and the samples used in the four studies. Details of the participants, materials and procedures for each study are included in their respective chapters.

3.1 The Australian Longitudinal Study on Women's Health

The Australian Longitudinal Study on Women's Health (ALSWH) is a multidisciplinary 20 year study based at the University of Newcastle and University of Queensland. ALSWH is funded by the Australian Government Department of Health and Ageing.

At the inception of the study, three cohorts of women were recruited through the Medicare (national health insurance) database, aged 18-23, 45-50 and 70-75 years in 1996, when the study started. Over 40000 women consented to participate in the survey – 14247 in the 1973-78 cohort, 13715 in the 1946-51 cohort and 12432 in the 1921-26 cohort. All participants completed the initial mailed survey in 1996, and from 1998 onwards each cohort has completed follow-up surveys on a three- yearly basis. Details of the schedule of surveys can be found in Figure 3.

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1973-78	S1				S2			S3			S4			S5			S6
1946-51	S1		S2			S3			S4			S5			S6		
1921-26	S1			S2			S3			S4			S5			S6	

Figure 3 Schedule of surveys (surveys in black are utilised in this project)

The ALSWH measures over 300 psychological, socio-demographic and life event variables at each survey and takes a biopsychosocial view of health. While mostly

quantitative, each survey also includes a qualitative component providing participants with an opportunity to elaborate on any topics they wish. Further information is available on the website at www.alswh.org.au.

3.1.1 *The ALSWH 1973-78 cohort*

The project used data collected from the 1973-78 cohort of the ALSWH. Aged 18-23 in 1996, these participants have now completed five surveys with a further survey due for completion in 2012. The 1973-78 cohort have answered questions relating to; physical and mental health, demographics, health service use, health behaviours and in particular, questions relating to childbirth and motherhood. In addition to quantitative items, a qualitative section is included in each survey. The strength of the ALSWH data in examining postnatal depression is the span of participant ages over the key childbearing years, including data from women aged 18-36 years. The ALSWH allows for detailed longitudinal data analyses to be completed, in order to develop a clear picture of the antecedents of postnatal depression.

The 1973-78 cohort were randomly selected from the Medicare database, with 36000 women were invited to participate in the longitudinal study. Due to inaccuracies in the Medicare database, the response rate cannot be precisely calculated, but is estimated to be between 41-42%. As the personal details of non-responders were not known to the research team, no follow-up could be conducted with this group (Brown, Dobson et al. 1999). There were 14,247 women who completed Survey 1 and provided the research team with their contact details. An analysis of the demographic profile of this group compared to the 1996 Census data was conducted, and the sample was determined to be

an adequate representation of the age group, although there was some over-representation of tertiary educated women and an under-representation of women from culturally and linguistically diverse backgrounds (Brown, Dobson et al. 1999).

Deliberate over-sampling of women from rural and remote areas was a key principle to recruitment in order for the study to more closely examine the health and well-being of women from these areas. All analyses where area is not included in the model are therefore weighted for area of residence reported at Survey 1.

Table 1 reports the retention rates for subsequent follow-up surveys. The first follow-up survey of the 1973-78 cohort was conducted in 2000. Of those who were eligible (ie those who completed Survey 1 and had not withdrawn or died in the interim) almost 69% completed Survey 2. Retention rates of over 61% have been achieved for all subsequent surveys. Figure 4 shows the patterns of retention for the 1973-78 cohort.

Table 1 Retention and attrition for 1973-78 cohort

	Survey 2 2000 22-27 yrs	Survey 3 2003 25-30 yrs	Survey 4 2006 28-33 yrs	Survey 5 2009 31-36 yrs
Eligible at previous survey	14247	14116	13886	13557
Ineligible				
Deceased between surveys	22	10	15	8
Frailty (eg intellectual disability)	3	6	4	3
Withdrawn before survey mailout	106	213	311	209
<i>Total ineligible</i>	131	229	330	220
Eligible at current survey	14116	13887	13557	13337
Non-respondents				
Withdrawn from the project	124	200	171	113
Contacted but did not return survey	1332	653	1371	1994
Unable to contact participant	2972	3953	2870	3030
<i>Total non-respondents</i>	4428	4806	4412	5137
Respondents				
Completed survey	9688	9081	9145	8200
Retention rate as % eligible	68.6%	65.4%	67.5%	61.5%

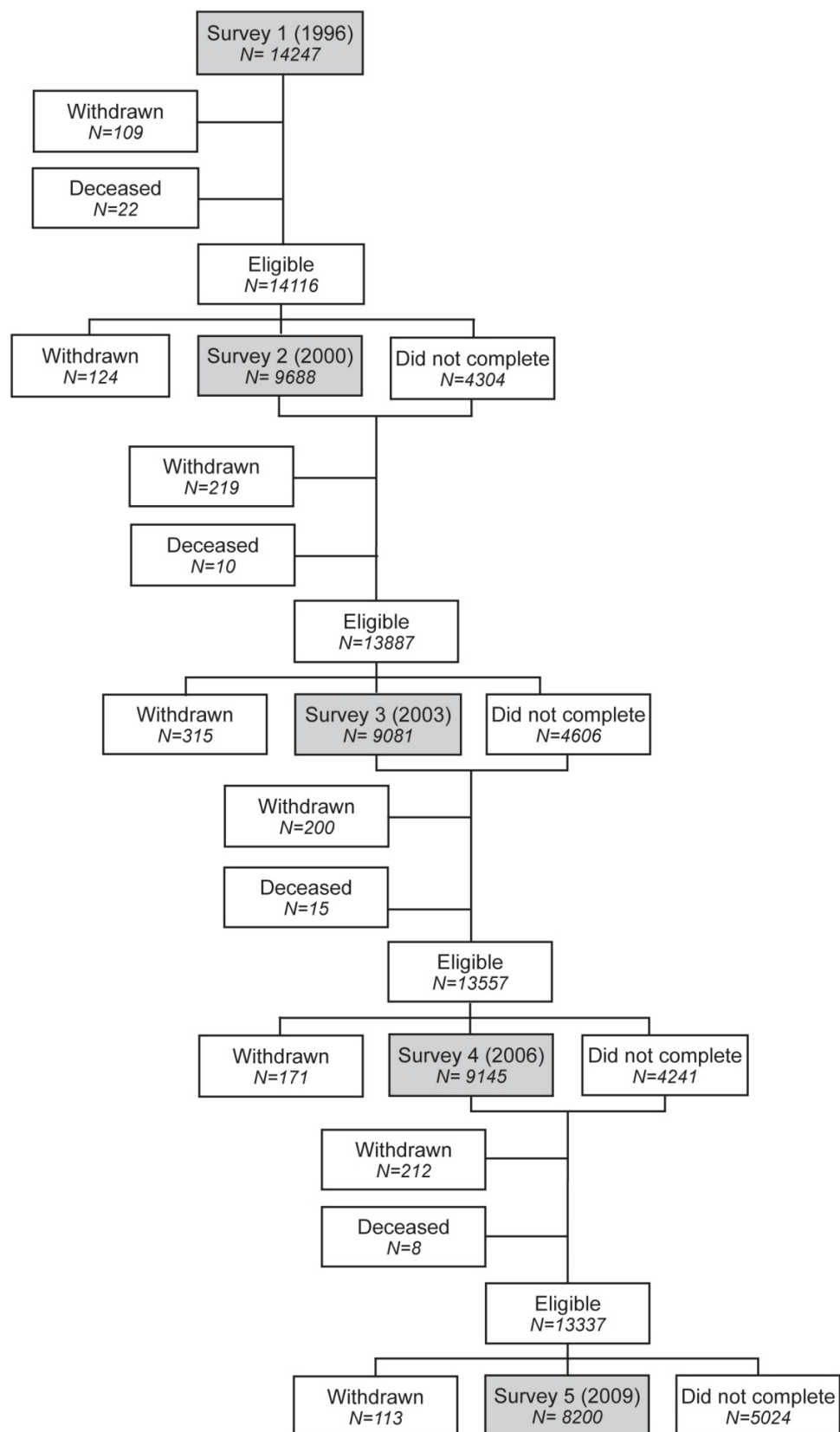


Figure 4 Attrition and responses to surveys

While numerous tracing strategies are employed in order to retain participants in the sample (Adamson and Chojenta 2007), many participants are not contactable or unable to complete a survey at any given follow-up. Procedures such as mailing an annual newsletter and following up on participants whose mail is returned to sender, ensures that participants are given to opportunity to re-connect with the survey whenever possible. Therefore numerous patterns of survey completion are possible, with a number of participants only completing Survey 1 in 1996 and then Survey 5 in 2009. Figure 5 shows the numerous combinations of patterns of survey completion.

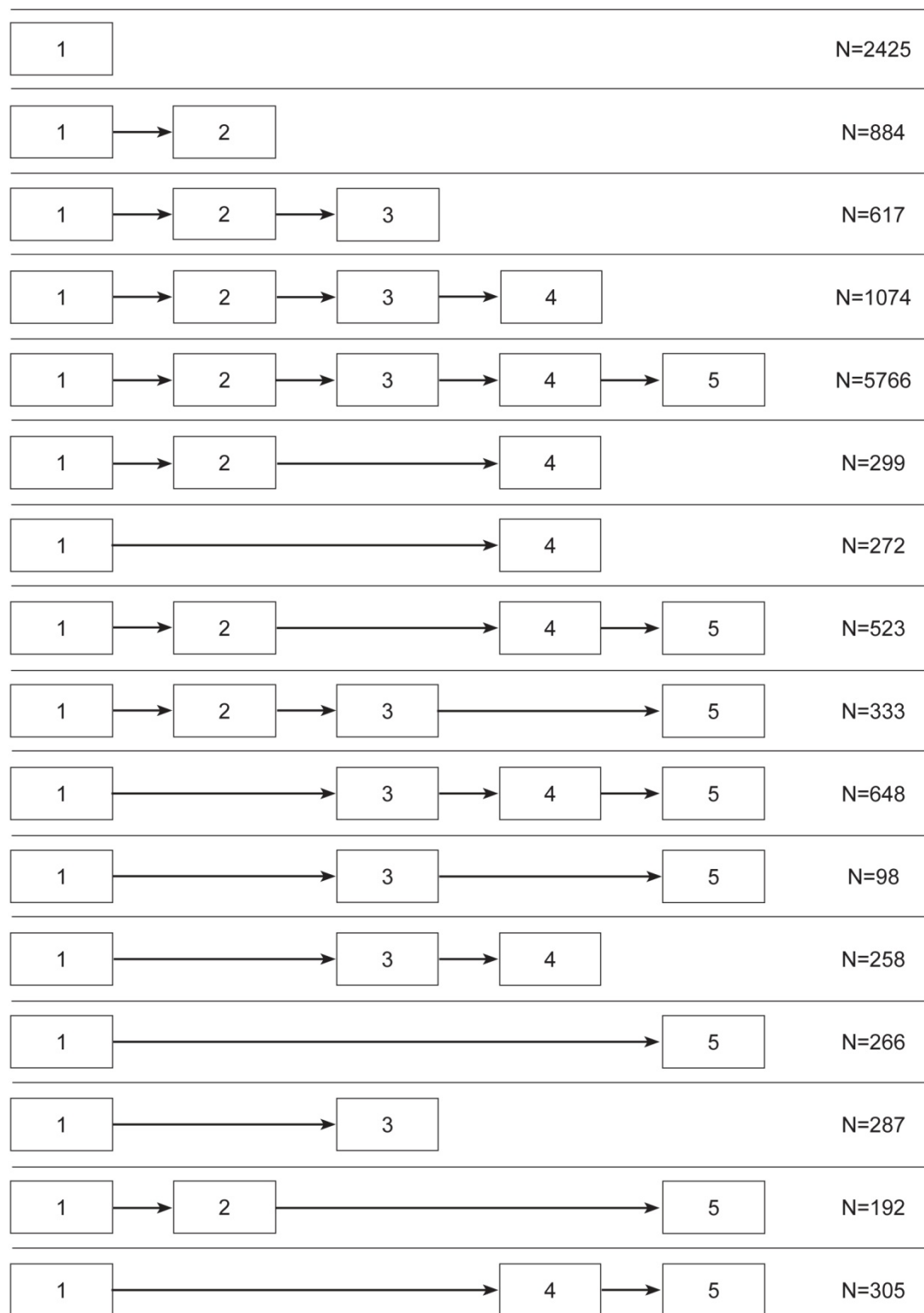


Figure 5 Patterns of survey completion

3.2 Research phases

This section summarises the phases of the research that will be undertaken in order to meet the aims of the project. With the exception of the literature review, all phases of the research will make use of the ALSWH; therefore this subsection starts with further information about the ALSWH and some specific information about the data that will be used in the current study. More details on each method employed for the four Studies follows in Chapter 4 to Chapter 7.

3.2.1 Preliminary quantitative analysis of the antecedents of postnatal depression using ALSWH survey data (Study 1)

Preliminary data analysis was conducted using data collected from the ALSWH 1973-78 cohort Surveys 1-4. At Survey 4, 4306 (48.7%) participants had ever given birth to a child. Participants were asked to record the dates of birth of all of their children and were asked if they were diagnosed or treated for postnatal depression in the 3 years prior to completing the survey. Similar items were asked in Survey 2 (2000) and Survey 3 (2003).

The prevalence of postnatal depression was calculated by selecting all eligible participants for a diagnosis of postnatal depression, being those women who had given birth to a child in the four years before completing the survey. The date of completion of the survey as recorded in the ALSWH participant database was used to assess the time before completion of the survey. This method was necessary to evaluate the prevalence of postnatal depression, as only women who had given birth four years prior to completing the survey were eligible for diagnosis or treatment in the last three years.

This technique was not optimal, as the sample size was greatly reduced by only using births in the last three years, therefore a modification to the items in Survey 5 was requested. The item in Survey 5 asked if the participant was diagnosed or treated for postnatal depression, antenatal depression, postnatal anxiety and antenatal anxiety for each of their children.

While the data analysis method is not optimal, and was rectified in Survey 5, it was still possible to conduct preliminary data analysis in order to inform the creation of a preliminary model of the predictors and antecedents of postnatal depression. In particular, this preliminary analysis examined several cross-cutting predictors and pre-pregnancy predictors of postnatal depression such as demographics, life events and social support.

3.2.1.1 Study 1 Participants

Participants in this analysis were selected based on completing all surveys from 1996 to 2003 (Survey 1 – Survey 4). This strategy ensured that the most complete data for prior psychosocial variables was possible. Figure 6 shows the sample composition for this analysis. The pathway in grey is the sample eligible for inclusion in this analysis.

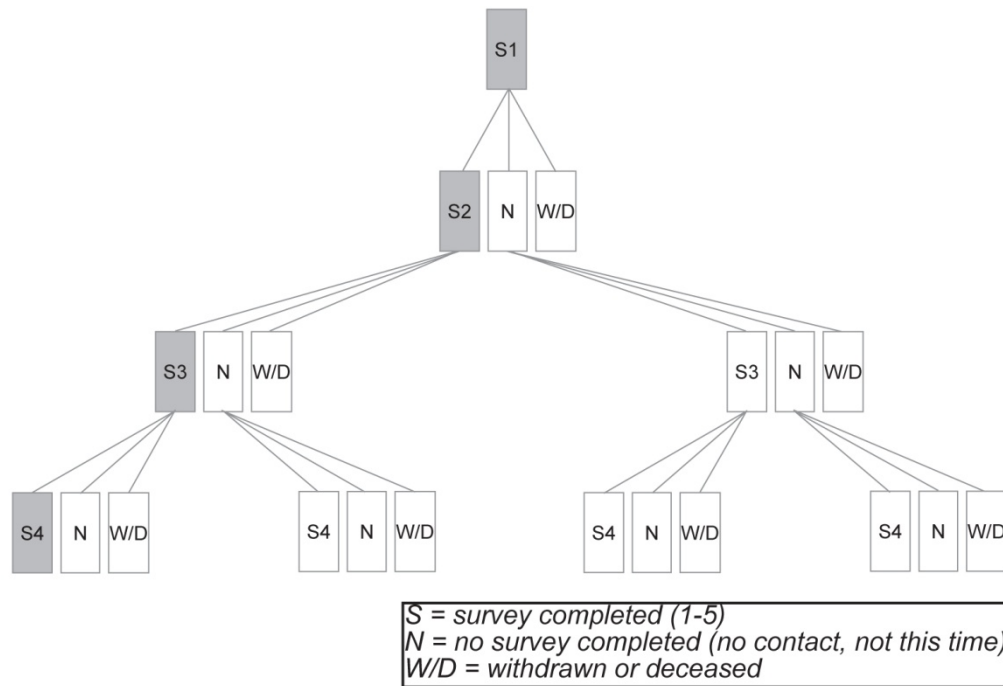


Figure 6 Sample composition

Further details on the method employed in this analysis can be found in Section 4.2.

3.2.2 Longitudinal qualitative analysis using incidental data collected by the ALSWH (Study 2)

The last question of each ALSWH survey is a free response question that asks:

Have we missed anything? If you have ANYTHING else you would like to tell us, please write on the lines below.

The free text responses to this item constitute a qualitative dataset indexed by participant identification number for each survey. An initial exploration of the data used

a keyword search for incidents of comments referring to postnatal depression using keywords such as “postnatal depression”, “post natal depression” “baby blues” and other types of spelling variations (results not reported). Due to the extremely low frequency of comments found using these keywords, a purposive sampling technique using responses to Survey 2-5 was employed. The free responses of all women who ever reported being diagnosed or treated for postnatal depression were read and thematically analysed, with a particular focus on the comments that precede a diagnosis of postnatal depression. The themes were coded in QSR Nvivo9 (QSR International Pty Ltd 2010).

3.2.2.1 Study 2 Participants

Figure 7 describes the composition of the sample used in this analysis. Of the 14,247 participants enrolled in the original 1973-78 cohort, 11738 participants completed at least one of the follow-up surveys in 2000, 2003, 2006 or 2009. Of these, 6849 reported having a baby at any survey and 1243 reported being diagnosed or treated for postnatal depression at least once. A total of 720 (58% of all women with postnatal depression) of these women responded to the open-ended qualitative question at least once (in 1996, 2000, 2003, 2006 or 2009) and this group is the subject of Study 2 analysis.

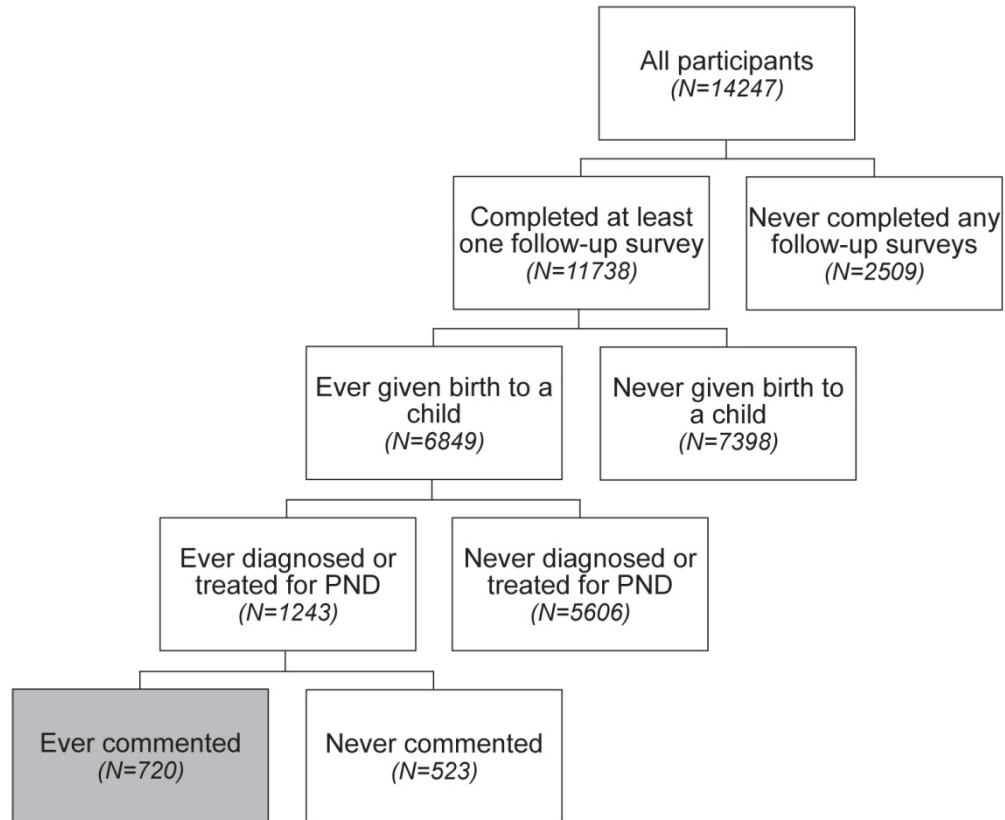


Figure 7 Sample composition

Further details on the method employed in this analysis can be found in Section 5.2.

3.2.3 Longitudinal analysis of the predictors and antecedents of postnatal depression using ALSWH data (Study 3)

In order to more closely examine the psychosocial model of depression as developed by Brown et al (1978), and expanded by Boyce (2003) to refer to postnatal depression, longitudinal data collected through the ALSWH was more closely examined. As described in Section 3.2.1, modifications were made to the measurement of postnatal depression in Survey 5 so that it was possible to examine postnatal depression for each birth for each woman who had ever given birth. A more accurate prevalence of

postnatal depression was calculated and participants were then grouped into three categories; those who have never given birth to a child, those who have given birth to a child and have never experienced postnatal depression and those who have given birth to a child and have experienced postnatal depression. Furthermore, because of the longitudinal nature of the ALSWH, the recurrence of postnatal depression over multiple pregnancies was tracked for the third group.

3.2.3.1 Study 3 Participants

In order to be eligible for inclusion in Study 3, participants must have completed Survey 5. Figure 8 shows the sample composition – the pathways in grey show that participants must have at least completed Survey 1 and Survey 5, but they may not have necessarily completed all other surveys. There were 8200 participants who completed Survey 5, and of these there were 5219 participants who reported giving birth to a child. In total there were 10407 births reported.

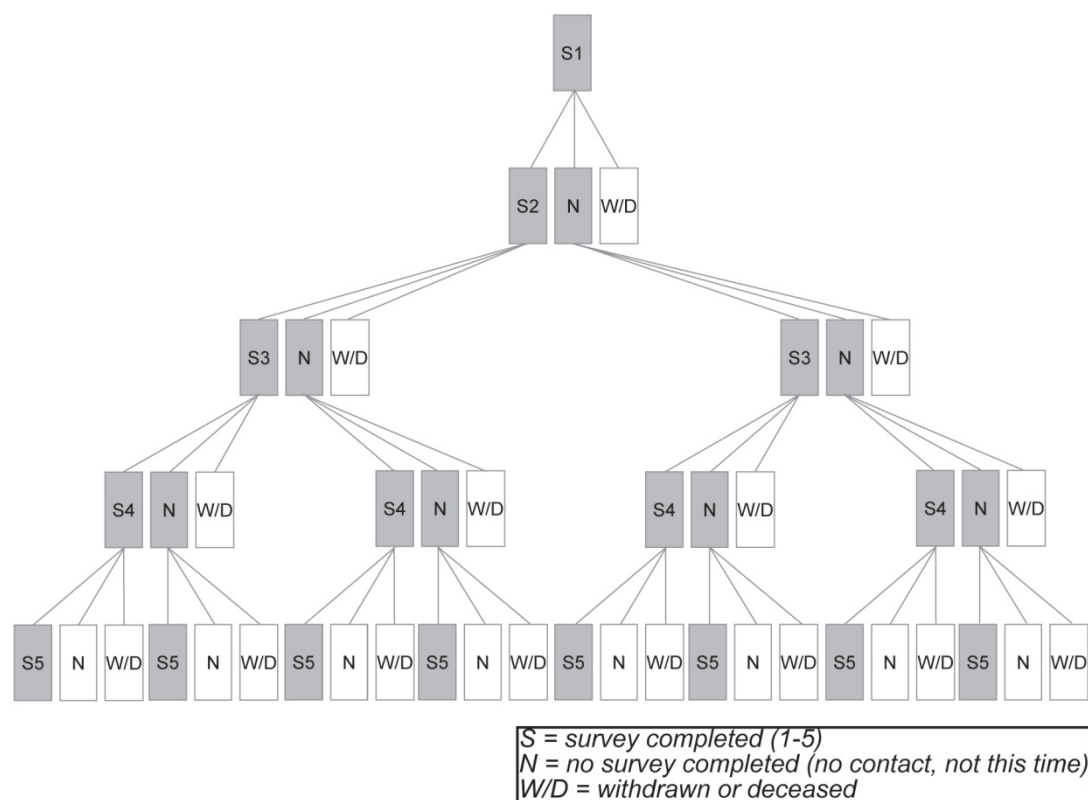


Figure 8 Sample selection for Study 3

Further details on the method employed in this analysis can be found in Section 6.2.

3.2.4 Qualitative exploration of experience of living with postnatal depression and treatment efficacy in a sample of ALSWH participants (Study 4)

On approval from the Publications, Substudies and Analyses (PSA) Committee of the ALSWH, it is possible to conduct additional, targeted research with sub-samples of women from ALSWH, termed “substudies”, in order to gain additional data on a specific topic. A qualitative interview substudy on postnatal depression was conducted to gain additional information on the experiences of postnatal depression and the results

were used to build upon information in conjunction with previously collected survey data. Questions investigated the life experiences and childbirth experiences of women who have experienced postnatal depression and women who did not experience postnatal depression. A further aim of this phase of the project was to examine the women's perceptions of treatments and treatment outcomes for women suffering postnatal depression – an issue that is not covered within the scope of the existing ALSWH surveys. Interview data was used to determine those experiences that led women to access health services, at what stage they were accessed and for what reason. The experiences of women who accessed psychological and/or pharmacological treatments for postnatal depression, was also investigated.

3.2.4.1 Recruitment

Interviews were conducted between November 2009 and May 2010. A sampling frame of 150 participants were selected for the substudy. Participants were eligible for the substudy if they had completed Survey 5 prior to November 2009, and reported giving birth to a child since 2002 at Survey 4 in 2006. As data collection was still in progress for Survey 5 at the time of conducting the interviews, it was not possible to use responses from Survey 5 to select the sample; therefore data from Survey 4 was used. Participants whose mailing details were not current with ALSWH, or who had nominated to not participate in substudies, were ineligible. The sample was purposively selected so that a diverse range of experiences of motherhood was represented by selecting 75 women who had reported experiencing postnatal depression in Survey 4 in 2006 and 75 women who did not report experiencing postnatal depression. Participants were sent a letter of invitation in batches of 10 participants at a time. Approximately

two weeks after mailout, all participants were telephoned and asked if they would like to participate in a telephone interview. A total of 16 interviews were conducted.

3.2.4.2 Study 4 Participants

While 150 participants were selected for the sample, only 70 participants were sent the information letter and invited to participate before saturation was achieved. Of the 70 participants who were invited to participate, 11 participants had out of date contact details, and 2 were ineligible. The 16 women who participated in this substudy had all completed Survey 5 prior to November 2009. There were nine women who had been diagnosed or treated for postnatal depression in this sample and an additional three women who had not been diagnosed, but self-identified as experiencing postnatal depression, leaving four who had not experienced postnatal depression.

Further details on the method employed in this analysis can be found in Section 7.3.

Chapter 4. Preliminary quantitative analysis of the antecedents of postnatal depression using ALSWH survey data (Study 1)

The findings in this chapter have been previously published and presented elsewhere:

- Chojenta C, Loxton D & Lucke J. How does previous mental health, social support and stressful life events contribute to postnatal depression in a representative Australian sample? *Journal of Midwifery and Women's Health*, 2012, 57 (2): 145-150.
- Chojenta C, Loxton D & Lucke J. *Prevalence and antecedents of postnatal depression in Australia*. The New National Agenda: The 6th Australian Women's Health Conference, Hobart, 18-21 May, 2010.
- Loxton D & Lucke J. *Reproductive health: Findings from the Australian Longitudinal Study on Women's Health*. Report prepared for the Australian Government Department of Health and Ageing, 2009.
- Chojenta C, Lucke J & Loxton D. Does social support reduce the likelihood of postnatal depression in Australian mothers? *Archives of Women's Mental Health*, 2009, 12 (Suppl 1) S20.
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4.1 Introduction

This chapter describes a quantitative examination of some of the key predictors of postnatal depression using data longitudinally collected about a community sample of young Australian women. Following the literature review as summarised in Chapter 2, key predictors of postnatal depression were selected for closer examination using ALSWH data collected from the 1973-78 cohort up to and including Survey 4 in 2006. In particular, mental health history, social support, life events and demographics were

examined. Depression and anxiety during or immediately prior to pregnancy have been strongly associated with postnatal depression (Milgrom, Gemmill et al. 2008).

However, while several studies have examined the predictors of postnatal depression, few longitudinal analyses have been conducted that encompass experiences in early adulthood and up to 10 years prior to motherhood. Consequently, very little is known about the earlier lives of women before motherhood, particularly the more distal predictors of postnatal depression, such as a history of mental health problems (depression and anxiety) and experiences of stressful life events. Some studies have identified predictors of postnatal depression, focusing on the events immediately prior to pregnancy and birth (Beck 1996, Henshaw, Foreman et al. 2004, Bloch, Rotenberg et al. 2006). However, none have been published that utilised longitudinal data collected prior to, during and after pregnancy to construct a model of the predictors of postnatal depression. There is an absence of prospective studies that have measured life events and experiences before pregnancy and birth, although some studies have used retrospective data collection methods to examine these factors (Collins, Dunkelschetter et al. 1993). This chapter reports upon data collected over an 11- year period from a large representative sample of Australian women to identify distal and proximal predictors of postnatal depression.

It was expected that women with a history of depression and anxiety would be more likely to experience postnatal depression than other mothers and that women who have experienced a high number of stressful life events both proximally and distally will also be more likely to report postnatal depression. In addition, it was expected that women

with lower levels of social support than other women would also be more likely to experience postnatal depression. The nature of the data collected will also allow for demographic factors such as area of residence, marital status and education to be taken into account.

4.2 Methods

The current analysis used data collected from the ALSWH 1973-78 cohort who completed four surveys (in 1996, 2000, 2003 and 2006; Surveys 1, 2, 3 and 4, respectively).

4.2.1 Participants

Data included in this chapter are only for those participants in the ALSWH 1973-78 cohort who completed Surveys 1 to 4, and who were aged 28-33 years old in 2006 on completion of Survey 4. Of the 6755 participants who completed all four surveys, 2451 had had a live birth in the four years preceding Survey 4 and it is the data collected from these women that provide the basis of the following analysis.

The mean age of participants was 30.8 years and the majority of participants were partnered. This sample consists of both primiparous (N=1111) and multiparous (N=1340) women. When this analysis was replicated with only primiparous women, the significant results remained largely unchanged, although the two groups differed significantly on several demographic factors such as education and area of residence (results not reported), therefore the two groups were collapsed for analysis.

4.2.2 Measures

The following measures were selected for inclusion based on the reviewed literature in Chapter 2 as the most reliable predictors of postnatal depression.

4.2.2.1 Diagnoses (*depression, anxiety, postnatal depression*)

At each survey respondents were asked to indicate whether they had been diagnosed or treated in the last three years for several conditions such as diabetes, hypertension and a range of mental health conditions. This analysis utilised measures of ‘depression (not postnatal)’, ‘anxiety’ and ‘depression (postnatal)’. These survey items can be found in Appendix A.

4.2.2.2 Partner Status

Respondents were asked to indicate their current marital status as either ‘Never married’, ‘married’, ‘de facto (opposite sex)’, ‘de facto (same sex)’, ‘separated’, ‘divorced’ or ‘widowed’. Due to low numbers in some categories, they were collapsed into either ‘partnered’ (married or de facto) or ‘not partnered’ (single, separated, divorced or widowed).

4.2.2.3 Education

Participants were asked to report their highest qualifications completed. The nine response options were collapsed in to three groups: ‘Year 12 or less’ (no formal qualifications / Year 10 / Year 12) ‘non-university tertiary’ (trade / apprenticeship / certificate / diploma) and ‘university’ (university degree / higher university degree).

4.2.2.4 Area of Residence

Respondents were classified by area of residence based on ARIA+ score (Accessibility/Remoteness Index of Australia) (Department of Health and Aged Care (GISCA) 2001). The score is calculated based on postal code and proximity to services, geocoded to coordinates and then categorised as either 'Major cities of Australia', 'Inner regional Australia', 'Outer regional Australia', 'Remote Australia' and 'Very remote Australia'.

4.2.2.5 Income Stress

Income stress was measured by asking how the respondent manages on the income they have available, with response options: 'impossible', 'difficult all of the time', 'difficult some of the time', 'not too bad' or 'easy'. These were collapsed into two categories; the first comprised 'impossible / difficult all or some of the time' and the second comprised 'not too bad / easy'.

4.2.2.6 Number of Life Events

Respondents were asked to indicate whether they had experienced a range of life events, either in the last twelve months or more than twelve months ago, from a list derived from Norbeck (1984). The items referred to events such as relationships, work stresses, beginning or resuming study. For the purposes of this analysis, number of life events was calculated and categorised into three groups: 0-2, 3-4 or 5 or more. The original Norbeck scale has been used in a sample of pregnant women and found to be a valid and reliable indicator stress in pregnancy (Norbeck and Anderson 1989).

4.2.2.7 MOS Social Support

The full version of the Medical Outcomes Study Social Support Index (MOS SSI) (Sherbourne and Stewart 1991) was included for the first time in Survey 4 in 2006, where previously only an abbreviated version had been included (Surveys 2 and 3). The index measures functional support and contains four factors – ‘Emotional/informational support’, ‘Tangible support’, ‘Affectionate support’ and ‘Positive social interaction’. For the purposes of this analysis the last two factors were collapsed into one factor following a factor analysis where ‘affectionate support’ and ‘positive social interaction’ measures loaded heavily on one factor. The emotional/informational subscale contains measures such as 'someone to count on to listen to you when you need to talk' and 'give you good advice about a crisis'. The tangible support subscale includes items such as 'someone to help you if you are confined to a bed' and 'take you to the doctor if you need it'. The affectionate support and positive social interaction combined factor includes items such as 'someone to have a good time with' and 'someone to love and make you feel wanted'. In order to obtain subscale scores, the average of the score for each item were used. The MOS SSI subscales have been evaluated and found to be valid and reliable measures of social support. In addition, each of the subscales were rated as relatively stable constructs over time (Sherbourne and Stewart 1991). A copy of the MOS SSI can be found in Appendix B.

4.2.3 Analysis

A logistic regression analysis, which employed the ‘enter’ method, was performed using SPSS (SPSS for Windows 2008) with postnatal depression reported at Survey 4 as the outcome variable and demographics (at Survey 4), previous mental health diagnoses (at

Survey 2 and Survey 3), number of prior life events (Surveys 1-4) and self-rated social support (Survey 4), entered as predictor variables.

4.3 Results

Participants were mostly Australian born (95%), with 3% from other English-speaking backgrounds, and the remainder from Europe, Asia or other countries. Table 2 reports the demographic profile of participants such as ability to manage on income (50% rated 'not too bad' or 'easy' vs 50% rated 'impossible some of the time' or 'impossible all of the time' or 'difficult all of the time'), area of residence (52% urban vs 48% rural/remote) and educational qualifications (29% no formal qualifications vs 30% trade or apprenticeship vs 41% university degree or higher).

Of the participants who had a live birth in the four years preceding Survey 4 in 2006, 9.8% reported being diagnosed or treated for postnatal depression in the last three years. The unadjusted associations are reported in Table 2. Significant associations were found for previous depression and anxiety as reported at both Survey 2 and Survey 3 and for reported number of stressful life events at Survey 2 and Survey 4. Results were not significant for any of the demographic measures or for emotional/informational support or tangible support, however lower affectionate support/positive social interaction was related to a higher likelihood of postnatal depression.

Table 2 The relationship between previous mental health, demographics, life events, social support and postnatal depression (unadjusted and adjusted odds ratios)

			n (%)	Unadjusted OR (95% CI)	Adjusted Model OR (95% CI)
Demographics					
Manage on Income (S4 2006)	Impossible / difficult		1230 (50%)	0.79 (0.60-1.03)	1.11 (0.83-1.49)
	Not too bad / easy		1213 (50%)	1.00 (ref)	1.00 (ref)
Area of Residence (S4 2006)	Urban		1246 (52%)	0.79 (0.60- 1.03)	0.78 (0.59-1.04)
	Rural / Remote		1170 (48%)	1.00 (ref)	1.00 (ref)
Highest Qualification (S4 2006)	No formal / Yr10 / Yr12		707 (29%)	1.22 (0.89-1.67)	1.15 (0.80-1.63)
	Trade / Apprenticeship		729 (30%)	1.08 (0.78-1.49)	1.10 (0.78-1.55)
	Uni degree or higher		1009 (41%)	1.00 (ref)	1.00 (ref)
Partner Status (S4 2006)	Partnered		2333 (95%)	1.00 (ref)	1.00 (ref)
	Not Partnered		118 (5%)	1.56 (0.91-2.65)	0.75 (0.39-1.44)
Previous Mental Health					
Depression (S2 2000)	Yes		218 (9%)	3.27 (2.31-4.62)*	2.10 (1.39-3.18)*
	No		2211 (91%)	1.00 (ref)	1.00 (ref)
Anxiety (S2 2000)	Yes		89 (4%)	2.42 (1.42-4.13)*	1.18 (0.60-2.31)
	No		2340 (96%)	1.00 (ref)	1.00 (ref)
Depression (S3 2003)	Yes		209 (9%)	3.06 (2.14-4.37)*	2.15 (1.38-3.35)*
	No		2204 (91%)	1.00 (ref)	1.00 (ref)
Anxiety (S3 2003)	Yes		98 (4%)	1.97 (1.15-3.39)*	0.92 (0.47-1.80)
	No		2413 (96%)	1.00 (ref)	1.00 (ref)
Life Events					
No. in last 12 months (S1 1996)	0		72 (3%)	1.00 (ref)	1.00 (ref)
	1-2		470 (19%)	1.85 (0.55-6.18)	1.48 (0.43-5.03)
	3-4		683 (28%)	2.46 (0.75-8.04)	1.83 (0.55-6.12)
	5+		1242 (50%)	2.92 (0.91-9.41)	1.95 (0.59-6.44)
No. in last 12 months (S2 2000)	0		395 (16%)	1.00 (ref)	1.00 (ref)
	1-2		958 (39%)	2.11 (1.29-3.47)*	2.09 (1.24-3.50)*
	3-4		714 (29%)	2.27 (1.37-3.77)*	1.91 (1.12-3.25)*
	5+		400 (16%)	2.68 (1.56-4.59)*	1.89 (1.06-3.40)*
No. in last 12 months (S3 2003)	0		630 (26%)	1.00 (ref)	1.00 (ref)
	1-2		1198 (49%)	1.13 (0.81-1.58)	1.11 (0.78-1.58)
	3-4		459 (19%)	1.28 (0.85-1.91)	1.00 (0.65-1.55)
	5+		180 (7%)	1.46 (0.86-2.46)	0.85 (0.48-1.51)
No. in last 12 months (S4 2006)	0		702 (29%)	1.00 (ref)	1.00 (ref)
	1-2		1166 (47%)	1.80 (1.25-2.60)*	1.70 (1.17-2.48)*
	3-4		466 (19%)	2.08 (1.36-3.16)*	1.72 (1.1-2.70)*
	5+		133 (5%)	3.72 (2.18-6.37)*	2.36 (1.28-4.34)*
MOS Social Support d (S4 2006)					
Emotional/informational support	All of the time		1394 (57%)	1.00 (ref)	1.00 (ref)
	Most of the time		733 (30%)	1.41 (1.05-1.90)	1.14 (0.76-1.71)
	Some of the time		233 (10%)	1.83 (1.21-2.77)	0.95 (0.50-1.79)
	A little of the time / None		90 (4%)	1.54 (0.80-3.00)	0.75 (0.30-1.90)
Affectionate/positive interaction	All of the time		1172 (48%)	1.00 (ref)	1.00 (ref)
	Most of the time		747 (31%)	1.43 (1.05-1.96)*	1.25 (0.81-1.93)
	Some of the time		355 (15%)	2.67 (1.74-4.10)*	2.37 (1.24-4.53)*
	A little of the time / None		159 (7%)	1.21 (0.47-3.09)	0.87 (0.26-3.16)
Tangible support	All of the time		1697 (69%)	1.00 (ref)	1.00 (ref)
	Most of the time		546 (22%)	1.39 (1.02-1.91)	1.08 (0.74-1.56)
	Some of the time		156 (6%)	2.70 (1.76-4.14)	1.05 (0.64-1.73)
	A little of the time / None		49 (2%)	1.24 (0.48-3.16)	1.34 (0.71-2.55)

The adjusted odds ratios are also reported in Table 2 for all reported factors. Data from a total of 2576 participants were analysed and the full model significantly predicted postnatal depression status. The adjusted model shows that depression reported at Survey 2 and Survey 3, number of life events reported at Survey 2 and Survey 4 and reported affectionate support/positive social interaction at Survey 4 reliably predicted postnatal depression at Survey 4. Mothers who reported depression at Survey 2 were more than twice the odds of other mothers to report postnatal depression at Survey 4 (OR 2.10; 95% CI, 1.39 - 3.18) and those who reported depression at Survey 3 also had more than twice the odds of reporting postnatal depression relative to other mothers (OR 2.15; 95% CI, 1.37 - 3.35).

Results for life events reported at Survey 2 and Survey 4 (in the last 12 months) were also significant in both the adjusted and unadjusted models. Those mothers that reported experiencing one to two life events at Survey 2 were more than twice as likely to report postnatal depression at Survey 4 as women who reported experiencing no life events on the list (OR 2.09; 95% CI, 1.24 - 3.50). Those who experienced three to four and five or more life events were almost twice as likely to report postnatal depression as those who experienced no life events (OR 1.91; 95% CI 1.12 - 3.25 and OR 1.89; 95% CI 1.06 - 3.40 respectively).

Women who reported affectionate support/positive social interaction available 'some of the time' were more than twice as likely to report experiencing postnatal depression as mothers who report this form of support available 'all of the time' (OR 2.37; 95% CI 1.24 - 4.53).

4.4 Discussion

This study is the first to demonstrate the associations between long term risk factors for postnatal depression in a longitudinal representative Australian sample utilising pre-pregnancy measures of a range of variables. The strongest predictor for postnatal depression was a having history of depression, with a lack of social support and stressful life events also showing a strong association with later postnatal depression.

The current study builds on previous cross sectional research which has demonstrated associations between past retrospectively measured depression and postnatal depression (Robertson, Grace et al. 2004). Compared with women who had not reported depression, women who reported depression 3 or 6 years prior to pregnancy were more than twice as likely to experience postnatal depression. In another Australian study, Boyce (2005) recognised the limitations of previous research and applied the Brown and Harris psychosocial model of depression (Brown and Harris 1978). This model is constituted of three key features - *vulnerability factors* that are defined as “life circumstances”, *provoking agents* such as life events, and *symptom-formation factors*, which do not influence the risk, but determine the severity of depression. Boyce found vulnerability factors; life events, social environment and psychopathology predicted postnatal depression and while each of these vulnerability factors were assessed in the current study, however there was only limited support for life events and social environment being significant factors. Psychopathology (as measured by history of depression and anxiety) was supported in the current study.

Contrary to previous evidence (Ross, Campbell et al. 2006, Gulnar, Caylan et al. 2009), demographic factors were not significant in this current model. While these results warrant further investigation to examine demographic factors in more detail, they suggest that postnatal depression is a condition that occurs across the studied population group.

The significant findings for life events indicate that those women who are experiencing postnatal depression are experiencing it in the context of both the consequences of distal life events and the stress of proximal life events. These results have important implications for policy and practice. For example, those women at greatest risk for postnatal depression are also more likely to experience barriers to health service use and therefore treatment (Chisholm, Conroy et al. 2004). Additionally, women who have postnatal depression will not only require intervention for postnatal depression itself but also more broadly for the factors that influence postnatal depression.

While results for social support must be viewed with caution (see below), the finding that affectionate support/positive social interaction for women who rated it available 'some of the time' was lower for those women with postnatal depression compared to those without postnatal depression, was particularly compelling. Past research has also suggested this at a clinical level (Mulvaney and Kendrick 2006, Razurel, Bruchon-Schweitzer et al. 2011), but the current study demonstrates this at the population level. These findings complement the results of another Australian study that found that social support was an appropriate modifiable factor and suggested interventions could be targeted in this area to improve outcomes for women (Milgrom, Gemmill et al. 2008).

The results of the current study indicate that affectionate support and positive social interaction are important factors of social support and interventions that improve these factors would be valuable to women at risk of experiencing postnatal depression. Further research is required to more closely examine social support deficits in women with postnatal depression in order to make any causal inferences.

The adjusted model reported in this paper indicates that not all distal predictors are significantly associated with postnatal depression as expected. For example, history of stressful life events was only significant for Survey 2 in 2000 and Survey 4 in 2006 (last 12 months only). These inconsistencies may indicate issues with the measures of life events; however they may also indicate that there is a critical period for the impact of distal predictors of postnatal depression. These findings will need to be investigated more closely with subsequent surveys of this cohort.

4.4.1 Limitations

While this analysis reports results from a nationally representative sample of Australian women, the limitations of the self-reported measure of postnatal depression must be acknowledged. As the postnatal depression measure relies on the participant to report that they have been diagnosed with postnatal depression, women who have experienced postnatal depression will not be captured in this diagnosis group if they do not consider they were diagnosed with the condition. While a valid screening tool for postnatal depression would have been a useful inclusion for this analysis, this was not feasible in the context of the large scale health study where space in the postal survey is limited.

This limitation is addressed to some extent in Chapter 6 when an improved method for measuring postnatal depression is used.

Another limitation of this analysis is the timing between the birth of the child and measures used, such as life events and social support. Caution must also be taken when interpreting these results, as the rating of social support was taken within the last month prior to survey completion, while the birth of their last child could have occurred up to three years before they completed the survey.

4.4.2 Strengths

Nonetheless, while it is not possible to make causal inferences with this dataset, a major strength of the study is its capacity to utilise data collected at previous time points in order to determine distal risk factors, as opposed to collecting retrospective data on these events. A further strength of this analysis is the use of a national community sample of women, which allows a comparison to a non-depressed population.

4.5 Conclusion

The current study highlights the value of longitudinal data in assessing both proximal and distal predictors of postnatal depression. The current analysis offers evidence that a history of mental health problems and experiences of stressful life events are significant risk factors for postnatal depression and a better understanding of these risk factors will allow for more targeted detection of women who are most at risk of developing postnatal depression. Further research into the risk factors for postnatal depression will inform intervention strategies that can target factors associated with postnatal

depression as well as for symptoms, that can be put in place to assist in reducing the number of Australian women and families who suffer from this debilitating condition. While this study showed how early experiences influence risk for postnatal depression, more information is required on the breadth and range of early experiences that are salient in young women's lives in order to explore them more deeply. The next chapter explores qualitative data collected from young Australian women to better understand the context and life events that may be predictive of a later experience of postnatal depression.

Chapter 5. Longitudinal qualitative analysis using incidental data collected by the ALSWH (Study 2)

These findings have been published and presented elsewhere:

- Chojenta C, Lucke J, Loxton D. *An examination of the narratives of women who have experienced postnatal depression in Australia*. Poster presentation at the 5th International Mixed Methods Conference, University of Leeds, UK, 8-11 July 2009.

5.1 Introduction

The previous chapter explored some of the most commonly discussed predictors of postnatal depression in contemporary literature. While previous literature has identified both long and short term predictors of postnatal depression, these predictors have typically been confined to a pre-determined set of known associations and those with a particular relationship with depression in general. This study builds on the results of both the literature review summarised in Chapter 2 and the results of Study 1 in Chapter 4, by not only examining those known risk factors already identified, but also exploring the existence of any new or emerging concepts contained in the qualitative data. The aim of this chapter is to explore the predictors of postnatal depression with a life-course approach, focusing on identifying any new or unexplored themes common among women who have experienced postnatal depression.

This is the first study to examine the content of incidental comments made by women about psychosocial history. As this is an emerging research area, a variety of strategies were employed when investigating these data to ensure that the most rigorous method

was utilised. The following section describes the strategies used and the resultant research findings.

5.2 Method

The responses to the last item asked at each ALSWH survey were analysed. The last question asks:

Have we missed anything? If you have ANYTHING else you would like to tell us, please write on the lines below.

The responses to this question are data entered by an independent data collection agency and provided to the research team in a .txt file, indexed by an identification number.

This number then links the results of quantitative questions stored separately. The .txt file is then converted in to a Microsoft Access database for storage and searching via a form or query (Microsoft Office 2006). The data can then be exported into data analysis software such as Nvivo (QSR International Pty Ltd 2010).

Two analysis strategies were implemented for this data. The first used a keyword search to identify comments made about experiences of postnatal depression. The second strategy combined quantitative responses to survey items about diagnosis or treatment for postnatal depression, combined with qualitative comments made to examine only those comments by women who had reported experiencing postnatal depression. Details on the two analysis strategies and an evaluation of the strategies are in the sections below.

5.2.1 Analysis Strategy 1: keyword search

An initial exploration of the data used a keyword search for incidents of comments including a reference to postnatal depression, using keywords such as “postnatal depression”, “post natal depression” “baby blues” and other spelling variations. The results of the keyword search are reported in Table 3. Due to the extremely low frequency of comments found using these keywords, a purposive sampling technique using responses to Survey 2-5 was employed. This method is discussed in the remainder of this chapter.

Table 3 Number of comments found per keyword search

	Survey 1	Survey 2	Survey 3	Survey 4	Survey 5
TOTAL SURVEY RESPONSES	14247	9688	9081	9145	8200
TOTAL NUMBER OF COMMENTS	2421	1948	2266	1940	2415
postnatal depress OR *post natal depress*	8	5	4	5	19
postnatal depression	2	0	3	3	4
baby blue	0	1	1	0	1

5.2.2 Analysis Strategy 2: mixed methods approach

As the keyword search strategy did not yield many comments, an alternative strategy was required. In order to explore the comments made by participants who had experienced postnatal depression, the responses to each of the postnatal depression items asked in Surveys 2-5 were used and the comments made by these participants at

any survey were then analysed. Since Survey 2 (2000), a question regarding diagnosis or treatment of postnatal depression has been included in each survey. A copy of each of the postnatal depression items can be found in Appendix A. In Survey 2, the item asked about diagnosis in the last four years (in order to cover the time between Survey 1 in 1996 and Survey 2 in 2000) and a separate item asked about a diagnosis earlier than this. In Survey 3 and Survey 4 the item asked only about the last three years. In Survey 5, diagnosis or treatment of postnatal depression was asked for each child that the participant has had. Rather than compare responses to these items across surveys, a participant was selected as part of the sample if they had ever reported being diagnosed or treated for postnatal depression and if they had ever responded to the “have we missed anything” question at any survey.

5.2.3 Participants

As the sampling strategy required the use of the postnatal depression items that were asked from Survey 2 onwards, only those participants who had completed at least one follow-up survey were eligible for selection. Figure 9 shows the breakdown of sample composition for this group. Of the 14247 original participants in the 1973-78 cohort, 11738 (82.4%) participants completed at least one of the follow-up surveys in 2000, 2003, 2006 or 2009. Of these participants, 6849 (58.3%) reported having a baby at any of the follow-up surveys and 1243 (18.1%) of these reported having postnatal depression at any follow-up survey. Of the women who had postnatal depression, 720 (57.9%) responded at any time to the open-ended qualitative question and it is the data from these 720 women that was the subject of the analysis.

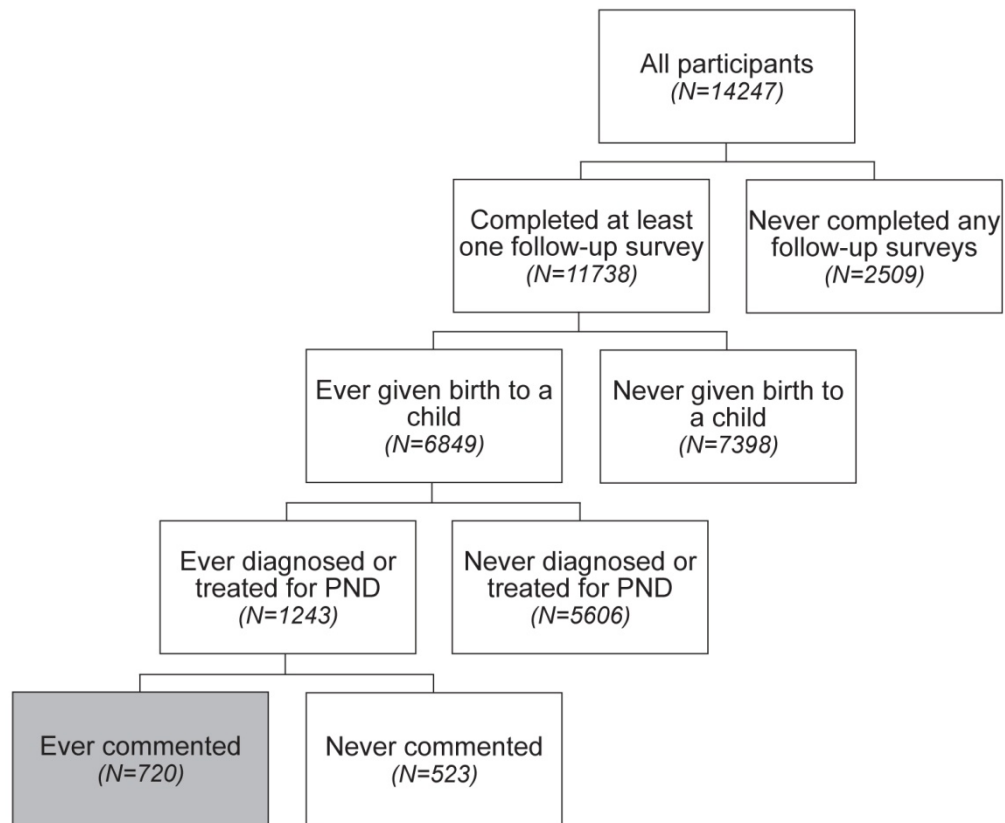


Figure 9 Sample composition

5.2.3.1 Sample demographics

Table 4 describes the demographic profile of those participants in the 1973-78 cohort who had made a comment at any of the surveys compared to those who did not make a comment. In order to compare the two groups, a number of measures were used including responses to the SF36 scale (Mental Health Index, Physical Functioning General Health and Social Functioning) (Ware and Sherbourne 1992), the modified life events scale (Norbeck 1984) and demographics including education and partner status. Broadly, those participants who responded to the open-ended question rated their

mental, physical, general health and social functioning worse than those who did not comment. Those who commented were also more likely to be more highly educated than those who did not comment. Results for partner status were inconsistent and must be interpreted with caution, as partner status was highly changeable for women in this age group over this time. Overall, the results indicate that some biases exist in the sample of participants who responded to the open-ended questions and this should be considered when interpreting the results.

Table 4 Comparison of participants who have commented versus those who did not comment at each survey

		Did not Comment	Commented	
Survey 1 (N=14247)		n=11826	n=2425 (17%)	
SF36 MHI		68.5	65.5	p<.001
SF36 PF		90.7	88.0	p<.001
SF36 GH		69.0	65.5	p<.001
SF36 SF		77.2	70.3	p<.001
Proportion of Life events (0-1)		0.16	0.19	p<.001
Education	Year 12 or less	70.0%	70.6%	p=.05
	Non-uni tertiary	17.8%	15.9%	
	Uni and higher	12.2%	13.6%	
Partner Status	Partnered	19.7%	23.2%	p=.01
	Un-partnered	83.4%	76.8%	
Survey 2 (N=9693)		n= 7745	n= 1948 (20.1%)	
SF36 MHI		68.7	66.3	p<.001
SF36 PF		91.6	89.3	p<.001
SF36 GH		70.7	67.6	p<.001
SF36 SF		79.4	73.3	p<.001
Proportion of Life events (0-1)		0.08	0.10	p<.001
Education	Year 12 or less	32.4%	30.4%	p<.001
	Non-uni tertiary	24.0%	20.1%	
	Uni and higher	43.6%	49.5%	
Partner Status	Partnered	23.0%	22.8%	p=.8
	Un-partnered	77.0%	77.2%	
Survey 3 (N=9018)		n= 6725	n= 2293 (25.4%)	
SF36 MHI		70.7	69.2	p<.001
SF36 PF		91.4	88.5	p<.001
SF36 GH		72.9	70.3	p<.001
SF36 SF		81.9	75.6	p<.001
Proportion of Life events (0-1)		0.06	0.07	p<.001
Education	Year 12 or less	27.4%	21.9%	p<.001
	Non-uni tertiary	24.6%	23.9%	
	Uni and higher	49.9%	54.2%	
Partner Status	Partnered	59.5%	60.6%	p=.36
	Un-partnered	40.5%	39.4%	
Survey 4 (N= 9124)		n= 6702	n= 2423 (26.6%)	
SF36 MHI		72.5	72.3	p=.01
SF36 PF		91.9	88.9	p<.001
SF36 GH		74.4	72.0	p<.001
SF36 SF		82.6	77.4	p<.001
Proportion of Life events (0-1)		0.06	0.07	p<.001
Education	Year 12 or less	22.9%	18.6%	p<.001
	Non-uni tertiary	26.6%	25.2%	
	Uni and higher	50.4%	56.2%	
Partner Status	Partnered	73.7%	71.2%	p=.49
	Un-partnered	28.0%	28.8%	

Table 4 continued

		Did not Comment	Commented	
Survey 5 (N= 8254)		n= 5771	n= 2483 (30.1%)	
SF36 MHI		72.7	71.9	p=.05
SF36 PF		91.4	87.5	p<.001
SF36 GH		74.6	72.1	p<.001
SF36 SF		84.5	78.4	p<.001
Proportion of Life events (0-1)		0.06	0.06	p<.001
Education	Year 12 or less	19.8%	15.2%	p<.001
	Non-uni tertiary	26.0%	23.3%	
	Uni and higher	54.2%	61.4%	
Partner Status	Partnered	77.4%	46.5%	p<.001
	Un-partnered	22.6%	23.5%	

5.2.4 Analysis

All women who had completed Survey 2 (2000) or Survey 3 (2003) or Survey 4 (2006) or Survey 5 (2009) who had reported being diagnosed or treated for postnatal depression and had ever responded to the open-ended question at the end of the survey were included in the analysis (n=720). There were 379 of these participants who were not coded as their comments did not include any potentially predictive information; for example, information was simply notifying researchers of a change of address, or unrelated comments such as thanking the research team for conducting the research project.

The analysis was conducted using Nvivo 9 software (QSR International Pty Ltd 2010) after SPSS (IBM Corp 2010) was used to select the sample. A Microsoft Access database (Microsoft Office 2006) was used to collate the qualitative and quantitative datasets and Microsoft Word (Microsoft Office 2006) was used to display the data per participant before being merged into Nvivo 9 for analysis.

5.2.4.1 Content analysis

An initial content analysis was conducted using the principles of directed content analysis (Hsieh and Shannon 2005). As participants were free to complete the open-ended question or not, it was assumed that the choice of topics by participants was important to them and salient to their lives at the time of completing the survey. The content analysis therefore involved coding each of the comments for any potentially predictive life event, situation or health-related issue that may have been related to a later incident of postnatal depression. Codes were developed using deductive category application (Mayring 2000). Using the principles of directed content analysis, the results of prior research were utilised in order to identify initial categories. Definitions were then developed in keeping with prior research, as well as within the framework of the Brown and Harris model of depression. This approach enabled the researcher to then develop useful operational definitions of themes and in turn make direct comparisons with the findings of the quantitative findings, and to consider the theoretical implications of the findings. This process involved the development of initial codes upon first reading of the comments and as new codes were developed the comments were re-read to ensure that the codes were appropriate and had been applied in all necessary instances. The initial round of content analysis resulted in 379/720 participants not being coded at all due to the nature of their comments not providing any relevant information, most commonly these unrelated comments involved a change of address or thanking the research team for including them in the survey.

5.2.4.2 Thematic Analysis

A coding structure was developed after coding was completed, so as to not impose any bias on the structure by developing the structure prior to coding being conducted. This structure grouped similar themes into related groups for further interpretation. This allowed an unbiased evaluation of the comments to be gained without imposing pre-determined themes on the data. The thematic analysis also involved a deeper level of analysis than the content analysis – initial codes were read and re-read to categorise similar concepts and to develop a hierarchical structure on the codes. The thematic analysis resulted in 210 codes being reduced to 110 themes within 19 parent themes. The thematic analysis was conducted over a number of months to ensure that credibility could be gained through prolonged engagement (Lincoln and Guba 1985). In addition, themes were developed through a collaborative team approach, where thematic groupings were verified by two researchers (the candidate in the first instance and then primary supervisor). As a final means of analysis, the themes that were developed were conceptually mapped to indicate the relationships between themes.

5.3 Results

The results of the thematic analysis have been summarised in Figure 10. The major themes identified are shown and their relationships with other themes are depicted by overlapping or touching circles depending on the strength of the association between themes.

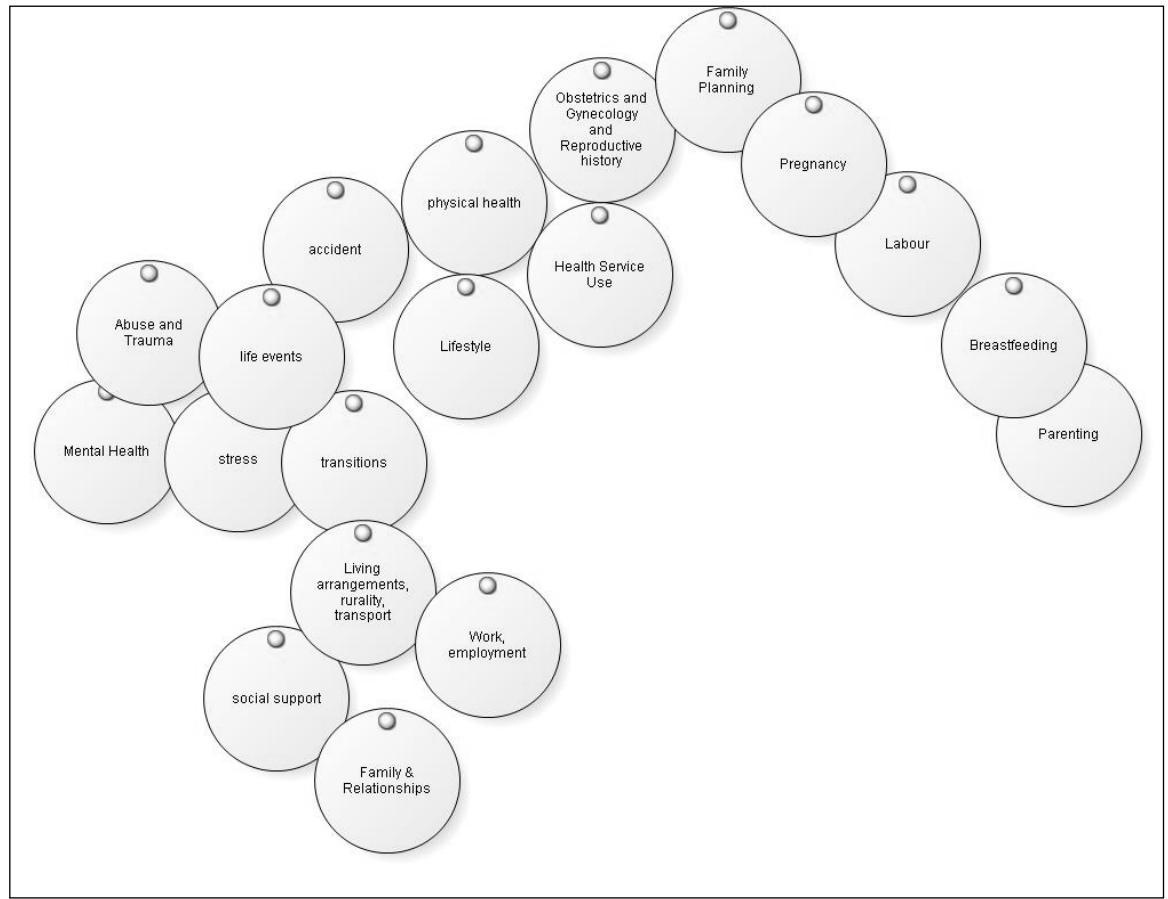


Figure 10 Relationship between major themes identified

The coding tree developed by this analysis can be found in Table 5. It shows both the main themes as displayed in Figure 10 as well as the subthemes organised under each main theme. A count of the number of unique sources for each theme is also displayed; although some themes were coded more than once per participant, but this has not been reported. Examples of the types of comments made for each category are shown in a more detailed table found in Appendix C.

The theme of '*Accident*' encompassed a number of comments describing injuries experienced by participants through accidents such as motor vehicle accidents. The '*Mental Health*' theme contains a number of subthemes primarily categorised by DSM-IV categories of mental health conditions described by participants. This section is particularly important as participants identified experiencing a number of less common mental health problems that were not covered by the quantitative survey items due to expected low frequency (such as bipolar disorder). The '*Obstetrics and Gynaecology*' theme covered descriptions of gynaecological health-related issues such as pap tests, sexually transmitted infections and endometriosis. The '*Lifestyle*' theme covered health behaviours such as smoking and alcohol as well as comments describing physical health issues relating to lifestyle and health behaviours. The '*Health Service Use*' theme encompassed comments to do with health care costs and unhappiness with health services. The theme also covered topics related to complementary and alternative medicine use and availability. The '*Abuse and Trauma*' theme covered descriptions of personal experiences of abuse including childhood abuse, sexual, and domestic abuse as well as abuse where the type of perpetrator was not identified. The '*Family and Relationships*' theme encompassed comments regarding relationship problems with family and friends. This theme also included descriptions of the stress associated with family member's ill health and caregiving. In addition, intimate partner relationships were described within this theme, including sexuality. The '*Life Events*' theme covered descriptions relating to stressful events and changes to lifestyle such as moving house, or starting a new job. In addition, specific stressful events such as divorce of parents, bereavement and adoption were included in this group. The '*Stress*' theme encompassed

descriptions of feelings and experiences of stress. In particular, stress relating to time pressure and financial stress were described in this theme. The '*Transitions*' theme describes life events that were not related to stress (as in the '*Life Events*' theme), such as overseas travel. The '*Physical Health*' theme covered descriptions of general physical health stress as well as specific conditions such as cancer, thyroid problems and headaches. The '*Social Support*' theme primarily encompassed descriptions of lack of social support and social isolation. In a minority of cases, presence of social support was described. The '*Labour*' theme encompassed descriptions of childbirth and labour. The comments were divided by a range of outcomes such as mode of delivery, premature birth and neonatal death. Similarly, the '*Pregnancy*' theme covered pregnancy-related comments with sub-themes for particular pregnancy outcomes such as termination, morning sickness and ectopic pregnancy. The '*Family Planning*' theme encompassed sub-themes such as timing of children and comments regarding infertility, as well as comments about contraception use. The '*Work and Employment*' theme covered comments regarding employment and unemployment. The theme also covered work-life balance comments and career decision-making comments. The '*Living Arrangements*' theme not only covered issues relating to area of residence, but also mobility within and around areas. Due to the oversampling of rural and remote participants, a number of comments were about rurality. In addition, comments regarding housing situations, such as share of tasks in the household, were covered in this theme. The '*Parenting*' theme encompassed comments relating to the participants experiences of parenting. These comments included discussion of childcare, sole parenting and step children as well as stress relating to parenting such as sleep

deprivation. The ‘*Breastfeeding*’ theme covered descriptions of breastfeeding experiences and in particular problems relating to breastfeeding.

Table 5 Coding tree

Theme	Count
Accident	9
Mental health	
Seasonal affective disorder	1
Anxiety	10
Self confidence	1
Depression	34
Mental breakdown	1
Menstrual problems and emotions	5
Emotional health	9
Eating disorder	14
Bipolar disorder	3
Antenatal depression	1
Suicidal ideation	1
PTSD	1
Control	1
Self perception	2
Agoraphobia	1
Obstetrics and gynaecology	
Gynaecological health	9
Ovarian cyst	1
PCOS	11
STIs	5
Abnormal pap test	7
Endometriosis	2
Stillbirth	3
Lifestyle	
Smoking	1
Illicit drug use	5
Alcohol	4
Physical health	1
Health service use	
Costs of medical care	3
Unhappy with health service	47
Public vs private health	2
CAM	2
Abuse and trauma	
Childhood abuse	6
Sexual abuse	4
Domestic violence	7
Abuse	14
family and relationships	
Relationship with mother	1
Relationship problems	17
Family health	6
Family stress	14
Sexuality	1
Caregiving	3

Table 5 continued

Theme	Count
Life events	4
Life stress	5
Lifestyle changes	7
Interstate move	1
Parents divorce	2
Adoption	1
Bereavement	5
Stress	13
Time pressure	3
Financial stress	8
Transitions	4
Overseas travel	6
Physical health	
Physical health stress	6
Asthma	1
Glandular fever	10
Cancer	22
Health conditions	25
Weight	12
Hormonal problems	2
Thyroid problems	14
Operations	1
Headaches	2
Back injury	2
Chronic fatigue syndrome	6
Prescription medications	1
Social support	2
Social isolation	4
Labour	
Labour stress	1
Childbirth complications	4
Disappointed with childbirth	1
Caesarean	3
Short labour	1
Premature birth	5
Traumatic birth	2
Neonatal death	2
Pregnancy	
Miscarriage	11
Ectopic pregnancy	2
Problem pregnancy	2
Unexpected pregnancy	2
Pregnancy stress	3
Pregnancy complication	4
Morning sickness	5
Termination	5
Family planning	
Dissatisfied with timing of children	7
Infertility	12
Contraception (inc the Pill)	6
Work, employment	3
Work stress	12
Unemployment	2
Career interruption	3
Education and work opportunities	5

Table 5 continued

Theme	Count
Work life balance	4
Living arrangements	
Isolation	13
Rurality	1
Mobility	5
Share of tasks	1
Parenting	
Parenting stress	1
Sole motherhood	9
Young motherhood	3
Child custody	2
Childcare issues	2
Sleep deprivation	4
Step-children	2
Infant health	10
Breastfeeding	3

5.4 Case Studies

The following two case studies are examples of the most commonly coded themes and additionally show the richness of longitudinal data available across the open-ended question of the ALSWH survey. Case Study 1 shows one participant's journey through infertility, her unhappiness with health services and her ongoing mental health problems. Case Study 2 describes the impact of rurality and life transitions on mental health. Not only do the qualitative comments show a developing story over time, but the inclusion of key quantitative data collected through the survey add richness to the comments made.

5.4.1 Case Study 1

The first case study is of a participant who was living in a rural area when she completed the Survey 1 in 1996 and was married. She reported never being pregnant. She spoke about her unhappiness with medical care across a range of services.

I feel that dental care is too costly and should be covered by my Medicare. Services have long waiting lists and many people I know would rather suffer in silence than go to a dentist. Emergency hospital care is disgusting with long waits and rude staff. There is a lack of radiologists and fertility services in my local area. Doctors and hospital staff seem to care more about money than their patients. I feel that my physical and emotional health is very poor and I am unable to get help. This I think is because of money and lack of services. Even professionals in the health industry don't care about my emotional health and only treat physical symptoms with quick fixes. Financial burdens [sic] make seeking treatment difficult.

At Survey 2 she was still living in a rural area, still married, had given birth to one child and was pregnant with another child. She also reported being diagnosed or treated for polycystic ovarian syndrome. She discussed mental and physical strain placed on her during her experience of fertility problems.

Your survey does not address any fertility problems and their effects on physical and emotional wellbeing/health. (except for Q38) Family planning/Infertility has consumed most of my adult life. It [sic] the cause of all my emotional & physical health problems. Polycystic [sic] Ovarian Syndrome is also hereditary. Passed from mother to daughter.

She also reported being diagnosed or treated for an anxiety disorder in the 4 years prior to completing the survey.

At Survey 3 she again reported living in a rural area and was married. Her score on the CES-D depression scale indicated a high likelihood that she was currently experiencing a depressive episode. She had given birth to two children. She described a range of life transitions and the strain put on her from being in a geographically isolated area. She also described her ongoing fertility treatment and unhappiness with medical services related to fertility and other health conditions. At this time she also reported being diagnosed or treated for an anxiety disorder and postnatal depression in the last three years.

This year has had alot [sic] of changes for me. I moved from my home of eight years and was forced to move twice. Lots of change. My life is now completely different even my transport has changed & family relationships. I have changed home twice - stress, transport - stress. In the last 12 mths [sic] only socially - stress, weight - stress, financially - stress, health - stress. Although my life is generally more positive now I feel less secure and socially inept. At the end of this year I plan to again do IVF infertility treatment to try for my 3rd child. I'm very disappointed with my local health professionals. Often not seeking needed medical advice due to cost. \$ a difficult decision when children are sick. As I approach IVF again I know I will need alot [sic] of medical care for up to a year. I feel the government has not done enough to ensure my quality of care. I'm afraid that local services will fail me. I feel alone. I will have Polycystic [sic] Ovarian Syndrome for life and probably anxiety problems as well. I feel these conditions

isolate me socially. But what is worse is that in my own town I feel there are no medical services that care.

At Survey 4 she again describes her dissatisfaction with medical services, this time commenting on mental health services. At this time she reports having four children in total with twins and another infant born between Survey 3 and Survey 4. She also reports being diagnosed or treated for anxiety, depression and postnatal depression in the last three years. Her CES-D depression score again indicated a high likelihood that she was experiencing a depressive episode.

Mental health services are difficult to obtain. I feel I've had alot [sic] of problems dealing with local doctors and their staff. The doctors are less understanding of mental health than the general public. Time restrictions make them less likely to listen and to[sic] quick to hand out scripts. I am very frustrated with available medical services for hospitals and specialists.

This case study shows the prevailing impact that infertility can have on a woman's mental health. While this participant had a number of children over the time of completing the surveys, she was unhappy with the timing of her children and perceived the stress of infertility and treatments for infertility as the key determinant of her poor mental health. In addition, the participant described several different interactions with health professionals for different conditions and was dissatisfied with many of these interactions.

5.4.2 Case Study 2

At the time of completing Survey 1, the participant was 23 years old, single and living in a remote area. She was studying part time at University. She made a brief comment about her impending marriage and current health. By Survey 2, the participant was married with two children, not in the paid workforce and had obtained a University degree. She discussed the pressures of motherhood and her emotional and physical health.

I have two children who are only 15 1/2 months apart in age. Both under the age of two. I find the full on full time care is often the reason I feel down and unmotivated. Topped with constant, housework, some days just seem to pass me by as if I don't exist. I love my children and family but look forward to the next few months as the youngest becomes more independent and therefore gives me more time to do things. The biggest hurdle is the fact that the youngest is still waking once a night and I am feeling tired. I am really looking forward to her sleeping through on a regular basis. Once she achieves that I will feel like a new person because I will be getting a solid night's sleep. An area that the survey didn't seem to cover was worry. I have found that as a mother I often worry when my children are sick and this definitely affects my health. We have had some awful experiences with the hospital and the treatment of our eldest daughter and the worry with this situation had a big impact on my emotional and physical state.

By Survey 3, the participant was still living in a rural area, married and in the paid workforce for 16-24 hours per week. She had given birth to two children and was pregnant with her third child. She reported she had had been diagnosed with depression

and discussed her history of depression and her relationship with her husband. While she did not identify that she had experienced postnatal depression at the time, she later reported (in Survey 5) that she had been diagnosed or treated for postnatal depression after the birth of her second child.

Q12 asked if I had been diagnosed with depression. The depression occurred in 1995 and 1996 but it wasn't until 2001 that I received a diagnosis after going through two brief episodes both mild. 3 sessions of counselling [sic] helped me to close the door on this depression mostly caused by a work situation. Q 80 refers to stress levels with my partner. As noted throughout the survey I have had no other sexual partners or serious relationships before marrying my husband. With the stress of becoming parents, raising [child's name}, managing finances etc I began to wonder if I had given myself enough opportunities or if I should have had other partners. For a while I felt unfilled both emotionally & physically. With advice & lots of thought (sole [sic] searching) our relationship is good now. I suffered two serious illness last year. Influenza and a viral illness that caused me to be ill for 5 weeks and unable to carry out daily chores. There was no specific reason for being so ill either time. My Doctor was concerned that I was so ill. I am now exercising more and trying to eat more fruits, veg & drink more water.

When completing Survey 4, she was still living in a rural area and still married with three children. She was working 1-15 hours casual paid work per week. The participant discussed her relationship with her husband and her emotional health. She also reported being diagnosed or treated for depression in the three years prior to completing the survey.

You asked several times about our emotional health but you did not ask why we feel happy or down. Generally I am a happy, optimistic person but my emotional relationship with my husband currently is not meeting my needs. This can cause me to feel lonely at times, down and feeling like I am overwhelmed. He does not listen well, I feel that at times his work is more important and that I come second. We did a course called celebrate love through the catholic church which was great but it hasn't resolved these feelings as 8 months later they are back. I will keep working on it! There are lots of reasons why a person can feel depressed. My example is just one.

By the Survey 5, the participant was still married, living in a rural area and had three children in total. She reported working 1-15 hours per week like she did at Survey 4. The participant did not report another incident of depression or postnatal depression, nor does she discuss her emotional health and her family as she did in previous surveys. She discusses the stress related to building a home and moving back to the area that she was originally from.

I am currently in between homes. We have left our home of 10 years to move into a new home built by us and a new area I am originally from. While it is an exciting time it is very stressful and this has impacted on some of my answers.

This case study shows an ongoing experience of depression and how it may be related to postnatal depression. In addition, problems with partners and social support are depicted in this case study.

5.5 Discussion

5.5.1 Language used by participants

The language used by participants in these comments provided valuable insights into how practitioners can most appropriately discuss psychosocial history with women. Importantly, the keyword search strategy employed to uncover comments relating to postnatal depression did not yield an adequate number of comments for analysis, while the mixed methods strategy uncovered numerous comments describing postnatal depression. This second strategy identified that women were likely to describe the symptoms and experiences of postnatal depression without identifying the event as 'postnatal depression'. Importantly, the slight increase in detecting the term 'postnatal depression' in more recent surveys was commensurate with the increased number of women having children for the first time as they aged. This is surprising as many psychosocial screening and education programs were initiated over this time period, but were not related to an increase in discussion of the condition in the comments. These findings indicate that for some women, symptomatology might be a more suitable strategy for discussion by health practitioners rather than direct labelling of the event as 'postnatal depression'.

In addition, the free-text comments provide numerous examples of the common terminology used by women of this age group to describe psychosocial history. For example, participants commonly described 'mental health' without defining the mental health condition that they were experiencing such as describing the symptoms related to the condition rather than the actual condition. These findings indicate that phrases such

as ‘previous mental health’ might be more appropriate in psychosocial screening than ‘previous depression’ or ‘previous anxiety’.

5.5.2 Commonly discussed topics

5.5.2.1 Mental health

As the results from Study 1 also indicated, mental health problems were commonly experienced by women who later experienced postnatal depression. Commonly participants described experiences of depression, stress and anxiety in the years prior to motherhood. Additionally, some women described other mental health problems that typically have a low prevalence in the community such as bipolar disorder and eating disorders. These findings are in keeping with previous literature that has found a significant relationship between previous mental health problems and postnatal depression (Beck 1996, Robertson, Grace et al. 2004), however the results from the current study also provide insights in to the experiences of previous mental health problems for women. For example, in Case Study 2, the participant described feeling “down” and “overwhelmed” at times, which may not always coincide with an episode of clinically significant depression, but indicate that for some women, the experience of mental health deficits may be common.

5.5.2.2 Life events

Study 1 demonstrated there was a significant relationship between experience of stressful life events and subsequent postnatal depression. In Study 2, women commonly described experiencing stressful life events such as bereavement, abuse and lifestyle

changes. In addition, the qualitative comments provided enrichment of these concepts, by relating these experiences to emotional deficits such as stress and decreased mood.

5.5.2.3 Reproductive history

A large proportion of participants described adverse reproductive events prior to postnatal depression. These results are important, as the findings from previous research have been contradictory for these factors. The findings reinforce previous literature that has found a relationship between pregnancy loss and later postnatal depression with a healthy birth (Blackmore, Cote-Arsenault et al. 2011). While more rigorous, quantifiable research is required, these results indicate that adverse events may have a long-term impact on women's mental health, and that women who have experienced pregnancy and infant loss may be a key group to target interventions towards.

5.5.2.4 Unexpected findings

Surprisingly, a large proportion of participants described ongoing unhappiness with health services. These results were particularly compelling when examining data longitudinally, as in Case Study 1, where dissatisfaction with health services was consistently experienced over time. These results may also indicate that early negative experiences with health professionals may impact on later trust and rapport with health professionals. This may in turn decrease the likelihood that women will disclose personal information to their health professional.

These findings indicate that trust and rapport by health professionals is not only important in the perinatal period in order to detect mental health problems but is a key factor over time. In turn, practitioners who are likely to come in to contact with women

of childbearing age or younger should be trained to be aware of the importance of rapport prior to pregnancy for later reliable screening.

5.6 Relationship between themes

Figure 10 shows the relationship between major themes found in the data. The major intersections are described below. While the overlap of themes cannot be completely depicted in the diagram, the most common overlap is presented.

5.6.1 Mental Health + Abuse and trauma

The concepts of mental health and abuse and trauma were often contained in comments together. For example, while only a small number of participants described experiencing abuse, most described experiencing depression at the time of the abuse or subsequently. While not typical, the following comment depicts the relationship between mental health and abuse. While many other stressful life events occurred, the participant drew a direct relationship between an experience of postnatal depression and being in an abusive relationship.

For 2 years I was in a abusive relationship. I was 19. I was ex-communicated from my religion. (Sex before marriage). Family rejection I fell pregnant and moved to QLD. I did not get to make any friends. Did not get on with his family. Felt trapped for a long time, attempted suicide 4 times. Had major post-natal depression in abusive relationship. Finally ended it. Had son kidnapped - 12 month court battle. Had nervous breakdown, went from 62 kgs to 48. New relationship was the same. Has just been ended. I am in pain just laying down - no

fat. I don't play sport but will work - up and about for hours before I eat won't eat breakfast, rarely lunch. No appetite at all. July 96 I was diagnosed with Attention Deficit Disorder. My need for peace, health and calmness is desperate [sic]. The medication (Dexametaphine) is great. But I've just broken off another relationship and I am moving to [gave address].

5.6.2 Mental Health + Stress

Several participants described previous mental health and the relationship with stress.

For example, the following participant recalled the stress associated with post-traumatic stress following a stressful experience with her infant.

Suffering post-traumatic stress, due to giving birth 4 months ago and having to turn my daughters [sic] life support machine off. We were given no hope for survival and if she did live we were told she would be severly [sic] handicapped. I prayed for her to die. She is now a very health, hopefully unhandicapped, gorgeous child. There is no sign of any disabilities but no guarantee. I am taking a long time to get over this emotionally, so my answers are very different to what they would of been six months previous and hopefully six months later.

5.6.3 Stress + Life events

A number of participants who described major life events also described their experience of stress as a direct result of the life event. Stress was described in the context of an accumulation of many different life events or changes in life situations.

For example the quote below depicts a large number of life changes and a direct relationship to stress was drawn by the participant.

Part of my issues stem [sic] from major life events - controlling, obsessive, sometimes [sic] violent father, parents separated [sic] at 19, pregnant at 20 10 1 night stand, [infant's name] born 21, engaged 22 to father of above, married 23, separated 24, divorced 25, single parent, relationship 27, de facto 28, engaged 29, still await catholic annulment [sic] (3 years in progress) & uni, post grad uni, work full time, bought & sold 3 houses, etc etc etc. My answers reflect stress, health of above.

5.6.4 Stress + Transitions

Several participants described their ongoing reaction to stressful events during their life, including life transitions. In the example below, the participant describes her experience of stress over time, and then describes how life transitions such as close relationships and study further impact on her stress levels.

I have found that in the last five years I have suffered illnesses caused by stress. I have had a thyroid problem in the past, when i was 15, which was so severe it has now left me to consume tablets on a daily basis to maintain my thyroxine level. Yet as my life has encountered other experiences such as boyfriends, study and problems with other friends, I have found I have become less tolerant to stress.

5.6.5 Transitions + Living arrangements, Rurality, transport

The issue of life transitions was also described in the context of living arrangements and rurality. In the example below, the participant describes how life transitions such as moving for study are further exacerbated by rurality.

As a student, it was hard to move out of home, into a city to attend a university all at the same time (ie a lot of new roles and responsibilities all at once) I found that there are not very many support services to help this.

In this example, social support is also related to rurality, a related issue that is described later.

5.6.6 Living arrangements, Rurality, transport + Work, employment

Living arrangements, and in particular rurality, was also related to work and employment. In the example below, the participant relates her difficulties experienced obtaining work not only to childcare arrangements but also to rurality – asserting that employment would be easier in a larger city.

I would love to be working. The extra cash would make life easier. It is difficult to get a job that suites [sic] school hours & I don't live close by to any big cities. Travel would make it to[sic] difficult and there is no before or after school care in my area.

5.6.7 Living arrangements, Rurality, transport + Social support

Rurality was commonly described in relation to social isolation and lack of social support. In the example below, the participant described her mental health problems in relation to her rurality and subsequent social support.

I have had a big change in my life in the last few months which accounts for a lot of my responses. I have just graduated and am currently doing relief teaching. My partner and I have just moved to a small town in remote Western Australia. As a result I am feeling very isolated because I have no friends or family around me and only casual work. Since this is not what I expected upon graduating from uni, myself esteem has taken a bit of a hammering. Luckily this move is only temporary, and in a few months I will be back in a vibrant city.

5.6.8 Social support + family and relationships

The connection between social support and family and relationships can be seen in the example below. The participant describes her feelings around her lack of social support due to a relationship she was in at the time. She makes a direct connection between the two concepts and rhetorically questions the relationship quality, owing to the reduction in social support provided by family and friends.

Some of the questions made me feel upset, thinking about loneliness and peoples support, being understood and communicating that understanding I am in a serious relationship now, yet at least once a week I am unsure about my feelings and his. I don't know if I have emotional insecurities or whether this is truly [sic]

a bad relationship. When I feel this way I become withdrawn and my friendships suffer. I do not think that I am as easy going as I have been in the past..

5.6.9 Transitions + Life events

Life transitions and life events co-occurred in a small number of comments. In this extreme example, the participant describes a number of stressful life events that also occurred while she was married, found employment, and subsequently divorced. She relates the large number of stressful events to the high levels of stress experienced in addition to the stress likely to be experienced during life transitions.

Part of my issues stem from major life events - controlling, obsessive, sometimes [sic] violent father, parents separated [sic] at 19, pregnant at 20 10 1 night stand, charlotte born 21, engaged 22 to father of above, married 23, separated 24, divorced 25, single parent, relationship 27, de facto 28, engaged 29, still await catholic annulment [sic] (3 years in progress) & uni, post grad uni, work full time, bought & sold 3 houses, etc etc etc. My answers reflect stress, health of above.

5.6.10 Life events + Accident

A small number of participants described experiencing accidents. Related to this issue is the experience of life events, for example in the quote below where the participant described the ongoing impact of her accident on later events.

Had a motorbike accident in my 2005. On a 2 year waiting list for knee reconstruction, not as physically fit as was before the accident. Also not knowing

when the opp is before having children was verry [sic]satisfied with life had very bubbly personality, only just came off medication for depression from first child.

5.6.11 Obstetrics and genecology and reproductive history + Family planning

These two themes were commonly related through polycystic ovarian syndrome (PCOS) and fertility problems, as PCOS commonly leads to fertility problems. In the example below, the participant directly describes her diagnosis of PCOS and her fertility issues.

Q31 says to mark one only but both of us have fertility problems. This form was filled in 4 weeks after finding out about me having Polycystic Ovaries Syndrom [sic] & impared [sic]glucose tolerance & him having a low/bad sperm count. So a lot of stress has come from this situation.

5.6.12 Family planning + pregnancy

Family planning and pregnancy was directly related by a number of participants, who described unhappiness with pregnancy. In the example below, the participant not only describes her unhappiness with timing of children in relation to her employment, but also the feelings associated with her current pregnancy.

What your survey will fail to pick up are the stresses & difficulties I have experienced over the last 24 mth [sic]. Whilst, they are not major life stresses, I - who have previously been quite successful & able to cope with things - have found life pretty hard (emotionally, physically, mentally). The trigger to this tough 24

mths [sic] was when I fell pregnant, unexpectedly after just gaining a good job. We decided to go ahead with the pregnancy but feelings of ..um,...uncertainty plagued my pregnancy & the first year of Jonathan's life.

5.6.13 Pregnancy + Labour

While pregnancy and labour are logically related, very few participants described the experiences of pregnancy and labour at the same time. They were more likely to describe a previous labour in relation to a current pregnancy than they were to describe the pregnancy and labour for one child. In the example below, an unplanned pregnancy is described in the context of labour events.

Further, the birth was horrific - public hospital (because we hadn't planned for pregnancy), went into labour 10 days early (wasn't ready), 18 1/2 hr labour, 2 x epidurals that didn't work, not able to get off bed for entire time due to monitors, 2nd degree tear, placenta didn't come away after birth & needed to[be] manually (& brutally) removed...

5.6.14 Breastfeeding + Parenting

Like pregnancy and labour, breastfeeding and parenting are conceptually related while very few participants related the two concepts directly. In the example below, the participant explains how her problems with breastfeeding impacted on her self-perception as a parent. While she does not describe how this may have impacted on her parenting style, it is evident that there was a link between the two concepts and indeed both were related to her experience of postnatal depression. This example shows the

complex nature of events in the postpartum, and how depressive symptoms may not be the only problem worthy of intervention for women.

With breastfeeding question - both pregnancies I had difficulty feeding my children but knew of the benefits of breastmilk so I expressed & bottle fed both breast milk exclusively for 3 months but the pressure of people assuming that they are not being fed breast milk was quite stressful. Just beacause [sic] they were not attached - I was deemed a bad mum - the effort to feed a bottle then a baby is huge. Because I couldn't do it the 'natural' way people made me feel inadequate, not normal - this compounded the postnatal depression symptoms. I still am quite emotional but receiving help

5.7 Strengths

The use of longitudinal qualitative data offers a richness of information that is not obtainable through quantitative means alone. The analysis of qualitative data would not have been possible without the inclusion of quantitative data, as very few participants actually discussed their experience of postnatal depression. In addition, the thematic analysis allowed the conceptual mapping of themes in order to explore how they may fit together and related to one another. This analysis was further enriched by the inclusion of quantitative data as in the case studies provided.

5.8 Limitations

While thematic coding of data and the large number of data would indicate that results were reliable, the limitations should also be acknowledged. In particular it should be

noted that the associations between prior events were made by the researchers and not by the participants. It is also unlikely that the participants reported all predictive events, and likely that they reported those that were salient at the time of completing the survey, therefore the results may not be as comprehensive as if the participants were directly asked to recall specific events.

5.9 Conclusion

The results of this analysis informed the development of the analysis in the following chapter. These results coupled with an analysis of previous literature have allowed the development of a comprehensive set of predictors of postnatal depression. The inclusion of qualitative free-text data in this analysis ensured a person-centred focus in the following quantitative analysis. While no specific framework was imposed on the participants' responses, they were free to comment on any issue they felt had been missed in the quantitative survey. This approach indicates that these issues were important and currently salient to the participants' life, adding strength to the data captured by this method. The results of this chapter informed the selection of variables for the next quantitative exploration of the predictors of postnatal depression as well as provided insights in to topics that were not covered in the survey.

Chapter 6. Longitudinal analysis of the predictors and antecedents of postnatal depression (Study 3)

A summary of the findings in this chapter have been presented elsewhere:

- Holden L, Dobson A, Byles J, Chojenta C, Dolja-Gore X, Hockey R, Lee C, Loxton D, Mishra G. *Mental Health: Findings from the Australian Longitudinal Study on Women's Health*. Report prepared for the Australian Government Department of Health and Ageing, 2013.
- Chojenta C, Loxton D, Lucke J, Forder P. *A longitudinal analysis of the predictors and antecedents of postnatal depression in Australian women*. Poster presentation at the International Marce Society Conference, Paris, France, 3-5 October 2012.

6.1 Introduction

The previous chapter described an analysis of longitudinal qualitative comments to an open-ended question in order to explore the life events and experiences prior to the experience of postnatal depression. In particular, factors such as prior stressful life events and prior mental health dysfunction were identified in this analysis. These findings, along with a thorough literature review, were used in the development of the range of risk factors to be investigated in the following study in this chapter.

The purpose of this chapter was to explore in more detail the relationship between a range of psychological, health and social factors and postnatal depression. In particular, both proximal and distal measures of factors were utilised in order to explore the associations between these factors and postnatal depression. Data collected over a 13 year period from the 1973-78 ALSWH cohort was used to construct a model of the predictors of postnatal depression. As discussed in Chapter 2, previous research has

indicated a large range of predictors to be significantly associated with postnatal depression. Of particular note, a large scale study by Milgrom et al (2008) examined the relationship between several antenatal risk factors and postnatal depression in Australian women. Measures of postnatal depression and risk factors were taken antenatally and repeated six weeks postpartum. However, this study did not take into account the cumulative impact of multiple pregnancies using a longitudinal perspective. Additionally, this study relied on retrospective recall of risk factors by participants.

Results of the literature review indicated that a range of demographic, health behaviour and mental health factors were important. In Chapter 4, preliminary ALSWH analyses specified that prior mental health factors and social support were important. In the previous chapter, experience of stressful life events was found to be important in the lives of women having children and the aetiology of postnatal depression. However, shortcomings of current research (cross-sectional, clinical samples), the preliminary ALSWH analysis and the non-representative nature of the analysis in Chapter 5 mean that a longitudinal prospective analysis is required. The current chapter describes such analysis.

While previous research has highlighted a range of risk factors for postnatal depression, no studies to date have examined a comprehensive set of risk factors at a population level using data collected prospectively. The purpose of this chapter was to explore in more detail the enduring relationship between a range of psychological, health and social factors and postnatal depression.

6.2 Method

Longitudinal data collected through the ALSWH was analysed in a multilevel mixed model in order to assess the predictors of postnatal depression. Data from Survey 5 of the 1973-78 cohort were used in combination with data from Surveys 1-4 in order to measure both proximal and distal predictors of postnatal depression.

6.2.1 Participants

There were 8200 participants who completed Survey 5 in 2009 and of these there were 5219 participants who reported ever giving birth to a child. In total there were 10407 births reported. In order to examine individual births, each infant was examined as an individual record, with multiple records for women who have had more than one child. The inter-correlation of family units was taken into account in the multilevel model, so that the events of previous pregnancies and births were accounted for in the history of subsequent births. For the purposes of this analysis when describing the events of each child, the term ‘reference child’ was used, to distinguish between older children within that family.

6.2.2 Measurement of postnatal depression

In previous surveys (Surveys 2, 3 and 4), postnatal depression was assessed in a question that asked “In the last 3 years were you diagnosed or treated for: postnatal depression” along with a series of other mental and physical health conditions at Survey 5. In order to more closely examine the relationship between birth outcomes and postnatal depression, the postnatal depression item was moved to the childbirth section of Survey 5. This question asked the participant to report the dates of birth of each of

their children in addition to answering a series of questions for each child. The postnatal depression item was contained in a question that asked “were you diagnosed or treated for: postnatal depression” along with other physical and mental conditions. A copy of these questions can be found in Appendix A. “...While this approach enabled the examination of postnatal depression for each of the children reported by each participant, this approach also had some limitations. Firstly, this approach resulted in a retrospective reporting of postnatal depression, which may have resulted in an over-reporting of the condition (Gregory, Masand et al. 2000). In addition, the self-report nature of a diagnosis of postnatal depression may have resulted in an under-reporting of the condition as women who experienced the condition may not have received a diagnosis from a doctor. Additionally it is not clear if participants responded affirmatively when they received a formal diagnosis, or only when they self-determined they had experienced some symptoms of depression. The limitations and implications of the measure of postnatal depression are discussed in more detail in Section 8.6.”

6.2.3 Sample

For their data to be included in Study 3, participants must have completed Survey 5 (2009). Figure 8 in Chapter 3 describes the sample composition in more detail. There were 8200 participants aged 31 to 36 who completed Survey 5, and of these there were 5219 participants who reported giving birth to a child. In total there were 10407 births reported.

6.2.4 Measures

For this longitudinal approach, a range of measures were developed:

- a) Distal/history variables which occurred prior to reference birth
- b) Proximal/current variables which occurred at the time of the reference birth
- c) Maternal factors not directly related to the birth (eg demographic factors)

6.2.4.1 Child birth predictors

Survey 5 contained a series of questions on birth-related events and outcomes that participants completed for each of their children. The question asked “Did you experience any of the following?” and a list of events such as ‘episiotomy’, ‘epidural or spinal block’ and ‘gas or injection for pain relief’ followed. There were nine numbered columns to allow participants to complete each question for each of their children. The date of birth of each child was also recorded. A copy of the childbirth questions can be found in Appendix D. In this section, the child birth events recorded for each individual child were evaluated.

6.2.4.2 History of child birth predictors

In addition to examining the child birth events for the reference child as above, the child birth history was also evaluated. For the reference child, a history variable for each child birth event asked in Appendix D was created for previous births by the woman. For example, if the reference child was the woman’s third child and she reported having an

episiotomy for either her first or second child, the history of episiotomy was coded as ‘yes’ for Child 3.

6.2.4.3 *Mental health history predictors*

The mental health status of the mother at the time of each child birth was also evaluated using the survey data prior to, and current for, the birth of each child. Several strategies for evaluating mental health history at the time of each birth were used, depending on the way in which questions were asked. For history of conditions (depression, anxiety, postnatal depression, antenatal depression, postnatal anxiety and antenatal anxiety) and for history of self harm or suicidal ideation, the date of birth of the child (recorded in Survey 5) was used in conjunction with the date that surveys were returned in order to calculate whether a mother reported any of these conditions prior to the birth of that child. These newly created history variables were coded as ‘yes’ or ‘no’ for any prior report of each of the conditions. For the three mental health scales (SF-36 Mental Health Index, Life Orientation Test Revised (LOT-R), Mean Stress), the most recent survey prior to the birth of the child was assessed using the date of birth of the child (recorded in Survey 5) and the date surveys were returned. The score for these scales was taken from the most recent survey prior to the birth of the child.

6.2.4.3.1 *SF-36 Mental Health Subscale*

Each survey contains the SF-36, a widely used and validated quality of life instrument. The SF-36 has been validated in an Australian context (McCallum 1995). The SF-36 contains 36 items that assess eight health domains – physical functioning, role limitations because of physical health problems, bodily pain, social functioning, mental

health (psychological distress and psychological well-being), role limitations because of emotional problems, vitality (energy/fatigue) and general health perceptions (Ware and Sherbourne 1992). The mental health subscale is calculated based on five items as shown in Appendix E. A score ranging from 0-100 was constructed based on responses to the five items with a score of six for ‘all of the time’ through to a score of one for a response of ‘none of the time’. A low score indicates poorer mental health. A categorical variable was calculated with four levels for further analysis. Details on creation of this variable are available in Appendix E.

6.2.4.3.2 Life Orientation Test Revised (LOT-R)

An abbreviated version of the Life Orientation Test Revised (LOT-R) (Scheier and Carver 1985) was included in the ALSWH 1973-78 cohort Survey 2 onwards. The scale was abbreviated by the ALSWH Research Team to exclude those items that did not load on to the factors after an exploratory factor analysis was conducted (see www.alwsh.org.au/infodata). The revised scale contains three positively rated and three negatively rated items, that are scored (negative items reversed) and a summary score ranging from 0-24 is calculated. See Appendix F for details on the creation of a categorical variable for further use in this analysis.

6.2.4.3.3 Mean Stress Score

After pilot testing with the ALSWH 1973-78 Pilot Group, a stress scale was developed and repeated in every survey of the 1973-78 cohort. The scale asked about perceptions of stress on a number of domains such as finance, relationships and health (see Appendix G for the items asked). The items are scored on a scale of zero to four and a

mean stress score calculated on the same range. Details on the creation of a categorical variable based on the mean stress score can be found in Appendix G.

6.2.4.4 *Reproductive history predictors*

At each survey, participants were asked about their experience of a range of reproductive events such as stillbirths, miscarriages, terminations and ectopic pregnancies. A history variable for each of these events was created by using the date of birth of the child and the dates of survey completion. These variables therefore measured experiences of adverse reproductive events prior to the birth of the reference child.

6.2.4.5 *Infant health and postpartum predictors*

Several infant health and postpartum predictors were assessed in Survey 5. For each child, premature birth and low birth weight status was asked (see Appendix D for a copy of the survey questions). In addition, diagnosis or treatment for antenatal anxiety was asked for each child (coded zero for 'No' and one for 'Yes'), as was number of months the child was breastfed. A new variable on breastfeeding was created, and those children that were breastfed for less than six months were coded as one and those who were breastfed for more than six months were coded as zero. Those that were currently being breastfed were coded as zero, as it was not possible to determine when their breastfeeding would cease (ie assumed breastfeeding stopped prior to six months). This approach took a conservative estimate to breastfeeding duration based on the low rates of breastfeeding reported in this population elsewhere (Hure, Powers et al. 2013).

6.2.4.6 History of infant health and postpartum predictors

Using the date of birth of each child and the date of survey completion, history of infant health and postpartum predictors were calculated. New variables for history of premature birth, low birth weight and breastfeeding for less than six months were created. Using data from the older siblings born prior to the reference child, new variables were created and coded as either 'yes' or 'no' to indicate a history of these infant health and postpartum conditions when the reference child was born.

6.2.4.7 Social support predictors

The full version of the Medical Outcomes Study Social Support Index (Sherbourne and Stewart 1991) was included in Survey 4 and Survey 5 and an abbreviated form of the Index was included in Survey 2 and Survey 3. The index measures functional support and contains four factors – 'Emotional/informational support', 'Tangible support', 'Affectionate support' and 'Positive social interaction'. Following a factor analysis of the structure of the scale, the last two factors were collapsed into one factor. The emotional/informational subscale contains measures such as 'someone to count on to listen to you when you need to talk' and 'give you good advice about a crisis'. The tangible support subscale includes items such as 'someone to help you if you are confined to a bed' and 'take you to the doctor if you need it'. The affectionate support and positive social interaction combined factor includes items such as 'someone to have a good time with' and 'someone to love and make you feel wanted'. For this analysis, the most recent report of social support was used using the date of birth of the reference child and the date of survey completion. This method of evaluating social support yielded 17-19% missing data for the newly created variables due to incomplete survey

waves by a number of participants. In order to maximise data, any missing data was replaced with the results of the social support items from Survey 5, as social support has been widely considered a stable trait and unlikely to have changed over the span of the surveys (Sarason, Sarason et al. 1986). Analyses were conducted both with and without imputed data for the 17-19% missing and the relationship with postnatal depression was not significantly different.

6.2.4.8 History of poor health behaviours predictors

A history of poor health behaviours such as tobacco use, illicit drug use and risky alcohol use were evaluated for each woman per child. Tobacco use was evaluated at each survey using a number of questions such as ‘How often do you currently smoke cigarettes or any tobacco products?’ and ‘In your lifetime, would you have smoked at least 100 cigarettes (or equivalent)?’. These items were then used to evaluate smoking status in keeping with the categories developed by the Australian Institute of Health and Welfare as ‘never smoker’, ‘ex-smoker’, ‘irregular smoker’, ‘weekly smoker’ and ‘daily smoker’ (Australian Institute of Health and Welfare 2000). A new variable for tobacco history was then developed per child using the date of birth of the child and the date of survey completion. If the mother was categorised as either an ex-smoker, irregular smoker or current smoker (weekly or daily) at any survey prior to the date of birth of the child, the newly created ‘tobacco history’ variable was coded as ‘yes’ and carried forward for data of subsequent births. A similar procedure was used to create an illicit drug history variable. If the mother reported using any illicit drugs at a survey prior to the birth of the child, the ‘illicit drug history’ variable was set to ‘yes’. Illicit drug use has been evaluated since Survey 2 of the 1973-78 cohort by asking if the participant had

tried a series of illicit drugs either in the last twelve months or more than twelve months ago. A history of risky drinking was evaluated using a similar strategy, where risky drinking was defined as consuming more than 15 drinks per week (National Health and Medical Research Council 2001). Alcohol consumption was evaluated with a series of questions on quantity and frequency of use, and the risky drinking variable was derived based on these questions.

6.2.4.9 *Stressful life events predictors*

Respondents were asked to indicate whether they had experienced a range of life events either in the last twelve months or more than twelve months ago, from a check list derived from Norbeck (1984). The items measured included relationships, work stresses, beginning or resuming study and other events relevant to the age group. The list of life events contained in Survey 5 can be found in Appendix H. The proportion of life events score was calculated for events experienced in the last twelve months. All events found in the list were used to create the score with the exception of ‘major personal illness’, ‘major personal injury’, and ‘major surgery’, which are used for face validity. The proportion of life events score ranges from zero to one. The most recent proportion of life events score prior to the birth of the reference child was evaluated using the date of birth of the child and the date surveys were returned. A new variable called ‘previous proportion of life events’ score was created. This variable was then converted from a continuous score to a categorical variable. Details of this conversion can be found in Appendix H.

In addition to the stressful life events scale, an item on experience of partner violence has been included in every survey. This item was used to create a new variable indicating history of partner violence in conjunction with the child's date of birth and the date of survey completion. If the mother had ever reported being in a violent or abusive relationship in a survey prior to the date of birth of the child, the partner violence history variable was coded to 'yes'.

6.2.4.10 General health predictors

The general health subscale of the SF-36 was used to assess physical health, based on the responses to the items found in Appendix I. A score ranging from 0-100 was constructed based on responses to the five items with a score of six for 'all of the time' through to a score of one for a response of 'none of the time'. A high score indicates better general health. A categorical variable was calculated with four levels for further analysis. Details on creation of this variable are available in Appendix I. In addition, overweight was assessed utilising the body mass index (BMI) as calculated by height and weight reported at each Survey. Overweight was categorised as a BMI greater than 25 and less than 30 and obese was categorised as a BMI greater than 30. A history of overweight or obese was created using the child's date of birth and date survey was completed in conjunction with anthropometric data from each survey. A history of overweight variable was created and responses were coded 'yes' if the participant recorded a BMI greater than 25 at any survey prior to the date of birth of the child.

6.2.4.11 Pregnancy-related health predictors

Several pregnancy health conditions were assessed in Survey 5 for each child that was reported by each participant. Conditions such as gestational diabetes, gestational hypertension as well as antenatal depression and anxiety were reported for each birth.

6.2.4.12 History of pregnancy-related health predictors

The history of pregnancy related health conditions was assessed per child. History of gestational diabetes and gestational hypertension are reported in the following section and the history of antenatal depression and anxiety are reported in the section on mental health history (see Section 6.2.4.3 for more information).

6.2.4.13 Demographic predictors

A number of demographic factors were examined at the univariate level. The most recent reporting of each demographic factor was recorded in a set of new variables, based on the date of birth of the child and the date the survey was returned.

6.2.4.13.1 Income

Income stress was assessed using the ‘money’ item in the ALSWH Stress Scale (see Section 6.2.4.3.3 for further information on this scale). The question asked, ‘Over the last 12 months how stressed have you been about the following areas of your life: Money?’, with response options on a scale from ‘not at all stressed’ to ‘extremely stressed’. See Appendix J for a copy of the question.

6.2.4.13.2 Education

Participants were asked about their highest qualifications at each Survey of the 1973-78 cohort. A copy of the question can be found in Appendix J. Categories were collapsed

in to three groups; ‘Year 12 or less’ (No formal qualifications / Year 10 or equivalent / Year 12 of equivalent), ‘non-University tertiary’ (Trade/apprenticeship / Certificate/diploma) and ‘University degree or higher’ (University degree / Higher university degree).

6.2.4.13.3 *Employment*

Current employment status was evaluated using the question found in Appendix J.

Categories were collapsed to include ‘in labour force, employed’ (paid shift work / paid work with irregular hours / paid work on short term contract / paid work in more than one job / paid work at night / paid work from home / self-employed) and ‘not in labour force / unemployed’ (I don’t do any paid work / none of the above).

6.2.4.13.4 *Sexual orientation*

A question on sexual orientation was asked at Survey 2 and Survey 3 of the 1973-78 cohort. The question from Survey 3 can be found in Appendix J. Categories were collapsed to ‘heterosexual’ and ‘homosexual/bisexual’.

6.2.4.13.5 *Partner status*

A question on marital status has been included in all Surveys (see Appendix J). The categories were collapsed to ‘partnered’ (married / de facto (opposite sex) / de facto (same sex)) and ‘not partnered’ (never married / separated / divorced / widowed) for further analysis.

6.2.4.13.6 Area of residence

The residential and postal postcode for each participant was asked in each Survey (see Appendix J). From the residential postcode, the positional longitude and latitude were calculated for each participant. For analysis purposes the coordinates were classified by area of residence based on ARIA+ score (Department of Health and Aged Care (GISCA), 2001). This score was then dichotomised to be either ‘urban’ or ‘rural/remote’.

6.3 Analysis strategy

For this analysis, each child recorded in the dataset was treated as an observation (ie a row of data) such that there were multiple data rows for each mother. To account for oversampling of women from rural and remote areas, results were weighted based on area of residence at Survey 1. To account for multiple data rows for each mother and the correlation of data within mother, multilevel linear modelling was conducted. This approach has become common in epidemiological applications over recent years and is most appropriate when longitudinal data is nested, and includes repeated measures (Greenland 2000). This technique allowed data to be nested within group (mothers) according to birth order and takes into account the clustering /correlation of observations within mother (Tabachnick and Fidell 2007) – ie as previous postnatal depression is a predictor of experiencing postnatal depression with subsequent children, women with multiple children were clustered so that predictors of postnatal depression could be examined in isolation.

Variables were evaluated at the univariate level initially, with statistical significance declared if the observed p-value was less than 0.001. Due to the large sample size and the numerous tests being conducted, a strict p-value criteria was used when evaluating the univariate results (Tabachnick and Fidell 2007). This approach minimised the risk of a multiple comparison problem where multiple tests with a larger p value may results in false positives (Rosner 2006). Once the univariate models were completed, a multivariate model was conducted. Inclusion of variables into the multivariate model was restricted to those variable declared statistically significant at the 0.001 level in a univariate model. Step-wise backwards elimination was used to arrive at the final multivariate model, using a 001 test criteria to exclude variables from the model.

6.4 Results

6.4.1 Sample Composition

There were 8200 participants who completed Survey 5 and of these 5219 reported giving birth to at least one child. Figure 11 shows the distribution of numbers of children reported by women who completed Survey 5. Of those women who reported giving birth to a child, the majority reported having two children and 15.7% reported experiencing postnatal depression for any of their children.

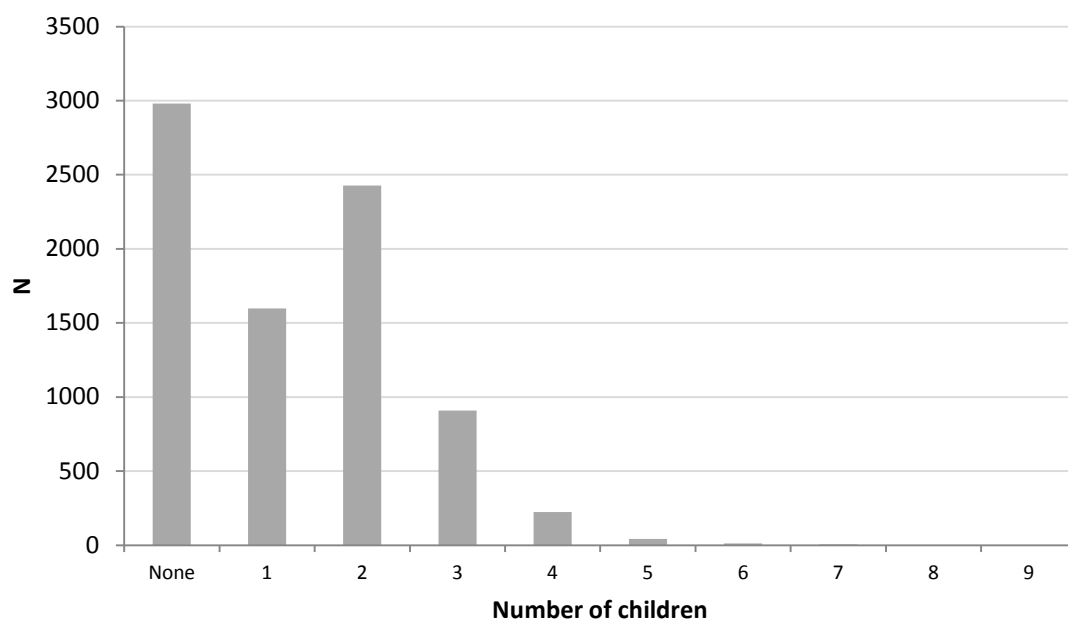


Figure 11 Number of children per mother who completed Survey 5 (2009)

Figure 12 shows the reported cases of postnatal depression per child, where 11.4% of mothers reported experiencing postnatal depression following the birth of their 1st Child, and 12% after their 2nd Child. Only very few women experienced postnatal depression after their 5th and subsequent children.

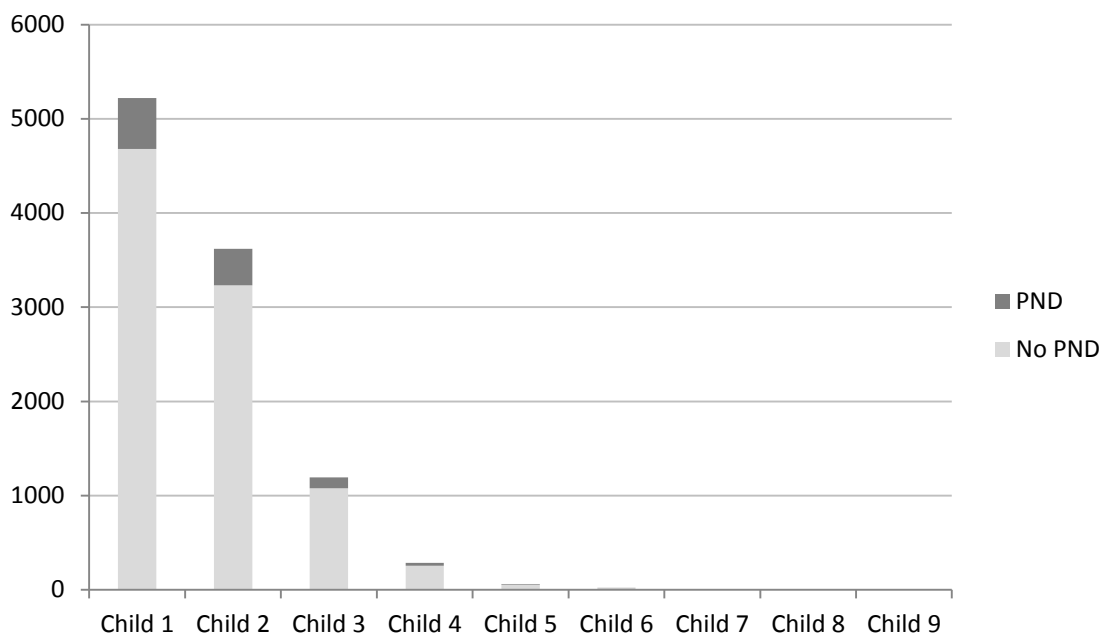


Figure 12 Reported cases of postnatal depression per child

6.4.2 Univariate results

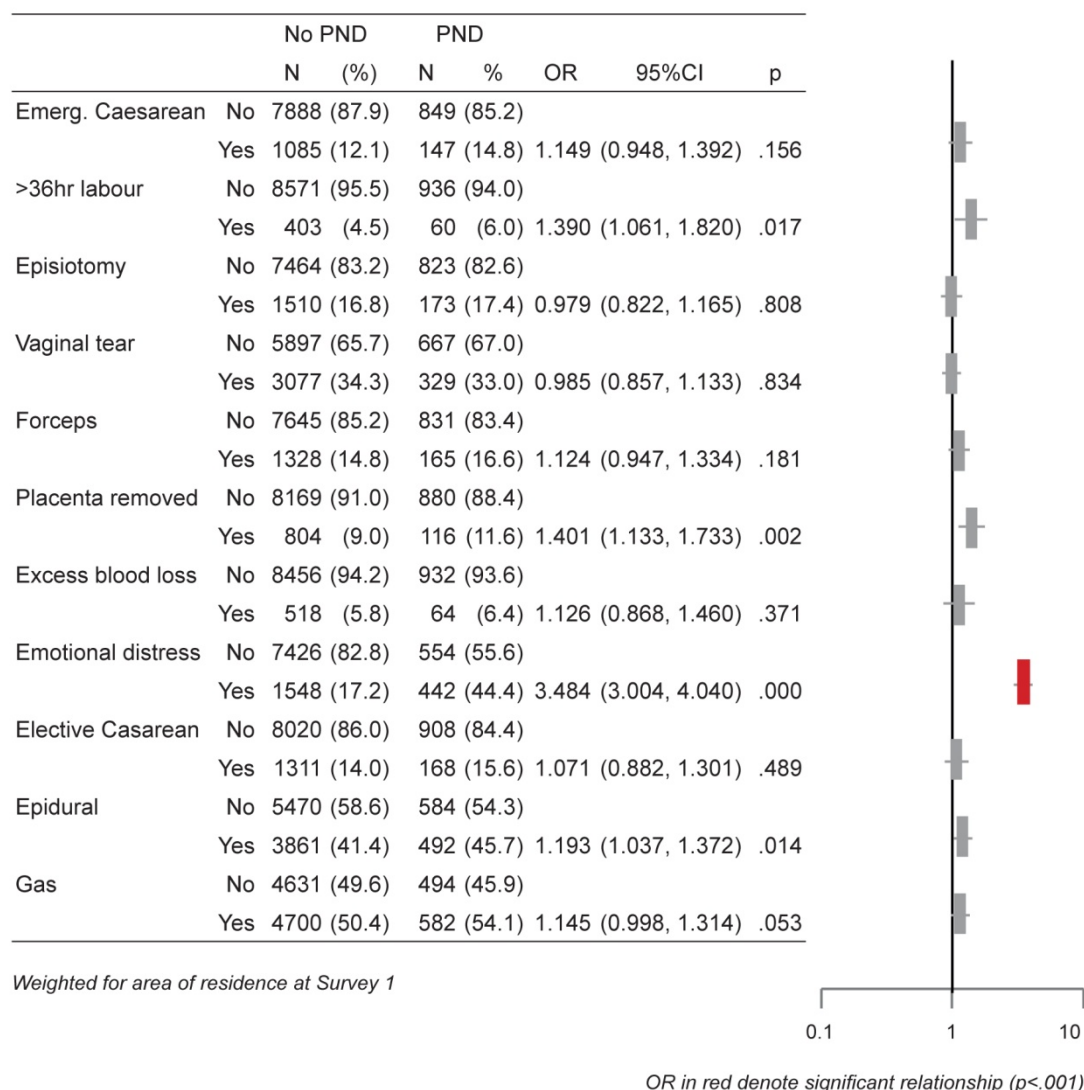
The following section details the univariate mixed model results, divided into thematic categories. All models were weighted for area of residence reported at Survey 1, in order to control for the deliberate over-sampling of women in rural and regional areas at baseline. As described in Section 6.3, the total number of births reported by the cohort was 10407 and each birth was treated as a single case, nested within mothers, in the following analyses.

6.4.2.1 Child birth predictors

Table 6 reports the numbers and percentages of child birth events per birth event, by presence or absence of postnatal depression. The odds ratios, 95% confidence intervals

and significance for each univariate model are also reported in the table and displayed in the forest plot with significant factors highlighted in red. Only one birth-related event was significantly related at the univariate level ($p < .001$); for those births where ‘emotional distress’ was present, the odds of being diagnosed or treated for postnatal depression was around 3.5 times compared to births with no reported emotional distress (95% CI= 3.004, 4.040).

Table 6 Univariate odds ratios (OR) and 95% confidence intervals (95% CI) for postnatal depression (PND) and childbirth predictors with forest plot

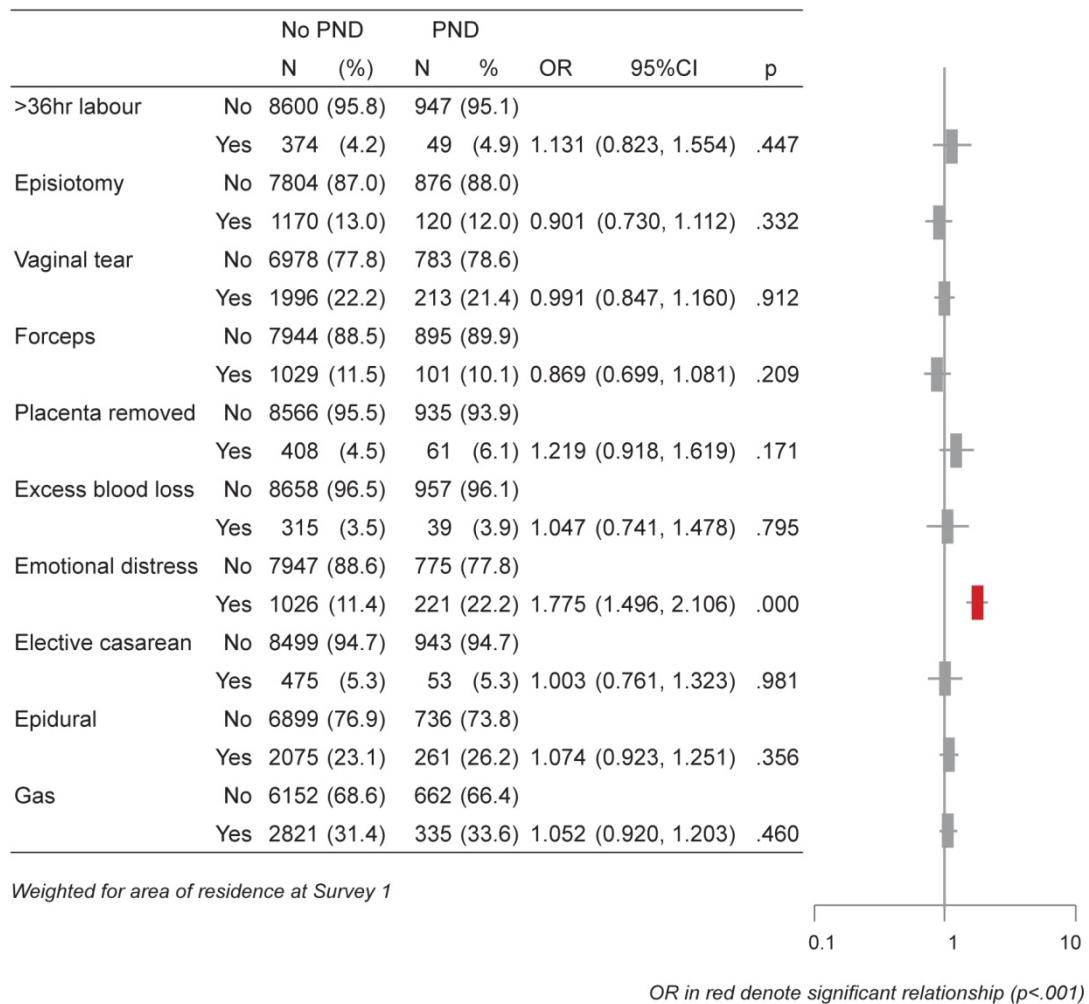


6.4.2.2 History of child birth predictors

Table 7 reports the numbers and percentages for the presence or absence of postnatal depression according to the history of childbirth events as well as the corresponding odds ratios, 95% confidence intervals, p-value and a forest plot of the results. Similar to the results for childbirth predictors at the univariate level, a history of emotional distress

was the only variable to be statistically significant with respect to postnatal depression (OR=1.775, 95%CI= 1.496, 2.106, $p<.001$).

Table 7 Univariate odds ratios (OR) and confidence intervals (95% CI) for postnatal depression (PND) and history of childbirth predictors with forest plot



6.4.2.3 Previous mental health predictors

The odds ratios and percentages of mental health conditions are reported in Table 8. All variables were significantly related to postnatal depression at the univariate level. Of particular note, having a history of postnatal depression increased the odds of a

diagnosis of postnatal depression with a current birth by more than seven-fold, when compared to women who did not have a history of postnatal depression.

Table 8 Univariate odds ratios (OR) and confidence intervals (95% CI) for postnatal depression (PND) and mental health history predictors with forest plot

		No PND		PND		OR	95%CI	p	
		N	(%)	N	%				
Hx depression	No	8351	(89.5)	793	(73.7)				
	Yes	980	(10.5)	283	(26.3)	2.947	(2.469, 3.518)	.000	
Hx anxiety	No	8850	(94.8)	966	(89.8)				
	Yes	481	(5.2)	110	(10.2)	1.984	(1.533, 2.568)	.000	
Hx PND	No	8961	(96.0)	820	(76.2)				
	Yes	370	(4.0)	256	(23.8)	7.208	(5.904, 8.800)	.000	
Hx anten. depres.	No	9271	(99.4)	1023	(95.1)				
	Yes	60	(0.6)	52	(4.9)	4.779	(3.103, 7.362)	.000	
Hx postnatal anx.	No	9151	(98.1)	989	(91.9)				
	Yes	180	(1.9)	87	(8.1)	2.511	(1.835, 3.435)	.000	
Hx anten. anxiety	No	9268	(99.3)	1034	(96.1)				
	Yes	63	(0.7)	42	(3.9)	4.104	(2.570, 6.552)	.000	
SF-36 MHI	0-51.99	1241	(13.8)	373	(37.4)	7.155	(5.510, 9.290)	.000	
	52-67.99	1497	(16.7)	230	(23.1)	3.606	(2.742, 4.743)	.000	
	68-87.99	4153	(46.3)	319	(32.0)	1.974	(1.534, 2.539)	.000	
	88-100	2083	(23.2)	74	(7.4)				
Mean stress	0 - .44	2051	(24.7)	86	(9.1)				
	.45 - .72	2177	(26.2)	148	(15.6)	1.394	(1.068, 1.819)	.014	
	.73 - 1.08	1747	(21.0)	215	(22.7)	2.631	(2.038, 3.395)	.000	
	1.09 - 4.00	2341	(28.2)	498	(52.6)	4.373	(3.454, 5.536)	.000	
LOT-R	0 - 12.99	1802	(20.1)	353	(35.4)				
	13 - 15.99	1815	(20.2)	204	(20.5)	1.376	(1.117, 1.696)	.003	
	16 - 17.99	2051	(22.9)	198	(19.9)	1.541	(1.247, 1.903)	.000	
	18 - 24	3306	(36.8)	241	(24.2)	2.728	(2.252, 3.305)	.000	
Hx suicidal ideat.	No	8756	(93.8)	946	(87.9)				
	Yes	575	(6.2)	130	(12.1)	2.048	(1.621, 2.588)	.000	

0.1 1 10

OR in red denote significant relationship ($p < .001$)

6.4.2.4 Reproductive history predictors

The results for adverse reproductive history variables can be found in Table 9. At the univariate level using a test significance at the .001 level, there was no statistical evidence of an association between any of the adverse reproductive history and postnatal depression.

Table 9 Univariate odds ratios (OR) and confidence intervals (95% CI) for postnatal depression (PND) and reproductive health predictors with forest plot

		No PND		PND		OR	95%CI	p
		N	(%)	N	%			
stillbirth	No	9267	(99.3)	1067	(99.2)			
	Yes	64	(0.7)	9	(0.8)	1.374	(0.649, 2.911)	.406
miscarriage	No	7989	(85.6)	877	(81.5)			
	Yes	1342	(14.4)	199	(18.5)	1.265	(1.053, 1.520)	.012
ectopic pregnancy	No	9298	(99.6)	1071	(99.5)			
	Yes	33	(0.4)	5	(0.5)	1.440	(0.511, 4.060)	.490
termination	No	8158	(87.4)	903	(83.9)			
	Yes	1173	(12.6)	173	(16.1)	1.319	(1.074, 1.620)	.008

Weighted for area of residence at Survey 1

OR in red denote significant relationship ($p < .001$)

6.4.2.5 Infant health and postpartum predictors

The odds ratios and confidence intervals for infant health and postpartum factors are reported in Table 10. The relationship between preterm birth and low birth weight with postnatal depression was not statistically significantly ($p = .004$ and $.0091$ respectively). Breastfeeding for less than six months was significantly associated with higher odds of postnatal depression (OR 1.698, 95%CI = 1.474, 1.957). Postnatal anxiety was also significantly related to postnatal depression, with women who reported experiencing

postnatal anxiety more than 24 times more likely to experience postnatal depression relative to women who did not experience postnatal anxiety ($p < .001$).

Table 10 Univariate odds ratios (OR) and confidence intervals (95% CI) for postnatal depression (PND) and infant health and postpartum predictors with forest plot

		No PND		PND		OR	95%CI	p	
		N	(%)	N	%				
preterm birth	No	8367	(89.7)	930	(86.4)				
	Yes	964	(10.3)	146	(13.6)	1.356	(1.101, 1.671)	.004	
low birth weight	No	8801	(94.3)	999	(92.8)				
	Yes	530	(5.7)	77	(7.2)	1.264	(0.964, 1.659)	.091	
breastfed <6mths	No	4842	(55.7)	412	(42.3)				
	Yes	3854	(44.3)	562	(57.7)	1.698	(1.474, 1.957)	.000	
postnatal anxiety	No	8797	(98.0)	700	(70.3)				
	Yes	177	(2.0)	296	(29.7)	24.667	(19.46, 31.269)	.000	

Weighted for area of residence at Survey 1

OR in red denote significant relationship ($p < .001$)

6.4.2.6 History of infant health and postpartum predictors

The results of infant health and postpartum history are reported in Table 11. Like current infant health predictors, a history of having experienced these conditions was also not related to postnatal depression (all $p > .001$).

Table 11 Univariate odds ratios (OR) and confidence intervals (95% CI) for postnatal depression (PND) and history of infant health and postpartum predictors with forest plot

		No PND		PND		OR	95%CI	p	
		N	(%)	N	%				
low birth weight	No	8469	(94.4)	930	(93.3)				
	Yes	505	(5.6)	67	(6.7)	1.264	(0.964, 1.659)	.091	
preterm birth	No	8059	(89.8)	871	(87.4)				
	Yes	915	(10.2)	125	(12.6)	1.356	(1.101, 1.671)	.004	
breastfed <6 months	No	6767	(75.7)	724	(72.8)				
	Yes	2169	(24.3)	271	(27.2)	1.066	(0.924, 1.229)	.380	

Weighted for area of residence at Survey 1

0.1 1 10

OR in red denote significant relationship (p<.001)

6.4.2.7 Social support predictors

The results for social support measures are presented in Table 12. Overall, all factors were significantly related to postnatal depression. The odds of reporting postnatal depression increased as the level of emotional support was eroded with women who rated the availability of emotional support as ‘none’ or ‘a little of the time’ being around two and a half times as likely to report postnatal depression when compared to women who had emotional support available ‘all of the time’.

Table 12 Univariate odds ratios (OR) and confidence intervals (95% CI) for postnatal depression (PND) and social support predictors with forest plot

	No PND		PND		OR	95%CI	p	
	N	(%)	N	%				
Emotional								
All of the time	4172	(55.9)	343	(42.8)				
Most of the time	2335	(31.3)	275	(34.3)	1.469	(1.223, 1.764)	.000	
Some of the time	705	(9.4)	130	(16.2)	2.147	(1.695, 2.721)	.000	
None / little of the time	251	(3.4)	53	(6.6)	2.409	(1.716, 3.383)	.000	
Tangible								
All of the time	3450	(46.5)	312	(39.2)				
Most of the time	2361	(31.8)	248	(31.2)	1.279	(1.063, 1.540)	.009	
Some of the time	1102	(14.9)	144	(18.1)	1.557	(1.242, 1.952)	.000	
None / little of the time	507	(6.8)	92	(11.6)	1.884	(1.425, 2.491)	.000	
Affectionate								
All of the time	5145	(69.0)	446	(55.8)				
Most of the time	1722	(23.1)	224	(28.0)	1.5	(1.247, 1.804)	.000	
Some of the time	479	(6.4)	105	(13.1)	2.636	(2.039, 3.407)	.000	
None / little of the time	113	(1.5)	25	(3.1)	2.116	(1.316, 3.402)	.002	
Weighted for area of residence at Survey 1								

0.1

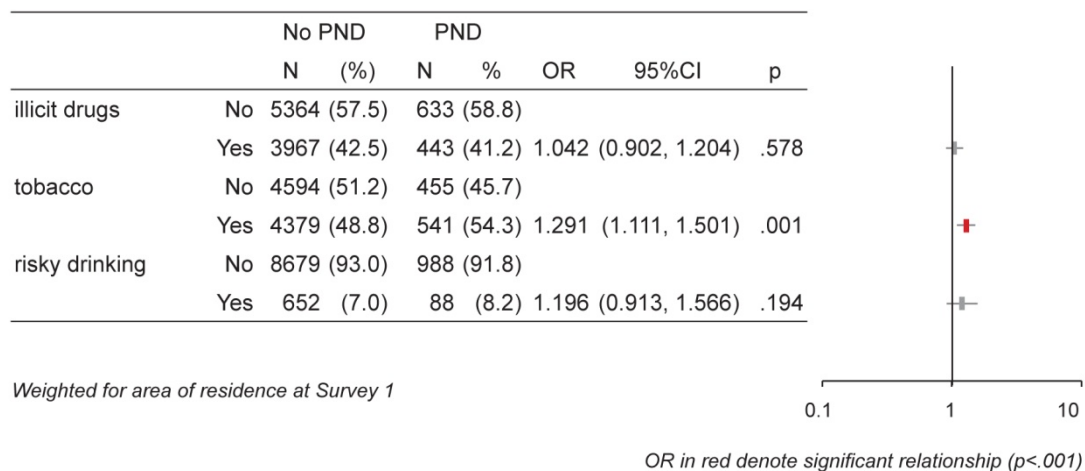
0.1 1 10

OR in red denote significant relationship ($p < .001$)

6.4.2.8 History of poor health behaviours predictors

The results for postnatal depression and its possible association with poor health behaviour histories are reported in Table 13. A history of tobacco use was marginally related to an increased odds of postnatal depression (OR=1.291, 95%CI= 1.111, 1.501). In contrast, both past use of illicit drugs and history of risky drinking were not significantly associated with postnatal depression ($p=.578$ and $.194$ respectively).

Table 13 Univariate odds ratios (OR) and confidence intervals (95% CI) for postnatal depression (PND) and health behaviour predictors with forest plot



6.4.2.9 Stressful life events predictors

Table 14 reports the results concerning stressful life events and history of being in a violent relationship. Of the life events categories, only the last was significantly related to postnatal depression, indicating that an increased proportion of life events is associated with higher odds of postnatal depression. Having a history of being in a violent relationship was also significantly related to a 50% increase in the odds of reporting postnatal depression.

Table 14 Univariate odds ratios (OR) and confidence intervals (95% CI) for postnatal depression (PND) and stressful life events predictors with forest plot

		No PND		PND		OR	95%CI	p
		N	(%)	N	%			
Life events	.000 - .029	2079	(23.2)	179	(18.0)			
	.030 - .059	2369	(26.4)	226	(22.7)	1.01	(0.821, 1.242)	.927
	.060 - .099	2238	(24.9)	251	(25.2)	1.212	(.0987, 1.868)	.066
	.100 - 1.000	2288	(25.5)	340	(34.1)	1.533	(1.258, 1.868)	.000
Violent relationship	No	8472	(90.8)	924	(85.9)			
	Yes	859	(9.2)	152	(14.1)	1.535	(1.246, 1.892)	.000

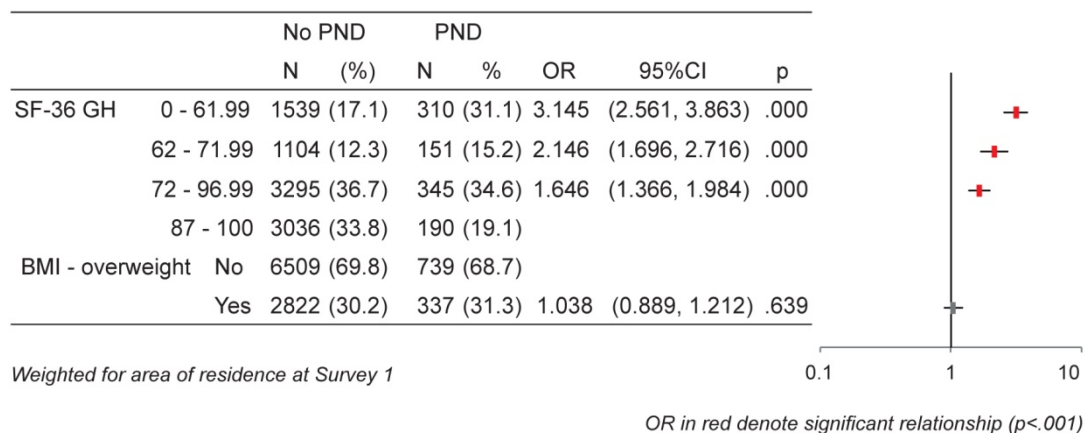
Weighted for area of residence at Survey 1

OR in red denote significant relationship ($p < .001$)

6.4.2.10 General health predictors

The odds ratios and 95% confidence intervals for general health measures can be found in Table 15. Each of the categories of SF-36 General Health were significantly related to postnatal depression, with women who rated their general health lowest over three times more likely to experience postnatal depression relative to women with the highest general health ($p < .001$). Being overweight or obese was not associated with postnatal depression ($p = .639$).

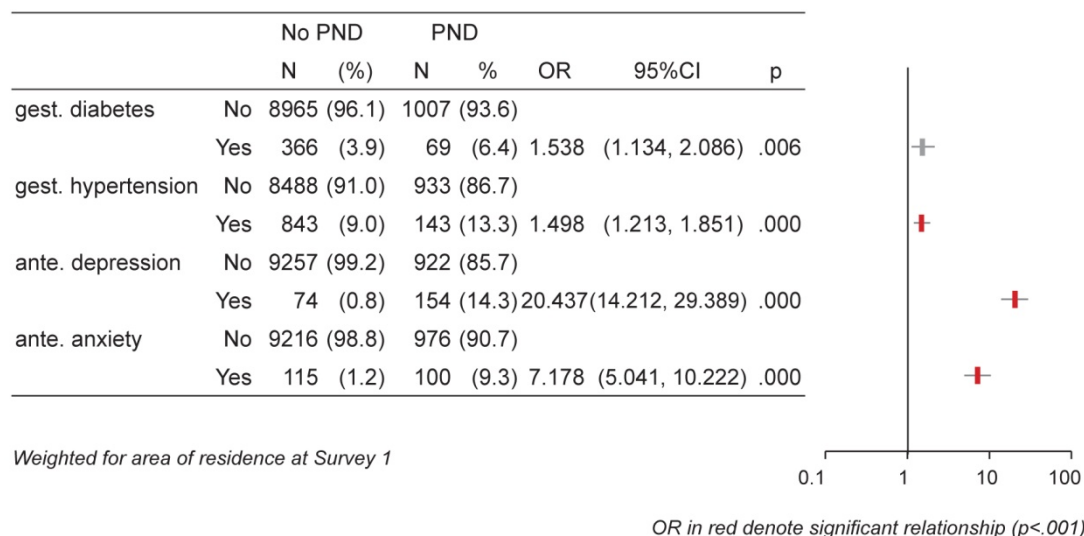
Table 15 Univariate odds ratios (OR) and confidence intervals (95% CI) for postnatal depression (postnatal depression) and general health predictors with forest plot



6.4.2.11 Pregnancy-related health predictors

The results for pregnancy-related health conditions are reported in Table 16. Gestational hypertension, antenatal depression and antenatal anxiety were all significantly associated with higher odds of postnatal depression. The strongest association was observed for antenatal depression and postnatal depression, with the odds of postnatal depression being increased by more than 20 times if a woman reported antenatal depression (OR=20.437, 95%CI = 14.212, 29.389, $p < .001$).

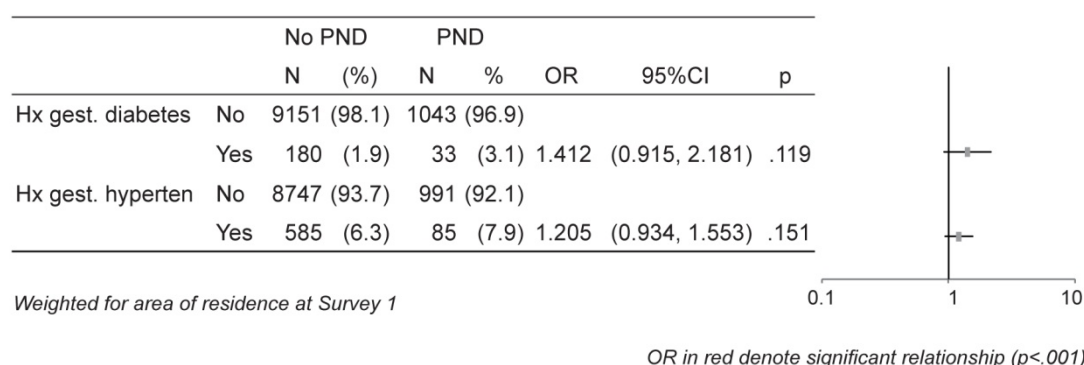
Table 16 Univariate odds ratios (OR) and confidence intervals (95% CI) for postnatal depression (PND) and pregnancy predictors with forest plot



6.4.2.12 History of pregnancy-related health predictors

Table 17 provides the results for history of pregnancy-related conditions and postnatal depression. Neither having a history of gestational diabetes or gestational hypertension were significantly associated with postnatal depression at the univariate level.

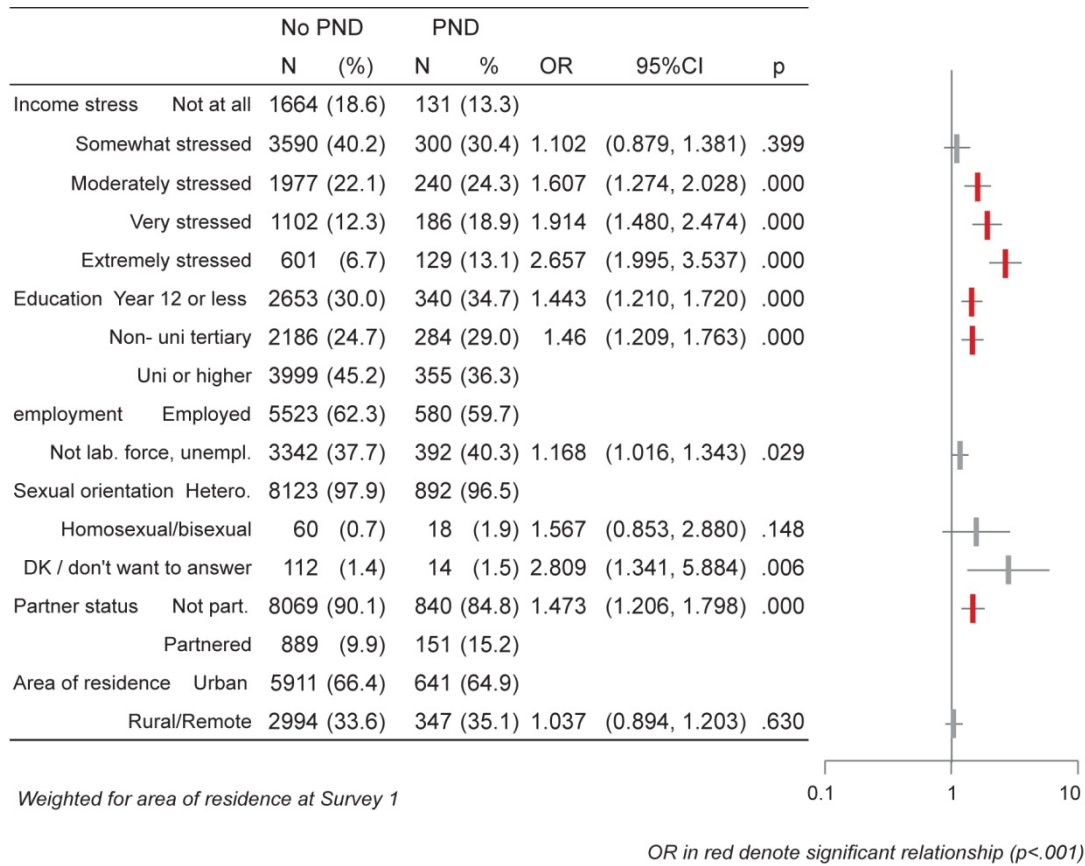
Table 17 Univariate odds ratios (OR) and confidence intervals (95% CI) for postnatal depression (PND) and history of pregnancy predictors with forest plot



6.4.2.13 Demographic predictors

At the univariate level, income stress was positively associated with postnatal depression, such that very high income stress was associated with more than a 2.5-fold increase in the odds of postnatal depression, compared to those women who reported no income stress. Education was also associated with postnatal depression, with women who did not have a higher degree more likely to report postnatal depression. Partner status was significantly associated with postnatal depression, such that non-partnered women were around 1.5 times more likely to experience postnatal depression than partnered women. There were no significant findings for employment, sexual orientation or area of residence (all $p > 0.001$).

Table 18 Univariate odds ratios (OR) and confidence intervals (95% CI) for postnatal depression (PND) and demographic predictors with forest plot

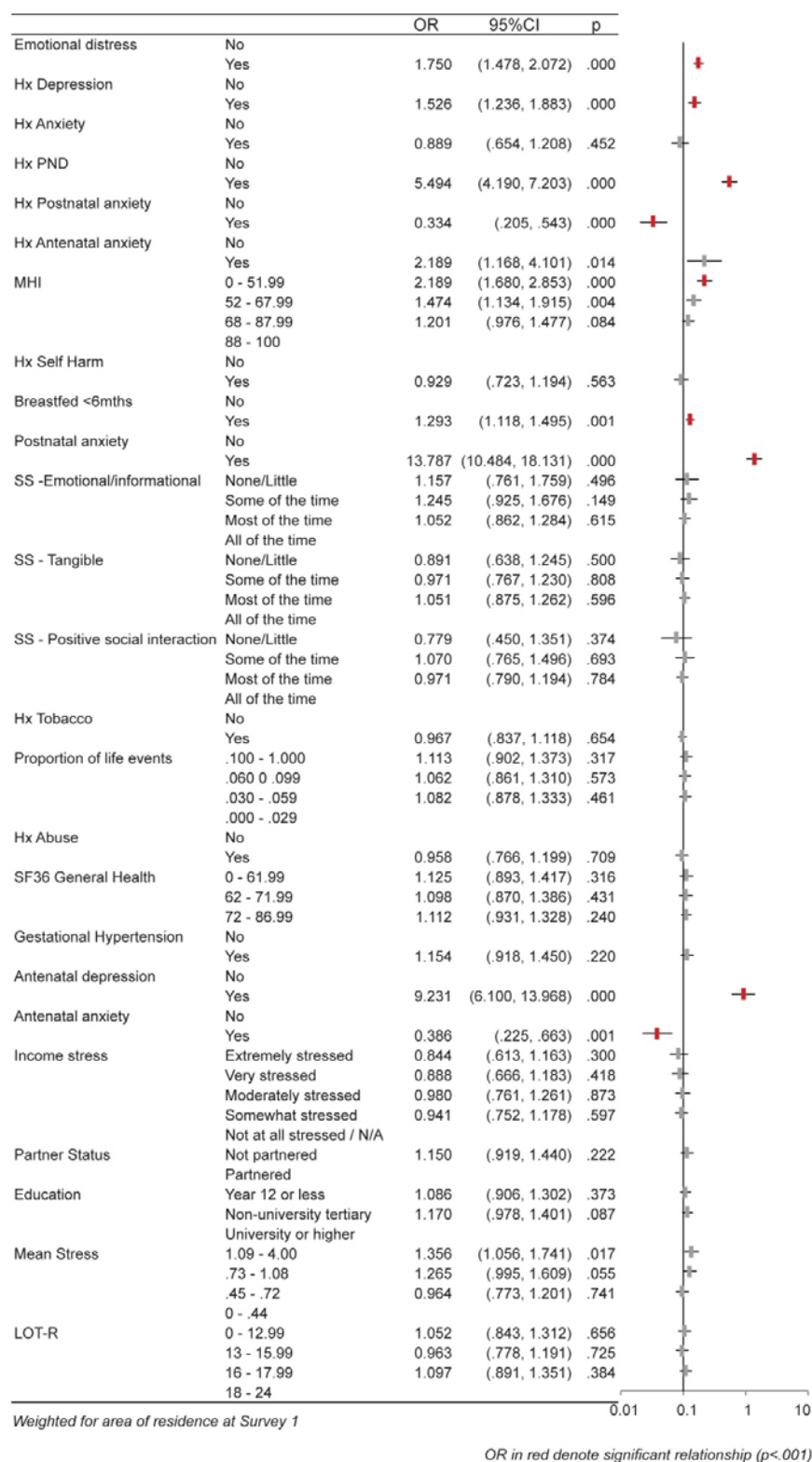


6.4.3 Full model of predictors of postnatal depression

All variables that were significant to .001 in the preceding univariate models were then entered in to a multivariate mixed model with backwards selection to determine the final model. Prior to conducting the mixed model, a correlation matrix of all variables was conducted to check for multicollinearity (see Appendix K). A level of .95 was selected as the criterion for possible multicollinearity and no two pairs of variables met this criterion.

The results of the multivariate model are reported in Table 19. There were nine factors that were uniquely associated with postnatal depression in the final multivariate model. Two factors were negatively associated; these were having a history of postnatal anxiety and having antenatal anxiety with the reference child. These unexpected findings indicated that women who experience postnatal anxiety were less likely to experience postnatal depression when all other factors had been taken into account. The strongest positive associations were for postnatal anxiety (OR=13.787, 95%CI= 10.484, 18.131) and antenatal depression (OR=9.231, 95%CI= 6.100, 13.968).

Table 19 Adjusted odds ratios (OR) and confidence intervals (95% CI) for postnatal depression (PND) and predictors with forest plot



6.5 Discussion

6.5.1 Univariate results

No significant associations were found between postnatal depression and any childbirth predictors with the exception of experiencing emotional distress during labour. These results fit with the findings of Johnstone, Boyce et al (2001) who found no relationship between obstetrics and postnatal depression. Similarly, only a history of emotional distress was significantly associated among the history of childbirth problems. These findings indicate that childbirth complications (either for the reference child or for previous children) are not related to postnatal depression; however mood and emotions during childbirth are likely to impact on the development of postnatal depression. Further, these results indicate that perception of emotions during and immediately after labour (as measured by the 'emotional distress' item) may be an important factor in the development of postnatal depression. These findings have important implications for treatment, as the immediate postnatal period appears to be an important time for intervention to be implemented such as counselling as standard postnatal care in hospital.

The strongest univariate associations were between postnatal depression and other mental health conditions. All previous mental health factors were significantly related, with the exception of the lower categories of LOT-R and mean stress. These results indicate that the development of postnatal depression is very closely related to mental health history. While the relationship between postnatal depression and other diagnosed conditions such as depression and anxiety has been well documented (Ohara and Swain

1996), these results indicate that even poor mental health in the absence of a diagnosable condition may be a predictor of a later diagnosis of postnatal depression and that perception of stress and optimism may also play a role.

Although previous research has indicated that reproductive events such as stillbirth and miscarriage are related to postnatal depression, these findings were not replicated in the current study. This may be due to the small numbers of stillbirths in the sample.

Another possible explanation is the timing and sequencing of pregnancies, as previous research has indicated that women who had experienced a stillbirth were more vulnerable to depression in the six months afterwards, but these deficits were not seen after 12 months. The relationship between adverse pregnancy events and mental health is discussed in more detail in Chapter 7.

As expected, there was a significant relationship between breastfeeding for less than six months and postnatal depression; however it is not clear from these findings whether any causality can be attributed. As described earlier, the WHO and UNICEF recommendations in the Global Strategy are exclusive breastfeeding for 6 months and “nutritionally adequate and safe complementary feeding starting from the age of 6 months with continued breastfeeding up to 2 years of age or beyond” (World Health Organization 2009). Worldwide, it is estimated that only 34.8% of infants are exclusively breastfed in the first 6 months (World Health Organization 2009).

Nationally, the objectives of the Australian National Breastfeeding Strategy (Australian Health Ministers’ Conference 2009) are, “to increase the percentage of babies who are fully breastfed from birth to six months of age, with continued breastfeeding and

complementary foods to twelve months and beyond” (p.1). The national strategy was developed in order to support the uptake of the WHO guidelines in Australia. National data reports that by 6 months only 14 % of infants are exclusively breastfed, while 56% are complementary fed and that by 12 months 30% are complementary fed (Australian Health Ministers’ Conference 2009). Women with postnatal depression are less likely to breastfeed for the recommended 24 months (Henderson, Evans et al. 2003). Australian research has found that barriers to women who are most likely to not breastfeed to the recommended 24 months include: breastfeeding intentions, maternal health practices (such as smoking and high BMI), the mother receiving relevant information and the infant receiving formula in hospital (Forster, McLachlan et al. 2006). However, a history of breastfeeding previous children for less than six months was not related to a later incidence of postnatal depression, indicating that it is the breastfeeding habits related the reference child that are key in the relationship with postnatal depression. Breastfeeding is discussed in more detail in Chapter 7. Postnatal anxiety was also significantly associated with postnatal depression, indicating a comorbid relationship between the two conditions, even in the postpartum period.

As expected, there was a significant relationship between postnatal depression and perceptions of social support. These results are important as social support has been promoted as an important tool in recovery from postnatal depression. However, as these results indicate that women with postnatal depression are less likely to have social support available to them, this may not be an available or accessible tool for all women reporting postnatal depression, thus making the use in recovery delayed or problematic.

While history of risky drinking and illicit drug use were not significantly associated with postnatal depression, a history of tobacco use was related. These findings are in keeping with previous literature that found a significant relationship between tobacco use and depression (not postnatal) (Flensburg-Madsen, Bay von Scholten et al. 2011).

Stressful life events as well as a history of domestic violence were related to postnatal depression. These findings confirm those of (Boyce 2003) who found that women who had experienced a high number of stressful life events since conceiving were more likely to be diagnosed with postnatal depression. The current study extends on these findings, as the timeframe of measurement of stressful life events was over a longer period than Boyce's study, yet the findings were still significant. Further, as the results of the current study were prospectively collected, the findings are strengthened as they are not the subject of recall bias.

The findings for general health predictors were somewhat inconsistent with previous research, which has found that BMI was related to postnatal depression (LaCoursiere, Hutton et al. 2007). However, as BMI in the postpartum could not be assessed in the current study, a history of overweight or obesity was used and could be one explanation for these results. Consistent with previous research, poor general health was related to postnatal depression.

Again, the strongest predictors for postnatal depression were other mental health conditions and antenatal anxiety and depression were found to be amongst the strongest predictors. These findings indicate that antenatal screening and treatment for mental

health conditions may be a key to reducing the number of women who experience postnatal depression. Gestational hypertension was also significantly related to postnatal depression for the current birth at the univariate level; however a history of gestational hypertension with previous births was not related to postnatal depression with the current child. These findings may indicate that physical stress during pregnancy could play an important role in the development of postnatal depression, but also that women who are experiencing both physical and mental health conditions during pregnancy are a particular at-risk group.

Univariate results for demographic factors were somewhat inconsistent with previous research. While strong associations have been found between postnatal depression and employment (Cooklin, Canterford et al. 2011), no significant relationship was found in the current study. There was a significant relationship between income stress and postnatal depression, which is consistent with previous research (Miyake, Tanaka et al. 2010, Coast, Leone et al. 2012). These findings are important as low income may also act as a barrier to treatment, or reduce treatment options available to women. While there was a significant relationship between postnatal depression and partner status, the numbers of unpartnered women were small, so caution must be taken when interpreting these results. Previous research (Papp 2010) has also indicated that relationship quality is an important predictor of postnatal depression, which is discussed in more detail in Chapter 7.

6.5.2 Multivariate results

The multivariate model indicated that mental health predictors are most strongly associated with postnatal depression, even when other factors are taken into account. The strongest relationship was observed with postnatal anxiety (Adjusted OR =13.79, 95%CI= 10.48,18.13). The co-morbid relationship between anxiety and depression is well documented (Sartorius, Ustun et al. 1996) and these results indicate this relationship also holds in the postpartum period. Significant results were also found for antenatal depression (Adjusted OR =9.23, 95%CI= 6.10,13.97), emotional distress during labour (Adjusted OR =1.75, 95%CI= 1.48,2.08), SF36 MHI score 0-51-99 (Adjusted OR =2.19, 95%CI= 1.68,2.85), history of depression (Adjusted OR =1.53, 95%CI= 1.24,1.88), and history of postnatal depression (Adjusted OR =5.49, 95%CI= 4.19,7.20). These findings confirm previous cross-sectional studies (Robertson, Grace et al. 2004) that found that reported history of mental health conditions is related to postnatal depression. Surprisingly, history of postnatal anxiety was significantly related to postnatal depression, however the relationship was inverse to expected (Adjusted OR =13.79, 95%CI= 10.48,18.13). These results may be due to women receiving treatment for postnatal anxiety and therefore experiencing an overall reduction in emotional health deficits. These results may also be due to the high correlations with other variables in the multivariate analysis, therefore caution should be exercised when interpreting these findings. However, the comorbid relationship between postnatal depression and anxiety is an important issue and worthy for exploration in future research, especially to determine whether treatment for one condition impacts on the occurrence of the other condition.

Contrary to previous findings, several key factors were not related to postnatal depression in the multivariate model. In particular, no demographic measures were significantly associated with postnatal depression where several other studies have found a significant relationship (Lancaster, Gold et al. 2010). Within the Australian context, Brown and Lumley (1994) found an association between demographics, although more recently Boyce (2003) did not observe such an association, which this current project supports. As discussed previously (Zlotnick, Miller et al. 2006), although socio-demographic factors may not be directly related to postnatal depression, the potential association between demographics and health service use and help-seeking behaviour should be considered in future research as an important factor, particularly in the postpartum for women. Previous studies have reported conflicting results regarding partner status and postnatal depression and the current study supported the findings of Boyce (2003) who found no such relationship. However, as Boyce discussed, partner status may in fact be more closely related to social support and the quality of the relationship may in fact be a key factor. This issue is discussed in more detail in Chapter 7.

Related to partner status is the issue of social support. Contrary to previous research, social support was not associated at the multivariate level even though a significant relationship at the univariate level was detected. These results indicate that there are no unique associations between these factors and postnatal depression when other factors are taken into account. Social support is discussed in more detail in Chapter 7.

6.5.3 Limitations

The limitations of this study must be acknowledged. Firstly, due to the way in which participants were recruited in to the ALSWH based on age, we are not able to examine older motherhood as a factor. However, in subsequent waves of surveys it will be possible to examine the effect of older motherhood while controlling for predictors of postnatal depression across the life course and during the prime childbearing years. In addition, the results of this study may be biased due to the patterns of retention in the ALSWH, however examination of this bias has found that there is no substantial barrier to data interpretation. (Powers and Loxton 2010) A further limitation of this study is the use of a self-report measure of postnatal depression as the outcome variable. While it would have been valuable to include a diagnostic measure of postnatal depression in the survey, this was not feasible within the scope of the omnibus healthsurvey, which had to accomodate diverse needs. In addition, a diagnostic measure would have only detected current cases of postnatal depression, whereas the self-reported diagnosis measure allowed us to collect incidences of postnatal depression per child.

6.5.4 Strengths

While acknowledging the limitations, the strengths of this analysis are that it includes data collected from a large, broadly representative sample of childbearing women within Australia. The use of longitudinal data collected prospectively allowed for the examination of accurate predictors of postnatal depression, rather than retrospective data collection which is known to be biased (Wu, Martin et al. 2001). In addition, the use of multiple surveys allowed recall bias to be minimised and data harmonisation to

be conducted. The multivariate mixed model approach, utilising a conservative inclusion criterion, also indicates that the results are robust and reliable.

6.6 Conclusion

The multivariate results indicate that understanding a woman's mental health history holds a very important role in the detection of those who are most vulnerable to postnatal depression. These findings also indicate that treatment and management of depression and anxiety earlier in life may have a positive impact on the incidence of postnatal depression. In addition, some factors that were identified in previous literature as related to postnatal depression were not found to be uniquely associated in the multivariate model, such as demographic factors and childbirth events. These findings indicate that while significant in cross-sectional studies, once incorporated in to a more holistic multivariate longitudinal model; these factors are indeed not related to postnatal depression.

While the multivariate results provided a comprehensive examination of the complex relationship between a number of predictors of postnatal depression, the context to which these events occur is still largely not understood. The next chapter will not only explore those factors identified in this chapter, but will also explore the lived experience of postnatal depression and early motherhood for Australian women.

Chapter 7. Qualitative exploration of experience of living with postnatal depression and treatment efficacy (Study 4)

A summary of the findings in this chapter have been presented elsewhere:

- Chojenta C, Loxton D, Lucke J. *'The perfect mother wouldn't have that': Australian women's experiences of motherhood and postnatal depression*. 16th Qualitative Health Research Conference, Vancouver, Canada, October 3-5, 2010.
- Chojenta C, Loxton D, Lucke J. *'The perfect mother wouldn't have that': Australian women's experiences of motherhood and postnatal depression*. Poster presentation at the International Marce Society Conference, Pittsburgh, USA, 27-30 October 2010.

7.1 Introduction

The last chapter described the quantitative findings of a longitudinal examination of the predictors of postnatal depression in an Australian community setting. Overwhelmingly, previous poor mental health was predictive of postnatal depression, even many years prior to pregnancy, indicating that early life experiences are important determinants of later wellbeing. While the quantitative analysis also examined the associations between a range of factors and reported the unique associations between factors and postnatal depression, the context of many of these life events was unclear. This next chapter describes an in-depth qualitative interview method employed to examine how the early events of women's lives impacts on events during pregnancy and motherhood. The results Study 1-3 as well as the literature review contained in Chapter 2 were used to develop the aims and research questions for Study 4 in order to not only understand the context of postnatal depression in women's lives but also the experiences of risk factors for postnatal depression.

This chapter describes an in-depth qualitative investigation of the experiences of motherhood with a focus on postnatal depression. Telephone interviews with a sample of 16 ALSWH 1973-78 cohort participants were conducted in 2009-2010 in order to explore in more detail the risk factors for postnatal depression, as well as the outcomes for women who have experienced postnatal depression. The experiences of women who accessed psychological and/or pharmacological treatments for postnatal depression were also investigated.

7.1.1 Aims:

The aims of this project were to explore the following research questions:

- What are the experiences prior to pregnancy through to early motherhood of women who have experienced postnatal depression and those who have not?
- What are the perceptions of key factors in the experiences of women who suffer from postnatal depression?
- What are the perceptions of treatment outcomes and perceptions of efficacy of treatment and support for women suffering from postnatal depression?

7.2 Methodological considerations

In order to examine the above aims, a qualitative method was devised. This method was developed in order to explore women's experiences of motherhood on a personal level, but at the same time enabling transference of meaning at a wider level (Hsieh and Shannon 2005).

A methodological stance was devised in order to frame methodological and analytical decisions throughout the study. A qualitative deductive approach was used. This approach utilises an existing theory and tests this theory (Hyde 2000). As the Brown and Harris model of depression underpinned this entire project, this stance was most appropriate. A deductive approach also provided a framework for developing an interviewing protocol, as well as contextualising the interpretation of results. More information about the deductive analytical approach can be found in Section 7.3.5.

Using a deductive approach in turn allowed the definition of saturation to be defined prior to beginning the interviews. By framing the results within the existing theory, while also exploring new and emerging concepts, saturation would be reached once the theory was confirmed and no new concepts were identified. This approach necessitated the analysis of interviews concurrent with interviewing – so that once each interview was completed, it would be transcribed and analysed prior to conducting the next. Saturation could be identified and confirmed after analysis using this approach.

7.3 Methods

Open-ended semi-structured telephone interviews were conducted with 16 participants from the ALSWH 1973-78 cohort. Telephone interviews were digitally recorded and transcribed verbatim. Analysis was conducted in Nvivo9 (QSR International Pty Ltd 2010) software.

7.3.1 Approvals and ethical considerations

Approval was sought from the ALSWH Publications, Substudies and Analyses

Committee who manage the use of ALSWH data and contact with participants.

Approval was then sought from the University of Newcastle Human Research Ethics

Committee (H-2009-0179), and approved on 10/09/09 then by the University of

Queensland Behavioural and Social Sciences Ethical Review Committee (2009001563)

approved on 06/10/09.

Several ethical issues were considered when developing this research protocol. To

begin, participants were sent a letter of invitation and information statement and were

invited to respond to the letter via telephone or email if they chose to reply. They were

informed that they would be contacted by the researcher within two weeks of mailing

the letter so that the researcher could answer any questions and gauge their interest in

participating. If the participant was interested in taking part in an interview, an

appointment was made with them for a suitable date and time to be contacted. At the

beginning of the interview, consent to participate was obtained and recorded. This

approach, as opposed to obtaining written consent prior to the interview greatly reduced

participant burden as participants were all mothers of young children, the task of

mailing back a consent form may have precluded many participants from taking part.

Prior to conducting the interviews, the interviewer (the candidate) completed mental

health first aid training, in order to ensure that she would be able to adequately deal with

any unforeseen distress that any participant may experience by taking part in the

interview. The interviewer also had significant experience in conducting telephone

interviews for other research projects and was experienced in handling stress and distress over the telephone. For example, when one participant became distressed due to experiencing a relationship breakdown on the day of the interview, the interviewer determined that the participant was too distressed to continue with the interview and it was abandoned. The interviewer then followed up with the participant on a later day to ensure that the participant was not additionally distressed by taking part in the interview and reiterated the support advice provided in all survey materials and at the time of abandoning the interview.

7.3.2 Sampling criteria

A sample of 150 participants were selected for the substudy from the 1973-78 cohort. Participants were eligible for the substudy if they had completed Survey 5 prior to November 2009 and had reported giving birth to a child since 2002, at Survey 4 in 2006. As data collection was still in process for Survey 5 at the time of conducting the interviews, it was not possible to use responses from Survey 5 to select the sample, therefore data from Survey 4 were used. Participants whose mailing details were not current with the project, or who had nominated to not participate in substudies, were ineligible. The sample was purposively selected so that a range of experiences of motherhood was represented by selecting 75 women who had reported experiencing postnatal depression in Survey 4 in 2006 and 75 women who did not experience postnatal depression.

7.3.3 Recruitment and data collection

Recruitment and interviews were conducted between November 2009 and May 2010. Participants were sent a cover letter and information sheet (see Appendix L) in batches of 10 participants at a time. Approximately two weeks after mailout, all participants were telephoned and asked if they would like to participate in a telephone interview. A total of 16 interviews were conducted until saturation of new concepts was reached. While the sampling frame comprised of an even distribution of women who did and did not report experiencing postnatal depression, the final sample comprised of nine participants who reported experiencing postnatal depression and seven who did not. Of those seven participants who did not report experiencing postnatal depression at a previous survey, three participants described being diagnosed with postnatal depression during the interviews. The non-reporting of postnatal depression was in two cases because the Survey was completed prior to their experience of postnatal depression and in one case because the participant did not receive a diagnosis from a health care professional so therefore did not complete the survey item.

7.3.4 Interviews

The interviews ranged from 6 minutes to 75 minutes although the majority of interviews took around 45 minutes. The interview that only took 6 minutes was discontinued by the researcher as the participant was judged to be too upset to continue. This participant revealed that she was experiencing the breakdown of her marriage at the time of the interview. The participant was distressed at the time of the interview and was given appropriate help numbers to consult at a later date. The researcher also followed up with

the participant within one week of the interview to ensure her welfare. The data that was collected during the shortened interview was still used during the analysis.

The interviews initially asked the participant to recall the pregnancy of their youngest child and then reflect on previous pregnancies. A copy of the interview schedule can be found in Appendix M. Questions relating to their emotional and physical wellbeing during pregnancy were asked. The participant was then asked to describe the labour for their last child and reflect on previous labours if they had older children. They were asked in particular to describe their emotions in relation to different events during labour. Questions relating to their hospital stay and their transition to home then followed. Participants were asked to detail their postnatal period, with specific detail asked of the first 12 weeks. They were asked about their social support, sleeping, feeding of their child and their feelings around these issues. If participants had reported experiencing postnatal depression in a previous survey, they were then asked to reflect on the experience of their diagnosis of postnatal depression. If they hadn't reported postnatal depression, they were asked a series of questions to identify whether they had experienced postnatal depression or depressed mood. They were then asked to relate their feelings towards diagnosis, treatment and support during their experience of postnatal depression. Both those participants who did and those who did not experience postnatal depression were asked to reflect on a time in their lives when they felt they hadn't coped well and describe the feelings around that time. The interview concluded with a discussion of their current life including return to work and plans for more children. If participants became distressed at any time during the interview, they were

asked if they wished to continue, and they were also provided with contact details for appropriate services such as Lifeline and *beyondblue*, who provide online crisis support in Australia.

7.3.5 Data analysis strategy

Analyses were conducted using Nvivo9 (QSR International Pty Ltd 2010) software.

Two independent reviewers coded the interviews initially for content (the candidate and primary supervisor). The principles of directed content analysis were used by reviewers (Hsieh and Shannon 2005). Codes were developed using deductive category application (Mayring 2000) in the first instance. Using the principles of directed content analysis, the results of prior research were utilised in order to identify initial categories. Definitions were then developed in keeping with prior research, as well as within the framework of the Brown and Harris model of depression. This approach enabled the researcher to then develop useful operational definitions of themes and in turn make direct comparisons with the findings of the quantitative findings, and to consider the theoretical implications of the findings. Deductive category application is the process of applying theory-based formulations on text and reviewing and revising codes and definitions as they develop. A coding structure was developed after coding was completed, so as to minimise bias on the structure, particularly for new themes that emerged outside of the existing literature. The technique of prolonged engagement, where the researcher becomes immersed in the data, was used to increase credibility (Lincoln and Guba 1985). Saturation of themes was evaluated during the process of interviewing as coding was occurring concurrently with interviewing.

7.4 Results

7.4.1 Profile of sample

The demographic profile of the full sample (N=150) can be found in Table 20 based on their responses to Survey 5. The majority of the sample lived in either a major city or inner regional area of Australia and were either married or in a de facto relationship. A majority of the group had post-school qualifications and were somewhat or moderately stressed about their finances. Therefore, this group appeared to be generally representative of the 1973-78 cohort, where the sample are more educated than the general population, however this bias is not significant enough to impact on interpretation of results (Powers and Loxton 2010).

Table 20 Demographic description of interview sample (N=150)

		N	(%)
Area of residence	Major cities	74	(49.3)
	Inner regional	46	(30.7)
	Outer regional	24	(16.0)
	Remote / very remote	6	(4.0)
Marital status	Married	121	(80.7)
	De facto	13	(8.7)
	Separated	7	(4.7)
	Divorced	2	(1.3)
	Single	7	(4.7)
Financial stress	N/A	1	(0.7)
	Not at all stressed	30	(20.0)
	Somewhat stressed	56	(37.3)
	Moderately stressed	37	(24.7)
	Very stressed	14	(9.3)
	Extremely stressed	12	(8.0)
Highest qualification	No formal qualifications	1	(0.7)
	Year 10 or equivalent	13	(8.7)
	Year 12 or equivalent	30	(20.0)
	Trade/apprenticeship	2	(1.3)
	Certificate/diploma	38	(25.3)
	University degree	47	(31.3)
	Higher university degree	14	(9.3)

A total of 16 participants randomly selected from the 150 interview pool completed an in-depth interview. They were aged between 31 and 37 years at the time of the interview. The average number of children was two and 13 of the participants were currently married. There were nine participants who had reported being diagnosed or treated for postnatal depression at Survey 4 as well as an additional three participants who reported during the interview they had experienced postnatal depression.

7.4.2 Major themes identified in the interviews

The summary of the major themes identified in the transcripts of the interviews are reported in Table 23. A count of the number of times a theme was identified in the text is also provided in the table – the count does not reflect the number of participants, but rather the number of times that separate pieces of text were coded to each theme.

7.5 Discussion

The following section describes the themes that were identified in the interviews in more detail.

7.5.1 Life Histories

This theme examined the life events that preceded postnatal depression including maladaptive coping strategies. The following subthemes are examples of life history (context) from which post postnatal depression develops over time.

7.5.1.1 History of depression

Several key stressful life events emerged throughout the interviews for women who experienced postnatal depression. As expected from previous literature and the

quantitative findings of this project, the relationship between postnatal depression and previous mental health conditions was evident. Several participants described having a history of mental health conditions especially depression. Here, this participant describes her experience of depression in her teen years:

I guess umm, like when you're a teenager like that like little things happen and you might feel like your whole world's coming down around you and umm that it's all too hard and yeah, that kind of thing and umm yeah just feeling that anxiety about issues and yeah.

This participant likened the feelings of “your whole world’s coming down around you” to her feelings in the postnatal period. Another participant described being able to identify a recurrence of depression and told her husband that she was starting to feel “sick again”. In these situations the participants were prompted to describe what they had learnt in previous experiences of depression in relation to coping strategies and treatment options, however no participants identified any of these. These results indicate that while depression in the postnatal period is identified well, that during other times throughout life that women are not adequately treated for mental health conditions.

7.5.1.2 Self-harm as a teenager

Another participant describes self harm in adolescence and how it has continued on throughout her adult life:

I used to self-harm when I was a teenager, I don't know, it just started and it continued off and on, every now and again I still do, I don't know why, it just

makes me feel better, but it's a case now I have to hide where I do do it because my ten year old has started to ask why.

This participant, who also reported being treated for postnatal depression, described a extensive history of maladaptive coping techniques to deal with stress and depression. Like other participants who had a history of depression, this participant did not report accessing appropriate treatment options for mental health conditions from adolescence onwards.

7.5.1.3 Coping with grief

When asked to recall other times in their lives when they had difficulties coping with stress, several women who had experienced postnatal depression also described coping with grief after the loss of a loved one. This participant described throughout her interview, how avoidance has impacted on her life; in particular when coping with grief.

When my father passed away...I was very good at you know walking into the hospital room and pretending everything was fine and waiting til I was home but I paid for it later because when my father in law got sick just a few years later and it was like everything that I'd held back in there, came out for that one.

Importantly, the participant related this as a significant point in their lives when they didn't cope and could also identify that their inability to cope that the time resulted in ongoing problems.

7.5.1.4 Illness

Another participant described the cumulative effect of several serious life events occurring at once when asked to recall another stressful time in her life when she did not cope:

We'd just got married and I found out I had a brain tumour and then my husband was going overseas for six months. It was all these terrible things happening at once.

While the participant did not report being depressed at the time of her brain tumour, she did report the stress related to the diagnosis and treatment of the brain tumour and the change in marital status and life circumstances was an important determinant in her ability to cope.

7.5.1.5 Miscarriage

A number of participants described the stress associated with pregnancy loss when asked to recall stressful events. This participant directly related the stress and grief associated with her miscarriage with her later experience of depression both throughout her next pregnancy and in the postpartum:

I wish and sometimes I wonder if it would have made that first um well it was the second pregnancy, because I'd miscarried the first time and the way that I'd found out because I didn't have any signs of it I'd actually gone in for an ultrasound um I think if I'd been handled better at that point I may have been less full of anxiety through the pregnancy and through those first few months and even the first year just always worrying that something would go wrong.

Participants who reported experiencing miscarriage also reported ongoing feelings of grief and loss after the miscarriage and during subsequent pregnancies. These participants often reported a lack of emotional support during the time of the miscarriage and the ongoing impact that the lack of support had on their ability to cope during subsequent pregnancies. Several women also reported heightened levels of anxiety in relation to the outcomes of subsequent pregnancies and the ongoing impact this anxiety had during pregnancy and postnatally.

7.5.2 Pregnancy

This theme examined the context of events of pregnancy and how they related to postnatal depression. In particular, the accumulation of events was examined. These subthemes look at the context of proximal life events in relation to postnatal depression.

7.5.2.1 Antenatal depression

While many women described no problems throughout pregnancy, a number of women who experienced postnatal depression also described experiencing depression through their pregnancy. Of note, only one participant had antenatal depression diagnosed at the time. The following quote from a participant who was not diagnosed explains the relationship between emotions during pregnancy and in the postnatal period:

I was alright, I actually had umm, I wasn't diagnosed but I was really depressed, I had antenatal depression so I got really depressed around the three month mark, and I didn't even know I was pregnant, and I didn't know why I was depressed. I just slept a lot, couldn't umm, just not motivated and that was so unlike me.

As most participants who reported experiencing antenatal depression were not diagnosed, they therefore were not treated for depression. Interestingly, participants did not describe being screened or assessed during pregnancy for depression, although several participants reported assessment during the postnatal period. As the quantitative results of this project highlight the close relationship between antenatal and postnatal depression, the findings that most participants were not screened or assessed is of great importance. While the National Perinatal Mental Health program came in to effect after the pregnancies of these participants, it is evident that pregnancy could be a time where women are less likely to have their mental health evaluated.

7.5.2.2 Unwanted pregnancy

Another participant described her initial feelings of resentment and resulting guilt when experiencing an unplanned pregnancy:

I said to my partner you know “maybe we should have an abortion” and he said “if you do that, our relationship’s over” so I feel like at the time I held some resentment towards him and stayed pregnant.

This participant also described the subsequent breakdown of this relationship and her ongoing feelings of resentment towards this child. The participant related the argument related to the abortion as the catalyst for a range of negative events in her life.

7.5.3 Labour

This theme looked at both the feelings, thoughts and beliefs towards labour, but also the events experienced by participants. In particular, the emotional context in relation to birth events was examined.

7.5.3.1 Expectations

As women who experienced postnatal depression described their childbirthing experiences, the issue of ‘expectations’ arose for several women. This participant described her disappointment at not experiencing a natural labour:

Umm yeah, like totally lost the plot to be honest. I, because with my first, cos [sic] I’m fully umm, like I’m not into antibiotics or medicine or anything like that and then to know that she was breaching and to have a caesarean I knew that I’d have to have umm like an epidural for that, which is totally against what I like and agree and everything, and having such a beautiful birth the first time I didn’t want to be cut open for the second. I pretty much cried all day, just feeling a bit ripped off that I wouldn’t be able to go through natural labour.

These results show that outcomes of labour can be important determinants of emotions postnatally and during subsequent pregnancies.

7.5.3.2 Trauma

In a more extreme case, a small number of participants described birth trauma and the ongoing impact of their labour experience. This participant reported the impact of a traumatic birth during a subsequent pregnancy:

Number one was a, a traumatic, very bad experience. I didn't really want it to be induced because I was, I'd been, the pain the first time was horrendous, I thought I was going to die, so I was just like "I don't want to have that again".

This participant also described a loss of control not only during the decision to induce this baby, but also a sense of loss of control in the postpartum.

7.5.4 First 12 weeks

This theme examines how the time most critical in the identification of postnatal depression was for women. With a focus on mental health, these subthemes examine the emotional context in which new motherhood resides for women.

7.5.4.1 Breastfeeding problematic

A surprise finding of this study was the large extent of problems associated with breastfeeding. Every participant mentioned experiencing some degree of problems breastfeeding, regardless of their experience of postnatal depression. This participant describes the pressures she felt when she was unable to breastfeed:

The pressure of hearing everyone 'you have to breastfeed, it's so important' and everything else you start to feel like a failure when it's not happening...it looks like a breeze you see women doing it at shopping centres and you think "how come I can't do it" but once I got on top of that I just felt "ok now I'm doing it"...I think back and think gees I wasted a lot of time worrying about breastfeeding and I'm glad I did persevere but it was a big stress. A very big stress.

While the participant above was eventually able to successfully breastfeed, other women described the guilt associated with choosing to formula feed their infants. Another participant also described the shame and embarrassment when receiving assistance with breastfeeding in the hospital:

... well my breasts are private, now they're all of a sudden ripped open for anyone else to have a look at umm haha, like the nurses "here you go, rip it open, here let's try and attach him", oh oh ok, that, that's my body...

This participant, like those who described trauma during labour, reported a loss of control in the hospital setting and also a loss of control in the postnatal period. These findings identify that a woman's perceived control over decision-making and receipt of assistance is important in maintaining good mental health in the postpartum.

7.5.4.2 Sleep deprivation

For most mothers, the first 12 weeks postpartum are generally a time of sleep deprivation and changes to lifestyle. This first quote is from a mother who did not experience postnatal depression.

I was just like a walking zombie really. Just, very sleep-deprived.

However, for some mothers, sleep deprivation was directly related to their emotional health. This participant had experienced postnatal depression previously and immediately noticed the signs for when she experienced sleep deprivation with her second child.

...[baby] didn't sleep, he woke every two hours and I started to feel funny again and I thought oh no. I said to my husband "we've gotta [sic] do something about this coz [sic] I think I'm getting sick again"

These findings show that while sleep deprivation is typical for new mothers, it is also closely related to mental health problems for others.

7.5.5 Diagnosis of postnatal depression

When women who had experienced postnatal depression described the experience of diagnosis, the majority of women described the diagnosis being conducted by a GP.

This first comment is from a woman who described her diagnosis occurring in conjunction with a routine appointment for her baby:

I ended up speaking to the GP when [baby] was about four months old around then I was actually diagnosed with post-natal depression as well.

This has important implications for detection of postnatal depression, as it is evident that screening for postnatal depression could co-occur with routine infant health screening. As screening for postnatal depression in Australia is a current policy-relevant issue, these results highlight the success of combining routine screening with infant health checks.

7.5.6 Conflict with partner

In the first 12 months postpartum, life events such as conflict with partners become a salient issue for women. One participant describes the strain on her relationship with her husband and the impact this had on how they communicated with each other.

My life had changed and his life hadn't as much and he wasn't understanding me

In an extreme example, another participant described how her experience of domestic violence escalated from pregnancy and over 12 months postnatally:

I left... cos [sic] the stress got quite bad, like you know he threatened our...he snapped and he always snapped before but he snapped and threatened to throw our son over the balcony and that freaked me out cos [sic] you know, I get used to tantrums but that's a bit of a different tantrum so I called the police then.

These examples show that postnatal depression can occur amongst a host of other stressful life events and is not experienced in isolation. Indeed, the participant whose infant was threatened by her husband went on to explain that she received counselling for her postnatal depression while also receiving marriage counselling with her husband.

7.5.7 Treatment

A surprise finding of this analysis was that very few women were offered treatment for postnatal depression and those who were offered treatment options were unlikely to take

them up. Of those women who did receive assistance, counselling and mediations were the primary sources of treatment, with two cases reporting the use of in-residence treatment.

7.5.7.1 Counselling

Counselling was described by several women as a treatment for postnatal depression.

This first participant found her experience of counselling successful:

GP who referred me to a psychiatrist and she was fantastic and she saw me right up until pretty much the end of my second pregnancy and just talked me through it...made me see that it wasn't, there was nothing wrong that I did, that's just how things happen sometimes and you've gotta [sic] deal with it.

This second participant did not find counselling to be successful:

Doctor Fruitcake, yeah I'm not the fruitcake, he was. Oh that was pointless Cos [sic] I didn't know him and didn't like the way he just wanders in and you know, he's going to solve life's problems.

These findings indicate that for some women, expectations of counselling were predetermined prior to attending counselling. For example, the above quote indicated that rapport and knowing the counsellor was important to this participant. These findings also indicate that for counsellors, the development of empathy and rapport very early in the session is key to success, particular in postpartum in the context of feelings of failure as a mother and judgement by others.

7.5.7.2 Antidepressants

The most common form of treatment described by women was antidepressant medication. This participant describes her feelings towards her use of antidepressants:

she just put me straight onto the medication...I got a job and I didn't want it to show up on a drug test. Because it was a very cliquey town that we moved to and I didn't want anybody in the town knowing I stopped using them and I was fine.

Surprisingly, those participants who were using antidepressant medication described long-term use of medications with very little follow-up provided by their GPs. It was expected that those participants who receive pharmacological treatments would also receive referrals to counselling and medication reviews by GPs, however this was not found. These results indicate that more research is required to identify the reasons for long-term anti-depressant use and the barriers to receiving GP follow-ups.

7.5.8 Support

Evidence suggests that positive social support is protective of postnatal depression; however these results indicate that a lack of social support is detrimental and therefore social support may not be a continuous measure as we have previously considered it to be.

7.5.8.1 Lack of social support

The following participant described how her social support situation changed during her pregnancy:

...prior to falling pregnant I used to go to church. And girls that fall pregnant and go to church doesn't go down real well. So yeah I lost a few friends that way.

This participant went on to report an ongoing experience of postnatal depression. These findings indicate how social support can change in the perinatal period and the impact of these changes on women's mental health.

7.5.8.2 Conflict with family

The following participant described how her social support was provided by her husband's family and how support was no longer provided after an experience of domestic violence resulted in legal issues regarding the abuse and custody of their infant:

Umm it stopped when I took their son to court. I was the bad one for taking their son to court.

This participant described being upset by the loss of supports, yet also understanding of the situation. She also described an ongoing lack of support from her own family and friends.

7.5.9 Feelings about postnatal depression

Women who had experienced postnatal depression also described the stigma, guilt and shame associated with their diagnosis.

7.5.9.1 Stigma

When I started talking to people and realising that there was others going through the same thing I think we all felt like there was a weight lifted off us that we didn't have to suddenly feel like we were hiding ourselves

7.5.9.2 Guilt

I think as a new mum maybe you don't see it as help, you see it as I failed and I can't do this? So now someone has to step in for me? But, and it's silly but I think that's how we look at it.

7.5.9.3 Shame

putting on one of those masks and pretending that everything's happy, joyful and you're you know, a perfect mother. Which I don't think there is such a thing

These feelings of guilt and shame may also contribute to a reluctance to disclose their emotions to their GP and also why only a limited range of treatment options were utilised by women.

7.5.10 Views about future children

7.5.10.1 No more children

Feelings of shame and fear were also evident in women's visions of the future. One participant described her reluctance for more children because of her experience of antenatal depression.

No, no, that last pregnancy was not fun, um yeah and I just feel that I really long for my old body back, I don't look the way I did, things don't operate the way they did, um and I don't wish to damage myself anymore. Um I know that's a selfish thing but I don't... and our house wouldn't suit more kids anyway, and I think two's enough for us.

7.5.10.2 Optimism in the face of adversity

However, not all women felt this way – one woman whose oldest child was severely disabled, was optimistic about the future, despite the adversity she faced:

Oh no, no. we've got a van, well we've got a wheelchair then so may as well fill the seats up haha.

7.6 Strengths

This Study employed a deductive qualitative research stance in order to explore the context in which long and short term predictors of postnatal depression occurs for Australian women. As rapport has already been developed with the participants via their ongoing participation in the ALSWH, a comprehensive examination of women's personal experiences was possible, with a number of women commenting throughout the interview that they had not disclosed some information to their close family members, but felt comfortable to disclose to the interviewer. In addition, a number of key variables could be taken from previous surveys (such as demographics) in order to reduce participant burden and maximise the efficiency of the interview by only focusing on information to supplement the survey. Further, knowing who may have experienced

postnatal depression from previous surveys ensured that the sample was maximised with positive cases, while still maintaining the community sample by not recruiting through practitioners.

7.7 Limitations

While the strengths of this study are significant, the limitations should also be acknowledged. Firstly, while a theoretical strategy for assessing saturation was devised prior to conducting the interviews, it is possible that with a larger number of participants, more divergent cases may have been identified. However, as procedural rigor was reached by transparently describing all methods and analysis strategies, this indicates that the conclusions made are sound (Kitto, Chesters et al. 2008). Secondly, using a deductive standpoint and a theoretical framework to underpin both the design of the interview as well as the analysis plan, it is possible that information collected was limited to only that information already known by the researchers. However, while an inductive approach may have yielded new information, divergent from the existing theory, a deductive approach was most appropriate for the overall project aims of expanding the existing theory.

7.8 Conclusion

These results indicate that for many women, a cycle of a lack of support is a barrier to treatment. However, the role of GPs in the screening and treatment of postnatal depression is paramount, as they are well placed to provide intervention while also providing care for infants.

The stigma and shame associated with postnatal depression also appears to be a barrier to treatment. With improved public education about the nature of postnatal depression, the condition will hopefully become destigmatised, which will in turn aid in the early detection and treatment of postnatal depression for women.

Similarly, the issue of expectations of motherhood requires further analysis but appears to be a barrier for many women to not only share their condition with others, but also exacerbates the experience of postnatal depression for many women.

Chapter 8. Discussion

The purpose of this thesis was to detect the long and short term risk factors and antecedents for postnatal depression in an Australian community setting and to explore the lived experience for women who have experienced postnatal depression. As the experience of postnatal depression can have both long and short term detrimental implications for both mother and infant, it is imperative to more closely understand the context in which these risk factors occur in order to target interventions and treatments to those most in need.

This project:

- Found that the prevalence of postnatal depression among Australian women using longitudinal data collected by the Australian Longitudinal Study on Women's Health (ALSWH) over a 13 year period was greater than 15%
- Validated and extended the Brown and Harris (1978) psychosocial model of the antecedents of postnatal depression across the life course by applying the model to the childbearing years for women, and by finding that prior mental health experiences were the most significantly associated risk factors for postnatal depression
- Found that women's experiences of postnatal depression treatment were limited to a small number of options, predominantly medications.

The following chapter draws together the results of four complementary studies conducted using ALSWH data – cross-sectional quantitative data analysis, longitudinal mixed-methods analysis, longitudinal qualitative, and in-depth qualitative interviews, and discusses the results in the light of current literature and the theoretical framework provided by Brown and Harris.

8.1 *Prevalence of postnatal depression*

Postnatal depression was reported by 15.7% of mothers for any of their births (aged up to 36 years) who participate in the ALSWH. A recent national study reported a lower prevalence of postnatal depression between 6.6% (urban) and 8.5% (rural) women at 6-8 weeks postpartum (Bilszta, Gu et al. 2008), however in their project, a score of 13 or more on the Edinburgh Postnatal Depression Scale (EPDS) was used as an indicator of likely depressive disorder, rather than a diagnosis of postnatal depression. Additionally, the low prevalence in the Bilszta et al study may have been due to the restricted time frame (6-8 weeks) and reliance on the screening tool rather than a complete diagnosis of postnatal depression.

The higher prevalence found in Study 4 is in keeping with the rates found in the NHMRC review (National Health and Medical Research Council 2000) and therefore indicates it may be a reliable estimate of postnatal depression in the Australian population. However, caution must be applied when interpreting these findings due to the restricted age range of the ALSWH cohort, and also due to the nature of the self-report and retrospective question used to measure diagnosis of postnatal depression. In future ALSWH surveys a more diagnostic measure of postnatal depression such as the

Edinburgh Postnatal Depression Scale could be included in order to examine rates of symptoms and also probable (but not diagnosed) depression. The limitations of the measures of postnatal depression employed in this analysis and the implications for the interpretation of results are discussed in more detail in Section 8.6.

The current study found that prevalence depended not only on how it was measured, but also that postnatal depression might be underreported. Differences in prevalence that were apparent between surveys provided evidence for the importance of accurate measurement, while the qualitative interviews found that women were reluctant to self-report a diagnosis of depression. Several participants who had not reported experiencing postnatal depression in Survey 4 (as used in Study 1) reported during the course of the interviews (Study 4) that they had either experienced postnatal depression after completing the survey, or they did not identify as experiencing postnatal depression at the time but upon reflection did indeed experience postnatal depression.

While the method of measurement employed in Study 4 may have resulted in an under-reporting of experiences of postnatal depression, these findings are important, as very little national data exist that evaluate actual diagnosis of postnatal depression. Indeed, the majority of measures of prevalence of postnatal depression utilise screening rates, which can result in potentially unreliable reporting due to only measuring current mood (underreporting) (Gibson, McKenzie-McHarg et al. 2009) and also due to using a screening tool rather than a diagnostic tool (over-reporting) (Krantz, Eriksson et al. 2008). Future national statistics should consider the use of self-reported diagnosis or

treatment of postnatal depression in order to minimise errors associated with other methods.

8.2 *Predictors of postnatal depression*

The following section draws together the findings of all four studies in relation to the thesis aims explored, and discusses the results in light of existing literature.

8.2.1 *Cross-cutting themes*

8.2.1.1 *Demographics*

While women identified employment, rurality and sole motherhood as important stressors in their experiences of postnatal depression (Study 2), there were no significant associations between demographics and postnatal depression at the population level (Study 1 and Study 4). These findings are important as it confirms that postnatal depression is not significantly associated with demographic factors as has been reported by previous literature. In Australia, Brown and Lumley (2006) reported an association between demographic factors, although Boyce (2003) found no such association. The Longitudinal Study of Australian Children (LSAC) reported a significant association between employment conditions in the postpartum and perinatal mental health problems (Cooklin, Canterford et al. 2011). However, their analysis did not take in to account a history of unemployment, and only looked at postnatal working conditions. In a large cross-sectional Australian study, Milgrom et al (2008) found significant relationships between postnatal depression and income, age and educational attainment, however they did not include these socio-demographic measures in their multivariate analysis due to small sample size so these significant univariate associations may not have remained in

a multivariate model. Age-based findings could not be replicated in the current study due to the restricted cohort age groups, however in the future as the cohort ages, it will be possible to examine the impact of older age on risk for postnatal depression using ALSWH data.

The current study findings are congruent with those of another large longitudinal study from the United States; that found no association between socio-demographic factors and perinatal mental health problems (Mota, Enns et al. 2011). Further, the authors found no association between socio-demographics and mental health problems outside of the perinatal period for women.

While demographic factors were not found to be significantly associated with postnatal depression in any component of the current project, the potential associations with severity of symptoms which could not be measured should be noted. For example, Zlotnick et al (2006) noted the association between poverty and severity of symptoms, finding that a higher degree of symptoms was related to living in poverty. While the current project used a measure of income stress as a measure of poverty in Study 1 and Study 3, the small sample size of women experiencing significant income stress meant it was not possible to detect a relationship between extreme income stress and postnatal depression. Furthermore, the over-representation of tertiary-educated women in ALSWH may make these associations difficult to detect. Nevertheless, the current findings provide evidence that portraying postnatal depression as an outcome for women in lower socioeconomic groups involves the risk of excluding or overlooking those women from higher socioeconomic status who seem to be at equal risk.

8.2.1.2 Health behaviours

Several health behaviours were examined in Study 3 and Study 4 including illicit drug use, alcohol use and tobacco smoking. In Study 3, no significant unique associations were found between history of health behaviours and postnatal depression. This contradicts the findings of previous research such as that conducted by Nunes and Phipps (2012) who reported a significant relationship between alcohol and postnatal depression, and Conde and Figueiredo (2010) who reported a relationship between mental health problems in pregnancy and tobacco use. While illicit drug use and binge drinking rates were small in the study sample, the data obtained in qualitative Study 2 provided an opportunity to examine more extreme cases of poor health behaviours. For example, one participant described over several surveys her experience with illicit drug use, her ongoing problems with relationships and her subsequent experience of postnatal depression. While this case was extreme, the complex relationship between poor health behaviours and other risk factors for postnatal depression which may mediate the direct relationship was illustrated.

While the results in the current project were limited due to the time frame placed on the health behaviour items in the survey, and in particular not having data specifically for pregnancy, the qualitative responses by women also provide important insights in to a particular at-risk group. The findings from qualitative Study 2 in particular indicate that at-risk health behaviour groups would benefit most from interventions not only to address their poor health behaviours, but also their mental health problems.

8.2.1.3 Life events, social experience

The results from this project indicate that not only do stressful life events around the time of pregnancy and postpartum have an impact on postnatal depression (as in the results of Study 4), but that stressful life events have a long-term impact on mental health (Studies 1-3). In addition, life events have a cumulative impact on postnatal depression, as a high proportion of life events was significantly related to postnatal depression.

Stressful life events and experiences such as abuse were measured in all four studies of this project. The results of Study 1 indicated there was a significant relationship between past experience of life events and postnatal depression. A proportional measure for a comprehensive list of life events was used in Study 3, where only those who experienced the highest proportion of life events were significantly more likely to experience postnatal depression. History of domestic violence was also assessed in Study 3, and a significant relationship with postnatal depression was detected. A large number of participants described stressful life events in Study 2, including domestic violence and child abuse. Other participants described the ongoing impact of experiencing stressful life events like the loss of a loved one or their own major illness on their mental health. A number of participants in Study 4 described similar events and the ongoing impact on their mental health. Of note, one participant was living in an abusive relationship at the time of the interview, and described the direct relationship between her experience of abuse and her poor mental health.

Most studies have only looked at stress during pregnancy and postpartum and have not taken into account the long-term impact of life events. While a review article by Swendsen and Mazure (2000) reported contradictory evidence for a relationship between postnatal depression and life events, more recent studies have consistently detected a relationship. However, this relationship was most commonly found only for experience of life events in pregnancy and postpartum.

In a US study, Certain, Mueller et al (2008) found that domestic violence in the year before the postpartum phase was significantly related to postnatal depression. Results are difficult to generalise due to a small sample size and limited details about the recency of abuse, however the current project confirmed that there was a relationship between experience of abuse at any time and subsequent postnatal depression. The current study expanded on previous research such as an US study by Silverman and Loudon (2010) who reported that pre-pregnancy abuse was a significant predictor of postnatal depression. In their study, the authors measured pre-pregnancy abuse during pregnancy; however the longitudinal results in Study 3 have confirmed these cross-sectional results.

8.2.1.4 Social support/Relationships

A significant relationship between affectionate support/positive social interaction and postnatal depression was found in Study 1, but no significant associations were found for informational or tangible support. These findings have important findings for clinical practice, as results indicate that help that is typically provided to new mothers (eg help with daily tasks, advice etc) is not as important as other forms of support (eg

getting a hug or feeling wanted). These results also highlight an important area for intervention and treatment, as social support is commonly available to new mothers via nurse visits and mothers groups, and those who are most vulnerable to postnatal depression can be directed to seek affectionate support and positive social interaction. While those women who are most vulnerable to postnatal depression may also be unlikely to seek out this type of assistance, a greater understanding of the importance of social support may encourage some women to seek it when it is lacking in their situation.

The results of Study 3 indicated that there was a significant association between social support at the univariate level, but this was not the case at the multivariate level. This suggests that there are no unique associations between social support and postnatal depression when other factors are taken into account. These results may also indicate that social support is highly related to other predictive factors. The qualitative studies shed light on this issue. For example, in Study 4, participants who described a lack of social support related this to their physical isolation (those living in rural and remote areas) or having moved away from their social network. While neither area of residence nor social support were significantly associated in the multivariate analysis, qualitative results suggest that social isolation might be a substantial issue. Similar themes arose in Study 2, where women who had recently moved into a new community or overseas described a lack of social contact and a subsequent impact on their moods. Related to social support is the experience of close relationships; a factor that was significant in Boyce's (2003) study of risk factors. While the quantitative studies of this project did

not measure relationship quality, both of the qualitative studies uncovered themes relating to relationship quality. Several participants described a lack of close relationships either with a partner, a parent or a friend, and their desire for someone to confide in (Study 2). Other participants described the stress associated with relationship breakdowns; some participants experienced this in pregnancy or postnatally and directly related it to their experience of postnatal depression. In Study 4, a number of participants described their unwillingness to share their emotions or feelings with people close to them, including their partner, for a fear of lack of understanding. In a more extreme example, one participant was experiencing a relationship breakdown at the time of taking part in the interview, and described the impact on her current mental health. Other participants described the support they obtained from parents, family and partners in pregnancy and postpartum, and directly related the absence of social support to their experience of postnatal depression. In addition, several participants described the expectations of social support they held and how the discordance between expectations and actual support brought feelings of disappointment and low mood. For example, one participant described wanting her mother to assist more with the infant, and how her lack of support impacted on her emotional wellbeing. While it is not possible to uncover the precise mechanisms and causal pathways between these events, these findings indicate that expectations of social support are important determinants of risk for postnatal depression for women. These findings are relevant to practice, as women can be effectively informed as to the expectations that are realistic versus those that are unrealistic in postpartum. Health practitioners can also target women's ability to directly address the discordance between her reality and her expectations, by learning to

intervene when expectations are not met, ie asking for support when it is not being provided.

Previous literature has similarly found a significant relationship between social support and postnatal depression. In an early study, Collins, Dunkelschetter et al (1993) found a weak relationship between social support and postnatal depression, however this may have been due to their retrospective data collection method. Contrary to the findings of Study 2 and Study 4, in Haslam, Pakenham et al's (2006) Australian study, partner support was not related to postpartum mood, whereas parental support was significantly related. While Study 4 found that parental support was significant, partner support was also important. It is possible that the interview method with committed participants of the ALSWH elicited more honest responses regarding partner support than was possible with Haslam and Pakenham's questionnaire method. The current studies have revealed the importance of teasing out the aspects of social support that are important to postnatal depression. A number of participants in Study 4 reported that they were revealing information to the interviewer that they had never told anyone else, indicating that the results were a true reflection of their feelings and are reliable.

While media and existing literature stress the importance of social support there is limited information available to ensure adequate analyses. The current findings underscore the importance of close personal relationships, the detrimental impact of adversity or negativity in these relationships and further, that even non-help can have a detrimental impact on mental health. Further research on relationship quality is required to more fully understand how practitioners can best intervene in this area.

8.2.1.5 Health service use

Health service use was explored in Study 2. A high proportion of participants described their ongoing dissatisfaction with health services and doctors over multiple surveys. Other participants described unhappiness with health services in direct relation to mental health problems. Of note, several participants described being uncomfortable disclosing their emotional problems to their doctor. These findings are particularly important in the context of postnatal depression as screening and detection of postnatal depression is highly reliant on the practitioner being able to elicit honest responses from their patient. It is evident that for some women, an ongoing mistrust of health professionals may impact on their willingness to provide honest answers when asked about their mental health.

These results are important as no studies to date have explored the long-term patterns of health service use and postnatal depression. Indeed these results indicate that rapport is a key factor in the detection of postnatal depression and risk factors and reliability of screening for current mood in the perinatal period. These findings show that rapport with patients is a long-term concern, and that negative experiences can have a long-lasting effect on patients.

8.2.1.6 Physical health

Physical health measures such as the SF-36 General Health Subscale and body mass index (BMI) were evaluated in Study 3. While high BMI (overweight or obese) were not related to postnatal depression, significant results were found in the relationship between low ratings of general health and postnatal depression. These associations were

not significant in the multivariate model suggesting that while these factors were associated with postnatal depression, they were not uniquely associated, and therefore related to other risk factors entered in to the model. A large number of physical health conditions were described by participants in Study 2 such as cancer, glandular fever, chronic fatigue, thyroid problems and other health conditions. Several participants described the relationship between their ongoing health problems and their poor mental health. The ongoing impact of physical health conditions on mental health is of particular concern in both pregnancy and postpartum when the focus of medical appointments is more likely to be placed on pregnancy and the infant rather than the health condition or indeed the general health of the mother which may in turn exacerbate the risk of postnatal depression (Surtees, Wainwright et al. 2003).

8.2.2 Pre-pregnancy

8.2.2.1 Mental health

The strongest associations for postnatal depression were found with other mental health conditions across all four studies. A significant relationship was found between previous anxiety and postnatal depression and between previous depression and postnatal depression (Study 1). When evaluated longitudinally in Study 3, there was a significant relationship between postnatal depression and previous depression and anxiety as well as for previous postnatal depression, postnatal anxiety and antenatal depression. Interestingly a reverse relationship was detected for both postnatal anxiety and antenatal anxiety. This may be explained by those women who are being treated for anxiety in pregnancy or postpartum being less likely to then become depressed due to

already receiving treatment. While it was not possible to examine the treatments that were being undertaken at the time, future analyses could more closely explore this relationship by utilising data collected in administrative datasets such as the national medical insurance database (Medicare). Despite these contrary results, a strong association between other mental health conditions across the life-course was found with postnatal depression. These results were supported in the qualitative studies, where several women described ongoing mental health problems (Study 2). Participants described their experiences of depression and anxiety, as well as other conditions such as bipolar disorder and eating disorders. The associations between other mental health conditions and postnatal depression were supported in Study 4, with a number of participants describing experiencing depression over their lives and then experiencing postnatal depression after having a child.

Beck's (1996) meta-analysis reported a moderate relationship between postnatal depression and previous episodes of depression. Robertson, Grace et al (2004) also found that a history of depression was a reliable predictor of postnatal depression, in their analysis of literature. The relationship between postnatal depression and previous mental health problems has been highlighted as a critical component of the psychosocial screening protocol recommended in Australia. Using previous literature and Milgrom's (2008) study as key evidence, it is recommended in the national guidelines that all pregnant and postnatal women be asked about their previous experience of mental health problems all visits with a relevant health care professional along with other risk factors and current mood (from the Edinburgh Postnatal Depression Scale) (Austin,

Hight et al. 2011). The results of this project confirm that previous mental health is a key indicator of risk of postnatal depression. While the current study shows definitively that previous mental health issues precede postnatal depression, there is still a need for further research to identify effective interventions. In particular, longitudinal data could identify differences between women who are at risk for postnatal depression and later develop the condition and those who are at risk but do not go on to experience postnatal depression. These findings are particularly important in the light of several participants in Study 4 who described a lack of screening or diagnosis of what they suspected was postnatal depression, as a better understanding of those women at greatest risk of postnatal depression will allow an awareness of the importance of screening and detection of postnatal depression.

8.2.2.2 Reproductive health

Past reproductive health was an unexpected theme uncovered in Study 2, based on a lack of previous literature linking the topic to postnatal depression. A number of participants described their experiences of polycystic ovarian syndrome, sexually transmitted infections, abnormal pap tests and other gynaecological issues. These findings suggest that women who have experienced adverse reproductive events may be more likely to experience postnatal depression at a later date. These findings are important as they are novel, and provide insights to the prior reproductive events of women who have experienced postnatal depression. Further empirical testing is required to explore these issues more in-depth; however these initial results are promising. The relationship between reproductive events and health service use is also worthy of further investigation as it is possible that experiencing negative reproductive events may impact

on trust and rapport with health services, which has been identified as a potential risk factor for postnatal depression. Additional interviews focussing on such issues would be appropriate to explore these relationships in more detail. Reproductive events such as miscarriage, stillbirth, terminations and ectopic pregnancy are discussed in Section 8.2.3.2 below.

8.2.3 *Pregnancy*

8.2.3.1 *Pregnancy health*

Several different pregnancy-related conditions were examined in this project.

Gestational diabetes and gestational hypertension for the index pregnancy as well as for previous pregnancies were examined in Study 3. While the relationship between gestational hypertension and postnatal depression was significant at the univariate level, this relationship did not hold at the multivariate level. Pregnancy-related conditions such as morning sickness and other complications were examined in Study 2, and several participants discussed the impact of these conditions on the levels of stress they were experiencing. In Study 4, a number of participants described experiencing unexpected pregnancies and, again, the stress and distress this caused them during their pregnancy and into the postpartum period. These results indicate that while some associations between pregnancy conditions and postnatal depression exist, it is more likely to be the resultant stress of a pregnancy complication that is related to postnatal depression.

Several previous studies have also examined pregnancy health in relation to postnatal depression, and found that poor health in pregnancy was predictive of postpartum mood

(Dennis, Janssen et al. 2004, Tuohy and McVey 2008). However, neither of these controlled for other factors in a holistic manner as did the current project. For example, previous studies did not consider the possibility that other factors such as attitudes towards health services may mediate the relationship between health in pregnancy and postpartum mood.

8.2.3.2 Pregnancy and reproductive history

Issues related to prior adverse pregnancy and reproductive events were assessed in Studies 2-4. In Study 3, history of stillbirth, miscarriage, ectopic pregnancy and terminations were examined however no significant relationships with postnatal depression were detected. Several themes relating to pregnancy and reproductive history emerged in Study 2, where several participants described the stress they experienced in relation to pregnancy loss and stillbirth. These themes also emerged in Study 4. In addition, several participants described their experiences of infertility in both Study 2 and Study 4. In Study 4, one participant described their experience of infertility after having one child and the impact of infertility on her mental health. Others related their infertility to stress experienced during subsequent pregnancies and postpartum.

While these findings are in part contradictory, they indicate the utility of different forms of data collection; population level data is most appropriate for policy development, and individual data most appropriate for understanding individual variation. In this situation, the quantitative results indicate that those women who experience adverse reproductive events are no more likely to experience postnatal depression after a healthy birth, suggesting that perinatal mental health policy and resource allocation is not necessary

for this group. However the qualitative results indicate that for some women who have experienced postnatal depression, adverse reproductive histories may be salient and relevant in a clinical setting, and important for discussion in a counselling setting.

8.2.4 Childbirth

8.2.4.1 Proximal birth issues

Labour and birth complications were assessed in Studies 2-4. In Study 3, labour interventions such as pain relief, caesarean birth, and events such as emotional distress during labour were examined. Significant associations with postnatal depression were found only for emotional distress during labour. This association remained significant in the multivariate model. In Study 2, several participants described their experience of childbirth complications such as emergency caesarean, traumatic birth, and breech birth. Similar themes emerged in Study 4, as well as a number of participants describing pain relief during labour, and expectations for labour. Further, a number of participants described the emotions relating to childbirth when expectations were not met.

In an early study, Brown et al (1994) found that obstetric factors may be a contributing risk factor for postnatal depression. This was supported by White et al's (2006) study that found caesarean birth was a risk factor for postnatal depression. While these studies were of Australian populations, they were conducted in only state-based populations, which may limit the generalisability of the results. Additionally, neither study measured emotional distress during birth, as was measured in the current project, and thus did not consider that it may be distress rather than the event that is related to postnatal depression. The results of the current project support the findings of other previous

studies that did not find a significant association between obstetric factors and postnatal depression (Johnstone, Boyce et al. 2001, Carter, Frampton et al. 2006). Furthermore, the results of the current project show that perceptions of emotional distress are critical rather than the event itself, offering a valuable opportunity to intervene and minimise the distress experienced by women during labour.

8.2.5 *Postnatal*

8.2.5.1 *Stress and coping*

Parenting stress was assessed in Study 2 and Study 4. A theme called ‘parenting stress’ emerged in Study 2, where women described their stress in relation to their infant. In Study 4, several participants described parenting stress in the context of the change to their routine and day-to-day life once their infant was born. In both Study 2 and Study 4, it was unclear whether the parenting stress preceded their diagnosis of postnatal depression or not.

A number of women in Study 4 also reported the stress associated with not meeting their expectations of motherhood. Several women also described the stigma and shame associated with admitting they were not enjoying motherhood or bonding with their infant. In Beck’s (2002) qualitative meta-synthesis, she found that ‘incongruity between expectations and reality’ was a major theme across many of the studies. Similarly, Knudson-Martin’s (2009) qualitative meta-analysis reported that the social construct of motherhood to be pivotal in women’s feelings and emotions during motherhood. Perceptions and expectations of motherhood appear important in the development of

postnatal depression and may also impact on help-seeking practices by women, therefore potentially exacerbating the condition.

Several previous studies have identified a relationship between postnatal depression and parenting stress, although as in the current study, no causal inferences can be made (Boury, Larkin et al. 2004, Page and Wilhelm 2007). Further research is required to more closely understand these relationships and to explore whether parental stress was a symptom or a predictor of postnatal depression. Nonetheless, these results indicate that women who experience postnatal depression are also likely to experience parenting stress, which in turn can have a particularly negative impact on the infant, and interventions should be targeted not only at depressive symptoms but also stress symptoms.

8.2.5.2 Sleeping patterns

Several participants in both Study 2 and Study 4 related sleep deprivation directly to their low mood postpartum. In addition, women who did not experience postnatal depression also discussed sleep deprivation in the postpartum, indicating that although disrupted sleep is experienced by many new mothers it was found to affect women in different ways.

Indeed, previous studies have identified that the relationship between sleeping problems and postnatal depression is difficult to untangle, in part due to many women experiencing sleeping problems in new motherhood, but also due to sleeping problems being related to other mental health conditions (Uhde, Cortese et al. 2009). Nonetheless,

like parenting stress, women who experience postnatal depression appear likely to experience sleeping problems beyond those normally experienced by new mothers, and in order to improve overall quality of life, interventions and treatments should target sleep dysfunction in addition to depressive symptoms.

8.2.5.3 *Infant health*

Infant health conditions such as premature birth and low birth weight were examined in Study 3. Breastfeeding was examined in Study 2-4. While both premature birth and low birth weight of the index child as well as previous children was assessed in Study 3, no significant associations were identified. Breastfeeding was also examined in Study 3 by evaluating if infants were breastfed for less than six months or if their older children were breastfed for less than six months (ie if the mother has a history of breastfeeding for less than six months). Significant results were found for the index child being breastfed for less than six months, and these results were also significant in the multivariate model. Breastfeeding problems were identified in both Study 2 and Study 4. In particular all participants whether they had experienced postnatal depression or not described difficulties with breastfeeding. In some situations, participants described the shame associated with being unable to breastfeed, and the impact on their mood when their experience did not live up to their expectations. Women also described how bonding with their infant was inhibited by difficulties with breastfeeding and how bonding related to their experience of postnatal depression.

Poor infant health is not commonly included as a risk factor for assessment many studies due to the burden placed on mothers of unwell children by participating in

research. The method employed by the current project was ideal to examine low birth weight and premature birth as risk factors for postnatal depression, and significant results were identified. Previous studies have found significant results, however the sample size was small (Ueda, Yamashita et al. 2006). Previous studies have also related breastfeeding problems with development of postnatal depression, however like sleeping problems, it is difficult to identify any causal relationship between the two events (Brown, Lumley et al. 1994, Pippins, Brawarsky et al. 2006, Thome, Alder et al. 2006).

8.3 Revisiting the Brown and Harris Psychosocial Model of Depression

Brown and Harris (1978) found four key vulnerability factors related to depression in their examination of women in London; having three or more children at home, having no outside employment, having low intimacy with their husband, and losing their mother before age 11. When applying motherhood as the ‘recent provoking agent’ in the Brown and Harris model, Boyce (2003) found that previous psychopathology, experience of stressful life events, lack of social support (including partner support) and having a vulnerable personality type were all significant vulnerability factors.

By using multiple methods and longitudinal data in the current project, a more comprehensive set of vulnerability factors were identified. Several of the vulnerability factors identified in Boyce’s application of the Brown and Harris model were confirmed in the current study – lack of social support, experience of stressful life events and mental health history (depression). However, the current research was unable to fine tune the understanding of the most important aspects of social support. In addition,

previous postnatal depression was found to be a vulnerability factor in the current study. Other new vulnerability factors additional to the Brown and Harris model were infertility, reproductive health factors such as PCOS and abnormal pap tests, physical conditions such as thyroid conditions, and health service use problems. Personality type was not evaluated in the current project and therefore could not be considered in an updated model.

While motherhood could be considered a recent provoking agent, several other factors were identified in addition to Boyce's findings. Recent mental health (self-reported mental health, postnatal anxiety and antenatal depression), emotional distress during labour, postpartum stress, breastfeeding current child for less than six months, and sleep deprivation were all identified as recent provoking agents.

The results of the current study confirm the Brown and Harris model – that both distal and proximal factors have an impact on an individual's risk for postnatal depression. Prior history of mental health conditions was particularly evident as having a significant impact on risk, which is reflected in the modification made to the model as seen in Figure 13 in red. The new arrow illustrates the relationship between history of depression and subsequent incidents of depression, particularly postnatal depression. This finding is important, as for the first time, the cumulative impact of mental health problems has been highlighted in this model.

Other significant factors that were found in the current project were long-term experience of stressful life events and lack of social support. In addition, the severity of

postnatal depression was impacted upon by stressful events in pregnancy and postpartum, such as difficulties breastfeeding, emotional distress during labour and sleep deprivation. Importantly, having previous experiences of postnatal depression was identified as a vulnerability factor – indicating that for some women childbearing years poses a time of significant mental health impairment. Interestingly, other events for previous infants such as prior breastfeeding practices, stressful labour events and emotional distress in the absence of postnatal depression did not pose a significant risk to subsequent postnatal depression. This indicates that while many prior experiences are important in the identification of risk, other factors are not related to prior experience and that knowledge of current breastfeeding and sleep practices are critical.

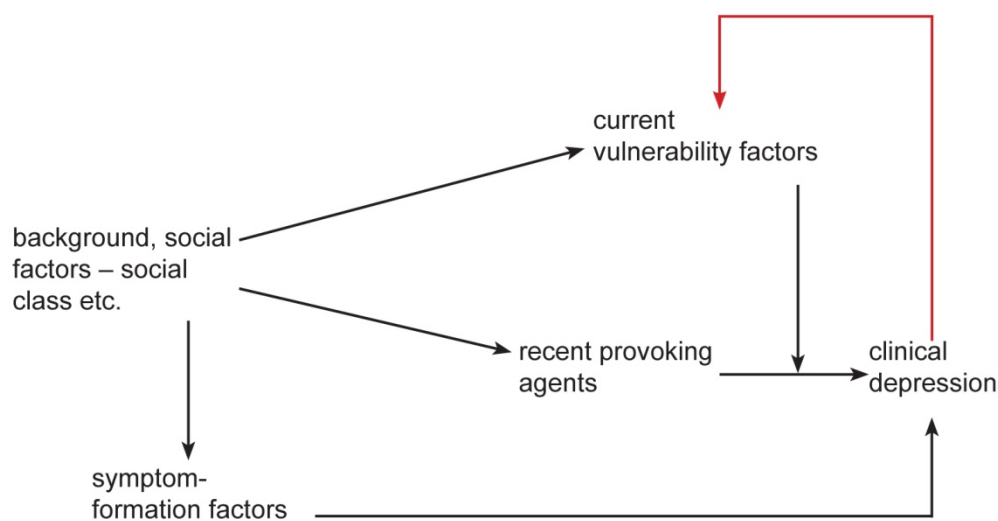


Figure 13 *The modified psychosocial model of postnatal depression (modifications in red)*

8.3.1 Implications of the updated Brown and Harris Psychosocial Model of Depression

Firstly, the finding of new vulnerability factors has important implications for future research and clinical directions. Previous episodes of postnatal depression as well as other reproductive factors such as infertility, PCOS, abnormal pap tests, chronic conditions such as thyroid conditions, and health service use problems were all identified in this project as significant vulnerability factors. For women in their childbearing years, these findings are particularly pertinent, as women who have had reproductive problems in the lead up to motherhood may be more vulnerable than other women to postnatal depression. Importantly, women who reported problems with health services (either distance to services, dissatisfaction with services or practitioners) were also more vulnerable, and while women who have experienced recent reproductive problems are also more likely to have had recent interactions with health services, these vulnerabilities may be magnified. These findings stress the importance of improved rapport between practitioners and patients in order to improve the experience and also develop a trusting relationship so that women feel comfortable discussing their mental health during perinatal screening for mental health problems.

8.4 Women's experiences of screening, diagnosis and treatment for postnatal depression

Several women who experienced postnatal depression described the experience of screening, diagnosis or treatment in the postpartum, in Study 4. Unexpectedly, few women reported being screened for psychosocial history and current mood in the postpartum even though several Australian states had initiated screening programs at the

time of the interviews. Of those women who did experience postnatal depression, participants reported receiving this diagnosis from GPs, and commonly were not referred to mental health professionals for detailed diagnostic testing. When prompted for additional details, very few participants could describe the events surrounding diagnosis, although a number of participants described not being honest with their practitioner as they perceived that there was a lack of understanding from their practitioners. Like the results for health service use described in Study 2, rapport appeared to be an important factor in the doctor-patient relationship, and if the patient did not perceive a positive rapport and understanding, they were unlikely to be honest about their current mental state. These results indicate that training needs to be provided to practitioners to improve their rapport-building skills and subsequent levels of trust with patients, in order to gain honest information during psychosocial risk analysis and mood screening.

In terms of treatment, only two different forms of treatment were described by participants. They were antidepressants and counselling. Those who had received prescriptions for antidepressants described long-term use of those medications, with little medical follow-up. While participants described improved mood after taking medications, they also perceived that long-term use was the only solution to their mood disorder. These interviews were conducted prior to the release of the *beyondblue* Clinical Practice Guidelines, in which good practice points include the follow-up of patients receiving treatment. Those participants who were receiving counselling provided mixed feedback on the usefulness of this approach. Similar to issues of

rapport-building with general practitioners, several participants described unhappiness with one counsellor, and a lack of perseverance either with the same counsellor or another after one dissatisfactory session. These findings indicate that patients require greater understanding of the options available to them regarding counselling and treatment options in order to optimise treatment success.

8.5 Strengths

The results of this project are strengthened by the use of a large, national, representative, longitudinal dataset, and by utilising a mixed methods design to evaluate the relationship between factors at the population-level, but also provide insights at the individual level with qualitative data. Data was collected at numerous time points from ages 18-23 years onwards, and a limitation of the majority of previous research was overcome by avoiding the use of retrospective measures in a clinical setting. The nature of the dataset also allowed for a comparison group of non-depressed women to be included in analyses.

This project directly built on Boyce's (2003) study, and added to his work by using a large longitudinal dataset rather than recruiting immediately after giving birth. Further, Boyce recommended that recruitment would be optimal during pregnancy in order to limit the difficulties in recruiting after giving birth, and to minimise the reliability of retrospective data collection. The current study took this recommendation further by utilising data already collected prior to birth to more accurately examine long-term risk factors at a population level.

8.6 Limitations

The limitations of this project should also be acknowledged. The prevailing limitation with the dataset utilised in this project is the reliability of the self-report postnatal depression item. As participants were asked if they were ‘diagnosed or treated for postnatal depression’, the prevalence of postnatal depression may be underreported as women must acknowledge and understand that they had been diagnosed with postnatal depression in order to answer this item positively. This limitation could have been minimised with a direct measure of current mood (eg EPDS), however due to the nature of the large-scale survey, it was not possible to include this at the time. There is also a potential risk of over-reporting of depression via retrospective answering as found in previous research of depression during different reproductive phases (Gregory, Masand et al. 2000). Validation of the self-report measure could be conducted in the future through the use of a variety of strategies including in-depth interviews and data linkage with administrative datasets that record current mood scores (eg Obstetrix database that is used in several NSW hospitals). Nonetheless, the prevalence detected in this project falls within the range reported in previous research, lending strength to the self-report item used.

Another limitation with self-reported survey data is the inability to more closely examine events near the time of the birth, as timing and sequencing is not possible. Therefore it is not possible to ascertain the order of events and precise timing of the event – this is particularly pertinent when examining pregnancy events such as miscarriage in relation to live births due to the nature of the questions included in the

survey. In order to examine the timing of these events more closely, validation of the self-report dataset could be conducted using linked data analyses whereby the survey data is linked to administrative data such as admitted patient data and perinatal data. This would allow more precise sequencing of events to be conducted.

Related to the issue of self-report data is the timing of the introduction of screening protocols at a national level, which may have lead to an overestimation of cases in the sample. For example, it is possible that those women who were screened for current mood and scored highly perceived that this was a diagnosis of postnatal depression, where diagnosis of the condition requires further detailed evaluation by the practitioner. However, the roll-out of screening may have also improved detection of cases that would have otherwise not been detected prior to screening taking place. These findings indicate that there are both advantages and disadvantages of screening in relation to the understanding of the meaning of high screening scores and to the accurate detection of cases of postnatal depression. As the clinical practice guidelines recommend, psychosocial risk assessment must be coupled with current mood screening in order to most accurately detect those women at greatest risk of postnatal depression. The results of this study are critical in the ongoing development of policies related to perinatal mental health as a clear set of risk factors for postnatal depression have been detected. Updated perinatal mental health policy should include those risk factors that were significantly associated at the multivariate level in this study, in order to allow practitioners to best identify where resources should be allocated.

8.7 Screening of current mood and psychosocial risk

There have been a number of important developments in perinatal mental health research and policy in Australia over the last 10 years and indeed during the current study period. A significant health policy development has been the establishment of the National Action Plan for Perinatal Mental Health (beyondblue: the national depression initiative and Perinatal Mental Health Consortium 2008), the establishment of the National Perinatal Depression Initiative (NPDI) (Australian Government Department of Health and Ageing Accessed Oct 2010), and the introduction of the NHMRC-endorsed *beyondblue* Clinical Practice Guidelines for Depression and Related Disorders in the Perinatal Period (Austin, Highet et al. 2011). These initiatives endorse universal, routine psychosocial assessment as a key component of pregnancy and postpartum care. In this context, psychosocial assessment including screening for current mood disorders and the administration of the Edinburgh Postnatal depression Scale (EPDS) (Cox, Holden et al. 1987) has been recommended in the Clinical Practice Guidelines. Psychosocial factors that are recommended for screening in the Guidelines were past or family history of mental health disorder, history of abuse, emotional and practical support, relationship with mother, drugs and alcohol, major stressors (Austin, Highet et al. 2011).

While screening of current mood state in pregnancy and postpartum is important, psychosocial risk factors give the practitioner the opportunity to intervene at an earlier time or indeed to identify those clients at higher risk of developing perinatal mood disorders in the future. While those risk factors that are identified in the Guidelines as

key factors are indeed important, additional factors such as infertility, reproductive health history and physical health conditions could be incorporated into screening protocols. In addition, those who have had dissatisfaction with health service use may be at additional risk but this also poses an additional problem to clinicians, as these clients may be less likely to attend appointments or develop a rapport with the clinician due to past dissatisfaction. The results of the current study also indicate that current vulnerability in postpartum such as breastfeeding problems and sleep disturbance may be indicators of risk. While such issues are common among the non-depressed population of new mothers, the cumulative impact of mental health disturbance with other factors such as infant feeding may pose an additional threat to women already at greater risk for postnatal depression.

Several past studies have recommended that ‘prevention’ of postnatal depression can be achieved by antenatal screening of risk factors such as current mood state (Austin 2004, Milgrom, Schembri et al. 2011) (Boyce 2003) or by early postpartum screening (Chen, Wang et al. 2011). Such strategies are cost-effective and relatively easy to initiate as routine training for all clinicians who have contact with pregnant and postnatal women is possible. However, the results of the current project indicate that there are earlier opportunities to intervene, as early risk, especially previous mental health risk, provide an opportunity to prevent recurrence of mental health dysfunction. In particular, all women of childbearing age, or even prior to childbearing years who has experienced depression should be considered to be at high risk of postnatal depression, and therefore additional support and preventative strategies should be targeted to this group.

This strategy is in keeping with other Australian mental health strategies, such as the work of Patrick McGorry's *Headspace* initiative. *Headspace* was developed on the premise of early intervention and prevention of mental health conditions for young people via 'one stop shop' type establishments which aim to holistically treat not only the symptoms of mental health conditions but also the recent provoking agents that may impact of the severity of symptoms (Headspace 2012). This model of effective and efficient treatment of mental health conditions in adolescence and early adulthood provide an opportunity to reduce the impact of previous mental health on the development of postnatal depression. Such strategies could see a reduction in the prevalence of postnatal depression and break the cumulative impact of mental health dysfunction for women across the life course.

8.8 Conclusion

For the first time, proximal and distal risk factors for postnatal depression were assessed in a broadly representative sample of young Australian women in a longitudinal context. Over 15% of women in the sample reported experiencing or being treated for postnatal depression, which attests to the great significance of this problem in the population.

Overwhelmingly, previous mental health problems were uniquely associated with postnatal depression, including previous depression and previous postnatal depression. Women's experiences of diagnosis and treatment were also explored, finding that treatment options were commonly restricted to medications and in some cases counselling.

The findings of this project provide clear direction for the development of future clinical guidelines regarding postnatal depression and support the premise of early intervention for mental health problems, such as the *Headspace* program to target mental health problems in adolescence. By preventing first incidences of mental health problems, recurrences such as those in the perinatal period should be reduced, which in turn will have a positive impact on mother-infant bonding, and on maternal health outcomes and infant outcomes.

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Appendices

Appendix.A Diagnoses questions (postnatal depression, depression, anxiety)

A.1 Survey 2 (2000)

Q12 Have you ever been told by a doctor that you have:
(Mark all that apply)

	A YES, IN THE LAST 4 YEARS	B YES, MORE THAN 4 YEARS AGO
<i>a</i> Gestational diabetes (during pregnancy)	☐	☐
<i>b</i> Insulin dependent (Type I) diabetes	☐	☐
<i>c</i> Non-insulin dependent (Type II) diabetes	☐	☐
<i>d</i> Heart disease	☐	☐
<i>e</i> Hypertension (high blood pressure) during pregnancy	☐	☐
<i>f</i> Hypertension (high blood pressure) other than during pregnancy	☐	☐
<i>g</i> Low iron (iron deficiency or anaemia)	☐	☐
<i>h</i> Asthma	☐	☐
<i>i</i> Postnatal depression	☐	☐
<i>j</i> Depression (not postnatal)	☐	☐
<i>k</i> Anxiety disorder	☐	☐
<i>l</i> Endometriosis	☐	☐
<i>m</i> Urinary tract infection	☐	☐
<i>n</i> Chronic fatigue syndrome	☐	☐
<i>o</i> Chlamydia	☐	☐
<i>p</i> Genital herpes	☐	☐
<i>q</i> Genital warts (HPV)	☐	☐
<i>r</i> HIV or AIDS	☐	☐
<i>s</i> Hepatitis B or C	☐	☐
<i>t</i> Cancer (Please specify on page 29)	☐	☐
<i>u</i> Other major illness (Please specify on page 29)	☐	☐
<i>v</i> None of these conditions	☐	

A.2 Survey 3 (2003)

Q12 In the **LAST 3 YEARS**, have you been diagnosed or treated for: (Mark all that apply)

YES, IN THE
LAST 3 YEARS

<i>a</i>	☐	Gestational diabetes (during pregnancy)
<i>b</i>	☐	Insulin dependent (Type I) diabetes
<i>c</i>	☐	Non-insulin dependent (Type II) diabetes
<i>d</i>	☐	Heart disease
<i>e</i>	☐	Hypertension (high blood pressure) during pregnancy
<i>f</i>	☐	Hypertension (high blood pressure) other than during pregnancy
<i>g</i>	☐	Low iron (iron deficiency or anaemia)
<i>h</i>	☐	Asthma
<i>i</i>	☐	Postnatal depression
<i>j</i>	☐	Depression (not postnatal)
<i>k</i>	☐	Anxiety disorder
<i>l</i>	☐	Endometriosis
<i>m</i>	☐	Urinary tract infection
<i>n</i>	☐	A Sexually Transmitted Infection (eg chlamydia, genital herpes)
<i>o</i>	☐	Hepatitis B or C
<i>p</i>	☐	Cancer (Please specify on page 30)
<i>q</i>	☐	Other major illness (Please specify on page 30)
<i>r</i>	☐	None of these conditions

A.3 Survey 4 (2006)

Q12

In the last 3 years, have you been diagnosed or treated for: (Mark all that apply)

Yes, in the last 3 years

a	Gestational diabetes (during pregnancy)	☐
b	Insulin dependent (Type I) diabetes	☐
c	Non-insulin dependent (Type II) diabetes	☐
d	Heart disease	☐
e	Hypertension (high blood pressure) during pregnancy	☐
f	Hypertension (high blood pressure) other than during pregnancy	☐
g	Low iron (iron deficiency or anaemia)	☐
h	Asthma	☐
i	Bronchitis	☐
j	Postnatal depression	☐
k	Depression (not postnatal)	☐
l	Anxiety disorder	☐
m	Endometriosis	☐
n	Polycystic Ovary Syndrome	☐
o	Urinary tract infection	☐
p	A Sexually Transmitted Infection (eg chlamydia, genital herpes etc)	☐
q	Cancer (please specify on page 30)	☐
r	Other major physical illness (please specify on page 30)	☐
s	Other major mental illness (please specify on page 30)	☐
t	None of these conditions	☐

A.4 Survey 5 (2009) – postnatal depression

Q39 Have you ever given birth to a child?

Yes ☐

No ☐ → If no, go to Q48

Q40 If you have ever given birth to a child, please write the date of each birth in the box.
(If you had twins, please write the date twice)

1st

2nd

3rd

4th

5th

6th

7th

8th

9th

Q41 Did you experience any of the following?
(Mark all that apply on each line)

	Never experienced this	1 st Child	2 nd Child	3 rd Child	4 th Child	5 th Child	6 th Child	7 th Child	8 th Child	9 th Child
a Premature birth	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
b Caesarean section before going into labour	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
c Caesarean section after labour started	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
d Labour lasting more than 36 hours	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
e Episiotomy (cutting of vagina)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
f A vaginal tear requiring stitches	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
g Forceps or Ventouse suction ('vacuum')	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
h Medical removal of placenta and / or blood clots by hand	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
i Excessive blood loss requiring extra blood or fluid by drip (IV infusion)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
j A low birth weight baby (weighing less than 2500 grams or 5 ½ pounds)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
k Epidural or spinal block	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
l Gas or injection for pain relief	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
m Emotional distress	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Q42 Were you diagnosed or treated for:
(Mark all that apply on each line)

	Never experienced this	1 st Child	2 nd Child	3 rd Child	4 th Child	5 th Child	6 th Child	7 th Child	8 th Child	9 th Child
a Antenatal depression?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
b Postnatal depression?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
c Antenatal anxiety?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
d Postnatal anxiety?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
e Gestational diabetes?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
f Hypertension (high blood pressure) during pregnancy?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Q43 How many complete months have you breastfed each of your children?
(Please write the number of MONTHS in the boxes)

1 st Child	2 nd Child	3 rd Child	4 th Child	5 th Child	6 th Child	7 th Child	8 th Child	9 th Child

A.5 Survey 5 (2009) – depression and anxiety

Q12 In the *last 3 years*, have you been diagnosed or treated for: (Mark *all that apply*)

Please record conditions related to pregnancy (gestational diabetes, hypertension during pregnancy, antenatal depression and postnatal depression) in the section relating to pregnancy later in the survey.

Yes, in
the last 3
years

a	Insulin dependent (Type 1) diabetes	☐
b	Non-insulin dependent (Type 2) diabetes	☐
c	Heart disease	☐
d	Hypertension (high blood pressure)	☐
e	Low iron (iron deficiency or anaemia)	☐
f	Asthma	☐
g	Bronchitis	☐
h	Depression	☐
i	Anxiety disorder	☐
j	Endometriosis	☐
k	Polycystic Ovary Syndrome	☐
l	Urinary tract infection	☐
m	Chlamydia	☐
n	Genital herpes	☐
o	Genital warts (HPV)	☐
p	HIV or AIDS	☐
q	Hepatitis B or C	☐
r	Skin cancer	☐
s	Other cancer (Please specify on page 30)	☐
t	Other major physical illness (Please specify on page 30)	☐
u	Other major mental illness (Please specify on page 30)	☐
v	Other sexually transmitted infection (Please specify on page 30)	☐
w	Other (Please specify on page 30)	☐
x	None of these conditions	☐

Appendix.B MOS Social Support Index

Q92 People sometimes look to others for companionship, assistance, or other types of support. How often is each of the following kind of support available to you if you need it?

(Mark one on each line)

		None of the time	A little of the time	Some of the time	Most of the time	All of the time
a	Someone to help you if you are confined to bed	☐	☐	☐	☐	☐
b	Someone you can count on to listen to you when you need to talk	☐	☐	☐	☐	☐
c	Someone to give you good advice about a crisis	☐	☐	☐	☐	☐
d	Someone to take you to the doctor if you need it	☐	☐	☐	☐	☐
e	Someone who shows you love and affection	☐	☐	☐	☐	☐
f	Someone to have a good time with	☐	☐	☐	☐	☐
g	Someone to give you information to help you understand a situation	☐	☐	☐	☐	☐
h	Someone to confide in or talk to about yourself or your problems	☐	☐	☐	☐	☐
i	Someone who hugs you	☐	☐	☐	☐	☐
j	Someone to get together with for relaxation	☐	☐	☐	☐	☐
k	Someone to prepare your meals if you are unable to do it yourself	☐	☐	☐	☐	☐
l	Someone whose advice you really want	☐	☐	☐	☐	☐
m	Someone to do things with to help you get your mind off things	☐	☐	☐	☐	☐
n	Someone to help with daily chores if you are sick	☐	☐	☐	☐	☐
o	Someone to share your most private worries and fears with	☐	☐	☐	☐	☐
p	Someone to turn to for suggestions about how to deal with a personal problem	☐	☐	☐	☐	☐
q	Someone to do something enjoyable with	☐	☐	☐	☐	☐
r	Someone who understands your problems	☐	☐	☐	☐	☐
s	Someone to love and make you feel wanted	☐	☐	☐	☐	☐

Appendix.C Thematic analysis of open-ended comments with examples

Table 21 Coding tree with count of instances and examples

Theme	Count	Example of comment
Accident	9	<i>Many of the answers I have given about physical health relate to a major MVA in Feb 2004 (head and spinal injuries). Many of the answers I have given about emotional health also are connected to this accident.</i>
Mental health		
Seasonal affective disorder	1	<i>I went to Qld a couple of weeks age and with the sun shining I couldn't stay in bed. I was up at 8 every morning. I was happy and very active. I come back to Melbourne. I sleep 14 hrs a day I get up after lunch. It is unhealthy. The sun doesn't shine I can't stand it. I'm going insane. Is it true people can get seasonal disorder or disease. Which occurs in the winter months.</i>
Anxiety	10	<i>Just to give you some more information. Regarding the weight loss question. My weight loss was due to anxiety problems affecting my eating habits</i>
Self confidence	1	<i>I think that this is important because is also helps to explain why I often feel tired, which adversely affects the way I feel about myself - confidence, etc. This has huge impacts on my social life, and my working life.</i>
Depression	34	<i>Just so you know I have had depression the last 6 months, only starting to feel better the last week changed my diet and have joined the gym, and am trying to stop drinking as well. And I'm seeing a phycharist [sic], once a month. Hopefully I will get better and start feeling good about myself again.</i>
Mental breakdown	1	<i>In the past couple of months my husband had an affair, I had a mental breakdown, and after hospitalization & counselling, I called the marriage quits 7 days ago.</i>
Menstrual problems and emotions	5	<i>I believe women should have one paid day off per month due to menstruation (if necessary). Sometimes I feel a day when my hormones are all over the place I could do with a day in bed. Some days you don't feel like you can cope with very much and it is something we women can't control, it's hormonal.</i>

Table 21 continued

Theme	Count	Example of comment
Emotional health	9	<i>I believe that in comparison to some people my health is very good, but I have a lot of mental and emotional problems., I think that once I left high school I lost the availability of counselling services. I am just an average person, I'm not a minority or am I in any obvious hardship. I believe it is the average person like me who often misses out on counselling because the problems are not very obvious.</i>
Eating disorder	14	<i>I have suffered from an eating disorder for over 2 years. Although I have not yet recovered from all symptoms, I managed to recover from my anorexia.</i>
Bipolar disorder	3	<i>Perhaps next time you could put in questions relating to mental illness, as I spent time in the "nuthouse" last year, for three weeks. I know of two other women my age group who have both been in hospitals for mental reasons. Incidentally [sic], I have been diagnosed with bi-polar disorder (manic depressive) and had been put on medication which I no longer need or take.</i>
Antenatal depression	1	<i>I also got pregnant when the baby was 8 mths old- surprise ! Hard pregnancy, severe ante-natal depression, still working 4 days/wk. Husband got full time job in Central QLD, and we joined him after baby no.2 arrived. Huge life adjustments in a small mining town where we knew no-one and have just moved to another small Central QLD town because of his job! When I look at all this it's no wonder that I'm stressed & unhealthy!</i>
Suicidal ideation	1	<i>There were times in my life when I felt like committing[sic] suicide.....perhaps you could ask people about that.</i>
PTSD	1	<i>Suffering post-traumatic stress, due to giving birth 4 months ago and having to turn my daughters life support machine off. We were given no hope for survival and if she did live we were told she would be severely [sic]handicapped. I prayed for her to die. She is now a very health, hopefully unhandicapped, gorgeous child. There is no sign of any disabilities but no guarantee. I am taking a long time to get over this emotionally, so my answers are very different to what they would of been six months previous and hopefully six months later.</i>
Control	1	<i>I believe I am much happier and healthier in the last few years due to travel, making small and large changes to my lifestyle, conquering small fears and meeting new people. I am a very happy person because I now believe I have control and choice in my life.</i>

Table 21 continued

Theme	Count	Example of comment
Self perception	2	<i>I feel the most confident and happy with my appearance than I ever have, but do still experience moments of dissatisfaction when comparing myself to others. I have not been in a relationship in the last four years and have been happy about it That's where I'm at.</i>
Agoraphobia	1	<i>and suffer a form of agrophobia. Received extensive counselling over last 6 months and have now dealt with my past and am looking forward to my future.</i>
Obstetrics and gynaecology		
Gynaecological health	9	<i>Over the last 3-4 years I have had many problems with my periods. While I was on the pill I would bleed for 3 weeks of the month which made me very sick. All the help I got from G.Ps to specialised doctors no one could find out what was wrong with me, I even turned to a naturopath for help, but no luck. Then I decided to come off the pill again so I could try and fall pregnant, but off the pill I did not have a period at all and I did not ovulate which to me was a very hard thing to cope with. Any way after 10 months I was told to stop trying and just relax and maybe I would have better chance of getting my body back to normal. After a few more months (6) nothing happened but I still felt stressed, I realised my work (fulltime) was possibly the answer to my stress problem (and I think it had always been), so a few months later I quit my job. 1 1/2 months later I fell pregnant. So I have learnt stress plays a big part in how your body works and in making a baby.</i>
Ovarian cyst	1	<i>Q12. In August, September 1999 I was diagnosed with an ovarian cyst on each of my ovaries. They were dermoid cysts, both removed okay when I was 13-14 weeks pregnant. The care in hospital (4 days) was great - healthwise, but no-one really took the time to discuss with me what actually was done or if my pregnancy was okay afterwards. Thank goodness it was and I am 31 weeks pregnant with a normal, healthy child as far as I know. After the baby is born, I will increase my level of exercise to try and lose weight. Now I weigh 100kg, before I got pregnant I was 95kg. Ideally I would like to weigh about 80kg. Not to be thin, but to be fitter and healthier.</i>

Table 21 continued

Theme	Count	Example of comment
PCOS	11	<i>Visiting 2 doctors last year I inquired about why I have not had my period for 12 months. They told me not to worry as I'd got off the pill - even though I wanted to get pregnant. The 3rd doctors visit finally found out it was (is) polycystic ovarian disease and I have seen a gynecologist [sic] since. It took 3 different doctors to find this out.</i>
STIs	5	<i>Have a current illness concern (STD) for 6 months and I have not seen a GP or anyone about it yet because I do not know a nice female doc & have so little time to see a doc.</i>
Abnormal pap test	7	<i>I had an irregular pap smear [sic] test last yr. After various tests I was told I had abnormal cells. (I am sorry. I know there is a name for this out i cannot remember) I had two options. I chose to have them burnt off. I will now continue to monitor [sic] them.</i>
Endometriosis	2	<i>I have suffered from endometriosis for over 12 months and feel that nobody understands what I'm going through because of it. 'Endo' makes everyday activities difficult and painful and has been responsible for a number of my relationships breakdowns.</i>
Lifestyle		
Smoking	1	<i>This may also be because I have quit smoking and to help this, stopped drinking as much as I used to.</i>
Illicit drug use	5	<i>I think more questions should have been asked about drug use because some of the questions that I answered eg feeling tired all the time are a direct result of daily use of recreational drugs.</i>
Alcohol	4	<i>Hi my life has just gone through a major change. I've left my last partner of 4 years after a rather hectic time of alcohol, drugs & court. I've recently lost weight & are looking at my own alcohol problem! (I went on the wagon recently for 2 mths) I'm about to go part time at work 3 days/wk. I have trouble finding a balance - I'm extremely happy & optimistic but equally feel overwhelmed by life - way too busy, impossible to relax. Need to chill out a bit. The war gets me down. I'm going P-T to pursue other interests in the non-govt sector. (I've always worked for govt). I hope to become an activist, not just a reformer in govt. Apparently collective action is good for your health!! Also, have met a gorgeous alcohol limited & smoke-free man that listens & is fun to be with - good times ahead!! See ya next time!!</i>
Physical health	1	<i>I find my physical fitness is poor due to the lack of regularly exercising, of which I have no desire during the winter months.</i>

Table 21 continued

Theme	Count	Example of comment
Health service use		
Costs of medical care	3	<i>It is hard financially to go and see a doctor due to paying a fee as we earn too much apparently to have a health care card, but we don't earn a lot to afford to pay to see a doctor. So most of the time I battle it out, if I am unwell as I feel guilty spending food or bill money just to see a doctor [sic] for myself. This makes me angry that the medical system fails to provide adiquet [sic] care for the middle income earners. We can not afford private health cover at all. The government has no idea, what kind of pressues[sic] this puts on mothers. PS the mothers need to be the healthiest to look after the family & children yet we suffer in health due to finances. 'Work that one out'.</i>
Unhappy with health service	47	<i>I feel that dental care is too costly and should be covered my Medicare. Services have long waiting lists and many people I know would rather suffer in silence than go to a dentist. Emergency hospital care is disgusting with long waits and rude staff. There is a lack of radiologists and fertility services in my local area. Doctors and hospital staff seem to care more about money than their patients. I feel that my physical and emotional health is very poor and I am unable to get help. This I think is because of money and lack of services. Even professionals in the health industry don't care about my emotional health and only treat physical symptoms with quick fixes. Financial burdens make seeking treatment difficult. I appreciated the studies you are conducting and see them as a positive step towards better care for women</i>
Public vs private health	2	<i>Further, the birth was horrific - public hospital (because we hadn't planned for pregnancy), went into labour 10 days early (wasn't ready), 18 1/2 hr labour, 2 x epidurals that didn't work, not able to get off bed for entire time due to monitors, 2nd degree tear, placenta didn't come away after birth & needed to manually (& brutally) removed, discharged myself 24 hrs after birth because ward was full of NESB families (no sleep), got home, husband returned to work, cracked nipples, infected stitches, community midwife didn't visit until I called in tears on day 6!!</i>
CAM	2	<i>I feel as though doctors need to tell me about natural ways to heal and prevent problems as well as using medications!</i>

Table 21 continued

Theme	Count	Example of comment
Abuse and trauma		
Childhood abuse	6	<i>I was molested at the age of 7, and have difficulty sustaining long-term relationships due to panic attacks & insecurity. Played a major role in bringing up my siblings. Never got along with my parents.</i>
Sexual abuse	4	<i>Have been sexually abused at ages 10 and 15 and raped at age 17.</i>
Domestic violence	7	<i>Everything you ask is about the last 12 months. Well the last 12 months are probably the best in my whole life. I also am divorced. I used to be in a relationship that was full of manipulation and verbal abuse and drug abuse on his part.</i>
Abuse	14	<i>I was drugged in the last 6 months at a night club and was made seriously ill and hospitalised the offender tried to take me with them but they are not know to me.</i>
family and relationships		
Relationship with mother	1	<i>My parents (due to mainly financial strain - dad now being a full-time musician) have split up recently. I know this has been hard on my sisters but I've never really got along with her. The girls look at me as a mum more than they do her. I've been in Japan teaching English for the last 5 months and mum has gone to India/Malaysia now that I'm back so I am staying up in her house to look after my sisters. Dad too has moved back to save paying rent. But when mum gets back we'll be moving out again. It's a hard life, but my motto - keep smiling.</i>
Relationship problems	17	<i>I am currently going through a separation/divorce which is ugly. My ex partner & the woman he secretly left me for are trying to take my children accusing me of emotional abuse. I have found a new person but have the issues that I am trying to resolve from my previous marriage. I have a domestic violence order on my ex partner for mental, verbal & physical violence. This new partner who was a friend of mine & I now know was having a relationship with my ex during our marriage - she was his work partner is fully involving herself & making accusations as well. The harassment has also moved to my family who are my support & provide me somewhere to live & finally to my children who are being hurt because their father wants control. I have found a new profession & all this combined explains my stress.</i>

Table 21 continued

Theme	Count	Example of comment
Family health	6	<i>I believe that a lot of my stress has to do with my sisters illness. She was diagnosed with cancer two years ago. her illness is a constant source of sadness and confusion for me. I do think that this has effected my health to a certain extent.</i>
Family stress	14	<i>Difficult to give an average answer for the last week as it was one of the most emotionally traumatic weeks within the last year due to family problems.</i>
Sexuality	1	<i>I have also been bisexual. At the moment I am involved with someone of the opposite sex. You would be AMAZED at the amount of young women that do, do and don't admit it, have done, would like to or at least think about it. Sexuality is a big issue for young women in the 1990's.</i>
Caregiving	3	<i>I also care for my two elderly grandparents who have difficulties walking but that too is unpaid. So finding time to work is difficult. So I suffer a lot from anxiety about money and my health.</i>
Life events	4	<i>I have had quite a few health problems in the last 12 months and have in the last month changed my job. I also married this year and my best friend lost her child of five months old. It has been quite a hectic year and I have had stress related illness/issues. I am sure things will improve from here... I would also like to apologise for not advising my address change earlier.</i>
Life stress	5	<i>Part of my issues stem from major life events - controlling, obsessive, sometimes violent father, parents separated at 19, pregnant at 20 10 1 night stand, [Child's name] born 21, engaged 22 to father of above, married 23, separated 24, divorced 25, single parent, relationship 27, de facto 28, engaged 29, still await catholic annulment (3 years in progress) & uni, post grad uni, work full time, bought & sold 3 houses, etc etc etc. My answers reflect stress, health of above.</i>

Table 21 continued

Theme	Count	Example of comment
Lifestyle changes	7	<i>Over the past 6 months i have gone through a lot of changes. I have decided to leave my job and profession to follow a life long dream. I have been very unsatisfied in my job but felt that i had to stick with it and as a consequence my health began to really suffer. I also have rheumatoid arthritis and that became severe to the point where 5 weeks out of 6 saw me battling with an extensively swollen knee. However after i made the decision to leave my work and i handed in my resignation my health started to improve and became more stable. I am currently seeking help from a naturopath to reduce the effects of my arthritis and i am able to do more physical exercise. I am very excited and positive about my future and my health.</i>
Interstate move	1	<i>I apologize if things don't entirely make sense. I have spent 5 mths living with relatives (partner is different state) and a couple of those at Ronald McDonald House (while kids stayed with grandparents) due to problems with my pregnancy. We were moving (his work) I stayed behind with kids to have an ultrasound and never left. Mentally I'm surprised I got thru that. My entire pgncy was a wait and see thing. Thankfully my bub held on and was only 7 wks early. I had a lot of worry and the guilt of putting parents out and what the kids were going thru being away from me, was horrid! It's not something I could go thru again.</i>
Parents divorce	2	<i>Parents separated when I was 15. A very difficult time for me. Has taken me until now to come to terms with this. I have not lived full-time with parents since I was 17. I think distancing myself from them (1300km) has helped my growth emotionally.</i>
Adoption	1	<i>In the survey you hadn't mentioned if I'm adopted, the stress of finding out. The emotion side etc. I am adopted and have had a lot of stress, I found a letter from my birthmother on my 18th birthday. Even though I've known of my adoption for many years, I still have emotional stress especially when meeting my birth mother because feeling the pain of my adoptive parents would feel when I tell them that I've met my natural mother.</i>

Table 21 continued

Theme	Count	Example of comment
Bereavement	5	<i>This "is an" interesting time to do this survey, as in the last 12 mnths I lost my mother to cancer, nearly lost my father 5 mths later in a serious tractor accident where he lost a limb and is still learning to become independent, my brother & wife miscarried a baby due on the same day as our baby- a very stressful situation. My health and weight have been up and down due to emotional distress, my pregnancy/childbirth, and back injury. I feel the future is much brighter.</i>
Stress	13	<i>Also in regards to seeking medical assistance for headaches (Q13), I have in the past undergone a number of tests and have been told it is stress, but still continue to experience them regularly.</i>
Time pressure	3	<i>I wish I had more time to do the things I'd like to do.</i>
Financial stress	8	<i>The ability to ever afford to own (not just rent) a house is one of my biggest worries. We never seem to be able to save the deposit need (as we often have other expenses arise eg. car). On top of this timing is simply poor as we had a baby almost 15 months ago so we were living doubled nearly everywhere! I am generally annoyed that we are paying off someone else's mortgage, they are getting tax breaks as well as & it takes so much longer to save! We are the big financial losers & also working ourselves silly & for what? I often ask myself why I put so much effort into working/saving when (even on our current income) we aren't getting very far! Our families both live far away & we are on our own with a child. Thank Goodness our relationship is good-otherwise life would simply suck!</i>
Transitions	4	<i>As a student, it was hard to move out of home, into a city to attend a university all at the same time (ie a lot of new roles and responsibilities all at once) I found that there are not very many support services to help this.</i>
Overseas travel	6	<i>Re Q75, I've just resigned from full time work. I'm heading overseas for 1 year and have 2 weeks off beforehand. I am currently (last 2 weeks) preparing to depart on a year long overseas trip. Prior to this, I was working full-time. It has been an emotional roller-coaster of a time.</i>
Physical health		
Physical health stress	6	<i>I have had various different diagnosis, from cancer to anenmia die to diet & also had many, many tests, all from male doctors which has left me with very little private & personal space, as everyone seems to know everything, I guess that's what medicine is all about.</i>

Table 21 continued

Theme	Count	Example of comment
Asthma	1	<i>Asthma worsening with age.</i>
Glandular fever	10	<i>Q12u - I had glandular fever in 1998. My tonsils were very inflamed and I was unable to eat and was admitted to hospital. It took me 6 months to recover and in this time I was unable to work or do pretty much anything.</i>
Cancer	22	<i>Referring to page 5 i have been diagnosed and treated for a benign brain tumor - apparently due to radiation for treatment of leukaemia when i was 2yrs 10mths, some of the tumor is still there but it's being monitored.</i>
Health conditions	25	<i>Treated for rheumatoid arthritis, a condition i have had for 9 years.</i>
Weight	12	<i>My weight ballooned to 140 kilos. He is now 20 months and I have lost 20 kilos of weight.</i>
Hormonal problems	2	<i>I believe most of my emotional problems are hormone related.</i>
Thyroid problems	14	<i>I have found that in the last five years I have suffered illnesses caused by stress. I have had a thyroid problem in the past, when i was 15, which was so severe it has now left me to consume tablets on a daily basis to maintain my thyroxine level. Yet as my life has encountered other experiences such as boyfriends, study and problems with other friends, I have found I have become less tolerant to stress.</i>
Operations	1	<i>My health is down at the moment due to operations with in the last 12 months.</i>
Headaches	2	<i>It is not a chronic illness, but I get migranes about once a week, which reduces my time to work etc..5-6days a week.</i>
Back injury	2	<i>A recent back injury did cause such concern, when i was pysicaly unalbe to do things i normally could do. I tried physio twice with no benefit. Bowen helped me recover (pressure pain). I have since been able to do normal things in the last 3 weeks. I aslo took myself off the pill 6/c i believe this makes me want sex less and i was also moody angry all the time this causing depression.</i>

Table 21 continued

Theme	Count	Example of comment
Chronic fatigue syndrome	6	<i>After being diagnosed with Chronic Fatigue Syndrome, shortly after the birth of my first child, I found that any treatment such as cleansing diets, drinks, vitamin & amino acid supplements were costing so much that I was unable to afford them and had to do without. This cause more problems with the "disorder" until I became pregnant with my second child. I found that too many doctors, physicians could tell me much about CFS; treatment, prevention of further relapses, how long I'd had it or why I have this ailment - apart from overtraining in swimming & triathlon over my teenage years. I still feel as much in the dark as I did before I saw 4 different doctors, physicians, naturalists, etc.</i>
Prescription medications	1	<i>Living in se asia for 3 years so questions about health came/insurance do not apply to me. Have been concerned for some time about the prescription/use of roaccutane forsome severe acne during my teenage years following suits against the drug company that produces it in the us (long term severe depression/suicidal tendencies etc). Whilst i don't think i have any lingering side effects i do wonder whether anyone in australia is tracking this drug. Perhaps it could be covered in future women's health surveys? I often wonder whether there is going to be any concession between my fertility & past of roaccutane, though haven't tried to make any babies yet to confirm this!</i>
Social support	2	<i>Some of the questions made me feel upset, thinking about loneliness and peoples support, being understood and communicating that understanding I am in a serious relationship now, yet at least once a week I am unsure about my feelings and his. I don't know if I have emotional insecurities or whether this is truely a bad relationship. When I feel this way I become withdrawn and my friendships suffer. I do not think that I am as easy going as I have been in the past. This may also be because I have quit smoking and to help this, stopped drinking as much as I used to. My health is much better and I am proud of myself, but I feel boring.</i>
Social isolation	4	<i>Lucky for me I haven't gone insane yet and my son is realtively good. But how I would like to go and have a coffee with someone and have them listen to my feelings and give me some sort of helping hand.</i>

Table 21 continued

Theme	Count	Example of comment
Labour		
Labour stress	1	<i>When I had my son, he was delivered via emergency C-section. I had been in labour on and off for 2 weeks. Was Posterior and never entered the Birth Canal.</i>
Childbirth complications	4	<i>Needed intervention during child-birth. -son was born posterier breech by forceps delivery. later on unbeknown to anyone I lost a lot of blood requiring at least 2 transfusions. Was still discharged on day 3 despite all this & with colostomy bag (doc had damaged my bladder performing the birth).Needless to say was very dissatisfied with service but my son is more than worth it all!!</i>
Disappointed with childbirth	1	<i>In the past 3 years I have had 2 children, as you would know, but both children were born by cesarean, I have found that has effected my health, my feelings (as was unable to have a natural birth) and my lifestyle (for the time being).</i>
Caesarean	3	<i>Please note that all responses in this survey are influenced by the current state of my health ie. a brand new, first time mother recovering from an emergency ceasarean delivery.</i>
Short labour	1	<i>I developed severe postnatal depression following the birth of my 2nd child. In retrospect, i believe the depression came on slowly after the birth of our first child. As my labour was only 1hr 40mins and the actual time from when my waters broke to delivering my 2nd baby was just 7 minutes - i personally feel my hormones didn't adjust after the birth and my brain was wanting to love the baby but there was no chemical support. Although i had 2 hrs 20 min labour with our first child, my waters broke first & i had adjustment time before delivery - although this was incredibly rapid for a first delivery. Fortunately my obstetrition & paediatrition were faultless in their support & i have had [Name] as my psychiatrist [City] throughout my recovery.</i>
Premature birth	5	<i>I've been very stressed during this pregnancy due to the fact that I had my daughter at 25 wks. And during this pregnancy my husband & I have had quite a few ups & downs.</i>

Table 21 continued

Theme	Count	Example of comment
Stillbirth	3	<i>I think it's great what you people do, I hope this helps. I know that just having to answer most of the questions in this survey has helped me to know just how even I feel at times and also has really helped me to be honest about myself and also to be honest of what I have had to endure over the past 2 or so years. Although this survey has some negative answers at times, it is just what has happened or is true and having to read and think over how to answer has helped me to see things the way they are. It's been the first time I've been able to recognize the loss of my child [Name] and express my feelings of my seperation after over seven years of Marriage</i>
Traumatic birth	2	<i>Last 17 months (my daughter was born then) affected by traumatic birth - arterial tear vaginal wall tear, major blood loss & numerous health problems along the road to recovery since significant marital strain due to parental adjustment & health issues</i>
Neonatal death	2	<i>After the death of my 48 hour old baby - I was at the lowest point in my life - I tried to hide from reality with drugs, usually a mixture of extacy, speed, pot & alcohol in one night - not too smart!! I worked out that was not resolving issues - just increased the desire to end my life. My mother also lost her son - my brother 5 years ago in a car crash. I am now the only child - this is what kept me alive when contemplating suicide - I couldn't put my mother through the pain I was feeling - she still hasn't dealt with losing. So after having a pranic healing done on me - I felt light - unburdened - clean and for the first time in a long black period - positive! I felt wonderful - I wanted to know how to achieve this feeling by myself. So I attended classes - I now am a success storey. My life has more meaning now than ever before, I know I can stand on my own 2 feet - my happiness is something I make happen and finally - I am happy to be alive!</i>
Pregnancy		
Miscarriage	11	<i>I had a miscarriage after 4 1/2 months gestational period and my placenta hadn't fully come away, so I had to get a curette. I was still bleeding so heavily that a second curette was required about a week later and by this time I had also developed urinary tract disease and was extremely anaemix, I was in hospital for about a week. A very agonising experience!</i>

Table 21 continued

Theme	Count	Example of comment
Ectopic pregnancy	2	<i>Q70 I mark yes for a death of a child I had an ectopic pregnancy and it was terrible, the doctor I had totally stuffed up basically he gave me the operation and that was it, he never explained anything to me I was heart broken. Then in the same week I had to go back into hospital for another operation because the first doctor didn't remove all of the unborn child and then I received lesions from that operation so I had to get that lasered off. The lesions connected my bowel to my uterus it was very painful, that was nearly two years and I still havent become pregnant I have only one tube Im worried I wont have children and they mean so much to myself & my partner we seriously would love to have children. I hope I have helped.</i>
Problem pregnancy	2	<i>Being pregnant with my second child has made me more aware of what my grandmothers went through when they were having their seven or eight children. This pregnancy is completely different compared with my first. I have been very sick, had a few scares: ectopic, (turned out to be a cyst on the ovary) to leakages at 27 weeks so basically this is my last pregnancy. I really don't know how they did at back then, but i certainly take my hat off to them. Not having the support that mothers of today do, would have made it very difficult, so they need to be applauded.</i>
Unexpected pregnancy	2	<i>The birth (home birth) was fine but afterwards got very sick very quickly. This year I had a baby - unplanned & not wanted (my husband did) time of my life. I really regret having the baby and am very unhappy with my life now. The child health nurse said I could see their psychologist if i thought it would help. I have seen her says its not post natal depression, its a combination of being sick & having never wanted kids.</i>
Pregnancy stress	3	<i>Gall stones - reference to Q12. Have what they call 'gravel' in the gall bladder - this was found out in the 21st week of pregnancy from a gall attack. In response to some of the questions - the answers I believe are a little amiss due to the fact I am currently 33 wks pregnant - have just stopped work (short term) & most of the questions have general symptoms of pregnancy related. Problems that will soon disappear. Overall doctors believe I am very healthy & emotionally soured but this survey may show short term responses to how I feel during this stage of pregnancy.</i>
Pregnancy complication	4	<i>Currently waiting on some test results on our unborn child so have been stressed over the past few weeks and been sick.</i>

Table 21 continued

Theme	Count	Example of comment
Morning sickness	5	<i>At present I am 15 weeks pregnant & have had morning sickness (Pausea & vomiting) for 9 weeks. This has impacted on how I view my own health at present & over the last 4 weeks.</i>
Termination	5	<i>Three weeks ago I had a termination, and this has affected my lifestyle and emotional and physical health.</i>
Family planning		
Dissatisfied with timing of children	7	<i>What your survey will fail to pick up are the stresses & difficulties I have experienced over the last 24 mth. Whilst , they are not major life stresses, I - who have previously been quite successful & able to cope with things - have found life pretty hard (emotionally, physically, mentally). The trigger to this tough 24 mths was when I fell pregnant, unexpectedly after just gaining a good job. We decided to go ahead with the pregnancy but feelings of ..um,...uncertainty plagued my pregnancy& the first year of [Name]'s life.</i>
Infertility	12	<i>Suffering infertility impacts on every aspect of life-social relationships, stress etc. I have found that you really have to look for information on the emotional aspects of fertility.</i>
Contraception (inc the Pill)	6	<i>Was on Depo-Provera for last 5 yrs for endometriosis. Have stopped recently to see if it helps with muscle pain etc.</i>
Work, employment		
	3	<i>I would love to be working. The extra cash would make life easier. It is difficult to get a job that suites school hours & I don't live close by to any big cities. Travel would make it to difficult and there is no before or after school care in my area.</i>
Work stress	12	<i>I don't think people in my work place give me a go. And they don't like New Australians and because of that give me a hard time at work and push in so that I break and leave but it will never happen</i>
Unemployment	2	<i>This survey was filled in a week after losing my job, thus some questions are effected from what they would normally be especially the "NOW" question.</i>
Career interruption	3	<i>Since last completing information for this research i have commenced an undergraduate degree in psychological science. This added interest outside the home, as well as having a new career goal to work towards (albeit long term) has brought balance to my position as full-time mum to three boys under 6 yrs old. I'm feeling more confident and satisfied than i have for over five years.</i>

Table 21 continued

Theme	Count	Example of comment
Education and work opportunities	5	<i>I found it interesting you asked about stresses and life changes I have recently returned to uni to study for a second degree which meant giving up my full time work as a journalist to get back to basics as a full time poor student. Subsequently, I am coping with adjusting to low income & study, also I have taken on shift work to contribute financially to my partners income. This seems to have taken its toll on my general energy levels but I beleive this to be transition only. I am living in a loving relationship and have The support of family and friends I can do anything .Women can do anything.</i>
Work life balance	4	<i>Considering I have a full time job, casual job, study 2-3 nights a week and play netball once a week and party every weekend I find that I can still cope. About a year ago I was stressed, unhappy (taking stress pills - (sedacalm) etc. I am now pretty much the happiest person in the world. I have learnt to take each day as it comes and not to take life too seriously. The best cure for me was a holiday and believe me I tried everything. Thanks to my holiday (alone) and the people I've met I wouldn't change my life for anything. My happiness is all that matters now.</i>
Living arrangements		
Isolation	13	<i>I have had a big change in my life in the last few months which accounts for a lot of my responses. I have just graduated and am currently doing relief teaching. My partner and I have just moved to a small town in remote western Australia. As a result I am feeling very isolated because I have no friends or family around me and only casual work. Since this is not what I expected upon graduating from uni, myself esteem has taken a bit of a hammering. Luckily this move is only temporary, and in a few months I will be back in a vibrant city.</i>
Rurality	1	<i>As a young women at the age of 19, I recently have come home from spending 1 year away from home in Far North Qld, living without the closeness of my family.</i>
Mobility	5	<i>Sorry it has taken me so long to write, we moved house in feb & it was all too much. I hope my answers can still be included. My biggest change since i last filled out a survey is i'm now married & planning to have children, starting at the and of this year.</i>

Table 21 continued

Theme	Count	Example of comment
Share of tasks	1	<i>I live with my dad and often am angry about the adult roles and responsibilities particularly domestic duties I've had to take on at an early stage since my Mum left 4 years ago. However, my dad is the greatest, he doesn't make me share the duties, it's just my nature. This role however I feel often leaves me more tired and stressed than girlfriends of mine whose mothers do their washing, food shopping, cooking and cleaning etc for them.</i>
Parenting		
Parenting stress	1	<i>Having and caring for a child is much harder than i ever thought it would be. Despite the joys, at times it is isolating, boring and just hard work. I had expectations that my partner would help much much more than he did/does and it took a toll emotionally and physically and mentally until i came to terms with the fact that i would be responsible for 99% of childcare and domestic chores. In hindsight i do wonder whether i experienced post-natal depression, or whether this is a normal experience all sleep deprived new mothers go through! Its taken a good 12 months for me to finally feel comfortable and happy in the role i have been doing for the last 15 months.</i>
Sole motherhood	9	<i>Although depressed, fighting ongoing Psoriasis and work, study & raising my child alone. I am quite proud of my efforts. Re-reading this survey I thought I sounded dreadful & almost not coping. I did want to add that although trying to cope with all of the above, I am doing better than most. I hope this survey helps.</i>
Young motherhood	3	<i>I feel there is no support for new young mothers. This is a time when they need help the most. Not to be looked down on.</i>
Child custody	2	<i>Q107.(h) motherhood-would have lived to have more contact with my children & a better relationship with my children, but as they live with their father & grandmother(due to my past natal depression & inability to cope at the time) & i don't get on too well with these 2 supposed to be mature adults, i have to put up with the situation until i can build up my case in cart. To get the boys back. And also as i live coexist with their grandfather(who is the only one on my ex-partners/boys fathers side of family who has treated me properly & decently), it would not look too good in the family courts mind. So i put up with seeing my boys on weekend visitations of 1 or 2 days, & treasure each moment thoroughly.</i>

Table 21 continued

Theme	Count	Example of comment
Childcare issues	2	<i>Where i live i dont have the option to put my child in care, therefore not able to go back to work f/t. There are 7 places for children under 2 in a town where 100 babies where born last year in a population of 3500.</i>
Sleep deprivation	4	<i>I think you should consider our part-time jobs more. I am a self supporting full time student who works a bar for between 7 + 20hrs on weekends. This affects my health, sleep patterns and emotional stability much more than anything I do during the week and yet you ask me to detail my main occupation which is student.</i>
Step-children	2	<i>How do i cope with my husband's 7yr daughter? It's difficult as we have different parenting skills. I have no children of my own yet but we are trying. His daughter hasbeen influenced by her mother (naturally), but i just can not bond with her, maybe she looks like her mother but my parents split when i was 15 years old. My mum has remarried and we adore him. Dad had a partner for 11 yrs till she left before christmas2005. He is a happier man now as she made life hell. I had very little to do with dad as she was bitter. So all i hope is i am not like her. So it's important to me to push the relationship with my husband and his daughter. As we see her 4 wks out of52 and yes we pay maintanance as we both work hard</i>
Infant health	10	<i>I apologize if things don't entirely make sense. I have spent 5 mths living with relatives (partner is different state) and a couple of those at Ronald McDonald House (while kids stayed with grandparents) due to problems with my pregnancy. We were moving (his work) I stayed behind with kids to have an ultrasound and never left. Mentally I'm surprised I got thru that. My entire pgncy was a wait and see thing. Thankfully my bub held on and was only 7 wks early. I had a lot of worry and the guilt of putting parents out and what the kids were going thru being away from me, was horrid! It's not something I could go thru again.</i>

Table 21 continued

Theme	Count	Example of comment
Breastfeeding	3	<i>Also I feel a lactation consultation should be allocated to every new mother if she needs help in the first 2 months or so to learn how to breastfeed ie. like a maternal health nurse. I feel every new mother should not be forced out of hospital before she feels ready, I spent 5 days in hospital, I could have spent longer learning how to breastfeed properly but with so many 'experts' - all the conflicting information is confusing and I just wanted to get out. I know first time mothers who are out of hospital in 3 days even before their milk 'comes in'</i>

Appendix.D Childbirth questions, Survey 5 (2009)

Q39 Have you ever given birth to a child?

Yes ☐

No ☐ → If no, go to Q48

Q40 If you have ever given birth to a child, please write the date of each birth in the box.
(If you had twins, please write the date twice)

1st

2nd

3rd

4th

5th

6th

7th

8th

9th

Q41 Did you experience any of the following?
(Mark all that apply on each line)

	Never experienced this	1 st Child	2 nd Child	3 rd Child	4 th Child	5 th Child	6 th Child	7 th Child	8 th Child	9 th Child
a Premature birth	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
b Caesarean section before going into labour	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
c Caesarean section after labour started	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
d Labour lasting more than 36 hours	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
e Episiotomy (cutting of vagina)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
f A vaginal tear requiring stitches	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
g Forceps or Ventouse suction ("vacuum")	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
h Medical removal of placenta and / or blood clots by hand	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
i Excessive blood loss requiring extra blood or fluid by drip (IV infusion)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
j A low birth weight baby (weighing less than 2500 grams or 5 ½ pounds)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
k Epidural or spinal block	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
l Gas or injection for pain relief	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
m Emotional distress	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Q42 Were you diagnosed or treated for:
(Mark all that apply on each line)

	Never experienced this	1 st Child	2 nd Child	3 rd Child	4 th Child	5 th Child	6 th Child	7 th Child	8 th Child	9 th Child
a Antenatal depression?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
b Postnatal depression?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
c Antenatal anxiety?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
d Postnatal anxiety?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
e Gestational diabetes?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
f Hypertension (high blood pressure) during pregnancy?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Q43 How many complete months have you breastfed each of your children?
(Please write the number of MONTHS in the boxes)

1 st Child	2 nd Child	3 rd Child	4 th Child	5 th Child	6 th Child	7 th Child	8 th Child	9 th Child

Appendix.E SF-36 Mental Health Inventory

E.1 Items used to construct MHI

Q28 For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the <u>past 4 weeks</u> : (Mark <u>one</u> on each line)		All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
a	Did you feel full of life?	☐	☐	☐	☐	☐	☐
b	Have you been a very nervous person?	☐	☐	☐	☐	☐	☐
c	Have you felt so down in the dumps that nothing could cheer you up?	☐	☐	☐	☐	☐	☐
d	Have you felt calm and peaceful?	☐	☐	☐	☐	☐	☐
e	Did you have a lot of energy?	☐	☐	☐	☐	☐	☐
f	Have you felt down?	☐	☐	☐	☐	☐	☐
g	Did you feel worn out?	☐	☐	☐	☐	☐	☐
h	Have you been a happy person?	☐	☐	☐	☐	☐	☐
i	Did you feel tired?	☐	☐	☐	☐	☐	☐

E.2 Development of a categorical variable for MHI

As shown in Figure 14, the MHI scores were normally distributed around a mean of 73.49 (SD=15.76). These scores were then divided into ten percentiles around the mean (Figure 15). A non-linear relationship was found (as indicated by the green line on the figure). This relationship was also verified by treating this categorical variable as a continuous variable. Therefore a new categorical variable of 4 categories was created, and the odds ratios can be seen in Figure 16. As there is a linear relationship between odds ratios and categories, this was the variable used for further analysis.

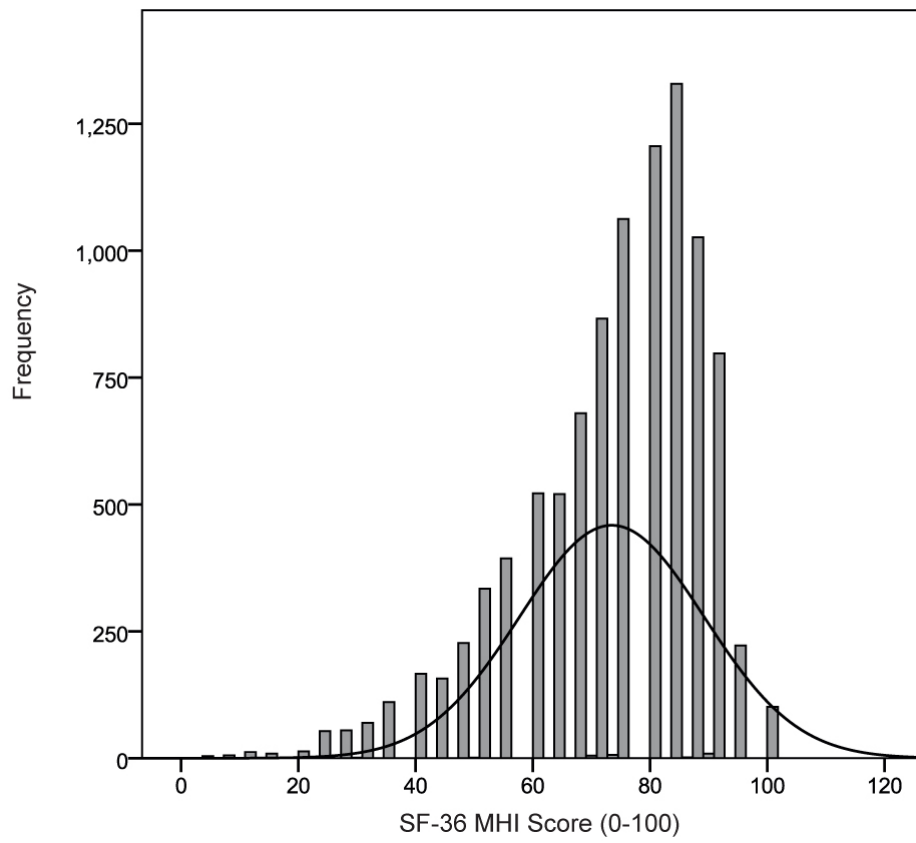


Figure 14 Distribution of MHI scores (0 - 100)

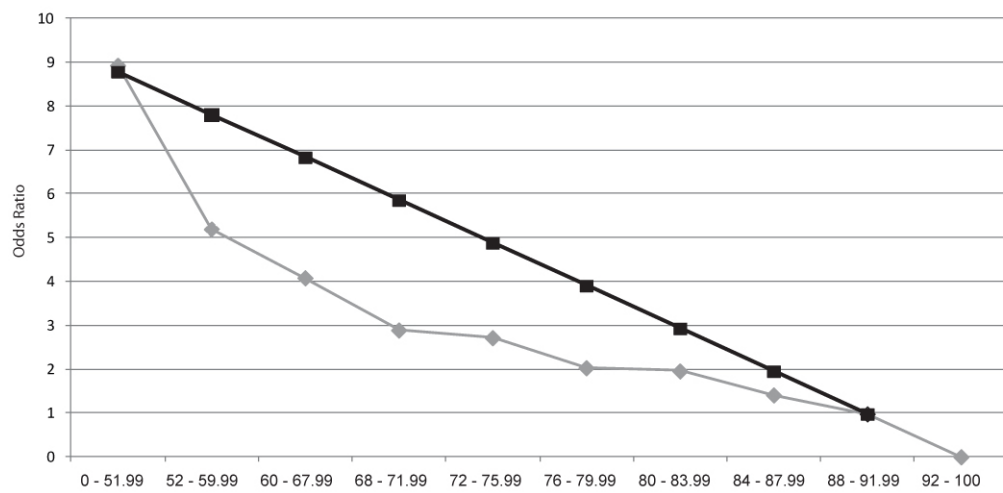


Figure 15 Grey line indicates odds ratios for MHI divided into percentiles around the mean. Black line indicates linear relationship.

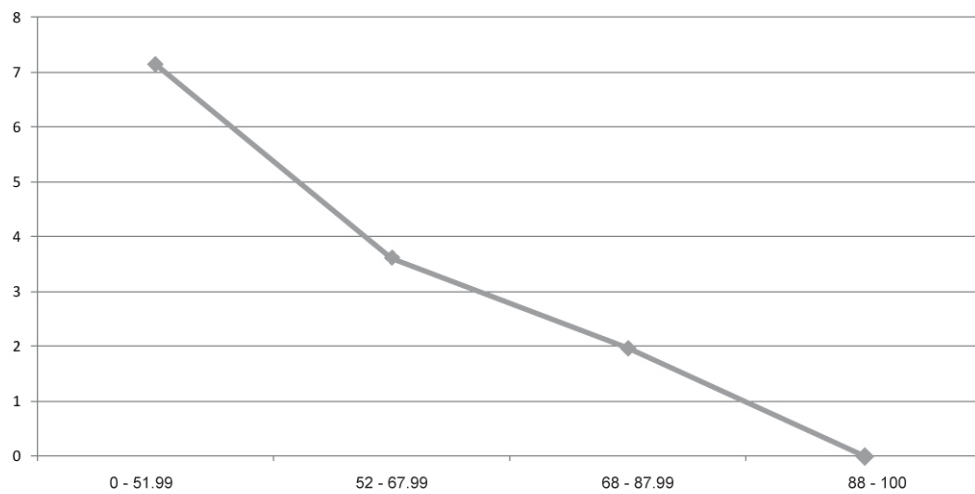


Figure 16 Odds ratios for MHI when divided into 4 categories

Appendix.F Life Orientation Test Revised (LOT-R)

F.1 Items used to construct LOT-R score

Q93	Thinking about your current approach to life, please indicate how much you think each statement describes you: (Mark <u>one</u> on each line)	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a	In uncertain times, I usually expect the best	☐	☐	☐	☐	☐
b	If something can go wrong for me, it will	☐	☐	☐	☐	☐
c	I'm always optimistic about my future	☐	☐	☐	☐	☐
d	I hardly ever expect things to go my way	☐	☐	☐	☐	☐
e	I rarely count on good things happening to me	☐	☐	☐	☐	☐
f	Overall, I expect more good things to happen to me than bad	☐	☐	☐	☐	☐

F.2 Development of a categorical variable for LOT-R

The same strategy employed for the MHI variable development was used to convert the continuous LOT-R score into a categorical variable. Four percentiles around the mean were created, and the odds ratios for these categories can be seen in Figure 17. As there is a linear relationship (the grey line closely resembles the black normal line), no further changes were required before using this variable.

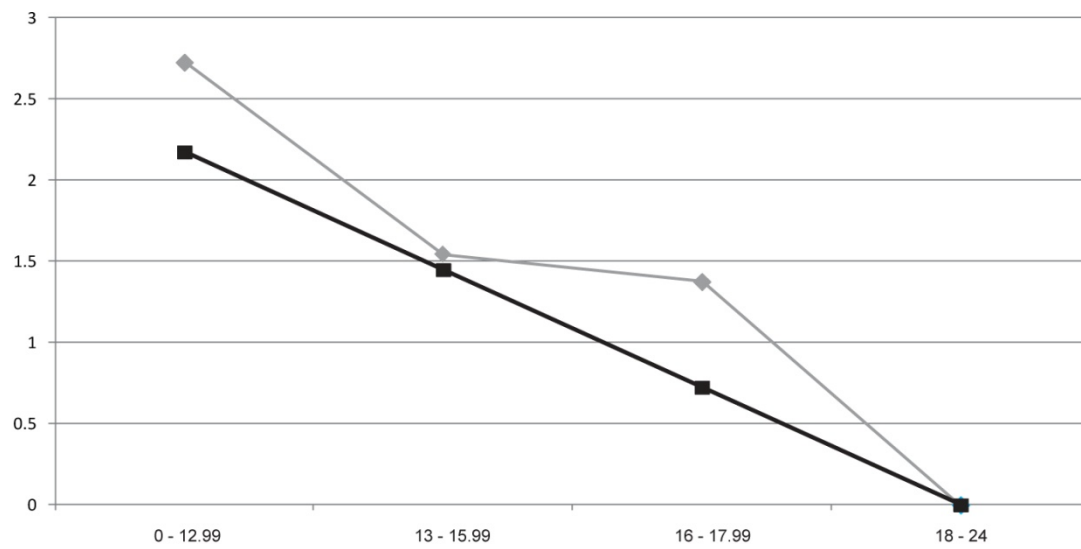


Figure 17 Odds ratios for categorical variable created for the LOT-R in grey, line of normal distribution in black

Appendix.G Mean Stress variable development

G.1 Items used to create mean stress score

Q91 Over the *last 12 months*, how stressed have you felt about the following areas of your life?
(Mark *one on each line*)

		Not applicable	Not at all stressed	Somewhat stressed	Moderately stressed	Very stressed	Extremely stressed
a	Own health		☐	☐	☐	☐	☐
b	Health of family members	☐	☐	☐	☐	☐	☐
c	Work / employment	☐	☐	☐	☐	☐	☐
d	Living arrangements	☐	☐	☐	☐	☐	☐
e	Study	☐	☐	☐	☐	☐	☐
f	Money	☐	☐	☐	☐	☐	☐
g	Relationship with parents	☐	☐	☐	☐	☐	☐
h	Relationship with partner / spouse	☐	☐	☐	☐	☐	☐
i	Relationship with other family members	☐	☐	☐	☐	☐	☐
j	Relationship with friends	☐	☐	☐	☐	☐	☐
k	Motherhood / children	☐	☐	☐	☐	☐	☐

G.2 Development of a categorical variable for mean stress

The same strategy employed for the MHI variable development was again to convert the continuous mean stress score into a categorical variable. Four percentiles around the mean were created, and the odds ratios for these categories can be seen in Figure 18. As there is a linear relationship, no further changes were required before using this variable.

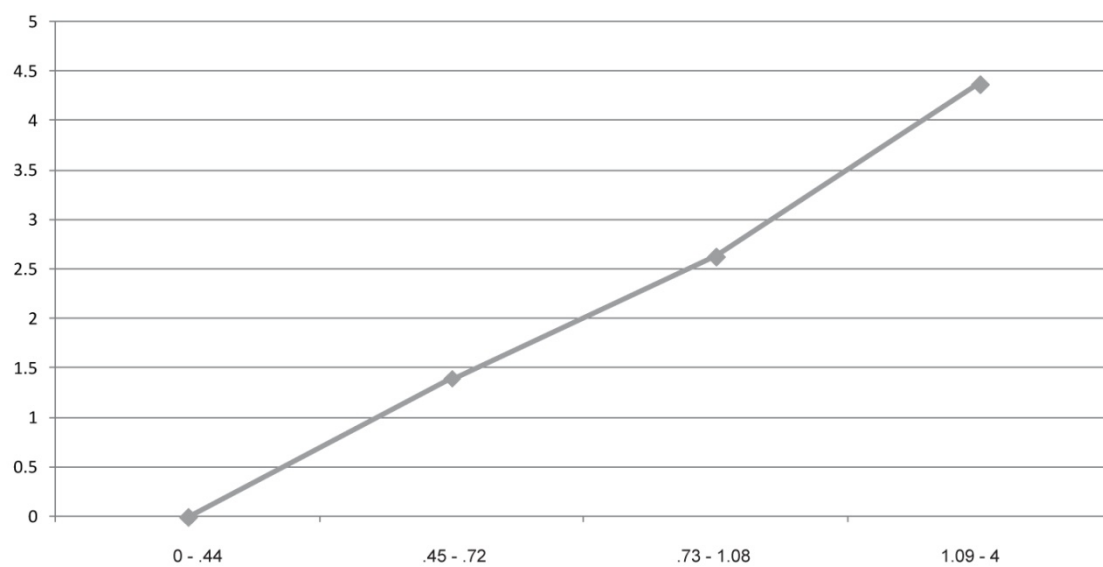


Figure 18 Odds ratio for mean stress scores for 4 categories around the mean

Appendix.H Proportion of life events

H.1 Items used to construct proportion of life events score

Q94 Have you experienced any of the following events?

(Mark all that apply)

		A Yes – In the last 12 months	B Yes – More than 12 months ago
a	Major personal illness	☐	☐
b	Major personal injury	☐	☐
c	Major surgery (not including dental work)	☐	☐
d	Birth of a child	☐	☐
e	Having a child with a disability or serious illness	☐	☐
f	Starting a new, close personal relationship	☐	☐
g	Getting married (or starting to live with someone)	☐	☐
h	Problem or break-up in a close personal relationship	☐	☐
i	Divorce or separation	☐	☐
j	Becoming a sole parent	☐	☐
k	Increased hassles with parents	☐	☐
l	Serious conflict between members of your family	☐	☐
m	Parents getting divorced, separated or remarried	☐	☐
n	Death of partner or close family member	☐	☐
o	Death of a child	☐	☐
p	Stillbirth of a child	☐	☐
q	Miscarriage	☐	☐
r	Death of a close friend	☐	☐
s	Difficulty finding a job	☐	☐
t	Return to study	☐	☐
u	Beginning / resuming work outside the home	☐	☐
v	Distressing harassment at work	☐	☐
w	Loss of job	☐	☐
x	Partner losing a job	☐	☐
y	Decreased income	☐	☐
z	Natural disaster (fire, flood, drought, earthquake etc) or house fire	☐	☐
aa	Major loss or damage to personal property	☐	☐
bb	Being robbed	☐	☐
cc	Involvement in a serious accident	☐	☐
dd	Being pushed, grabbed, shoved, kicked or hit	☐	☐
ee	Being forced to take part in unwanted sexual activity	☐	☐
ff	Legal troubles or involvement in a court case	☐	☐
gg	Family member / close friend being arrested / in gaol	☐	☐
hh	You or a family member involved in problem gambling	☐	☐
ii	None of these events	☐	

H.2 Development of a categorical variable for proportion of life events

Following the strategy used to create categorical variables as above, the proportion of life events score was divided into four percentiles around the mean. A linear relationship was found (as seen in Figure 19), and therefore no further modifications were required to the variable for it to be used in further analysis.

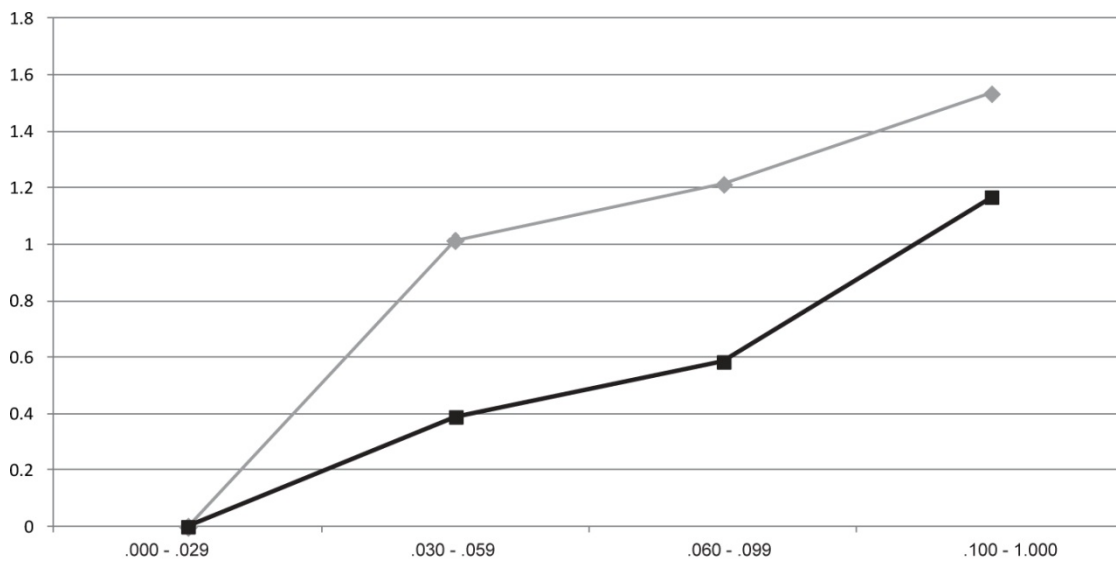


Figure 19 Odds ratios for categorical variable created for proportion of life events in grey, line of normal distribution in black

Appendix.I SF-36 General Health

I.1 Items used to construct General Health

Q20		In general, would you say your health is:				
		(Mark <u>one only</u>)				
	Excellent	☐				
	Very good	☐				
	Good	☐				
	Fair	☐				
	Poor	☐				
Q30		How <u>true</u> or <u>false</u> is <u>each</u> of the following statements for you? (Mark <u>one on each line</u>)				
		Definitely true	Mostly true	Don't know	Mostly false	Definitely false
a	I seem to get sick a little easier than other people	☐	☐	☐	☐	☐
b	I am as healthy as anybody I know	☐	☐	☐	☐	☐
c	I expect my health to get worse	☐	☐	☐	☐	☐
d	My health is excellent	☐	☐	☐	☐	☐

I.2 Development of a categorical variable for General Health

The scores for General Health were divided into ten percentiles around the mean (Figure 20). A non-linear relationship was found (as indicated by the green line on the figure). This relationship was also verified by treating this categorical variable as a continuous variable. Therefore a new categorical variable of 4 categories was created, and the odds ratios can be seen in Figure 21. As there is a linear relationship between odds ratios and categories, this was the variable used for further analysis.

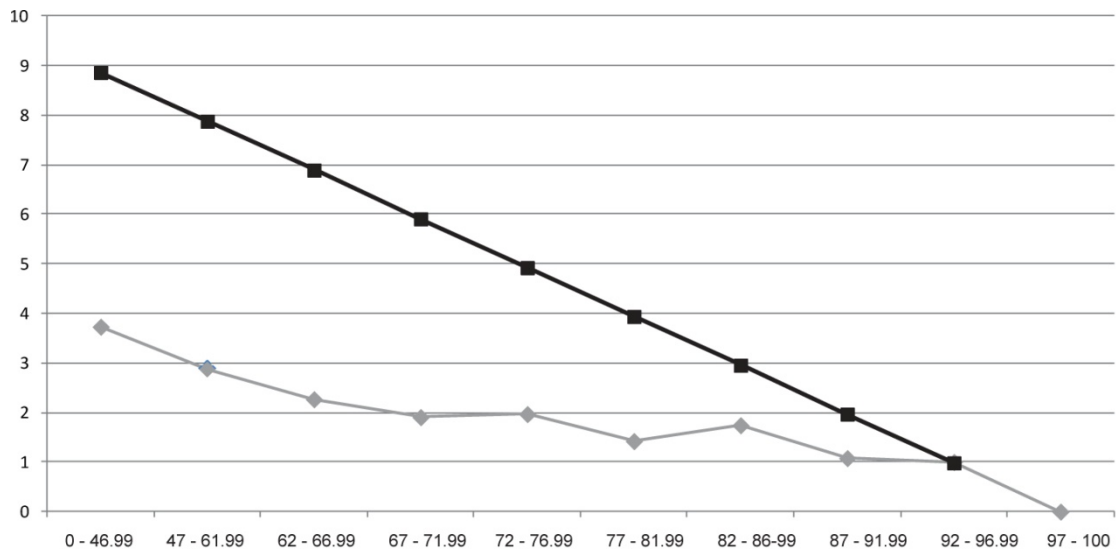


Figure 20 Grey line indicates odds ratios for General Health divided into percentiles around the mean. Black line indicates linear relationship.

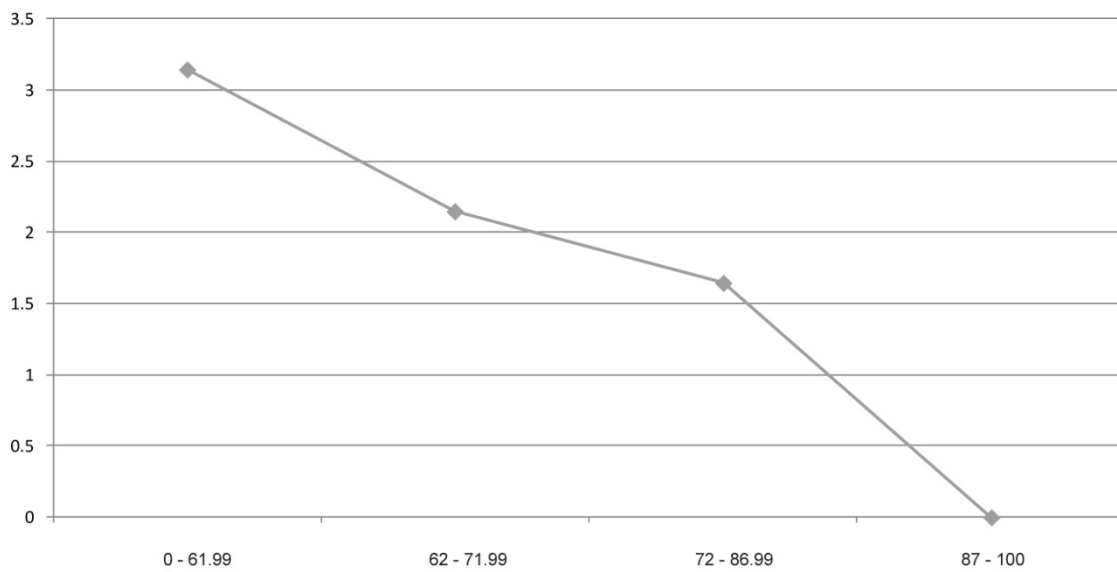


Figure 21 Odds ratios for General Health when divided into 4 categories

Appendix.J Demographics – items used

J.1 Income

Q91 Over the *last 12 months*, how stressed have you felt about the following areas of your life?
(Mark *one on each line*)

		Not applicable	Not at all stressed	Somewhat stressed	Moderately stressed	Very stressed	Extremely stressed
a	Own health	☐	☐	☐	☐	☐	☐
b	Health of family members	☐	☐	☐	☐	☐	☐
c	Work / employment	☐	☐	☐	☐	☐	☐
d	Living arrangements	☐	☐	☐	☐	☐	☐
e	Study	☐	☐	☐	☐	☐	☐
f	Money	☐	☐	☐	☐	☐	☐
g	Relationship with parents	☐	☐	☐	☐	☐	☐
h	Relationship with partner / spouse	☐	☐	☐	☐	☐	☐
i	Relationship with other family members	☐	☐	☐	☐	☐	☐
j	Relationship with friends	☐	☐	☐	☐	☐	☐
k	Motherhood / children	☐	☐	☐	☐	☐	☐

J.2 Education

Q115 What is the highest qualification you have completed? (Mark *one only*)

No formal qualifications	☐
Year 10 or equivalent (eg School Certificate)	☐
Year 12 or equivalent (eg Higher School Certificate)	☐
Trade / apprenticeship (eg hairdresser, chef)	☐
Certificate / diploma (eg child care, technician)	☐
University degree	☐
Higher university degree (eg Grad Dip, Masters, PhD)	☐

J.3 Employment

Q110 Do you normally do any of the following kinds of paid work? (Mark <u>all that apply</u>)		
a	I don't do any paid work	☐ → Go to Q112
b	Paid shift work	☐
c	Paid work with irregular hours	☐
d	Paid work on short-term contract (less than one year)	☐
e	Paid work in more than one job	☐
f	Paid work at night	☐
g	Paid work from home	☐
h	Self employment	☐
i	None of the above	☐

J.4 Sexual orientation

Q28	Which of these most closely describes your sexual orientation? (Mark <u>one only</u>)
☐	I am exclusively heterosexual
☐	I am mainly heterosexual
☐	I am bisexual
☐	I am mainly homosexual (lesbian)
☐	I am exclusively homosexual (lesbian)
☐	I don't know
☐	I don't want to answer

J.5 Partner status

Q121 What is your present marital status? (Mark <u>one only</u>)	
Never married	☐
Married	☐
De facto (opposite sex)	☐
De facto (same sex)	☐
Separated	☐
Divorced	☐
Widowed	☐

J.6 Area of residence

Q15	What is your postcode?							
a	What is your RESIDENTIAL postcode? <i>(where you live)</i>							Mark here if living overseas ☐
b	What is the postcode of your POSTAL ADDRESS? <i>(if different from residential)</i>							

Appendix.K Correlation matrix for full model of predictors

Table 22 Correlation matrix for full model

		Emotional distress	Hx Emotional distress	Hx Depression	Hx Anxiety	Hx postnatal depression	Hx Antenatal Depression	Hx Postnatal anxiety	Hx Antenatal Anxiety	SF-36 MHI	Hx self harm or suicidal ideation	breastfed < 6mths	Postnatal anxiety	Social Support - Emotional	Social Support- Tangible	Social Support – Positive social interaction	Hx Tobacco	Life Events	Hx Abuse	SF-36 GH	Gest. hypertension	Antenatal depression	Antenatal anxiety	Income	Partnered	Education	Stress	LOT-R
Emotional distress	Pearson Corr. Sig. (2-tailed) N	1	.162**	.109**	.056**	.038**	.038**	.034**	.043**	.174**	.053**	.044**	.215**	.078**	.053**	.094**	.054**	.052**	.051**	.129**	.049**	.110**	.113**	.082**	.022*	.015	.177**	.069**
		9970	.000	.000	.000	.000	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.031	.127	.000	.000
Hx Emotional distress	Pearson Corr. Sig. (2-tailed) N	.162**	1	.081**	.065**	.292**	.134**	.264**	.168**	.114**	.055**	.015	.056**	.065**	.068**	.075**	.051**	.044**	.035**	.092**	-.011	.077**	.094**	.067**	-.034**	.030**	.125**	.046**
		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.143	.000	.000	.000	.000	.000	.000	.001	.000	.257	.000	.000	.000	.001	.003	.000	.000
Hx Depression	Pearson Corr. Sig. (2-tailed) N	.109**	.081**	1	.349**	.142**	.068**	.073**	.065**	.115**	.208**	.016	.115**	.049**	.047**	.060**	.058**	.040**	.122**	.091**	.015	.109**	.123**	.067**	-.021*	-.020*	.131**	.045**
		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.109	.000	.000	.000	.000	.000	.000	.000	.000	.124	.000	.000	.000	.035	.050	.000	.000
Hx Anxiety	Pearson Corr. Sig. (2-tailed) N	.056**	.065**	.349**	1	.082**	.066**	.129**	.083**	.056**	.107**	-.011	.110**	.008	.002	.027**	.051**	.003	.071**	.031**	-.007	.071**	.108**	.029**	-.018	-.025*	.072**	.020*
		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.288	.000	.412	.850	.007	.000	.799	.000	.002	.483	.000	.000	.003	.066	.012	.000	.046
Hx postnatal depression	Pearson Corr. Sig. (2-tailed) N	.038**	.292**	.142**	.082**	1	.259**	.407**	.177**	.108**	.069**	.030**	.119**	.077**	.079**	.069**	.029**	.042**	.064**	.071**	.002	.150**	.113**	.078**	.009	.058**	.102**	.088**
		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.003	.000	.000	.000	.000	.004	.000	.000	.823	.000	.000	.000	.380	.000	.000	.000	.000
Hx Antenatal Depression	Pearson Corr. Sig. (2-tailed) N	.038**	.134**	.068**	.066**	.259**	1	.208**	.313**	.062**	.044**	.009	.084**	.039**	.042**	.050**	.016	.035**	.032**	.042**	-.004	.321**	.119**	.039**	.045**	.032**	.067**	.046**
		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.346	.000	.000	.000	.000	.102	.000	.001	.000	.695	.000	.000	.000	.000	.001	.000	.000
Hx Postnatal anxiety	Pearson Corr. Sig. (2-tailed) N	.034**	.264**	.073**	.129**	.407**	.208**	1	.405**	.062**	.022*	.023*	.223**	.022*	.017	.035**	.019	.017	.026**	.049**	.000	.119**	.202**	.039**	-.002	.011	.074**	.033**
		.001	.000	.000	.000	.000	.000	.000	.000	.000	.026	.022	.000	.027	.096	.001	.053	.082	.010	.000	.962	.000	.000	.000	.877	.280	.000	.001
Hx Antenatal Anxiety	Pearson Corr. Sig. (2-tailed) N	.043**	.168**	.065**	.083**	.177**	.313**	.405**	1	.051**	.001	.001	.123**	.035**	.031**	.034**	.032**	.034**	.023*	.044**	.001	.097**	.269**	.029**	.014	.020*	.061**	.045**
		.000	.000	.000	.000	.000	.000	.000	.000	.000	.887	.906	.000	.000	.002	.001	.001	.001	.021	.000	.957	.000	.000	.003	.171	.045	.000	.000
SF-36 MHI	Pearson Corr. Sig. (2-tailed) N	.174**	.114**	.115**	.056**	.108**	.062**	.062**	.051**	1	.132**	.092**	.121**	.322**	.220**	.316**	.081**	.151**	.104**	.413**	.026**	.129**	.092**	.290**	.122**	.110**	.492**	.413**
		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.008	.000	.000	.000	.000	.000	.000	.000	.000
Hx self harm or suicidal ideation	Pearson Corr. Sig. (2-tailed) N	.053**	.055**	.208**	.107**	.069**	.044**	.022*	.001	.132**	1	-.001	.060**	.102**	.068**	.109**	.056**	.045**	.085**	.076**	.023*	.071**	.048**	.075**	.016	.024*	.122**	.112**
		.000	.000	.000	.000	.000	.000	.026	.887	.000	.958	.000	.000	.000	.000	.000	.000	.000	.000	.000	.022	.000	.000	.000	.107	.015	.000	.000
breastfed < 6mths	Pearson Corr. Sig. (2-tailed) N	.044**	.015	.016	-.011	.030**	.009	.023*	.001	.092**	-.001	1	.047**	.030**	.015	.045**	.096**	.048**	.048**	.135**	.062**	.024*	.021*	.086**	.080**	.172**	.043**	.142**
		.000	.143	.109	.288	.003	.346	.022	.906	.000	.958	.000	.002	.146	.000	.000	.000	.000	.000	.000	.000	.015	.040	.000	.000	.000	.000	.000
		9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970

		Emotional distress	Hx Emotional distress	Hx Depression	Hx Anxiety	Hx postnatal depression	Hx Antenatal Depression	Hx Postnatal anxiety	Hx Antenatal Anxiety	SF-36 MHI	Hx self harm or suicidal ideation	breastfed < 6mths	Postnatal anxiety	Social Support - Emotional	Social Support- Tangible	Social Support - Positive social interaction	Hx Tobacco	Life Events	Hx Abuse	SF-36 GH	Gest. hypertension	Antenatal depression	Antenatal anxiety	Income	Partnered	Education	Stress	LOT-R
Postnatal anxiety	Pearson Corr. Sig. (2-tailed) N	.215** .000 9970	.056** .000 9970	.115** .000 9970	.110** .000 9970	.119** .000 9970	.084** .000 9970	.223** .000 9970	.123** .000 9970	.121** .000 9970	.060** .000 9970	.047** .000 9970	1 9970	.017 .099 9970	.013 .210 9970	.027** .008 9970	.024* .018 9970	.016 .111 9970	.033** .001 9970	.069** .000 9970	.030** .002 9970	.203** .000 9970	.350** .000 9970	.052** .000 9970	.001 .904 9970	-.011 .268 9970	.113** .000 9970	.054** .000 9970
Social Support - Emotional	Pearson Corr. Sig. (2-tailed) N	.078** .000 9970	.065** .000 9970	.049** .000 9970	.008 .412 9970	.077** .000 9970	.039** .000 9970	.022* .000 9970	.035** .000 9970	.322** .000 9970	.102** .000 9970	.030** .002 9970	.017 .099 9970	1 9970	.628** .000 9970	.745** .000 9970	.087** .000 9970	.137** .000 9970	.090** .000 9970	.236** .000 9970	.013 .203 9970	.068** .000 9970	.056** .000 9970	.212** .000 9970	.120** .000 9970	.141** .000 9970	.292** .000 9970	.304** .000 9970
Social Support- Tangible	Pearson Corr. Sig. (2-tailed) N	.053** .000 9970	.068** .000 9970	.047** .000 9970	.002 .850 9970	.079** .000 9970	.042** .000 9970	.017 .000 9970	.031** .002 9970	.220** .000 9970	.068** .000 9970	.015 .146 9970	.013 .210 9970	.628** .000 9970	1 9970	.596** .000 9970	.073** .000 9970	.138** .000 9970	.089** .000 9970	.176** .000 9970	.007 .466 9970	.060** .000 9970	.036** .000 9970	.162** .000 9970	.125** .000 9970	.120** .000 9970	.213** .000 9970	.236** .000 9970
Social Support - Positive social interaction	Pearson Corr. Sig. (2-tailed) N	.094** .000 9970	.075** .000 9970	.060** .000 9970	.027** .007 9970	.069** .000 9970	.050** .000 9970	.035** .001 9970	.034** .001 9970	.316** .000 9970	.109** .000 9970	.045** .000 9970	.027** .008 9970	.745** .000 9970	.596** .000 9970	1 9970	.097** .000 9970	.130** .000 9970	.109** .000 9970	.225** .000 9970	.002 .860 9970	.086** .000 9970	.066** .000 9970	.199** .000 9970	.165** .000 9970	.143** .000 9970	.277** .000 9970	.288** .000 9970
Hx Tobacco	Pearson Corr. Sig. (2-tailed) N	.054** .000 9970	.051** .000 9970	.058** .000 9970	.051** .000 9970	.029** .004 9970	.016 .102 9970	.019 .053 9970	.032** .001 9970	.081** .000 9970	.056** .000 9970	.096** .000 9970	.024* .018 9970	.087** .000 9970	.073** .000 9970	.097** .000 9970	1 9970	.103** .000 9970	.157** .000 9970	.109** .000 9970	.225** .000 9970	.036** .000 9970	.027** .007 9970	.049** .000 9970	.128** .000 9970	.123** .000 9970	.232** .000 9970	.090** .000 9970
Life Events	Pearson Corr. Sig. (2-tailed) N	.052** .000 9970	.044** .000 9970	.040** .000 9970	.003 .799 9970	.042** .000 9970	.035** .000 9970	.017 .082 9970	.034** .001 9970	.151** .000 9970	.045** .000 9970	.048** .000 9970	.016 .111 9970	.137** .000 9970	.138** .000 9970	.130** .000 9970	.103** .000 9970	1 9970	.163** .000 9970	.130** .000 9970	.019 .056 9970	.062** .000 9970	.030** .003 9970	.209** .000 9970	.182** .000 9970	.141** .000 9970	.195** .000 9970	.130** .000 9970
Hx Abuse	Pearson Corr. Sig. (2-tailed) N	.051** .000 9970	.035** .001 9970	.122** .000 9970	.071** .000 9970	.064** .000 9970	.032** .001 9970	.026** .010 9970	.023* .021 9970	.104** .000 9970	.085** .000 9970	.048** .000 9970	.033** .001 9970	.090** .000 9970	.089** .000 9970	.109** .000 9970	.157** .000 9970	.163** .000 9970	1 9970	.119** .000 9970	.034** .001 9970	.050** .000 9970	.038** .000 9970	.102** .000 9970	.114** .000 9970	.122** .000 9970	.111** .000 9970	.091** .000 9970
SF-36 GH	Pearson Corr. Sig. (2-tailed) N	.129** .000 9970	.092** .000 9970	.091** .000 9970	.031** .002 9970	.071** .000 9970	.042** .000 9970	.049** .000 9970	.044** .000 9970	.413** .000 9970	.076** .000 9970	.135** .000 9970	.069** .000 9970	.236** .000 9970	.176** .000 9970	.225** .000 9970	.109** .000 9970	.130** .000 9970	.119** .000 9970	1 9970	.088** .000 9970	.065** .000 9970	.057** .000 9970	.232** .000 9970	.110** .000 9970	.143** .000 9970	.340** .000 9970	.334** .000 9970
Gest. hypertension	Pearson Corr. Sig. (2-tailed) N	.049** .000 9970	-.011 .257 9970	.015 .124 9970	-.007 .483 9970	.002 .823 9970	-.004 .695 9970	.000 .962 9970	.001 .957 9970	.026** .008 9970	.023* .022 9970	.062** .000 9970	.030** .002 9970	.013 .203 9970	.007 .466 9970	.002 .860 9970	.036** .000 9970	.019 .056 9970	.034** .001 9970	.088** .000 9970	1 9970	.019 .058 9970	.036** .000 9970	.046** .000 9970	-.002 .866 9970	.057** .000 9970	.055** .000 9970	.049** .000 9970
Antenatal depression	Pearson Corr. Sig. (2-tailed) N	.110** .000 9970	.077** .000 9970	.109** .000 9970	.071** .000 9970	.150** .000 9970	.321** .000 9970	.119** .000 9970	.097** .000 9970	.129** .000 9970	.071** .000 9970	.024* .015 9970	.203** .000 9970	.068** .000 9970	.060** .000 9970	.086** .000 9970	.027** .007 9970	.062** .000 9970	.050** .000 9970	.065** .000 9970	.019 .058 9970	1 9970	.382** .000 9970	.060** .000 9970	.078** .000 9970	.045** .000 9970	.100** .000 9970	.083** .000 9970
Antenatal anxiety	Pearson Corr. Sig. (2-tailed) N	.113** .000 9970	.094** .000 9970	.123** .000 9970	.108** .000 9970	.113** .000 9970	.119** .000 9970	.202** .000 9970	.269** .000 9970	.092** .000 9970	.048** .000 9970	.021* .040 9970	.350** .000 9970	.056** .000 9970	.036** .000 9970	.066** .000 9970	.049** .000 9970	.030** .003 9970	.038** .000 9970	.057** .000 9970	.036** .000 9970	.382** .000 9970	1 9970	.050** .000 9970	.022* .028 9970	.024* .015 9970	.094** .000 9970	.066** .000 9970
Income	Pearson Corr. Sig. (2-tailed) N	.082** .000 9970	.067** .000 9970	.067** .000 9970	.029** .003 9970	.078** .000 9970	.039** .000 9970	.039** .000 9970	.029** .003 9970	.290** .000 9970	.075** .000 9970	.086** .000 9970	.052** .000 9970	.212** .000 9970	.162** .000 9970	.199** .000 9970	.128** .000 9970	.209** .000 9970	.102** .000 9970	.232** .000 9970	.046** .000 9970	.060** .000 9970	.050** .000 9970	1 9970	.147** .000 9970	.172** .000 9970	.492** .000 9970	.251** .000 9970
Partnered	Pearson Corr. Sig. (2-tailed) N	.022** .031 9970	-.034** .001 9970	-.021* .035 9970	-.018 .066 9970	.009 .380 9970	.045** .000 9970	-.002 .877 9970	.014 .171 9970	.122** .000 9970	.016 .107 9970	.080** .000 9970	.001 .904 9970	.120** .000 9970	.125** .000 9970	.165** .000 9970	.123** .000 9970	.182** .000 9970	.114** .000 9970	.110** .000 9970	-.002 .866 9970	.078** .000 9970	.022* .028 9970	.147** .000 9970	1 9970	.209** .000 9970	.122** .000 9970	.115** .000 9970
Education	Pearson Corr.	.015	.030**	-.020*	-.025*	.058**	.032**	.011	.020*	.110**	.024*	.172**	-.011	.141**	.120**	.143**	.232**	.141**	.122**	.143**	.057**	.045**	.024*	.172**	.209**	1	.024*	.259**

		Emotional distress	Hx Emotional distress	Hx Depression	Hx Anxiety	Hx postnatal depression	Hx Antenatal Depression	Hx Postnatal anxiety	Hx Antenatal Anxiety	SF-36 MHI	Hx self harm or suicidal ideation	breastfed < 6mths	Postnatal anxiety	Social Support - Emotional	Social Support- Tangible	Social Support – Positive social interaction	Hx Tobacco	Life Events	Hx Abuse	SF-36 GH	Gest. hypertension	Antenatal depression	Antenatal anxiety	Income	Partnered	Education	Stress	LOT-R
	Sig. (2-tailed)	.127	.003	.050	.012	.000	.001	.280	.045	.000	.015	.000	.268	.000	.000	.000	.000	.000	.000	.000	.000	.000	.015	.000	.000		.019	.000
	N	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9263	9970
Stress	Pearson Corr.	.177**	.125**	.131**	.072**	.102**	.067**	.074**	.061**	.492**	.122**	.043**	.113**	.292**	.213**	.277**	.102**	.195**	.111**	.340**	.055**	.100**	.094**	.492**	.122**	.024*	1	.278**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.019	.000	
	N	9263	9263	9263	9263	9263	9263	9263	9263	9263	9263	9263	9263	9263	9263	9263	9263	9263	9263	9263	9263	9263	9263	9263	9263	9263	9263	9263
LOT-R	Pearson Corr.	.069**	.046**	.045**	.020*	.088**	.046**	.033**	.045**	.413**	.112**	.142**	.054**	.304**	.236**	.288**	.090**	.130**	.091**	.334**	.049**	.083**	.066**	.251**	.115**	.259**	.278**	1
	Sig. (2-tailed)	.000	.000	.000	.046	.000	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9970	9263	9970

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Appendix.L Study 4 Cover letter and Information sheet

Postal:
Women's Health Australia
Reply Paid 70
Hunter Region MC NSW 2310



Ph: 1800 088 081
Fax: (02) 4913 8888
Email: whasec@newcastle.edu.au
Web: www.alswh.org.au

<ID>

<TITLE> <FIRSTNAME> <SURNAME>
<PREADDRESS>
<ADDRESS>
<SUBURB> <STATE> <POSTCODE>

<Date>

Dear <FIRSTNAME>,

Thank you for your continued participation in the Women's Health Australia (WHA) project. We appreciate how many demands there are on your time, and are grateful for your continued involvement.

When you agreed to take part in the Women's Health Australia project, we mentioned that you might be invited to participate in projects on a range of health issues between the main surveys. One important issue for women your age is their experiences of early motherhood. For this project we are collaborating with Catherine Chojenta from the University of Newcastle. There is more information about Catherine in the enclosed information sheet.

Thank you for considering our invitation. The experience of motherhood is an important issue in Australia today, and we are interested in your opinions.

Yours sincerely,

Deborah Loxton
Deputy Director

Postal:
Women's Health Australia
Reply Paid 70
Hunter Region MC NSW 2310



Ph: 1800 068 081
Fax: (02) 4913 8888
Email: whasec@newcastle.edu.au
Web: www.alswh.org.au

**Information Statement for the Research Project:
Experiences of Motherhood
Document Version 2; dated 03/08/09**

You are invited to participate in the research project identified above. The research is part of Catherine Chojenta's studies at the School of Medicine and Public Health, University of Newcastle, supervised by Dr Deborah Loxton from the Research Centre for Gender, Health and Ageing, University of Newcastle and Dr Jayne Lucke, School of Population Health, University of Queensland.

Why is the research being done?

The purpose of the research is to explore the experiences of early motherhood, such as experiences of labour and emotional wellbeing (eg the baby blues and postnatal depression) during the weeks after childbirth.

Who can participate in the research?

We are seeking women in the Women's Health Australia 1973-78 cohort who have given birth to a child in the last seven years. If you have received this invitation and do not fall into this category we would be grateful if you would take the time to phone us on 1800 068 081 or let Catherine know when she calls you to see if you would like to take part in an interview.

What choice do you have?

Participation in this research is entirely your choice. Only those people who give their informed consent will be included in the project. Whether or not you decide to participate, your decision will not disadvantage you. If you do decide to participate, you may withdraw from the project at any time without giving a reason and have the option of withdrawing any data which identifies you. Please be assured that this will not affect your continuing participation in the Women's Health Australia project.

What would you be asked to do?

You will be asked to participate in a telephone interview at a time convenient to you. The interview will ask questions such as 'can you tell me about the birth of your youngest child?', 'when you arrived home, what kind of support was available to you?' and 'how was your emotional health at the time?'. The interview will be recorded and then transcribed. To save you from re-answering some questions that you have already answered in the main surveys, we may link what you say in the interview with your answers from previous surveys.

How much time will it take?

It is anticipated that the phone interview will take approximately 45 minutes.

What are the risks and benefits of participating?

If you take part in the research you may feel a benefit from talking about and reflecting on your experiences of motherhood.

We do not expect that this research will cause any distress, but sometimes people become upset when talking about their motherhood experiences. If this happens you can stop the interview, or take a break. You might also like to contact one of the following services:

- Lifeline 131 114
- Beyond Blue: www.beyondblue.org.au 1300 22 4638
- PANDA: www.panda.org.au 1300 726 308 (9.30am - 4.30pm, Monday to Friday)
- Maternal and Child Health Line: 132 229
- Parentline: 132 289

How will your privacy be protected?

No identifying information will be included in the typed transcript. If you choose you may use a pseudonym (a different name) during the interview. You may also ask to review, edit or erase the recording of your interview, or request a transcript to edit the interview. The recording will be destroyed once the transcript has been checked for accuracy. The transcripts will then be securely stored and will only be accessible to the researchers connected with the project. Data will be kept for at least 5 years at the Research Centre for Gender, Health and Ageing.

How will the information collected be used?

The results of the research will be used to prepare a research thesis to be submitted for Catherine's Doctoral degree. The results will also be used to write papers for journals and for presentation at conferences. Individual participants will not be identified in any reports arising from this project. A summary of the results of this project will be sent to you in 2010.

What do you need to do to participate?

Please read this Information Statement and be sure you understand its contents before you consent to participate. If there is anything you do not understand, or you have questions, contact us on 1800 068 081.

If you would like to take part in this research, you do not need to do anything. Catherine will call you in the next few weeks to answer any questions you might have and, if you would like to take part, Catherine will arrange a suitable time to complete the telephone interview. If you would prefer not to be contacted, please call us on 1800 068 081 or email us at whasec@newcastle.edu.au or write to us at the address at the top of this letter.

Further information

If you would like further information please call Women's Health Australia on 1800 068 081.

Thank you for considering our invitation.

Deborah Loxton
Deputy Director, Women's Health Australia, University of Newcastle

Jayne Lucke
Deputy Director, Women's Health Australia, University of Queensland

Catherine Chojenta
School of Medicine and Public Health, University of Newcastle

Complaints about this research

This project has been approved by the University of Newcastle Human Research Ethics Committee, Approval No. H-2009-0179 and the University of Queensland's Human Research Ethics Committee Approval No. 2009001563.

If you have any complaints about this project and would prefer to discuss these with an independent person, you should feel free to contact the University of Newcastle's Human Research Ethics Officer (02) 4921 8333 or write to them at the University of Newcastle, University Drive, Callaghan, NSW, 2308. You could also contact the University of Queensland's Human Research Ethics Officer on (07) 3365 3824 or write to them at the University of Queensland, St Lucia, QLD, 4072.

Appendix.M Study 4 Interview schedule

INTERVIEW SCHEDULE - Experiences of motherhood

[In the following protocol, the main questions are indicated with a dashed bullet “ – “ and prompts are contained underneath. It is not expected that each participant will answer every question in the protocol, but that these questions will cover the expected direction of the interview]

[Initial contact will be made with the participant by telephone after the letter of invitation and information sheet has been posted, see ‘initial telephone contact’ protocol. Those women who had not received the letter will be resent it before the interview will commence. A suitable appointment time will be made at this time, and those women who are ineligible or would prefer not to participate will have an opportunity to let the researcher know. The following protocol will be used for the interview.]

Introduction:

[recorder off]

Hello my name is Catherine, I am calling from the Women’s Health Australia project at the University of Newcastle. Can I please speak to [name of participant]?

Is it still convenient for you to do the interview about your experiences of motherhood now? It will take about 45 minutes. Just let me know if you need to stop at any point while we are talking.

I would like to confirm that you have received the letter that we sent you regarding this project, and ask if I can answer any queries before I begin.

Before we start I need to read a series of statements to you. These are to comply with ethical clearance to confirm that you give consent to participate in this project. Do you have any questions you would like to ask before the recorder is turned on?

I am switching the recorder on now.

Consent:

[recorder on]

The recorder is now running. Before we begin I need to ask you some questions about your willingness to take part in this interview.

Just answer 'yes' or 'no'.

- Do you acknowledge that you have read and kept a copy of the letter which invited you to take part in this research? Do you understand why this research is being conducted, and have you had all of your questions about the research answered?
- Do you consent to participate in a telephone interview about your experiences of motherhood?
- Do you understand that the interview is being recorded, and that information on this recording will be used for research which may be published, provided that you will not be identified in the research or publications?
- Do you understand that your personal information will remain confidential to the researchers?
- Do you understand that you can stop the interview at any time if you do not wish to continue, or would like to take a break, and that you do not have to give any reason for doing this?

Do you have any questions before we begin the interview?

Pregnancy

- Thinking about your youngest child, how was that pregnancy?
- How was your emotional wellbeing/feelings during this pregnancy?
- How do you feel that you coped during this pregnancy?
- How was your physical health eg high blood pressure, severe tiredness etc.

Childbirth

- Can you tell me about the childbirth of your youngest child?
- what type of labour eg caesarean, natural
 - pain relief
 - who was present
 - duration
 - complications
- emotions/coping/feelings
- Hospital/care type – public, private, midwife led care, home birth etc
- Before childbirth, how did you expect your childbirth to go? How close was your actual childbirth to your ideal childbirth? How did you feel about that?
- How long did you stay in hospital after the birth of your youngest child?
- How would you say you felt during these early days after childbirth? Also, how does this differ from how you think about those days now?
- What was your experience of feeding your baby during your hospital stay?
(could be breast, bottle, combo, other)

Postpartum (6 weeks)

- When you arrived home from the hospital, what kind of support was available to you?

For example:

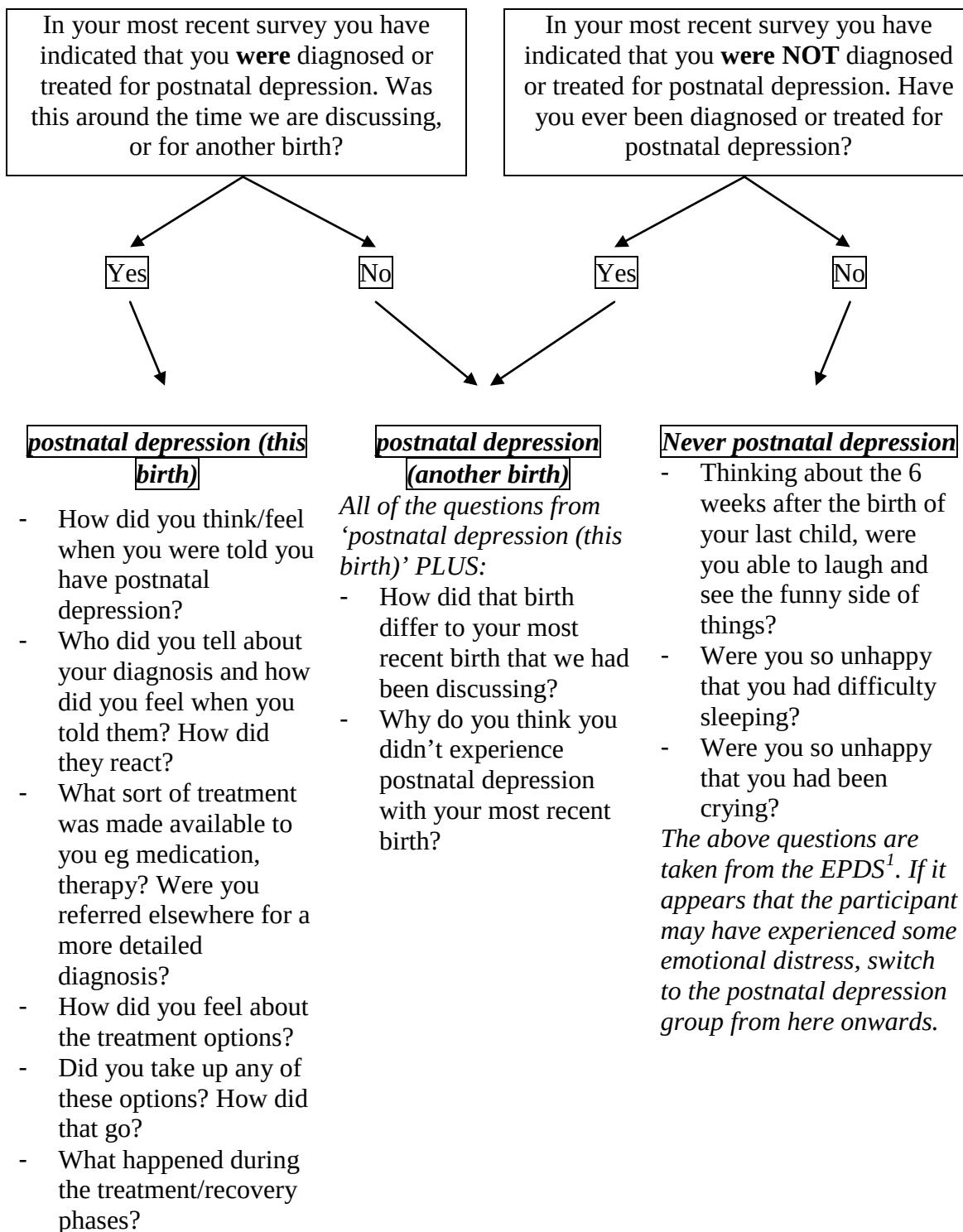
- Partner
 - Family
 - Friends
 - Services
 - Australian Breastfeeding Association
 - Maternal health nurse
 - Doctor
- Was the support that was available to you adequate? What else would have been useful?
- What was your experience of feeding your baby during the first month or two at home?
- Could you tell me about your sleep during this time?
- What was your relationship with your partner like during these weeks?
- Did you have other children at home?
 - If yes: What was this time like for them? What was it like for you managing your older child/ren and your baby?
- Throughout the first six weeks how would you say you were feeling?
 - If not well: If you were not feeling well, did you tell anyone, or ask for any help? Who did you tell and how did that go?
 - If well: Why do you think you were feeling well?

Postnatal (7 weeks – 12 months)

[The postnatal checkup is the ‘bridge’ between these two sections.]

- Can you tell me about your postnatal checkup?
- Where did you go for this checkup?
- How was your physical health at the time?
- How was your baby’s health?
- How was your emotional health at the time?
- Were you asked about your emotional health/mental health at this time?
 - o *If yes:* how did that go?
 - o *If no:* would you have liked somebody to talk to you about your emotional health at this time?
 - o *If can’t remember:* What would you have said? What help would you have liked?

[Determine whether or not the participant has experienced postnatal depression, or postpartum emotional distress. Use the item from ALSWH Survey 4 (“in the last three years have you been diagnosed or treated for postnatal depression”) to determine this.]



¹ Edinburgh Postnatal Depression Scale

Pre-pregnancy

postnatal depression (this birth):

Can you tell me about another time when you felt similar to this?

When was this time?

What were the circumstances around this?

Can you tell me about your recovery after this?

Never postnatal depression:

I would just like to change to a different topic now, and ask you to reflect on another major and potentially stressful event in your life.

What was this event?

How did you feel?

Would you say that you were depressed during this event?

How did your feelings at this time differ to how you felt after the birth of your last child? Why do you think you felt the same OR different?

Postnatal – current

- Switching back again to the first year after the birth of your youngest child, you have told me quite a bit about your health, and your baby, but what about the other things that were happening too?
- Were you doing or considering paid work?
 - o Can you tell me about how you decided to return to work (or not return to work)?
 - o How did you feel about this decision?

- What about other aspects of your life for example your other children, and your friends and family?
- How did you feel about fitting in other events/obligations into your life at this point in time?
- What was feeding your baby like at this time? Were you breastfeeding, bottle feeding, formula feeding?
 - o How did you feel about that?
- Now thinking about the time after the birth of your youngest child compared to now how would you say that your emotions and feelings have changed? [Do not ask for women still in the postnatal phase of their youngest child]
- Why do you think your emotions have changed? What caused this change?

Finishing up

- Now that I've finished with the questions I would like to ask you, is there anything else you would like to add about any of these topics?
- How are you feeling now?

If the participant is or has been distressed, reiterate the help lines that are available to them:

- o Lifeline 131 114
- o Beyond Blue: www.beyondblue.org.au 1300 22 4636
- o PANDA: www.panda.org.au 1300 726 306 (9.30am - 4.30pm, Monday to Friday)
- o Maternal and Child Health Line: 132 229
- o Parentline: 132 289
- Would you like to ask me anything?

- I am turning the recorder off now

[Recorder off]

Thank you very much for your time today. I appreciate you taking the time to speak to me. Goodbye.

Appendix.N Interviews coding tree

Table 23 Coding tree – major themes identified in interviews (N=16)

Theme	Count	Example of comment
Life Histories		
Depression	6	<i>.. when you're a teenager like that like little thing happen and you might feel like your whole world's coming down around you and umm that it's all too hard and yeah, that kind of thing and umm yeah just feeling that anxiety about issues and yeah.</i>
Self harm	1	<i>I used to self-harm as a teenager, I don't know, it just started and it continued off and on, every now and again I still do...</i>
Coping with grief	2	<i>When my father passed away... I was very good at you know walking into the hospital room and pretending everything was fine and waiting til I was home but I paid for it later...</i>
Illness	2	<i>We'd just got married and I found out I had a brain tumour and then my husband was going overseas for six months. It was all these terrible things happening at once.</i>
Miscarriage	2	<i>I had a miscarriage and I fell pregnant pretty much straight away and hadn't sort of grieved the miscarriage..</i>
Fertility / conception	4	<i>I went through 5 cycles of fertility medication, and you sort of take a pill and think 'right this is going to be the month that I get pregnant' and when it didn't happen 5 times, um, my husband came home and found me trying to find something to cut myself with, coz I was just so angry.</i>
Pregnancy		
Antenatal depression	3	<i>I wasn't diagnosed but I was really depressed. I had antenatal depression so I got really depressed around the three month mark.</i>
Unwanted pregnancy	2	<i>I was in a previous relationship of ten years and my husband and I divorced and then I met a man and pretty much fell pregnant straight away so I, you know, was sort of, wasn't really good timing</i>
Health during pregnancy	4	<i>Id have a gall attack so I was in hospital probably from about 32 weeks trying to keep him in</i>
Labour		
Expectations	3	<i>...they said it "oh well that, that's just normal child-birth, that's normal child-birth" but I knew mine was not normal. Umm so it's like well hang on if this is normal then ok, I know mine's not normal so is there any differences.</i>

Table 23 continued

Theme	Count	Example of comment
Trauma	2	<i>Number one was a, a traumatic, very bad experience. I didn't really want it to be induced because I was, I'd been, the pain the first time was horrendous.</i>
Breech birth	1	<i>I just umm yeah was devastated cos I kept on saying to them throughout my whole pregnancy "I haven't felt any kicks above my belly-button" sort of thing and I was a bit concerned and a bit worried umm but they were like "no it's ok, it's ok" and then it was only a week before I was due that they realised that she was breached and that they tried, they were, she was booked in to be, to try and have her turned umm but yeah obviously that wasn't her fate because she broke my water that night and yeah I had to have a caesarean.</i>
Change in birth expectations	3	<i>Umm yeah, even when, even when she came out umm I was really upset because when I had my caesarean and epidural I'd, I'd lost the plot on the operation table like because they, even when they were trying to put the injection into me, I was, I was quite feral actually, like I remember they had to literally pin me down to put the needle in my back, umm and then umm after she was born umm, because you can't get up for twenty four hours, you have to try and breast feed on your back which is quite hard.</i>
Other health problems	1	<i>the doctor just said "look, feed her whatever she can keep down". So and then eventually it they were starting to get an infection so they double operation right pretty suddenly, right at the end.</i>
Natural birth	1	<i>Umm I, I've done my umm three quarters of my midwifery training so umm there was a fairly lot I really wanted to have the experience of umm going through the labour and the birth and being able to have, like I guess we do a lot about the emotional umm the emotional bonding through having natural birth and the experience and that kind of thing so yeah I was a bit disappointed that I wasn't able to have that experience, yeah.</i>

Table 23 continued

Theme	Count	Example of comment
Pain relief	2	<i>It wasn't the whole you know hero worship thing you know what I mean, you know I didn't want to be a hero, but um, for some reason I just didn't think that I would need it, um... I had had a miscarriage ah a couple of years before my first baby and that was a pregnancy that I didn't know about and so um I was at home and miscarried and you know that was very very painful and it wasn't until after the event that I'd that the doctor spoke to me and said you know, could you have been pregnant? Yes I could have been um and do you realise it could have been a miscarriage, and I never really thought about it until then and so after that, well I thought if that's what child birth feels like, um coz I believe that you know, I was in labour um and not knowing what was going on made it more painful so I sorta had an idea of what to expect, what my body would do if that makes any sense at all.</i>
First 12 weeks postpartum		
Breastfeeding	19	<i>Baby um wouldn't feed and so I spent 6 weeks um in hell basically. I think staying in hospital a bit longer would have been a better choice. Um just to get feeding established um I didn't breastfeed very well at all and so yeah I got very down after that.</i>
Sleep deprivation	4	<i>was really teary easily and wasn't sleeping well and yeah so I was really emotionally drained</i>
Diagnosis of postnatal depression	10	<i>I ended up speaking to the GP when [baby] was about four months old around then i was actually diagnosed with postnatal depression as well.</i>
Treatment		
Counsellor	3	<i>Umm, I went to the doctor first of all and umm started on medications [mm ok] and then I also went to a counsellor as well.</i>
Didn't treat it properly	1	<i>Umm yes I did. I actually got diagnosed with post-natal depression after my first child haha, umm haha, this could go on forever, umm. Haha and it sort of, it didn't really go away cos I didn't really treat it properly. Umm and umm it's only recently that I'm getting help for it.</i>
Didn't tell doctor	1	<i>Yep. Depressed, fully depressed not that I sort of told any doctor about it but umm just fully felt like I was losing the plot, I'd cry all the time, I'd get angry at my husband all the time.</i>

Table 23 continued

Theme	Count	Example of comment
Medications	4	<i>I was on Zoloft, I still am actually umm and then eventually well all my painkillers, they ruined my stomach, so I'm those sorts of, I'm on Nexium now for umm reflux of the stomach.</i>
Naturopath	1	<i>Umm he was more of a naturopath. And I knew he oh he was a GP but he's, he likes natural medicines before main medicine.</i>
Health service use	1	<i>The Heath Care Direct or um the 1800 number where you speak to a registered nurse, I think I rang that a couple of times, you know just to reassure myself that I wasn't starving the baby, you know he's only feeding once a day, is that ok? And they're always great the ladies that you speak to there, um but apart from that no I can't remember. I guess I probably went to see um oh what are they called, family and community oh the ladies that you go to with your little blue book.</i>
Residential treatment	3	<i>Umm it was actually really good, I did it at a umm, I did a, I think it was like a trial course through at <name of program> at <name> University, the centre there. And umm you had to take photos to this guy, like part of it was more umm an expressive one? Where you took photos to try and say how you felt, like photo's of things that described how you felt at that time? umm and I think that helped, yeah, yeah it was good.</i>
Expectations and feelings towards motherhood		
Didn't know what to expect	2	<i>Very sore and sorry for myself for while because I couldn't really adjust to anything? Um but yeah that one was probably ok because I didn't really know what to expect. Whereas the second time around, I sorta knew what to expect?</i>
Overwhelming motherly feeling	1	<i>it was more of a automatic thing as soon as he was born, there was that overwhelming like motherly feeling that happened when he was born...</i>

Table 23 continued

Theme	Count	Example of comment
Second child, knew what to expect	2	<i>Uhh a little bit more reassuring cos I'd sort of been through the system a little bit better whereas first time round you didn't know, is this normal, is this not normal, is this what happens. Yeah, cos everyone said oh it's old hat, the midwives are, yeah don't worry about that this is old hat but and they sorta sometimes they'd be a bit condescending at you? Umm because it's like "as if you don't know". Umm but yeah, the second time round "oh you've already had a child" and it's as if you're in the club now ha sort of thing. So it, it was quite hard when your first time round you want that reassurance but you don't really get it. They just say "oh that's just normal" or "that's normal" and you go "but .. it doesn't look normal".</i>
Wanting perfect family	2	<i>Umm ohh... like as in... ohh like just guess wanting a perfect family and umm frustration of not being able to get pregnant and not knowing why you can't get pregnant and that kind of thing I guess yeah .Umm I guess just being able to umm yeah have the umm the family that you planned, we'd always planned to have a couple of children and umm yeah it's just being able to be happy healthy yeah.</i>
Feelings towards infant		
Couldn't connect	6	<i>I found I didn't connect with the second baby as well um didn't know him didn't understand him um you know, physically boys are different from us as well and you you've gotta get used to how their bodies work and what the need as well.</i>
Problems bonding	4	<i>I reckon it was about two or three months I reckon. Like I wouldn't seem to umm, like to want to, like I would, when she woke up I would just feed her, change her bum and put her straight back in her bassinet. Whereas my first child, I'd sort of, well she'd fall asleep on me and I'd give her cuddles and just you know, she'd be asleep and I'd check her all out whereas yeah my poor second one I'd just be like, have a feed change bum go. Like get away from me sort of thing like it was yeah, it was quite horrible. But now obviously it's you know, I love her to death but yeah.</i>

Table 23 continued

Theme	Count	Example of comment
Resentment towards children	2	<i>Umm I guess, umm during post-natal depression it's a lot stronger, deeper feeling. Umm, like I had umm times where I felt suicidal and that kind of thing, so that was really hard and a lot of resentment towards my partner and my sons, so umm that kind of feeling which you don't get like previously, and that's really hard, you've really got to work at getting through each day yeah.</i>
Wanted infant to disappear	1	<i>you start to read things about it and you think right well that was a symptom and that was a symptom and I don't think at the time you can diagnose yourself as being depressed at the time, I think it's after the fact that you go 'right' the day that I was quite happy for that child to go out the door and not come back was probably a good sign that yeah something probably wasn't right.</i>
Social Support		
Friends	2	<i>Umm there was a, there was I did have a support group ring me probably every two, three weeks initially, but yeah it was more just my friends and that that realised that well hang on, you are struggling umm and at that time she could help so she came over and she pretty much just "here's your meals, do this, ok we'll start this"</i>
Isolation	3	<i>I guess umm there was good days and bad days and ye, yeah but it was a very lonely, like it felt like you was the only one that was going through it and umm felt very isolated and yeah.</i>
Mother	1	<i>Umm well when I had the new baby, it was first time round, I had my mum's support for the first week.</i>
Partner support	3	<i>I think my partner is very supportive so that helped a lot umm yeah so I think we coped fairly well considering the circumstances but *phone breaks up for one second* a few tears and that kind of thing at the time</i>
Social group	2	<i>Well don't really know, I just ring up my husband say "ahh you've gotta come home real soon, as fast as you can, there's a meltdown happening and then the other one's triggering and the other one's anxiety's going and I have two hands here". Umm haaa, but yeah at times if I see that I try and get them in the car or my friend that lives nearby will come but she's got three of her own little children to move around and she, they don't really need to witness it. but at, as a desperation, that will happen.</i>

Table 23 continued

Theme	Count	Example of comment
Lack of interest in socialising	1	<i>wasn't interested in going out of the house or socialising and I found it really hard in situations with other parents</i>
Getting over last relationship	1	<i>it sort of was still getting over my last relationship I guess and umm had to deal with a pregnancy and a new partner haha and umm yeah, it was quite difficult. At the time.</i>
Marriage breakdown	1	<i>I am receiving counselling at the moment and my marr., and my marriage just broke down with my, my partner so, it's not good.</i>
Feelings about postnatal depression		
Labelled	1	<i>I guess umm. Like I knew that I didn't want to be that way and I didn't want to be that type of mother? So you put a lot of pressure on yourself and you force yourself to wanna like, you wanna be able to do it and be emotionally attached but you just can't? and I guess, you sorta go through all the motions but it's not necessarily how you feel? And you put on a big front I guess?</i>
judgement	1	<i>Just getting out, the idea of seeing other people and umm thinking they might judge me, haha</i>
Stigma	4	<i>When I started talking to people and realising that there was others going through the same thing I think we all felt like there was a weight lifted off us that we didn't have to suddenly feel like we were hiding ourselves</i>
Guilt	6	<i>I think as a new mum maybe you don't see it as help, you see it as I failed and I can't do this? So now someone has to step in for me?</i>
Shame	1	<i>Putting on one of those masks and pretending that everything's happy, joyful and you're you know, a perfect mother. Which I don't think there is such a thing.</i>
Postpartum emotions		
Being in the moment of stress	1	<i>I knew something wasn't right but I think because it was um rather than just being a mental state of where I was because there were things going on it was something that was affecting me, rather than the way that I was dealing with life, I don't know if I'm making sense, you know there was this baby, um it wasn't feeding, I wasn't coping with it, it was just the cycle um I don't think at the time I was able to stop and say 'hang on a sec, somebody tell me why I'm feeling like this'. Does that make any sense?</i>

Table 23 continued

Theme	Count	Example of comment
Breaking point	2	<i>Um I ended up when he was due for his first lot of immunisation shots we went to the doctor and the doctor who I knew quite well just took one look at me and said well whatever you're doing, stop it and do something else coz you look terrible and yeah I was at breaking point that day when I saw him and he knew that something wasn't working. [yeah] um yeah it'd been pretty horrible.</i>
Mental strength	1	<i>Very frustrated, probably slightly angry, umm because well, there's so many people I've helped them go through their things and yet they seem to blinded to my, you could say cry of help, umm and it took a real extreme situation before people realised what it was, like when I had my breakdown that I really was crying out for help here. Umm they'd just asking for help and saying "well I think these are my problems" they didn't seem to see it as a concern. Because the minute I voiced it well "oh you understand what your problem is ok fix it". Umm because my father is a probably has brought me on a culture of you can always do better within yourself, you can fix yourself that way. umm mental strength you could say. Is if someone says you can't do it, I go out and prove that I can so he thinks "oh yeah" by knocking me down a little, it'll make me want to fight a little more to go, to prove them wrong?] Well that used to happen until I had this and I just, yeah I just give up. I'm just not, nowhere near the strength that I used to have. As far as mental strength.</i>
Didn't realise had depression	1	<i>Yeah, it's umm, I didn't realise I had depression. I just wasn't interested in going out of the house or socialising and I found it really hard in situations with other parents and umm I just became really withdrawn.</i>
Mental breakdown	1	<i>Umm I had a mental breakdown. Basically I had a nervous breakdown. I just collapsed because I was struggling on my own, and by that time I had two kids umm and I've got a back problem so I've got a back degeneration of the discs and it, it sorta, I got through pregnancy quite ok with both of them [mm-hmm] but then it started playing up because I was starting, I had to lift them a lot more and they were getting heavier. Umm and I had to back off on that cos I had to be very careful of it but it was just, I had post-traumatic stress, not post-traumatic, umm post-natal?</i>

Table 23 continued

Theme	Count	Example of comment
Retrospection	1	<i>um yeah I think it was never spoken of but I think I was depressed. Um it's not something that I ever went to see a doctor specifically about but I do believe I was depressed looking back on it now.</i>
Anxiety	1	<i>just became really withdrawn and, and suffered from anxiety.</i>
Prone to depression	2	<i>I think I'm a person who's prone to being in that state and I have to really watch myself, I got the flu a couple of weeks ago and found myself feeling like I was sinking back to down to that place, um, but having kids now helps me because um there's an expectation that I will be up out of bed every morning and I will be friendly and um that helps me, so yeah I think, yeah if I I probably am a person who's prone to getting down a lot.</i>
Suicidal ideation	4	<i>o I got to the point of complete utter nearly suicide umm but the only thing that held me back was who's going to look after my kids cos they need me, no one else can understand them.</i>
Establish my own identity	1	<i>Umm, especially the first time I umm really needed that adult interaction and umm I guess it helps me find myself and umm establish my own identity. I guess I get to be my own person when I'm at work and I only have to think about what I need to do at that time.</i>
Feeling of failure	1	<i>Umm, oh yeah probably it wasn't something that I knew happened until sort of it got to a, probably about three months and it was a yeah, but I think it was umm the whole birth experience was a little bizarre of where it led up and the umm feeling of failure with breast-feeding and I felt like I'd failed because I hadn't had a natural birth and yeah and the whole motherhood experience wasn't what I expected it to be and yeah. So I think that was probably all the build up to it and umm yeah.</i>
Frustrated	1	<i>Umm I guess I would get umm very angry with myself and very frustrated and like 'why do I feel this way? I shouldn't feel this way' that kind of thing?</i>
Guilt	1	<i>Um trying to get out of the house and organise you know babysitting there's always that guilt that I'm handing my child over to someone else who I can look after myself, so it was guilt thing.</i>

Table 23 continued

Theme	Count	Example of comment
Kept it to myself	1	<i>Umm no one, I just kept it to myself cos I umm didn't think I was supposed to feel that way so I guess I internalised a lot of my emotions and umm I didn't want to go to my doctor because I worked with them so yeah.</i>
Private person	1	<i>Um, well yes and no. um I'm a fairly private person and so I think having a stranger step in would be a bit much</i>
Views on the future and more children		
More children	5	<i>...we've got a van, well we've got a wheelchair then so may as well fill the seats up</i>
No more children	1	<i>No, no, that last pregnancy was not fun, um yeah and I just feel that I really long or my old body back, I don't look the way I did, things don't operate the way they did, um and i don't wish to damage myself anymore.</i>