Incidence and factors associated with postnatal depression among Jordanian women

Khitam Ibrahem Shlash Mohammad
RN RM BN MMid

A thesis submitted in the fulfilment of the requirements for the Degree of Doctor of Philosophy in the School of Nursing and Midwifery, Griffith Health at Griffith University.
October 2007
Forward
Acknowledgments

I would like to acknowledge the supervision and support provided by Professor Debra Creedy and Dr Jennifer Gamble. They each willingly gave guidance, insight and constructive criticism in relation to this research.

I am indebted to the women who participated in the study and gave so willingly of their time. The study would not have been possible without their support.

To my husband, Khaled, son, Mohammad, and daughter, Daniah, thanks for their love, support and understanding while I completed this research.
To my parents, sisters, and brothers, thanks for their help and support.

I would also like to thank the midwifery staff of the antenatal clinics of participating health centres and hospital for facilitating data collection.
Statement of originality
This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

Khitam Ibrahem Shlash Mohammad
Synopsis

Postnatal depression (PND) is the focus of considerable clinical and research attention however it has been neglected in many developing countries. Using a prospective design with a representative sample of women (n = 353), this longitudinal study aimed to determine the incidence and associated factors in the development of antenatal and postnatal depression in Jordanian women.

There are three Phases of the study. During Phase 1 women in their last trimester of pregnancy and receiving public antenatal clinic care were recruited. In addition to obtaining demographic details, a questionnaire sought information on the antenatal factors commonly associated with depression. These included whether the pregnancy was planned, reproductive history, personal and family history of psychiatric illness including antenatal and postnatal depression, relationship with husband, relationship with mother-in-law, and stressful life events. Standardised measures were used to assess depression, social support, worry, anxiety and stress, preparation for birthing and parenthood, and self-efficacy.

Phase 2 consisted of a telephone or face-to-face interview conducted six to eight weeks postpartum. Participants (n = 353) completed the Postnatal Questionnaire, Edinburgh Postnatal Depression Scale (EPDS), Maternal Social Support Scale (MSSS), and Depression, Anxiety and Stress Scale-21 (DASS-21). In Phase 3 a second telephone or face-to-face interview was conducted at six months postpartum. Participants (n = 353) completed Edinburgh Postnatal Depression Scale, Maternal Social Support Scale, and Depression, Anxiety and Stress Scale-21.

Nineteen percent of participants (n = 67) reported symptoms of probable antenatal depression. Antenatal variables found to contribute to the development of depression were unplanned pregnancy, stressful life events due to financial problems, difficult relationship with husband, difficult relationship with mother-in-law, psychological factors of anxiety; stress; and
worry in general (worry about labour and birth, relationship with husband, and financial problems in particular), low social support, poor general knowledge regarding labour; birth and mothering, and low maternal self-efficacy.

At six to eight weeks postpartum, over twenty percent (22.1 %, n = 78) of women scored \( \geq 13 \) on the EPDS. At six months postpartum, the rate of depression dropped slightly to 21.2% (n = 75). Similar factors were found to contribute to the development of postnatal depression as were associated with the development of antenatal depression with the exception of anxiety.

There was an association between antenatal depression and the development of PND \( \chi^2 (1) 5.880, p = 0.015 \). Personal and family history of psychiatric illness (including antenatal and postnatal depression) were not associated with development of antenatal depression or postnatal depression. This may be related to a lack of awareness by women that they themselves suffered from any psychiatric illness including depression in past pregnancies or/and after the birth as well as a lack of awareness of mental health problems of relatives and an unwillingness to disclose this information. In Jordan, people in general and women in particular are not aware of the psychiatric illness (including antenatal and postnatal depression) and there is little community knowledge about psychiatric illness (including antenatal and postnatal depression). This may be partly because there is a focus of health services on the provision of physical care and a deficit in provision of health education or psychological care.

Intrapartum factors associated with the development of PND were obstetric events, satisfaction with care during labour and birth, and feelings whilst in labour. Seven obstetric events were consistently associated with the development of PND. These were long and painful labour, increased number of vaginal examinations, lithotomy position during the birth, episiotomy, suturing, use of analgesia (pethidine and nitrous oxide). There was an association between the perception of overall poor quality of care during
childbirth and development of postnatal depression $[\chi^2 (1) 5.880, p = 0.015]$. Satisfaction with emotional care and midwifery and medical care were statistically associated with the development of PND. Women who felt that childbirth was “taken over by strangers and/or machines” were more likely to develop PND. Women who did not talk to any health professional about how they felt about what happened during their labour and birth were more likely to develop PND. Feelings associated with lack of control, helplessness, anxiety, and fear during labour and birth increased women’s risk of developing postnatal depression.

It appears that it is not the pain or process of normal labour and birth that is associated with the development of PND, but rather the experience of intervention and poor care. Despite available information identifying predictors of positive and negative birth experiences and the well-documented overuse of medical intervention in childbirth, birthing services in Jordan have been slow to change and implement this evidence. Birthing services in Jordan still perform many obstetric interventions on labouring women (e.g. excessive vaginal examinations, episiotomy, suturing, ineffective analgesia, and lithotomy position during birth), as well women receive poor care during labour and birth (e.g. not involve in the decision making process, their choices are not respected, and are not routinely given information or explanation regarding their care).

Postnatal factors associated with development of PND were perceived poor social support, and psychological factors of anxiety and stress. There is a high incidence of comorbidity between depression and anxiety. Gender of the baby was also associated with the development of PND with women who gave birth of female babies being more likely to develop PND.

Depression during pregnancy and after childbirth is an under-recognised phenomenon in developing countries and no other similar research has been conducted in Jordan to date. The present study identified a high level of depression suffered by women during pregnancy and after childbirth. This
research is also distinctive in that it identifies the antenatal, obstetric and care factors that contribute to the development of PND. The findings have important implications for maternity practices in Jordan. Recommendations relate to improving antenatal care that recognises and acknowledges the importance of addressing women emotional needs throughout pregnancy and assessing women for depression during pregnancy and postpartum. Maternity service providers need to be cognisant of the incidence of this debilitating condition and be able to identify at risk women for early intervention and referral to a mental health practitioner if appropriate. Staff development activities need to ensure that health care providers are more supportive of women during this important time, to involve women in decision-making processes regarding their care and to respect women's choices. A final recommendation relates to the need for women to be better supported in labour with the inclusion of women’s family members during labour and birth if she wishes.
Table of Contents

Synopsis ................................................................................................................ III

Chapter 1 ........................................................................................................... 1

Introduction ...................................................................................................... 1
  Cultural background of Jordan ................................................................. 3
  Midwifery history in Jordan ................................................................. 5
    Traditional childbirth attendants ........................................................ 5
    Registered midwives ........................................................................ 7
  Jordanian maternal health care ............................................................. 8
    Antenatal care .................................................................................... 10
    Labour and birth care ....................................................................... 15
    Postnatal care .................................................................................... 18
  Types of postnatal mood disorders ......................................................... 19
  Definition of postnatal depression .......................................................... 21
  Incidence of postnatal depression .......................................................... 22
  Research problem .................................................................................. 25
  Significance of the study ....................................................................... 26
  Overview of the thesis ........................................................................... 27

Chapter 2 .......................................................................................................... 30

Literature Review .......................................................................................... 30
  Confirmed risk factors ........................................................................... 32
    Previous psychiatric history ............................................................... 32
    Antenatal depression ......................................................................... 33
    Anxiety ............................................................................................... 37
    Stressful life events ............................................................................ 39
    Social support .................................................................................... 41
    Marital problems ............................................................................... 44
  Probable risk factors .............................................................................. 45
    Infant temperament ............................................................................ 45
    Birth experience ............................................................................... 46
    Single parenthood ............................................................................. 46
  Possible risk factors ............................................................................... 55
    Demographic factors ........................................................................... 56
    Poor relationship with parents .......................................................... 57
    Satisfaction with intrapartum care and support .................................... 57
    Socio-cultural risk factors of PND ..................................................... 59
    Maternal self-efficacy ......................................................................... 69
    Theoretical perspectives of PND ......................................................... 70
    Conclusion .......................................................................................... 73
    Purposes of the research study ............................................................ 73
      First purpose .................................................................................. 73
      Second purpose ............................................................................... 73

Chapter 3 .......................................................................................................... 75

Method ............................................................................................................. 75
Design issues ............................................................................................................. 75
Setting ...................................................................................................................... 76
Time of data collection ............................................................................................... 77
Participants ................................................................................................................. 77
  Inclusion criteria .................................................................................................. 77
  Exclusion criteria ................................................................................................ 77
Sample size ................................................................................................................ 77
Method of data collection ............................................................................................. 78
Description of instruments ......................................................................................... 78
  Antenatal questionnaire ......................................................................................... 78
  Edinburgh Postnatal Depression Scale (EPDS) ..................................................... 79
  Maternity Social Support Scale (MSSS) .................................................................. 80
  Cambridge Worry Scale (CWS) .............................................................................. 80
  Depression, Anxiety, and Stress Scale-21 Items (DASS-21) ............................... 81
  Perceived Knowledge Scale .................................................................................. 82
  Perceived Self-Efficacy Scale (PSES) ................................................................... 82
  Postnatal questionnaire ........................................................................................... 83
Procedure ..................................................................................................................... 84
  Phase 1: Pilot Study ............................................................................................... 84
  Phase 2: Recruitment and antenatal measures ...................................................... 87
  Phase 3: Follow-up at six to eight weeks postpartum ............................................ 87
  Phase 4: Follow-up at six months postpartum ...................................................... 87
Ethical considerations ................................................................................................. 88
Proposed statistical procedure .................................................................................... 89
Chapter 4 .................................................................................................................... 91
Results: Demographics, obstetric events, measures and incidence of
antenatal and postnatal depression ......................................................................... 91
  Response rate ......................................................................................................... 91
  Demographic data ................................................................................................. 93
  Obstetric details ..................................................................................................... 94
  Dissatisfaction with care ....................................................................................... 95
  Feeling during labour ............................................................................................. 96
  Gender of the baby ................................................................................................. 96
Reliability of instruments ............................................................................................. 97
  Edinburgh Postnatal Depression Scale (EPDS) ..................................................... 97
  Depression, Anxiety and Stress Scale–21 items (DASS-21) ............................... 97
  Maternity Social Support Scale (MSSS) .............................................................. 98
  Cambridge Worry Scale (CWS) ............................................................................ 98
  Perceived Knowledge Scale .................................................................................. 98
  Perceived Self-Efficacy Scale (PSES) ................................................................... 98
  Depression, anxiety, stress, worry, social support, parenting knowledge, and
  maternal self-efficacy ............................................................................................ 98
  Phase 1 ..................................................................................................................... 99
  Phase 2 ................................................................................................................... 101
  Phase 3 ................................................................................................................... 102
Incidence of antenatal and postnatal depression .................................................... 104
Comparisons between antenatal and postnatal data .............................................. 104
### Results: Factors associated with antenatal and postnatal depression

<table>
<thead>
<tr>
<th>Topic / Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factors associated with antenatal depression</td>
<td>107</td>
</tr>
<tr>
<td>Demographic and obstetric factors</td>
<td>107</td>
</tr>
<tr>
<td>Psychological factors</td>
<td>108</td>
</tr>
<tr>
<td>Social support</td>
<td>109</td>
</tr>
<tr>
<td>Perceived parenting knowledge</td>
<td>109</td>
</tr>
<tr>
<td>Maternal self-efficacy</td>
<td>109</td>
</tr>
<tr>
<td>Unplanned pregnancy</td>
<td>109</td>
</tr>
<tr>
<td>History of psychiatric illness</td>
<td>110</td>
</tr>
<tr>
<td>Family history of psychiatric illness</td>
<td>110</td>
</tr>
<tr>
<td>Stressful life events</td>
<td>110</td>
</tr>
<tr>
<td>Marital relationship</td>
<td>110</td>
</tr>
<tr>
<td>Relationship with mother-in-law</td>
<td>110</td>
</tr>
<tr>
<td>A model for the development of antenatal depression in Jordan</td>
<td>111</td>
</tr>
<tr>
<td>Antenatal factors associated with postnatal depression</td>
<td>112</td>
</tr>
<tr>
<td>Demographic and obstetric factors</td>
<td>112</td>
</tr>
<tr>
<td>Psychological factors</td>
<td>113</td>
</tr>
<tr>
<td>Social support</td>
<td>114</td>
</tr>
<tr>
<td>Perceived parenting knowledge</td>
<td>114</td>
</tr>
<tr>
<td>Maternal self-efficacy</td>
<td>114</td>
</tr>
<tr>
<td>Unplanned pregnancy</td>
<td>115</td>
</tr>
<tr>
<td>History of psychiatric illness</td>
<td>115</td>
</tr>
<tr>
<td>Family history of psychiatric illness</td>
<td>115</td>
</tr>
<tr>
<td>Stressful life events</td>
<td>115</td>
</tr>
<tr>
<td>Marital relationship</td>
<td>115</td>
</tr>
<tr>
<td>Relationship with mother-in-law</td>
<td>116</td>
</tr>
<tr>
<td>Intrapartum and postpartum factors and PND at six to eight weeks</td>
<td>116</td>
</tr>
<tr>
<td>Obstetric factors</td>
<td>116</td>
</tr>
<tr>
<td>Satisfaction with care</td>
<td>117</td>
</tr>
<tr>
<td>Feelings during labour</td>
<td>118</td>
</tr>
<tr>
<td>Psychological factors</td>
<td>118</td>
</tr>
<tr>
<td>Social support</td>
<td>119</td>
</tr>
<tr>
<td>Gender of the baby</td>
<td>119</td>
</tr>
<tr>
<td>Regression analysis of factors related to PND</td>
<td>119</td>
</tr>
<tr>
<td>Intrapartum and postpartum factors and PND at six months</td>
<td>121</td>
</tr>
<tr>
<td>Obstetric factors</td>
<td>121</td>
</tr>
<tr>
<td>Satisfaction with care</td>
<td>121</td>
</tr>
<tr>
<td>Feelings during labour</td>
<td>122</td>
</tr>
<tr>
<td>Psychological factors at six to eight weeks postpartum</td>
<td>123</td>
</tr>
<tr>
<td>Social support at six to eight weeks postpartum</td>
<td>124</td>
</tr>
<tr>
<td>Psychological factors at six months postpartum</td>
<td>124</td>
</tr>
<tr>
<td>Social support at six months postpartum</td>
<td>125</td>
</tr>
<tr>
<td>Gender of the baby</td>
<td>125</td>
</tr>
<tr>
<td>Conclusion</td>
<td>125</td>
</tr>
</tbody>
</table>
Chapter 6 ................................................................................................................................. 127

Discussion .............................................................................................................................. 127
Incidence of antenatal depression ...................................................................................... 127
Incidence of postnatal depression ...................................................................................... 131
Incidence of depression, anxiety, and stress in pregnancy and postpartum ...................... 133
Antenatal factors associated with antenatal and postnatal depression .............................. 133
Intrapartum and postpartum variables associated with PND .............................................. 146
Obstetric events and intervention ...................................................................................... 146
Perceptions of care .............................................................................................................. 152
Feelings whilst in labour ..................................................................................................... 158
Postpartum social support .................................................................................................. 160
Anxiety and stress at six months postpartum ..................................................................... 162
Gender of the baby .............................................................................................................. 163
Limitations ........................................................................................................................... 165
Conclusion ............................................................................................................................ 166

Chapter 7 ................................................................................................................................ 169

Conclusion ............................................................................................................................. 169
Incidence of antenatal and postnatal depression .............................................................. 169
Jordanian social and cultural context and postnatal depression ......................................... 170
Relationship with parents-in-law ....................................................................................... 170
Gender preferences and fertility control ............................................................................. 171
Cultural beliefs regarding the expression of emotional distress ........................................ 171
Model of maternity services delivery ................................................................................ 172
Implications for policy and management, practice, education and research .................... 172
Implications for health service management ..................................................................... 173
Implications for clinical practice ......................................................................................... 175
Implications for education of maternity health care professionals .................................. 177
Implications for research .................................................................................................... 178
Conclusion ............................................................................................................................. 179

Appendix A: Antenatal Questionnaire ..................................................................................... 180
Appendix B: Edinburgh Postnatal Depression Scale (EPDS) .................................................. 182
Appendix C: Maternity Social Support Scale (MSSS) ............................................................. 184
Appendix D: Cambridge Worry Scale (CWS) ......................................................................... 185
Appendix E: Depression Anxiety and Stress Scale–21 (DASS-21) ........................................ 186
Appendix F: Perceived Knowledge Scale .............................................................................. 187
Appendix G: Perceived Self-Efficacy Scale (PSES) ................................................................. 188
Appendix H: Postnatal Questionnaire .................................................................................... 191
Appendix I: Information and Consent Forms ........................................................................ 198
References ................................................................................................................................ 202
List of tables and figures

Table 2:1: Details of studies investigating issues relevant to the Jordanian context........................................................................................................65

Table 4:1: Demographic characteristics of participants compared with the National population.........................................................................................94

Table 4:2: Obstetric characteristics of the sample.................................................................................................................................94

Table 4:3: Mean scores for population data and for this sample for EPDS, DASS-21, MSSS, Perceived Knowledge Scale and PSES..................99

Table 5:1: Association between antenatal anxiety, stress and worry and antenatal depression (AND)........................................................................108

Table 5:2: Association between antenatal factors and antenatal depression.................................................................................................111

Table 5:3: Association between antenatal depression, anxiety, stress and worry and PND at six to eight weeks and six months postpartum........................................................................................................113

Table 5:4: Obstetric variables associated with PND at six to eight weeks postpartum.........................................................................................116

Table 5:5: Satisfaction variables associated with PND at six to eight weeks postpartum.........................................................................................117

Table 5:6: Feelings during labour and PND at six to eight weeks postpartum.................................................................................................118

Table 5:7: Association between depression, anxiety and stress measured at six to eight weeks and development of PND at six to eight weeks postpartum........................................................................................................118

Table 5:8: Association between antenatal, intrapartum and postpartum variables and PND.........................................................................................120

Table 5:9: Obstetric variables associated with PND at six months postpartum.................................................................................................121

Table 5:10: Satisfaction variables associated with PND at six months postpartum.................................................................................................122

Table 5:11: Feelings during labour and PND at six months postpartum.................................................................................................123

Table 5:12: Association between depression, anxiety and stress (measured by DASS at six to eight weeks postpartum) and EPDS-depression at six months postpartum........................................................................................................123

Table 5:13: Association between DASS at six months postpartum and EPDS.................................................................................................124

Figure 1: Response rates from the three phases of the study.........................92
CHAPTER 1

Introduction

Having a child is a time of biological, psychological and social change in a woman’s life. These changes can contribute to personal growth and happiness, but can also predispose women to mental distress. Postnatal depression (PND) is an important public health problem which has negative effects on the mother, infant and the whole family (Dennis & Ross, 2006a; Husain et al., 2006; Righetti-Veltema, Conne-Perread, Bousquet, & Manzano, 2002). Depression in general, and especially in new mothers, has been actively and extensively studied during the last three decades in western countries.

Some authors have suggested that postnatal depression (PND) is a problem of industrialised countries. It has been argued that socio-cultural patterns, such as traditional postnatal family support, limit the likelihood of PND in non-industrialised populations (Agoub, Moussaoui, & Battas, 2005; Felice, Saliba, Grech, & John, 2004; Inandi et al., 2002). Although there is still relatively limited information, studies from non-industrialised countries have begun to emerge (Abiodun, 2006; Andajani-Sutjahjo, Manderson, & Astbury, 2007; Felice et al., 2004; Green, Broome, & Mirabella, 2006). For example, Green et al. (2006) reported a 22% prevalence of PND in United Arab Emirates women, which is higher than the rates published in studies of women in western developed countries (Green et al., 2006).

The cause of postnatal depression remains unclear with diverse researchers suggesting a multi-factorial aetiology (Ross, Sellers, Gilbert Evan, & Romach, 2004). A past history of psychiatric illness, psychological disturbance during pregnancy, marital discord, a poor relationship between the woman's parents during childhood, low self-esteem, low socio-economic status, unwanted pregnancy, dissatisfaction with labour and birth, medical interventions in labour, and stressful life events during pregnancy or around the time of birth.
have consistently been shown to be associated with postpartum depression (Abiodun, 2006; Andajani-Sutjahjo, Manderson, & Astbury, 2007; Baker et al., 2005; Dennis & Ross, 2006a & 2006b; Husain et al., 2006; McCoy, Beal, Shipman, Payton, & Watson, 2006). A close association between antenatal depression and postnatal depression has also been observed (Alami et al., 2006). PND has an effect on the child’s cognitive, social, behavioural and emotional development because the symptoms of depression on the mother interfere with her ability to build relationships, communicate and interact sensitively with the child (Bugdayci et al., 2004; Dennis & Ross, 2006a; Husain et al., 2006). Postnatal depression can impaired maternal-infant relationship which has been linked to delay in the emotional development, social/interaction difficulties and attachment insecurity in children (Dennis & Ross, 2006a; Grace, Evindar, & Stewart, 2003; Husain et al., 2006; Lee & Chung, 2007). Children’s expressive language development, cognitive skills, and attention have been negatively affected by postnatal depression (Grace et al., 2003; Husain et al., 2006; Righetti-Veltema et al., 2002).

In addition to the risk factors mentioned above, there are other risk factors associated with the development of PND amongst women in developing countries. These factors are related to specific cultural norms and include birth of a daughter when a son was desired, and relationship difficulties with the mother-in-law (Abiodun, 2006; Green et al., 2006; Lee, Yip, Leung & Chung, 2004).

There is a dearth of studies related to pregnancy, childbirth and postpartum experiences of women from Middle Eastern countries. This study aims to investigate the incidence of depression across the antenatal and postnatal periods for women in Jordan and identify the associated risk factors and service issues that may be contributing to these adverse outcomes.

This thesis begins with a discussion of cultural background, midwifery history, and maternal health care system in Jordan. Types of postnatal mood disorders, definition and incidence of postnatal depression (PND) throughout
the world will be covered. The problem and significance of the study will be discussed. An overview of the thesis will be in the final section of this chapter.

**Cultural background of Jordan**

Jordan is one of the smaller countries to the east of the Mediterranean. It is bordered on the north by Syria, the north-east by Iraq, the west by Palestine, and the south by Saudi Arabia. The total area of Jordan is 34,440 square miles (Abushaikha & Oweis, 2005). The total population of Jordan of 5,329,000 (Safadi, 2005) is increasing at an annual rate of 2.8%. The fertility rate in Jordan is 3.5% in urban areas and 4.2% in rural areas (Safadi, 2005).

More than 92% of Jordan’s residents are Muslims. About 6% are Christian and the other 2% are several small Shi’a Muslim and Druze religious populations (Central Intelligence Agency, 2005).

An extended family is traditional in Jordan. This means that a typical household consists of an elder man, his wife, his unmarried daughters, and his sons, as well the wives and children of his married sons. Within the family the father is the master of his own nuclear family, whereas the eldest male is the undisputed ruler of the extended family (Khalaf & Callister, 1997; Safadi, 2005). In Jordan, the family is the basic unit of social organisation. It evolved as a patriarchal, pyramidal system with respect to age, gender and extended relations (Safadi, 2005). The family formation is patriarchal, with the roles of family members clearly proscribed. The different roles of men and women are complementary and carefully ordered. The father is the provider and head of the family. Women are reared in preparation for their future roles as wives and mothers (Khalaf & Callister, 1997; Oweis, 2001; Safadi, 2005). Marriage, childbearing and child rearing are considered the most important activities in the life of the Jordanian women. Children are cherished and expected to be obedient to their parents.
In Jordan, after marriage, the women moves to the household of her husband and is caught within the axis of the socio-dynamic of her husband and mother-in-law (Safadi, 2005). Initially, the daughter-in-law is marginal and immediate pregnancy is an important aspect of this marriage in order to have her integrated into the new family dynamics. Furthermore, the daughter-in-law must take the initiative to adjust to the new family and she expected to show respect and obedience to her parents-in-law (Safadi, 2005).

In Jordanian and Muslim traditions, the birth of the baby is a special event and is celebrated (Abushaikha & Oweis, 2005; Safadi, 2005). Traditionally, a woman remains an outsider from another family until she gives birth to the first child (Safadi, 2005). Becoming a mother gives a women a higher status in the family and a titular recognition (Abushaikha & Oweis, 2005; Oweis, 2001; Safadi, 2005). Gender differences in the valuing of children exist, and sons are more valued than daughters (Khalaf & Callister, 1997; Oweis, 2001; Safadi, 2005). On the birth of her first son, her name changes, ignoring her first name and, out of higher regard, she will be called “Um” meaning the mother of, and followed by the boy’s name (Nahas & Amasheh, 1999a; Safadi, 2005). This is not the case for a baby girl. After giving birth to a girl, a mother is not allowed a rest period and her status is insecure until she gives birth to a boy (Safadi, 2005). The birth of the male will honour her with the name and lead to her being integrated into her husband’s family (Safadi, 2005).

In Jordan, support follows the traditional family laws and gender division of labour. It is the responsibility of the female side of the family. The father is external and is not expected to provide either psychological support or child care after the birth. His only responsibility is financial (Khalaf & Callister, 1997; Safadi, 2005).

Modesty among women is valued highly, and some women cover essentially all parts of the body, including the face while in public. Most women, however, have adopted Westernised style dress (Adams, 1994; Oweis, 2001).
Educational opportunities for women have increased dramatically in a short time and they have the same chance as men for education. Jordan has one of the highest rates of educated females in the Middle East (Department of Statistics and Macro International Inc, 2003).

Jordanian people can use a range of health care providers from the public sector, non-governmental organisations, and private sector facilities. Around 52% of Jordanian women do not have health insurance and pay directly for the health care they receive. The remaining 48% of Jordanian women use government or private health insurance (around 40% of women use government health insurance and 8% use private health insurance). Less than 1% of women have health insurance from the United Nations Relief and Works Agency (UNRWA)¹ (Department of Statistics & Macro International Inc, 2003). In Jordan, 63.6% of women use public health sector and 33.4% use the private health sector for health care associated with childbearing (Department of Statistics & Macro International Inc, 2003).

**Midwifery history in Jordan**
Fifty years ago, childbirth in Jordan was mostly home-based as they had been for centuries. Fortunately, childbirth was assisted by highly respected and experienced community women known as *dayas* (Sultan, 1998), who were in most cases illiterate. They learned how to practice their profession by apprenticing under supervision of a traditionally expert family member or friend with no formal degree course in midwifery being available (Sultan, 1998).

**Traditional childbirth attendants**
The traditional practices adopted by *dayas* mirrored their traditionally held beliefs that emotions and stress had a negative impact on the physical state of the mother. Thus, during childbirth the *dayas* placed great emphasis on

¹ United Nations Relief and Works Agency (UNRWA): Is an international organisation which provides help and support to Palestinian refugee in Jordan.
psychological support and traditional methods of pain relief, such as olive oil massage and drinking herbal teas (Shaban, 2006). Most often, dayas use both traditional methods and conventional medicine when tending childbearing women. In this way, dayas created their own combination of old and modern methods. Massage (tamlis), herbal treatments (a’shaab), spiritual healing with the Holy Qur’an (ilaaj bil-Qur’an), and cupping (kassat hawa) are some of the indigenous practices that are still in use by a large number of Jordanian dayas (Shaban, 2006). During labour, the dayas give labouring women herbs such as sage (mayramieh) and cumin (kamoun) to strengthen their contractions (Shaban, 2006). A birthing mother would be instructed to eat dates (tamr), following the example of Maryam, as instructed in the Holy Qur’an (Surat 19; verses 25–26) (Shaban, 2006). Traditional foods given to the mother following birth are chicken soup and rice. Fenugreek (hilbeh) and anis (yansoun) were used to increase the mother’s milk supply. The old dayas continue to use salt water to clean the cord of the newborn. When visiting a postpartum mother, the daya regularly massages the baby’s body with olive oil, and rubs salt on the baby’s skin. The majority of dayas swaddle the newborn. They also help women with her home chores and childcare.

Since 1963, the Jordanian government launched a six-month training program for dayas and started licensing them in order train and supervise them and ensure reporting of births (Adams, 1994). The dayas, through their district supervisory system, received appropriate training qualifying them to refer women at-risk of complications, or those experiencing prolonged labour or other birth-related complications to hospitals (Shaban, 2006). However, referral of a pregnant woman experiencing complications to the hospitals was problematic. Accessibility to the hospitals was difficult at that time as the roads were not sealed and transportation did not exist in all areas or was not operated during certain hours (Shaban, 2006). These factors meant that there were many serious emergencies linked to the daya’s failure to refer. However, the outcome of homebirths has never been assessed. Inaccuracy or lack of reporting in homebirths is a serious obstacle to such evaluations.
In the 1970s, and with the opening of the Nursing and Midwifery College, only a small number of midwives had been licensed, including the *dayas* who could legally assist home births (Shaban, 2006). Jordanian MOH’s implicit policy was to encourage hospital births. To further this goal, the MOH decreased the cost to the woman of public hospital-based birth (currently exceed no more 20 JD=A$40). Trained midwives were not allowed to perform homebirths. *Dayas* continued to be licensed only as a stopgap measure until they became too old to practice. It is not known how many *dayas* still in practise in Jordan today (Shaban, 2006).

**Registered midwives**

In Jordan, midwives are the sole persons allowed by law to practise the profession of midwifery if they hold an appropriate certification as issued by MOH, and membership of the Jordanian Nurses and Midwives Council (JNMC) (Shaban, 2006). Until the late 1970s, few people became midwives because there was only one route of preparation, a 22–month direct entry midwifery program. From 1970 onwards, nurses trained to become midwives through an 11–month program. To attract women into midwifery the criteria and level of educational achievement was low (Sultan, 1998).

In 1978, the midwifery school moved to be part of the Jordanian Nursing College. Midwives and nurses studied the same courses in their first year. Then, midwives were separated from nurses for their second and third years (Sultan, 1998).

At present, a variety of midwifery education is offered in Jordan (Abushaikha, 2006). Firstly, the MOH launched a three-year direct entry Graduate Diploma program in two nursing and midwifery colleges located in the cities of Irbid and Zarka (Abushaikha, 2006; Shaban, 2006). Females students who have obtained their high-school certificates are eligible for enrolment in these programs. These two diploma programs were established in 1984. Around
110 midwifery students graduate from this program every year (Abushaikha, 2006).

Secondly, a 12-month post-basic Diploma of Midwifery program is sponsored by the Royal Medical Services, and conducted at the Princess Muna Nursing Collage in King Hussein Medical City in Amman (capital of Jordan) and the Faculty of Nursing at Mu’tah University in Karak city (Abushaikha, 2006). This program was established in 1987. In 2002, the program was upgraded to a Higher Diploma Degree in Midwifery (Abushaikha, 2006). Only nurses with a Bachelor degree can enrol in this program to be trained as a midwives. Around seven students graduate from this program every year (Abushaikha, 2006).

Thirdly, a Bachelor of Midwifery program is run by the Faculty of Nursing at Jordan University of Science and Technology (JUST) (Abushaikha, 2006; Shaban, 2006). The program was established in 2002 and it is the first of its kind in Jordan and the Middle Eastern countries (Abushaikha, 2006). The midwifery program at JUST contains two paths. The first path is a two-year Bachelor completion program, and is given to midwives with a Diploma. The second path is a direct-entry four-year Bachelor of Midwifery program offered to female students who have achieved their high-school certificates. The midwifery program had 21 students enrolled in each path in the first year of its establishment (Abushaikha, 2006). The first cohort of the two-year Bachelor-completion program graduated in June 2004 and the first group of direct-entry midwifery students graduated in June 2006.

**Jordanian maternal health care**
The Ministry of Health started the first maternal and child health program in 1955 in Amman (The Hashemite Court of Jordan, 2002). Primary health care (PHC) in Jordan is provided through a network of public health centres. There are now around 44 comprehensive health centres, 339 primary health centres, 264 village health centres and 33 maternal and child health centres
located throughout the kingdom (Abushaikha & Oweis, 2004). Primary health care services in Jordan reach up to 90% of the population and access to primary health care is no longer a major problem in Jordan (Abushaikha & Oweis, 2004).

Outcomes for women and children have improved as a result of improved services. Infant and child vaccination rates are above 90%. Infant mortality rates decreased from 40 per 1000 live births in 1985 to 22 per 1000 live births in 2002, and maternal mortality rate is 41 deaths per 100,000 live births. The percentage of women who receive antenatal care rose from 58% during 1978-1983 to 99% in 2002, and the percentage of women who gave birth under health professional supervision also rose to 99.5% in 2002. The percentage of mothers receiving postnatal care however remains low at 25% (Department of Statistics & Macro International Inc, 2003; Engenderhealth, 2004).

Despite declining infant mortality and fertility rates, the need for family planning services continues. Fertility rates have decreased to 3.7 births per woman compared with 7 in 1976 (DOS & MI, 2003; Engenderhealth, 2004). According to a 1997 population and health survey, almost 40% of Jordanian women stated that their last pregnancy had not been planned, and about half of those women did not want more children. The percentage of women using family planning (all methods) was 55.8 % (DOS & MI, 2003; Engenderhealth, 2004). As Jordan has a large, young population (40% of the population are under the age 15 years), the need for family planning is expected to rise. An important factor influencing the effectiveness of health education and family planning is illiteracy. Fortunately, among women in Jordan, illiteracy is steadily decreasing from 53.2% in 1972 to 14% in 2002 (EngenderHealth, 2004).

Maternity care in Jordan incorporates the antenatal, intrapartum and postnatal period. The following sections will discuss aspects related to the care given during those periods.
Antenatal care

The health care a mother receives during pregnancy and at the time of birth is important for the survival and well-being of both mother and child. This section will discuss the place and structure of antenatal services; number of recommended antenatal visits; and components of antenatal care.

Pregnant women in Jordan can receive antenatal care (ANC) from hospital clinics and community clinics. Hospital clinics are usually run by doctors with the assistance of nurses or/and midwives. The role of the nurse is to control the clinics, complete documentation, and prepare women for ultrasound scans. The clinic doctors also provide care to women suffering any gynaecological problems. They admit women to the hospital if required.

There is an ultrasound machine in most clinics and doctors use the ultrasound at every visit and request blood and urine samples if required. Nurses usually measure a woman’s blood pressure and weight at each visit. There is a room for electronic fetal monitoring using a cardiotocograph (CTG). Midwives perform a CTG if requested by the doctor however decisions regarding the CTG results are made by the doctor.

Mawajdeh, Al-Qutob, and Bin Raad (1995) conducted a study with 289 pregnant women receiving care from maternal and child health centres in Irbid city, Jordan, to assess their perception with the quality of available reproductive health services, as well as their level of satisfaction with the care received. Women’s perceptions of the service quality, as well as their level of satisfaction with the care they received, were validated with independent observations of the service delivery process. The authors found that women in general were dissatisfied with the client-provider relationship and with the extent of information exchange between themselves and their care provider. However, they were modestly satisfied with the technical competence of the providers.
The staff responsible for the provision of antenatal care in community clinics are a physician (male or female), a midwife, a nurse, and a nurse aide. The clinics have set days for different functions. For example, one day is allocated to newly registering women, chosen when both the physician and laboratory dispatch are available. Another day is reserved for follow-up appointments (Mawajdeh, Al-Qutob, & Bin Raad, 1995).

Women presenting for the first antenatal visit are attended initially by the midwife and the nurse aide who record the women’s sociodemographic, obstetric, and family histories. Laboratory tests, including urine analysis, measurement of blood haemoglobin, blood type, and Rh factor, are performed (Mawajdeh et al., 1995). Questions on the obstetric record are asked as a formality without further inquiry into the substantive causes of illness or death among members of the family when reported. Moreover, when pregnant women volunteer details answers to a question, their responses are ignored. Their relatives are also ignored. For example, the mother of an 18-year-old pregnant woman was aggressively interrupted by the midwife when she tried to state that her husband had diabetes. The midwife said to her “I am addressing the pregnant woman and not you” (Mawajdeh et al., 1995, p. 6).

After the history taking, the physician examines the woman (Mawajdeh et al., 1995). Women returning for subsequent appointments are the sole responsibility of the midwife and nurse aide, except when referral to the physician is judged necessary by the midwife, or upon request by the pregnant woman (Mawajdeh et al., 1995). Medical care provided to pregnant women during their follow-up visits, however, consisted mainly of addressing health concerns, examining the size of the uterus, checking fetal heartbeats, fetal presentation, and leg oedema. Laboratory investigations are independent of the stage of pregnancy or parity, but depended primarily on the midwives’ clinical judgement (Mawajdeh et al., 1995). Complicated pregnancies are usually referred to the hospital by the physician.
Women are not invited to be seated while information is added to the health record, possibly as a result of the overcrowding of the maternity clinic. When a seat is vacant, women still ask permission to sit on the chair; otherwise, they are kept standing for about 10 minutes, holding their crying babies while waiting for the provider to record the required information. Sometimes, a tired expectant mother sits on the floor with her sleeping baby (Mawajdeh et al., 1995). While completing registration details, preparing for a physical examination, or laboratory test, women were rarely asked about their motivation for visiting the facility, the purpose of their current check-up, or whether they have any specific complaints (Mawajdeh et al., 1995).

Al-Hiasat (1999) conducted a study to assess adequacy and content of antenatal care services delivered to women in both public and private health care settings in Amman-Jordan. She found deficits in provision of basic antenatal procedures and even greater deficits in provision of health education and health behaviour advice in both sectors. She reported that there were no standards for antenatal care and significant differences in the provision of care between providers and sites of care.

Recent data identifies that almost all women (99%) received antenatal care from trained personnel (doctors, midwives, and nurses). The majority of women (93%) receive antenatal care from a doctor, and around 5% from a midwife or a nurse (DOS & MI, 2003).

Around 81% of Jordanian women make six or more ANC visits during their entire pregnancy but the percentage of visits is higher in urban areas than rural areas. Eighty-five percent of women have their first ANC visit before the fourth month of pregnancy indicating that many Jordanian women start ANC at a relatively early stage of their pregnancy (DOS & MI, 2003).

The high client-provider ratio limits contact time between women and care givers and prevents the health care providers from giving any professional childbirth teaching during the antenatal period. It is also limits the quality and
quantity of care that is provided to the pregnant women (Oweis, 2001). These factors may lead women to be dissatisfied with the care they receive. For example, Mawajdeh et al. (1995) reported that most Jordanian women were dissatisfied with the client-provider relationship. About half were dissatisfied with the degree of privacy, and one-third were dissatisfied with lack of communication and interaction between themselves and care providers. The researchers observed that the midwife obtained obstetric information from the pregnant woman while keeping her back turned to her. In another clinic, the midwife talked sarcastically to a primiparous woman breastfeeding her 8 month old baby. Most communication took place with the women standing (Mawajdeh et al., 1995).

The pregnant woman–provider relationship in all observed clinics lacked privacy, and women were rarely involved in discussions about their social and psychological well-being. Providers were observed to only partially listen to the pregnant women when they expressed ideas or revealed fears, and seldom encouraged women to join discussions to find appropriate solutions to their problems (Mawajdeh et al., 1995). For example, a pregnant woman came to the health centre complaining of vaginal bleeding that had started five days earlier. The doctor and the midwife blamed her for not having reported the bleeding earlier. The woman looked depressed and told them that she didn’t know that this could be dangerous and then said “any way it was not planned pregnancy and I don’t care if the baby dies” (Mawajdeh et al., 1995, p. 7). None of the providers reacted to this attitude, nor did they discuss with her any social problems which could have been related to her reaction and they also didn’t do anything to alleviate her pain nor to support her emotionally (Mawajdeh et al., 1995).

There is a lack of privacy when physical examinations (all physical examinations included vaginal examination and abdominal palpation) are performed on pregnant/labouring women (Mawajdeh et al., 1995). Screens were not used, the doors were kept open, and extraneous people were present at most times (Mawajdeh et al., 1995). In one facility, “although the
The door of the maternity room was closed, it was suddenly opened by the physician in the midst of a midwife's examination of a 40 year old pregnant woman, resulting in the immediate embarrassment of the woman and her attempt to cover herself” (Mawajdeh et al., 1995, p. 8). Discussions from behind the screen were heard clearly by all strangers in the room, including exchanges about the care of breasts and nipples, personal hygiene, and inquiries about vaginal discharge and sexual activity (Mawajdeh et al., 1995).

Women were asked to get on the examination couch without the assistance of stools or without the help of care providers, and were only supplied with a covering sheet when one was available. During the physical examination, women were given little information about the standard procedures. In one clinic, a first time mother was talking to the midwife while being examined. She did not keep her face turned aside as requested, leading the provider to adjust the position of her head in a harsh manner and say angrily: "You bother me with your breath. Now, keep your face turned aside." A similar incident was observed in another clinic while the woman was trying to express her pain with hand motions (Mawajdeh et al., 1995, p. 8).

Concerns about healthcare providers' behaviours were also identified by Khalaf et al. (2007) in their study of Jordanian childbearing women’s perception of postnatal care. Women reported that they were examined quickly, in a cursory manner, and that providers spent little time with them and did not provide them with any education unless they specifically asked questions. They also spoke of the lack of privacy and confidentiality (Khalaf et al., 2007).

The limited research to date has identified the scant emphasis placed on the psychological needs of women and that care is concentrated on performing tests and measurements while other aspects such as information on the labour and birth process, preparation for parenthood and emotional support are neglected.
Labour and birth care

The objective of providing safe intrapartum services is to protect the life and health of the mother and her child. An important component in reducing the health risks to the mother and child is to increase the proportion of infants delivered under the supervision of health professionals. Appropriate health professional care, coupled with hygienic conditions during labour and birth can reduce the risk of complications and infection that may cause death or serious illness for mothers and infants. The following section will discuss labour and birth in Jordan including the place of birth; structure and systems used in the labour and birth wards; as well as care and delivery outcomes.

The main provider of public health services in Jordan is the Ministry of Health through Government hospitals and Jordanian Armed Forces (Royal Medical Services) (Abushaikha & Oweis, 2005). The Royal Medical Services has several centres providing medical health services for all acting and retired military personnel. Eighty-one percent of births take place in a public health facility. A further 16% of women use private health facilities and 3% of women give birth at home (DOS & MI, 2003).

In Jordan, the modern trend of hospital birth is the only accepted trend to the women and the home birth is something of the past (Safadi, 2005). Health care policies in Jordan discourage home birth and are in favour of hospital birth for the following reasons: 1) to decrease maternal and neonatal morbidity and mortality rates; 2) emergency management difficulties related to transportation to hospitals, especially in rural areas; 3) the shortage of qualified and trained midwives (DOS & MI, 2003; Safadi, 2005). Furthermore giving birth in the hospital is associated with social class advantage (Safadi, 2005).

In hospitals, women usually share a labour and birthing room with as many as four other labouring women. The beds are sometimes separated by curtains but often there is no privacy. Women with complications during labour may
have a single room. Electronic fetal monitoring is usually available in the ward and is used in special cases such as suspected fetal distress. Labouring women are not allowed to leave their beds except to go to the toilet and they are often seen by many doctors, midwives, and students without first receiving permission.

Labouring women stay in the labour room until the cervix is 8-10cm dilated and are then transferred to the delivery room for birth. Delivery of the infant and placenta are usually performed by two midwives (one to take care of the woman and deliver the placenta and the other midwife to take care of the infant). If the ward is busy the delivery can by done by one midwife. In the case of a complicated delivery the doctor attends and performs the delivery with a midwife to assist him.

Pethidine and Phenergan are drugs of choice for pain relief during labour and delivery. Doctors judge the need to use pharmacological pain relief interventions based on individual needs (Abushaikha & Oweis, 2005). These medications are given under the supervision of doctors. The lithotomy position is used during birth, and an episiotomy is performed on all primigravida women in both the public and private sectors by doctors or midwives after administration of local anaesthesia (xylocaine injection 1%). The episiotomy is usually mediolateral. The doctor performs the episiotomy repair.

During labour care includes monitoring labour progress, the fetal heart rate, and maternal vital signs if required. CTG monitoring is used in special cases like meconium-stained liquor. Most women have spontaneous rupture of membranes, but doctors and midwives can artificially rupture the membrane to accelerate labour as well as administer an oxytocin infusion.

The care given to women immediately after birth includes administration of Syntocinon 5i.u by intramuscular injection. Assessment of the placenta is not common in public hospitals.
Immediate newborn care after birth includes routine suctioning, weighing and measurement of infant height and head circumference, ensuring the umbilical cord clamp is secure, administration of Vitamin K 1mg by intramuscular injection, and applying an identification band. Some delivery wards bath the baby. Few women receive help with breastfeeding. Obstetricians are the primary decision-makers and women are not included in decision making regarding their care or treatment and they are not provided with emotional support (Abushaikha & Oweis, 2005). Oweis (2001) stated in her study that Jordanian women who gave birth in public and military hospitals rated their labour and birth nurses and midwives less helpful than those who gave birth in private hospitals.

In Jordan, there are no established national health policies regarding non-professional labour attendance and the norm has been that non-professional attendants, including expectant fathers, are not allowed to attend the birth of their babies (Abushaikha & Oweis, 2005).

Caesarean section is generally performed if the mother has a medical problem or is experiencing complications of labour. WHO has determined that the rates of caesarean in Jordan should not be less than 5% and not more than 15% of all pregnancies if the lives of women and infants are to be protected (UNICEF, 1999). It is considered that rates below 5% may indicate that women and babies lives are at risk because of inadequate access to obstetric services. Rates above 15% indicate an unnecessarily high reliance on a major surgical procedure with the numerous risks (UNICEF, 1999).

Currently, 16% of women in Jordan give birth by caesarean indicating that the performance of caesarean section need to be reviewed and addressed (DOS & MI, 2003). The proportion of older women (over 35 year old) having a caesarean (25%) is twice as many as for younger women (12%) and this maybe related to a woman’s previous history of having a caesarean and the proclivity of the obstetrician to routinely deliver by caesarean if the woman has experiencing caesarean previously (DOS & MI, 2003).
Clearly, labour and birth care is concentrated on performing measurements and obstetric interventions, while ignoring other aspects such as including women in decision-making regarding their care, maintaining privacy, and emotional support.

Postnatal care

A large proportion of maternal and neonatal deaths occur during the first 48 hours of birth (UNICEF, 1999). Safe motherhood programs have recently increased their emphasis on the importance of postnatal care, recommending that all women receive a health check within two days of birth (UNICEF, 1999). The following section will discuss postnatal care in Jordan including place, source and components of postnatal care.

In Jordan, most women give birth in hospitals and receive some degree of postpartum care before they leave the hospital. After discharge some women receive postnatal care through hospital clinics or community clinics. However, 69% of women did not receive any postnatal care once they were discharged from the hospital, 1% had a check-up within two days postpartum, 25% had a check-up between three and 39 days of birth, and 5% had a check-up after 39 days postpartum (DOS & MI, 2003).

Before women leave hospital they receive postnatal care from doctors, midwives, or nurses. Care includes assessing uterine involution, lochial loss, checking the episiotomy site (if present), and assessing the general condition of the mother. The doctor makes the decision about discharge, which usually occurs 12 hours after birth. If RH immunoglobulin (Rhogam) is necessary, it is given before discharge. The newborn is examined by a paediatrician.

Khalaf, Abu-Moghli, Mahadeen, Callister, and Al-Hadidi (2007) conducted a qualitative descriptive study with 24 Jordanian childbearing women to explore their perceptions of their needs and the postpartum health care services they received. The majority of the women indicated that most of the services...
perceived and provided during the postpartum period were related to childcare. They reported that they attend postpartum visits mostly for treatment, childcare and/or family planning. Furthermore they stated that they have not told about the postpartum visits during pregnancy or after giving birth. Women also reported that they need a comprehensive health education sessions and emotional support from the health care providers (Khalaf et al., 2007).

Postnatal care in Jordan, like antenatal care and intrapartum care, is concentrated on the provision of obstetric and medical interventions while ignoring other aspects of care such as emotional support, advice, education, including women in the decision-making process, and maintaining privacy. At times, basic respect is lacking.

Types of postnatal mood disorders
Postpartum mood disorders have been classified into three different categories based primarily on the timing of onset, length of episode, and severity of symptoms. Postnatal depression lies between the two extremes of maternity blues and postpartum puerperal psychosis (Brockington, 1996; Dennis & Ross, 2006a).

Maternal blues is a common, often benign, and transitory condition. It represents a common reaction after childbirth, usually beginning 3-4 days after birth and peaking on days 4-5 (Dennis & Ross, 2006a; Leung, 2001; Nicolson, 1998). The incidence ranges from 30%-80% (Josefsson et al., 2002). Maternal blues is postulated to relate to hormonal and biological factors and includes symptoms such as crying, anxiety, mood liability, insomnia, dysphoria, and confusion (Leung, 2001; Robertson et al., 2004). Symptoms usually last from a few hours to two days and it does not require treatment. Persistent maternal blues are commonly associated with the development of depression (Brockington, 1996; Leung, 2001; Dennis & Ross, 2006a).
At the other end of the spectrum is postpartum psychosis, which represents a serious mental disorder and begins within the first three weeks of birth (Leung, 2001; Nicolson, 1998). The occurrence of postnatal psychosis has been estimated as 0.1%-0.2% of postnatal women (Dennis & Ross, 2006a; Josefsson et al., 2002; Robertson et al., 2004). It is characterised by obsessive thoughts, delusions, insomnia, loss of sense of reality, irritability, and can manifest without depressive symptoms (Brockington, 1996; Leung, 2001). This disorder is thought to be biologically mediated and immediate psychiatric intervention and hospitalisation is required (Brockington, 1996; Leung, 2001; Robertson et al., 2004).

It has been suggested that many different disorders are labelled under PND, such as anxiety disorders (which will be discussed in chapter two as a risk factor for PND) and post-traumatic stress disorders (PTSD) (Miller, Pallant, & Negri, 2006; Beck, 1998).

PTSD is “a direct personal experience of an event that involves actual or threatened death or serious injury, or a threat to the physical integrity of self or others” (American Psychiatric Association, 1994, p. 424). Creedy et al. (2000) stated that PTSD following childbirth is a complex set of symptoms that are mainly anxiety related resulting from exposure to extreme stress during childbirth. In western countries, the reported prevalence of diagnosed PTSD after childbirth ranges from 2% to 9.6% and the possible features of PTSD presentation in mothers after birth, include fear of childbirth, sexual avoidance, and parenting and mother-infant attachment problems (Beck, 2004; Cohen et al., 2004; Gamble et al., 2005; Maggioni et al., 2006; Soderquist et al., 2006; Son et al., 2005). For example, White et al. (2006) conducted a prospective study with 349 Australian mothers to provide further evidence regarding the prevalence of post-traumatic stress symptoms resulting from traumatic birth experiences and to investigate the extent to which symptoms of trauma and depression occur together in the postnatal period. At six weeks postpartum, the prevalence of PTSD was 2%. A further 10.5% of women reported experiencing significant distress related to
childbirth and several symptoms of post-traumatic stress without meeting the full diagnostic criteria. The result also revealed that the prevalence of PTSD remained relatively stable across the first 12 months postpartum, with estimates being 2.6% at six months and 2.4% at 12 months. The co-morbidity between posttraumatic stress and PND was high at all three time points.

**Definition of postnatal depression**

The first formal definition of postnatal depression (PND) was by Pitt (1968). He described PND as the presentation of unfamiliar and prolonged depressive symptoms, which usually started after discharge from hospital, lasted for several weeks, and caused distress to the mother and her family.

PND was defined by Cox (1989) as a psychiatric disorder that most commonly occurs within two months after birth and is optimally identified at three months postpartum. Werrett and Clifford (2006) defined postnatal depression as a moderate to severe depression that occurs within the first three months following childbirth. Untreated PND can last up to a year or more. Postpartum depression is referred to as a non-psychotic episode that begins in, or extends into, the postpartum period (Cox et al., 1993).

Nicolson (1998) stated that traditional research literature does not formulate a clear definition of PND. The National Health and Medical Research Council (NHMRC) (2000) suggest that the difficulty in defining PND is related to varying time spans of onset and variable methods of measurement. Many studies reported that the time of vulnerability to PND as one year after childbirth (Agoub et al., 2005; Dennis & Ross, 2006a; Parry & Haynes, 2000; Stowe et al., 2005).

The symptoms and clinical criteria of PND are considered similar to depression in the general population. In the Diagnostic and Statistical Manual Disorders (DSM-IV-R, American Psychiatric Association (APA), 2000), PND is defined as a major depressive disorder with postpartum onset. Standards for
diagnosis of PND in the APA include a period of at least two weeks of depressed mood or loss of interest in almost all activities and at least four other symptoms, including: sleep disturbance; feelings of worthlessness or guilt; changes in appetite and weight; decreased energy; difficulty in concentrating, thinking and taking decision; low self-esteem; recurrent thought of suicidal ideation, plans, or attempts. The duration of PND depends on early identification, severity, and treatment. It can last from three to six months or, in a few cases, up to 12 months following childbirth (Andajani-Sutjahjo et al., 2007; Goldbort, 2006).

Some of the signs and symptoms of PND are comparable to those frequently experienced in the postpartum period, such as low libido, lack of general interest, weight loss, appetite change, anxiety, compulsive thoughts and feeling of incompetence (Beck et al., 1992). Mothers in the postnatal period commonly experience difficulties in coping and transient symptoms of depression as a result of the increased demands of the baby (Boyce, Stubbs, & Todd, 1993). The similarity between the signs and symptoms of PND and symptoms that mothers experience in the first days and weeks after birth, results in difficulties in the detection of PND.

There is general consensus that postnatal depression usually occurs within 6 to 12 weeks postnataally, and is moderate or mild (Andajani-Sutjahjo et al., 2007; Goldbort, 2006; Josefsson et al., 2002). It is characterised by self-blaming thoughts, guilt, tearfulness, excessive fatigue, anxiety, irritability, feeling of hopelessness, poor concentration, mood liability, and sometimes sleep disorders (Andajani-Sutjahjo et al., 2007; Dennis & Ross, 2006a). The woman may be worried, anxious, scared, and feel overwhelmed (Andajani-Sutjahjo et al., 2007; Bishop, 1999).

**Incidence of postnatal depression**

Depression is the most common mental health disorder (Andajani-Sutjahjo et al., 2007; Bowen & Muhajarine, 2006b; Bugdayci et al., 2004).
Epidemiological studies have established that the incidence of depression, both after childbirth and in general, is higher in women than in men (Austin & Lumley, 2003; Birkhauser, 2002). Women are also more likely to be admitted to a psychiatric hospital than men and are particularly prone to being diagnosed as having a mental illness (Austin & Lumley, 2003; NHMRC, 2000). In Jordan, the rate of depression among the general population of women was 24.8% using Beck Depression Inventory-II (BDI-II) with a cut-off of 18 (Hamid, Abu-Hijleh, Sharif, Raqab, Mas’ad, & Abbas, 2004). An American study demonstrated that a BDI-II cut-off of 18 results in 92% accuracy in diagnosing major depression (Arnau, Meagher, Norris, & Bramson, 2001). Factors associated with depression among Jordanian women were stressful life events, marital separation, financial and health problems (Hamid et al., 2004).

Postnatal depression, according to Dennis and Ross (2006a) affects approximately 13% of mothers from diverse populations within the first 12 weeks postpartum. It affects approximately 10%-15% of all women in western societies (Adewuya & Afolabi, 2005; Green et al., 2006; Husain et al., 2006). The literature suggests that approximately 1 in 10 women in Western countries will experience various degrees of PND (Goldbort, 2006).

There is no consistent support for the hypothesis of cultural differences in the prevalence of PND. In most Arab and Asian cultures there is stigma associated with experiencing psychological problems (Al-Adawi et al., 2002; Haj-Yahia, 1999; Leung, 2001). In some cultures it may be more acceptable to present with somatic complaints following childbirth (NHMRC, 2000).

Recently, studies on the incidence of postnatal depression have been conducted in non-western countries, including Arab countries. Incidence of PND ranged from 15.8%-22% for women living in various Arab countries when measured between one week and nine months postpartum (Agoub et al., 2005; Alami et al., 2006; Chaaya et al., 2002; Ghubash & Abou-Saleh, 1997; Green et al., 2006). On the other hand, incidence of PND ranged from
11.2%-36% for women living in various non-Arab developing countries when measured between two weeks and six months postpartum (Abiodun, 2006; Aydin et al., 2005; Bugdayci et al., 2004; Husain et al., 2006; Lee et al., 2001; Montazeri, Torkan, & Omidvari, 2007; Patel, Rodrigues, & DeSouza, 2002).

The rate of PND varies depending on the definition used, assessment tool used (whether it is a screening tool or a diagnostic process that is used), time interval of assessment (which may vary from a few days up to several years), different study designs (prevalence or incidence), and geographical area (Evins, Theofrastous, & Galvin, 2000). Many studies did not use an appropriate time for PND screening. For example, Ghubash and Abou-Saleh (1997) and Zhang et al. (1999) interviewed women seven days after birth and Bergant et al. (1999) interviewed mothers five days after birth. During that time up to 80% of women experience transient mood disturbance and screening during those periods will not give correct results. Other studies, such as Bernazzani et al. (1997) interviewed women during the second trimester of pregnancy. The onset of depression symptoms after birth was generally reported to be at four to six weeks postpartum and the recommended times for depression surveillance are during the third trimester of pregnancy, six weeks postpartum, and during the initial six months of the first postpartum year (Evans et al., 2001; Stowe, Hostetter, & Newport, 2005). Some researchers used only one standardised instrument (Johnstone et al., 2001; Tammentie, Tarkka, Astedt-Kurki, & Paavilainen, 2002). Standardised instruments should be used in the detection of PND because this will improve reliability and validity, and the use of more than one standardised instrument will increase the sensitivity of detection of PND. Appropriate sample sizes should be obtained in order to enhance the generalisability of results. For example, Ghubash and Abou-Saleh (1997) conducted their study with a relatively small sample (95 women) and Chan et al. (2002) conducted their study with 35 women.
**Research problem**

PND in mothers is commonplace, affecting 10%-15% of recent mothers. It is still under-diagnosed and if unidentified, is often untreated. If PND is left untreated, it can have adverse effects not only on the mother, but also on the partner, the child’s development and on the well-being of the whole family (Bugdayci et al., 2004; Chaaya et al., 2002; Dennis & Ross, 2006a; Husain et al., 2006).

In general, PND may affect women’s social and personal adjustment, mother-infant relationship, and marital relationship (Dennis & Ross, 2006a; Murray, Fiori-Cowley, & Hooper, 1996). The effect of PND may vary in cultures with different structures and norms (Dennis & Ross, 2006a). Women with untreated PND may be prone to other psychiatric disorders, such as anxiety disorders, personality disorders as well as it may lead to chronic depression (Miller et al., 2006; NHMRC, 2000; Son et al., 2005; White et al., 2006).

PND has a significant effect on the male partner of affected women. Partners may face difficulties in coping with a depressed wife and this will increase the likelihood of marital separation or divorce (Carro, Grant, & Gotlib, 1993). Partners of depressed women are more likely to develop depression themselves (Areias, Kumar, Barros, & Figueiredo, 1996).

Mothers with PND report significantly higher rates of infant feeding problems and relationship problems with their infants (Bugdayci et al., 2004; Jomeen, 2004). PND affects the infant’s language skills, social and emotional development and intelligence quotients (Chaaya et al., 2002; Dennis & Ross, 2006a; Jomeen, 2004). As PND may have an impact on both infant and family, continued exploration of the prevalence and degree of postpartum depressive symptoms is important (Affonso et al., 2000; Chaaya et al., 2002; Husain et al., 2006). In particular, for accurate prevention, diagnosis, and treatment, more information is needed about differences between women with various degrees of risk in regards to the prevalence and course of PND.
Although there is growing interest in depression in the antenatal and postnatal periods in developed countries the experience of childbearing women in Middle Eastern countries is relatively unknown. These women are often constrained by a range of social and cultural norms that may make it unacceptable for them to express negative emotions associated with pregnancy and childbirth. As noted, there is a high level of medical intervention provided by maternity services in Jordan. The lack of continuity of care, emphasis on medical procedures, lack of privacy, poor client-provider relationship, and absence of emotional care may contribute to emotional distress during pregnancy as well as postpartum. The present study will investigate the incidence and factors associated with the development of antenatal and postnatal depression in Jordanian women.

**Significance of the study**

PND has received a very little attention in Arab countries or in the Middle Eastern countries. Few studies have been conducted on PND in Arab countries. There have been two recent studies conducted in the United Arab Emirates (Ghubash & Abou-Saleh, 1997; Green et al., 2006), one in Lebanon (Chaaya et al., 2002), two in Morocco (Agoub et al., 2005; Alami et al., 2006), and one in Jordan (Oweis, 2001). There have been two studies conducted in Israel (Dankner et al., 2000; Glasser et al., 1998)

An extensive literature search found only one study about postnatal depression in Jordan which was conducted with only primiparous women (Oveis, 2001). Therefore, the present study will be the second study of PND in Jordan. PND is a significant burden for women, causes family distress, and has a negative impact on infants including problems with cognitive and behavioural development. Describing the problem and determining the factors associated with the problem are the first steps in successfully addressing these issues in Jordan. The present study also aims to establish a method of data collection for investigating a sensitive topic. As identified, there is little acknowledgment of women’s emotional distress by health professionals in
Jordan and society at large. The present study will have the potential to inform the development of strategies to prevent or decrease the incidence of antenatal and postnatal depression.

**Overview of the thesis**

Chapter 1 has introduced the problem, explained the cultural background, midwifery history, and maternity health care in Jordan. The types of postnatal mood disorders, the definition and incidence of PND, the research problem, and significance of the study are provided. Chapter 2 critiques the possible contributing factors that may be related to women’s experience of PND. Firstly, some studies suggest that predisposing factors increase women’s vulnerability to PND. These include antenatal depression, family history and/or previous history of psychiatric illness (including antenatal and postnatal depression), psychological factors of anxiety and stress, social support, unwanted pregnancy, sex of the baby, stressful life events, and women’s relationship with their husband and their mother-in-law. Secondly, the experience of certain obstetric interventions has been identified as traumatic for some women and may lead women to develop PND. Thirdly, a poor relationship between health care providers and birthing women may also contribute to the development of PND. Factors such as feeling powerless during procedures, paucity of information, and perceived unsympathetic attitude by health professionals have been identified as increasing the risk of PND. This chapter concludes by outlining the rationale, purposes, and hypothesis of the study.

The methodological considerations for the major study are outlined in Chapter 3. The study employed standardised measures to identify the incidence of antenatal and postnatal depression and adhered to the timeframe used and recommended by most previous studies for measuring incidence of antenatal and postnatal depression. The main study included three Phases: last trimester of pregnancy, six to eight weeks postpartum, and six months postpartum. The large sample used in the current study allowed for a range of
statistical analyses in determining the contribution of specific factors to the development of antenatal depression as well in determining the contribution of antenatal, obstetric, and care factors to the development of PND.

Chapter 4 presents the initial analysis of the results. The descriptive data for the sample presents the demographic characteristics, obstetric variables, satisfaction with care variables, feelings while in labour variables, and gender of the baby variable establishes the representative nature of the sample. The reliability and validity of the instruments used in the present study are discussed. The mean antenatal and postnatal scores for measures of depression, anxiety, stress, and social support are provided. The mean antenatal scores for the variables of worry, perceived parenting knowledge, and maternal perceived self-efficacy are also provided. Finally, the incidence of depression, anxiety, and stress are compared to findings from other available studies from both developed and developing countries.

Chapter 5 presents a further analysis of the data to determine: (1) the incidence of antenatal depression; (2) the identification of contributing factors in the development of antenatal depression; (3) the incidence of PND at six to eight weeks postpartum and six months postpartum; and (4) identification of contributing factors in the development of PND in the present study.

Chapter 6 discusses the research results in regards to the contemporary literature. Comparisons are made with other studies in relation to the incidence of antenatal and postnatal depression, antenatal variables, obstetric interventions, and satisfaction with care and women’s feelings during labour. The similarities and differences between the present study and previous research are discussed. The limitations are described.

The thesis concludes with a discussion in chapter 7 of the emerging issues from the current study. The incidence of both antenatal and postnatal depression in the present study is high. This is not only related to the factors reported in the literature but instead, it is related to the following issues: lack
of empowerment of the Jordanian women (especially in regards to gender preferences, control exerted by mother-in-law, and family planning); cultural beliefs which inhibit discussion and expression of emotional problems; and domination of medical model in the provision of maternity care. The implications of the present research study are described and future research directions are suggested.
CHAPTER 2

Literature Review

Postnatal depression (PND) results from an interaction between multiple factors (NHMRC, 2000). The National Health and Medical Research Council (NHMRC) (2000) grouped PND risk factors into four categories according to the volume of supporting evidence and strength of the measure of association. The four groups are: confirmed risk factors with agreement from randomised controlled trials or approximately 75% of well-designed cohort studies; probable risk factors with agreement from 40% to 60% of peer-reviewed published studies; possible risk factors with either very little evidence or only equivocal findings available at present and; protective factors needing further investigation (NHMRC, 2000). The incidence, prevalence, and risk factors for PND, in addition to the theoretical perspectives of PND, will be explored in the following sections and lead to the rationale and purposes of the study.

The major databases including CINAHL, MEDLINE, PROQUEST, SCIENCE-DIRECT, Cochrane, Sociological Abstracts, EMBASE, PsychINFO, and MIDIRS were searched to retrieve English or Arabic language publications. The reference list of each article retrieved was checked. In addition, doctoral and master theses addressing the variables of interest were obtained from the digital thesis website. All combinations of the keywords defining the childbearing phase (“postpartum” “postnatal” “antenatal”, “antepartum” or “perinatal”) were used with “depression”, and “incidence”, “prevalence”, “risk factors”, “associated factors”. Terms which identify other mood disorders and emotional states were also used including “anxiety”, “stress”, “worry” and “fear”. The ‘grey literature’ was not searched. Peer-reviewed research articles were included that used any methodology and had any focus on postnatal depression. Three-hundred and eighteen (318) papers were retrieved that met the inclusion criteria.
There are a number of limitations in studies conducted to investigate the prevalence or incidence of PND and its associated factors. It is important to bear these in mind when considering the evidence presented below. First, many of the studies had small sample sizes, sometimes including less than 100 mothers. Studies with small sample sizes may not have the statistical power to detect risk factors where they exist. Some studies only measured PND and its associated factors after birth and therefore were only able to retrospectively assess possible risk factors during pregnancy such as antenatal mood disorders.

There is a wide variation in the assessment of PND and its associated factors. Some studies have used a single questionnaire. Overall, a wide variety of self-administered questionnaires have been used although sometimes psychological outcomes were assessed by clinical interview. This diversity of measures makes the comparisons between studies difficult. In addition, even when the same scale is used the cut-off score used to identify women probably experiencing PND varies. The different measures and cut-off scores used may account for variation in the findings of the studies and makes comparison difficult.

The type of women being studied differs between studies. Some studies include only primiparous women, others include only women who have had emergency C/S or preterm birth. There are also differences in the comparison groups used. For example, in some studies caesarean-delivered women were compared to all other women, but in other studies they are compared only to women who have had spontaneous vaginal birth. These differences in study design may also account for differences in study outcomes.

Other differences in the samples studied may also explain some of the findings. For example, studies were carried out in several different countries. Sociocultural factors appear to influence incidence or prevalence of PND because they act as protective factors against PND. The studies also differ in the timing of PND measurement. Some studies examined depression in the
first few days after birth, others had longer-term follow-up at several months postpartum or even a year after delivery. Research has shown that physical, emotional and hormonal changes associated with the birth have an impact on the occurrence of PND, if it is measured immediately after birth. Therefore differences in the timing of the assessment for PND may also account for some of the contradictory findings presented below.

**Confirmed risk factors**

Confirmed risk factors, according to NHMRC (2000), includes the following factors: previous psychiatric history, antenatal depression, anxiety, stressful life events (in the year preceding the pregnancy, during pregnancy and after the birth), lack of social support and marital problems.

**Previous psychiatric history**

A psychiatric history, especially previous depressive episodes, is commonly reported to predict PND (Aydin et al., 2005; Brugha et al., 1998; Green et al., 2006; Inandi et al., 2005). There is also a strong relationship between a prior history of all types of psychiatric illness, PND, and development of depression during pregnancy (Alami et al., 2006; Brugha et al., 1998; Dindar & Erdogan, 2007). Beck (2001) conducted a meta-analysis of 84 studies published in the 1990’s to determine the relationship between postnatal depression and various risk factors. She found that a previous history of psychiatric illness was one of the ten risk factors which had moderate effect size in the development of PND. The mean effect size indicator ranges for previous psychiatric history was 0.38 to 0.39.

Appleby et al. (1994) reported that women receiving past treatment of depression were three times more likely to be depressed than women with no treatment history. Women without a history of PND but who developed PND tended to be less depressed, quicker to recover and less likely to relapse than those with previous depression (Bell, Land, Milne, & Hassanyeh, 1994). A history of PND increases the risk of developing a recurrence following a
subsequent pregnancy by up to 50% (Cooper & Murray, 1997; Stowe et al., 2005). Verkerk et al. (2003) reported a personal history of depression and high depressive symptomatology during mid-pregnancy were independently predictive of PND. Subsequent studies consistently report that women with a previous history of depression (antenatal and postnatal depression) are at increased risk of developing PND (Aydin et al., 2005; Goldbort, 2006; Josefsson et al., 2002; Lee & Chung, 2007).

Antenatal depression

There is less research on antenatal depression than postnatal depression (Bowen & Muhajarine, 2006b; Pajulo et al., 2001). A recent study suggested that antenatal depression (AND) is as prevalent as postnatal depression (Bowen & Muhajarine, 2006b; Rubertsson et al., 2003). Some studies suggested that the severity and nature of depressed mood does not differ before and after childbirth (Evans et al., 2001; Stowe et al., 2005). Several epidemiological studies show that antenatal depression is more common than previously believed and between 10%-20% of pregnant women suffer from AND (Alami et al., 2006; Da Costa et al., 2000; Evans et al., 2001; Felice et al., 2004; Stowe et al., 2005).

Symptoms of AND such as emotional sensitivity, sleep disturbance, fatigue, and appetite changes can be difficult to distinguish from normal experiences during pregnancy (Hendrick, Altshuler, & Suri, 1998). Factors associated with AND as reported by Bernazzani et al. (1997) include history of psychiatric illness, marital problems, unplanned pregnancy, lack of control over the environment, stressful life events, and inadequate social support. Willinck and Cotton (2004) conducted a prospective longitudinal study with 620 Australian women to investigate the association between a range of risk factors and postpartum depression. They assessed women for depression during second or third trimester of pregnancy using EPDS with a cut-off >12. Antenatal risk factors for PND were also assessed using the antenatal components of Maternity Psychosocial Risk Assessment Tool (MPRAT). Postnatal
components of MPRAT were administered two to three days postnatally. While, PND was measured at six to eight weeks postpartum using EPDS with the same cut-off used during pregnancy. The results revealed that 7% of women who screened for PND at six to eight weeks postpartum scored >12 in EPDS. The authors found antenatal and perinatal risk factors for PND. Antenatal risk factors were relationship problems, antenatal depression, limited support and domestic violence. While, perinatal risk factors were no partner or support person at birth and dissatisfaction with care in labour.

Several strengths of the study were identified. The use of a prospective longitudinal study design, the use of a large sample size and the use of the recommended cut-off score of EPDS (>12). In addition, EPDS was validated to be used with the Australian childbearing women. However, one limitation of the study was inadequate reporting of data about depression during pregnancy.

Other risk factors associated with antenatal depression include low or lack of social support, family history of depression, unwanted pregnancy, stressful life events, difficult relationship with mother-in-law, younger age, history of menstruation discomfort, premenstrual mood change, and anxiety (Alami, Kadri, & Berrada, 2006; Andersson et al., 2004; Bonari et al., 2004; Bowen & Muhajarine, 2006b; Felice et al., 2004; Lau & Keung, 2007).

Most studies investigating factors associated with antenatal depression reported that demographic factors of age, educational level and occupation were not associated with antenatal depression (Alami et al., 2006; Lau & Keung, 2007; Tychey et al., 2005). Regarding parity both multiparous and nulliparous women were at risk of developing antenatal depression (Lau & Keung, 2007; Pajulo et al., 2001). On the other hand, Rubertsson et al. (2003) reported that unwanted pregnancy of primigravida women and single status for multigravida are associated with antenatal depression.
Depression during pregnancy is associated with increased risk of epidural analgesia, instrumental deliveries, preterm birth, caesarean section, antepartum bleeding, pre-eclampsia; increased uterine irritability, and increased admission of newborns to neonatal intensive care units (Bonari et al., 2004; Bowen & Muhajarine, 2006b; Chung et al., 2001). Antenatal depression affects infant's motor, behavioural, cognitive, and emotional development (Bonari et al., 2004; Huizink et al., 2003; O'Connor, Heron, Golding, Beveridge, & Glover, 2002). The evidence suggests that women who experience depression during pregnancy had a much higher chance of developing postnatal depression (Alami et al., 2006; Lee et al., 2004; Lee & Chung, 2007; Felice et al., 2004; Limlomwongse & Liabsuetrakul, 2006).

Bernazzani et al. (1997) conducted a prospective study with large sample of nulliparous and multiparous Canadian women (n = 213) to assess the relationship between depression during pregnancy and developing PND. They assessed women during the second trimester of pregnancy and at six months postpartum. Antenatal depression was assessed using Beck Depression Inventory (BDI) with a cut-off $\geq 8$. While, PND was assessed using EPDS with a cut-off $\geq 13$. During pregnancy, 6.2% of women scored $\geq 8$ in the BDI. At six months postpartum, 12.7% of women scored $\geq 13$ in the EPDS. The researchers found that elevated antenatal Beck Depression Inventory (BDI) scores were a significant predictor of PND. They concluded that depression during pregnancy is a significant risk factor for PND.

The study had several strengths. The authors used a prospectively collected data to evaluate association between depression during pregnancy and after childbirth in a Canadian Cohort. They also used a large sample size. The EPDS was validated to be used with the Canadian women (Cronbach’s alpha was 0.88). In addition, EPDS was used with the recommended cut-off score ($\geq 13$). However, one weakness of the study was the use of different screening tools to measure depression during pregnancy and postpartum.
This makes comparison between the incidence of antenatal and postnatal depression difficult.

Kitamura et al. (2006) conducted a prospective study with 290 Japanese women expecting their first baby to assess the association between antenatal and postnatal depression. They interviewed women during the last trimester of pregnancy and within 12 months postpartum using DSM-III-R. They found that the incidence of depression was 5.6% during pregnancy and 5% postpartum. They also found that 28.6% of women who developed PND had experienced depression during pregnancy. The findings revealed that antenatal depression was a major risk factor for PND.

Although the authors used a large sample size and assessed psychological status of women during pregnancy and postpartum, cautions should be considered in generalising the study findings since the study was conducted with only primiparous women. In addition, the study was conducted in Japan where the sociocultural factors appear to influence the incidence of both antenatal and postnatal depression.

Pregnancy is a time of regular contact with health care services. Identification of women at risk is important to enable the development of interventions that can prevent or alleviate the negative consequences of AND (Pajulo et al., 2001). Because all psychotropic medications cross the placenta and are excreted in breast milk, non-pharmacological treatments like psychotherapeutic interventions (interpersonal psychotherapy and supportive psychotherapy), cognitive behavioural therapy, and dynamic psychotherapy are effective in the treatment of both antenatal and postnatal depression and are recommended (Bowen & Muhajarine, 2006a; Hendrick, 2003; Henshaw, 2004; Hostetter et al., 2000; Smith, Brunetto & Yonkers, 2004).
Anxiety

Very few studies have investigated the occurrence of anxiety symptoms in the antenatal and postnatal periods (Adewuya & Afolabi, 2005). This may be related to anxiety being assumed to be part of antenatal and postnatal depression (Adewuya & Afolabi, 2005; Heron et al., 2004). There is increasing evidence that co-morbid anxiety may be a significant feature in the occurrence of both antenatal and postnatal depression (Adewuya & Afolabi, 2005; Heron et al., 2004; Miller et al., 2006; Sayil, Gure, & Ucanok, 2006; Wenzel, Haugen, Jackson, & Brendle, 2005). Austin et al. (2006) conducted a longitudinal study in Sydney, Australia to examine the relationship between antenatal anxiety and postnatal depression. A sample of 748 women completed the Brief Measure of Worry Severity (BMWS), the State-Trait Anxiety Inventory (STAI), A 17-item Pregnancy Risk Questionnaire, and the EPDS during the third trimester of pregnancy. EPDS was administered again at eight weeks postpartum. During pregnancy, 9.8% of women scored 13 or above on EPDS, 14.1% scored above 12 on BMWS, and 11% scored above 45 on STAI. At eight weeks postpartum 9.2% scored 13 or above in EPDS. The results showed that women with high antenatal anxiety were 2.6 times more likely to have probable PND than those with low scores.

Several strengths of the study were identified. The use of a large sample size, the use of a recommended cut-off score of EPDS, the reporting of instruments’ reliability and cut-off scores used in the study, and the assessment of depression during pregnancy and postpartum.

Similarly, Liabsuetrakul, Vittayanont, and Pitanupong (2007) reported that antenatal and postnatal anxiety was a strong predictor of PND among Thai women. Anxiety is defined by Fettling (2002) as a feeling of uneasiness, apprehension or dread. Anxiety is a common symptom of PND and for some women it is their main symptom because these women usually don’t feel ‘sad’ or ‘depressed’ and they can find a diagnosis of PND hard to accept (Fettling, 2002). In some cases anxiety symptoms begin antenatally. High anxiety
levels during pregnancy and postpartum have been associated with PND but it is not sufficient to predict the likelihood of PND (Adewuya & Afolabi, 2005; Heron et al., 2004; Milgrom, Martin, & Negri, 1999).

In women with PND, anxiety can take several forms such as general or non-specific anxiety, irritable concern for their own health, or health of their baby, or as physical symptoms (Fettling, 2002). In some cases of PND, anxiety can be so severe that women experience panic attacks (Fettling, 2002). Jomeen (2004) found a positive correlation between self-report depression scores and self-report anxiety scores during both early and late pregnancy. Heron et al. (2004) conducted a prospective longitudinal study to investigate the association between anxiety and the development of PND. Self-reported anxiety and depression were assessed at 18 and 32 weeks gestation and eight weeks and eight months postnatally in a community sample of women in England (n = 8323). Maternal anxiety was measured using the anxiety items from Crown-Crisp Experiential Index (CCEI) with a cut-off ≥ 9. Maternal depression was assessed using the EPDS with a cut-off ≥ 13. They found that the majority of cases of postnatal depression were preceded by antenatal depression; similarly, postnatal anxiety was preceded by antenatal anxiety. Finally, antenatal anxiety predicted postnatal depression at eight weeks and eight months.

The study had the following strengths. It was a prospective longitudinal study, conducted with a large sample size, and the internal consistencies of both EPDS and CCEI exceeded 0.80 for each of the four assessments. In addition, both depression and anxiety were assessed during pregnancy and postpartum. EPDS was used with the recommended cut-off score (≥ 13).

A history of anxiety disorder is a significant risk factor for postnatal depression and women with antenatal anxiety were nearly three times more likely to present with postnatal depressive symptoms (Matthey, Barnett, Howie, &
Psychological stress and anxiety during pregnancy may have long-term effects. High levels of anxiety during pregnancy are associated with spontaneous abortion, fetal structure malformations, increased risk of pre-eclampsia, preterm delivery and reduced birth weight, which adversely affect fetal and maternal wellbeing (Jomeen, 2004). O’Connor et al. (2002) reported that high level of anxiety during pregnancy increases the risk of behavioural problems in early childhood. They related this to the direct effect of maternal anxiety and stress on fetal brain development.

Stressful life events

The birth of the child, with the associated demands on newly acquired skills, is a significant stressor in the lives of parents (Milgrom, Martin, & Negri, 1999). According to Swendson and Mazure (2000) stressful life events and certain stresses specific to motherhood increase the risk of maternal blues and diagnosis of PND. Life situations that are already precarious prior to pregnancy can become untenable following childbirth, particularly for women who have multiple stressors and limited support (Swendson & Mazure, 2000).

Lane et al. (1997) reported that there are many different types of stressful events associated with PND (e.g., housing, bereavement, marital relationship, finance, and unemployment), and the influence of any stressor is related to the women’s perception and appraisal of the event. A sharp accumulation of life stresses over a short time period, rather than a gradual accumulation is also associated with PND (Milgrom, Martin & Negri, 1999).

Stressful life events happening during pregnancy and birth or following birth increase the risk of PND (Agoub et al., 2005; Aydin et al., 2005; Andajani-Sutjahjo et al., 2007; Chaaya et al., 2002; Husain et al., 2006; Rahman et al., 2003). Problems experienced with the infant in terms of health complications
and childcare issues have been strongly associated with PND (Aydin et al., 2005; Danaci et al., 2002; Dennis & Ross, 2006a; Nakku et al., 2006; Inandi et al., 2005).

Paykel, Emms, Fletcher and Rassaby (1980) conducted the first study on the association between stressful life events and PND. They interviewed 120 women in England with mild clinical PND regarding stress experienced from the beginning of the pregnancy until the date of the interview. They found a strong association between recent stressful events and PND.

Hall, Kotch, Browne and Rayens (1996) conducted a prospective study with unemployed low income and predominantly young African–American mothers (n = 738) to assess the relationship between stressful life events and PND. Data were collected during in-home interview one to two months postpartum using the Everyday Stressor Index (ESI), the Life Experiences Survey (LES) and the Centre for Epidemiologic Studies-Depression Scale (CES-D). A score greater than 15 in the CES-D indicates a high level of depressive symptoms. The findings showed that 42% of women had depressive symptoms. The authors reported that depression was related to higher levels of everyday stressors, number of negative life events, low self-esteem, and poor marital relationships.

Although the study conducted with a large sample size, the authors did not assess the psychological status of women during pregnancy. In addition, the study conducted with unemployed low income women which may reduce the generalisability of the results to other population.

Bugdayci et al. (2004) reported that high levels of economic distress among Turkish women in their study could have influenced the high rate of PND (29%). Similarly many studies report that stress related to financial problems is associated to the development of PND (Andajani-Sutjahjo et al., 2007; Goedde, 2003; Horowitz et al., 2005; Oveis, 2001).
Social support

Various epidemiological studies have identified that the major aetiological factors of PND are largely of a social nature (Dankner et al., 2000; Dennis & Ross, 2006a; Green et al., 2006; Husain et al., 2006; Rahman et al., 2003). Especially important are the absence of social support from partner, family, or friends and presence of stressful life events (Andajani-Sutjahjo et al., 2007).

Social support can take many forms including: practical support (such as baby-sitting, housework, and financial support); emotional support (perception that one is cared for and loved); and informational support (that one belongs to or is attached to a network of reciprocal support) (Dennis & Ross, 2006a; Hiltunen, 2003). Networks according to Oakley (1992) provide shared values, norms, and ideologies, whereas individual relationships lack the collective consensual elements. Social networks include size of the network, number of confidants, proportion of kin, and frequency of contact in supportive interactions (Kendall-Tackett & Kaufman-Kantor, 1993).

Stuchbery, Matthey and Barnett (1998) conducted a study in southwestern Sydney, Australia to identify the components of social support (defined as support from partners, their own mothers, and from others) associated with PND in Vietnamese, Anglo-Celtic and Arabic mothers. The social support network and postnatal mood were assessed at six weeks postpartum. Postpartum depression assessed using EPDS. The seven social support variables were wanting more practical support from one’s partner or from another person; wanting more emotional support from one’s partner, one’s mother, or another person; and the quality of the relationship with their partners and one’s mother. They found that for Anglo-Celtic women, low postnatal mood was associated with perceived need for more emotional support from partner and mothers (accounted for 25% of the variance in EPDS). For Vietnamese women, low postnatal mood was associated with poor quality of relationship with the partner and perceived need for more practical help from him (accounted for 34%). For Arabic women, low postnatal
mood was associated with perceived need for more emotional support from partner (accounted for 5%). Arabic women also reported better quality relationships with their mothers than the other two groups. The findings revealed that cultural factors mediate the relationship between social support and PND.

Although the study conducted with a large sample size, the researcher did not assessed the maternal mood during pregnancy. In addition, they did not mentioned the cut-off score of EPDS used in the study.

Felice, Saliba, Grech and John (2004) conducted a study with 239 Maltese pregnant women to investigate the prevalence and psychosocial characteristics associated with depression in pregnancy and postpartum period. They interviewed the women at booking using a detailed socio-demographic history, the revised Maltese version of the clinical interview schedule (CIS-R) and Maltese version of the EPDS. The (CIS-R) and the EPDS were administered again at 36 gestational weeks and eight weeks postpartum. The prevalence of depression meeting ICD-10 research criteria was 15.5% at booking, 11.1% in the third trimester and 8.7% during the postpartum, of which only 3.9% had an onset since birth. The authors concluded that the low rate of new onset PND might be attributable to the social support available to Maltese women who enjoy a strong supportive network provided mainly by their mothers. The support given is both emotional and practical, including household chores and caring for the baby and other children (Felice et al., 2004).

Although the study conducted with a large sample size and assessed maternal mood during pregnancy and postpartum, the authors did not mentioned the cut-off score of EPDS used in the study. In addition, the results may have limited generalisability since sociocultural factors appear to influence the development of PND.
The main sources of social support in relation to PND are partner support and support from other family members (Dennis & Ross, 2006a; McVeigh, 2000). According to Ogrodniczuk (2004) support from partner is most important to maternal well-being and mothers who were satisfied with their partner support experienced less overt signs of depression six weeks after birth. The partner is an important source of emotional, practical and informational support and women who received good support from their partners were more likely to experience an easier, more satisfied transition to motherhood, report less stress, and enjoy their infants more (Ogrodniczuk, 2004; Reece, 1995). Aydin et al. (2005) reported that lack of support from husband was a significant factor in the development of PND among Turkish women. In Jordan, support follows the traditional family laws and gender division of labour rules (Safadi, 2005). It is the responsibility of the females, especially from the wife’s side of the family. The husband is external and is not expected to provide either psychological support or child care after the birth (Safadi, 2005). Fathers responsibility is only financial (Safadi, 2005).

Low social support and high levels of stress and anxiety are linked to fear of childbirth (Mosallam, Rizk, & Ezimokhai, 2004; Saisto et al., 2001) which leads to negative childbirth experiences and in turn an increased risk of postnatal depression (Zar et al., 2001).

Social support is important in relieving the negative effects of stress experienced by mothers proceeding and following childbirth, it has the primary influence of reducing depressive symptoms in mothers postnatally (Hung, 2007; Hung et al., 2005; Ogrodniczuk, 2004; Swenden & Mazure, 2000).

Providing a support base and weekly counselling by a trained health care providers are the first treatments of choice for most women experiencing PND (Wickberg & Hwang, 2001). Oakley (1992) conducted a study to examine the effects of social support as an intervention for PND. She found that women who had a health provider visit their home, who listened to their worries and
provided support and continuity had a much more rapid improvement in their emotional health.

Emotional support from partners, antenatal information classes, support from a companion during labour and birth, and practical help have all been proposed as the means to help decrease physical and emotional complications associated with motherhood (Dennis & Ross, 2006a; Hung, 2007; NHMRC, 2000; Ogrodniczuk, 2004).

**Marital problems**

Women with a poor marital relationships appear to be particularly vulnerable to the development of PND (Abbott & Williams, 2006; Andajani-Sutjahjo et al., 2006; Aydin et al., 2005; Green et al., 2006; Lee & Chung, 2007). Dennis and Ross (2006) conducted a study to examine the influence of maternal perceptions of conflict and relationship and postpartum specific support from partner on the development of PND in the first eight weeks postpartum. Self-administered measures of partner support (Social Provisions Checklist, Postpartum Partner Support Scale), partner conflict (Quality of Relationship Inventory), depression (EPDS with a cut-off > 9) were mailed within eight weeks postpartum to a population-based sample of 396 mothers. The prevalence of PND was 14.1%. Women with depression symptoms had overall significantly higher levels of conflicts than those who were not depressed. As well, women with depression symptoms had overall significantly lower levels of postpartum specific support. The authors concluded that partner conflict is important postpartum depression risk factor.

Although the researchers used a large sample size and provided the reliability of the instruments, the results may have limited generalisability since the authors did not use the recommended cut-off score of EPDS.

Beck (2001) reported in a meta-analysis of 84 studies that there is a moderate relationship between poor marital relationship and PND. A poor
marital relationship combined with a history of depression increases the risk of PND (NHRMC, 2000).

**Probable risk factors**
The probable risk factors discussed in the present study are those recognised as the most widely discussed. These factors are: infant temperament, birth experience, and single parenthood.

**Infant temperament**
Few studies have examined the relationship between infant temperament and PND (Milgrom, Martin & Negri, 1999). Hopkins et al. (1984) identified that researchers have paid little attention to the effect of the infant on mothers’ emotional states. The existing studies report that mothers of babies who vomit or cry more than average will be more likely to be depressed (Mayberry & Affonso, 1993). Whiffen and Gotlib (1989) stated that difficult behaviour in two-month old babies was associated with PND. It could be that irritable infants have difficulty controlling their emotions and they are less easy to soothe compared to other babies.

Problems associated with infant temperament along with complications associated with childbirth and childcare stress are potential causes of PND (Aydin et al., 2005; Dennis & Ross, 2006a; Swendsen and Mazure, 2000). In a meta-analysis of 84 studies to update the findings of an earlier meta-analysis of PND predictors, Beck (2001) reported that infant temperament is moderately related to PND. In addition, Aydin et al. (2005) conducted a study with 728 Turkish women in their first postnatal year to assess the prevalence and risk factors for PND. Data were collected using a structured questionnaire and the EPDS with a cut-off score ≥ 13. The percentage of women who had scores ≥ 13 was 34.6%. The authors found that having an infant with health problems and a temperamentally difficult baby were associated with the development of PND. In addition, they found that history of psychiatric illness,
lack of husband’s support, stressful life events, and unemployed husband were associated with the development of PND.

Although the authors reported the reliability of EPDS, used a large sample size and used the recommended cut-off score of EPDS, they did not assessed psychological status of women during pregnancy.

Some researchers hypothesise that women who perceived their infant as more difficult to care for and temperamentally fussy, who felt under-prepared for motherhood, and more overwhelmed by the tasks required were more likely to be depressed (NHMRC, 2000). In this way, infant temperament is postulated to have both a direct effect on the level of PND as well as influencing parenting self-efficacy (Milgrom, Martin & Negri, 1999).

A number of studies suggest that infant-related stressors and postpartum depressive symptoms are correlated (Alami et al., 2006; Dennis & Ross, 2006a; Murray et al., 1996). However, it is not known whether increased infant-related stress precedes PND or is related to the mother's perceptions of their infant and therefore makes the complex issue more difficult to diagnose (NHMRC, 2000). There are fewer studies on the role of infant factors in the aetiology of PND. It is possible that infants react to parental mood and depression and vice versa. Further independent studies on the relationship between infant temperament and PND are needed.

**Birth experience**

Pregnancy or labour complications have been inconsistently related to PND. Some studies report more frequent mood disturbances in women with more stress, pregnancy or labour complications (Agoub et al., 2005; Alami et al., 2006; Saisto, Salmela-Aro, & Nurmi, 2001). Other studies reported that obstetric factors, such as induction or augmentation of labour, episiotomy, or being referred during pregnancy or labour for complications were not associated with PND (Feinman, 1997; Forman et al., 2000; Josefsson et al.,
For example, Johnstone et al. (2001) conducted a prospective study to examine the obstetric risk factors for PND in an urban and rural community sample (n = 490), with concurrent consideration of personality, psychiatric history and recent life events. Obstetric information, obtained from the New South Wales Midwives Data Collection, was completed shortly after delivery. Information on other risk factors was obtained from a questionnaire administered within one week postpartum. Psychological status was assessed at eight weeks postpartum using EPDS with a cut-off > 12. They found that 13.1% of participating women scored > 12 in EPDS. The authors reported no association between obstetric history, complications during pregnancy, labour and birth and PND. They also reported that non-obstetric factors such as personality, history of psychiatric illness and stressful life events were associated with the development of PND. The authors did not assessed depression during pregnancy. However, the strength of the study was the use of a large sample size.

Obstetric factors have been examined with mixed results in different studies. For example, Yoshida et al. (1997) found an association between PND and operative birth, difficult labour, and long labour (longer than 12 hours). Similarly, other studies reported that difficult labour and birth and premature delivery were associated with the development of PND (Bergant et al., 1999; Matthey, Silove, Barnett, Fitzgerald, & Mitchell, 1999; Tamaki, Murata, & Okano, 1997). Brown (1998a) reported that emergency caesarean section, not talking with caregivers about the birth experience, and not being able to hold the baby soon after the birth were associated with the development of PND while, length of labour, elective caesarean section, birth with forceps or vacuum extraction, experience of pain, and use of pharmacological pain relief were not associated with the development of PND.

There is very mixed evidence regarding the impact of mode of birth on PND (Boyce, 2003). Some studies reported no association between mode of delivery and PND (Agoub et al., 2005; Alami et al., 2006; Brown, 1998a; Johnstone et al., 2001; Small et al., 2003; Tamentie et al., 2002; Warner et
al., 1996) while, other studies reported a significant association (Boyce et al., 1992; Chaaya et al., 2002). For example, Chaaya et al. (2002) conducted a study with 396 women from the urban and rural area in Lebanon to assess the prevalence and determinants of PND. Women were interviewed 24 hours after delivery to assess risk factors for PND using a semi-structured questionnaire. PND was assessed using EPDS at three to five months postpartum. The prevalence of PND was 21%. The authors found that lack of social support, stressful life events, poor knowledge, and vaginal delivery were associated with the development of PND. It may be that vaginal delivery was associated with PND because women see vaginal delivery as a source of pain, fear, and stress as it is usually associated with painful obstetric interventions such as vaginal examination, episiotomy and stitches. Women experiencing caesarean section may receive more support.

Although the authors used a large sample size, they did not mentioned the EPDS cut-off score used and they did not assessed depression during pregnancy.

Carter et al. (2006) conducted a meta-analysis of 24 studies to examine the association between caesarean section and postpartum depression. Their review criteria were: 1) studies that analysed the impact of C/S on the development of PND. Studies that have examined delivery complications, assisted delivery, obstetric interventions, non-spontaneous delivery, peripartum stressful events and emergency C/S were excluded; 2) All studies evaluated maternal mood between ten days and one year postpartum were reviewed; 3) studies that analysed depression symptoms using a continuous measure rather than categorising participants as depressed or non depressed. The findings revealed that five studies found a significant adverse association between caesarean section and PND, 15 studies showed no significant association, and four studies had mixed results.

Patel, Murphy and Peters (2005) conducted a prospective longitudinal population based cohort study with 14,663 women in England to assess the
association between elective caesarean section and PND compared with planned vaginal birth and whether emergency caesarean section or assisted vaginal delivery is associated with PND compared with spontaneous vaginal birth. Using the EPDS with a cut-off score of greater than 12 at eight weeks postpartum revealed that elective caesarean section did not alter the odds of developing PND compared with planned vaginal birth. Similarly, there was also little evidence of differences between women who had an emergency caesarean section or assisted vaginal delivery and those who experienced a spontaneous vaginal birth. Women who plan a vaginal birth but require emergency caesarean section or assisted vaginal delivery can be reassured that they are not at increased risk of postpartum depression (Patel et al., 2005).

Several strengths of the study were identified. The use of prospectively collected data and a large sample size. In addition, the EPDS was developed a validated in the United Kingdom and as such is an appropriate screening tool for PND in this population. However, the study did not examine maternal mood during pregnancy.

Similarly, Wiklund, Edman, & Andolf (2007) conducted a prospective cohort study in Sweden to investigate the association between planned caesarean section, planned vaginal delivery and development of PND. In addition, the study investigated mothers undergoing C/S in the absence of a medical indication, their reasons for request, a self-report of their health, experience of delivery, and duration of breastfeeding. A sample of 357 healthy primiparous women from two different groups “C/S on maternal request” (n = 91) and “controls planning a vaginal delivery” (n = 266) completed three self-administered questionnaires in late pregnancy, two days after childbirth and three months postpartum. PND was assessed at three months postpartum using EPDS with a cut-off ≥ 12. The authors found no differences in the signs of PND between the two groups at three months postpartum. The results showed that women requesting C/S reported poorer health than women in the control group and were more often planning to have only one child. In
addition, they were more likely to report that they were anxious about lack of support during labour, loss of control, and fetal injury/death. Women planning a C/S were more likely to report having a better birth experience compared with women planning a vaginal delivery however fewer women in the C/S group were breastfeeding three months after birth. Although the authors collected data prospectively from a large sample size, the results may have limited generalisability since the sample consisted of only a primiparous women.

Ukpong and Owolabi (2006) conducted a controlled study in Nigeria to investigate the association between C/S and PND among 47 women experiencing C/S by comparing them at six to eight weeks postpartum with 47 matched controls experiencing a normal vaginal birth. General psychopathology in the women was assessed using the General Health Questionnaire (GHQ) with a cut-off score of $\geq 5$. Depression was assessed using BDI with a cut-off score of $> 9$. The results showed that 42% of women experiencing a C/S scored > 5 in GHQ compared to 2.1% of women in the control group. Similarly, 29.8% of women who had C/S scored > 9 in BDI compared to 4.2% in the control group. The authors concluded that C/S was a significant risk factors for PND. The use of a small sample size (< 100 women) limits the generalisability of the findings.

Saisto et al. (2001) conducted a prospective longitudinal study with 211 Finnish women to examine the extent to which socio-economic background, personality characteristics, depression, fear, anxiety about pregnancy and birth predict disappointment with delivery and the risk of PND. The participants filled in questionnaires measuring socio-economic status, personality traits, marital satisfaction, obstetric data about pregnancy and birth, depression, and anxiety once before and once after 30th weeks of pregnancy and two to three months postpartum. Depression was measured using BDI and anxiety measured using Pregnancy Anxiety Scale (PAS), fear of childbirth measured using Fear of Childbirth Questionnaire. The results showed that the major predictors of disappointment with childbirth were the pain in labour and the mode of delivery. Women experiencing more pain, or
inadequacy in pain relief, or a C/S as an emergency procedure after labouring, were more likely to be disappointed with the birth. The authors reported that duration of labour, labour pain, spousal attendance during labour, or mode of delivery were not associated with PND.

The strengths of the study are that a large sample size was used and data was collected prospectively. Maternal mood was assessed during pregnancy and postpartum, and reliable instruments were used.

Abushaikha and Oweis (2005) conducted a descriptive study with 100 low-risk Jordanian women who experienced vaginal births to assess labour experiences and labour pain intensity. The women responded to three instruments: Numeric Pain Intensity Scale (NPIS) (ranging from 0-10), a pain assessment questionnaire and a demographic questionnaire. They found that the majority of women did not receive pain relief. Eighty-one women reported pain intensity levels of 8 or greater on the NPIS. The mean pain intensity level during the second stage of labour was 8.83. There was a significant difference in pain between primiparous and multiparous women. It was concluded that Jordanian women who reported painful labour experiences had negative birth perceptions. These negative birth perceptions may affect their psychological status and increase the risk of PND.

A Finnish prospective study investigated the association between type of pain relief used during labour and delivery and the development of PND (Hiltunen et al., 2004). A sample of 185 women filled in the EPDS at one week and four months postpartum. The incidence and the risk of high EPDS scores were calculated according to the mode of pain relief during vaginal delivery. Altogether, 16.2% of mothers were depressed immediately after birth (scored $\geq 13$ in EPDS), and 13% were depressed at four months postpartum. Mothers who were depressed immediately after birth were at a higher risk of being depressed at four months postpartum. The authors reported that mothers who received a epidural/paracervical analgesia during labour spent less time in the delivery room than mothers who used the nitrous oxide/acupuncture or
mothers with no pain relief and had shorter length of labour than mothers without pain relief. They stated also that the adjusted risk of depressive scores at the first postnatal week was decreased in mothers who received epidural/paracervical analgesia compared with mothers with no pain relief. This difference was not shown at four months postnatal.

Effective labour pain management involves using of both pharmacological and non-pharmacological interventions. Pharmacological interventions include the use of effective analgesia, while non-pharmacological interventions have included childbirth education and continuous midwifery care and support during labour (Simkin & O’Hara, 2002). Effective labour pain management has been linked to maternal childbirth satisfaction and good birth outcomes (Abushaikha & Oweis, 2005).

Although the majority of studies found no significant association between C/S and PND (e.g. Patel et al., 2005; Saisto et al., 2001), some studies found that C/S is a significant risk factor for PND (Boyce et al., 1992; Fisher et al., 1997; Ukpong & Owolabi, 2006) and protective against PND (Chaaya et al., 2002). A number of possible explanations exist for these findings. Some studies have methodological limitations related to small sample size and design issues. For example, studies with the largest sample sizes found no significant association between C/S and PND. Furthermore, cohort studies have more power to evaluate the impact of risk factor than other study designs, because they have equal proportions of participants who have been exposed, or not exposed, to the risk factor (e.g. Carter et al., 2006). In addition, it seems that C/S may operate as a risk factors for PND only if women are vulnerable to PND for some other reasons (Carter et al., 2006). Also it has been suggested that the effect of C/S on maternal mood depend on the context in which the C/S occurs, including the cultural norms, the social support available to women, and the preparedness. For example Chen and Wang (2002) found no adverse effect of C/S on PND and they relate this to the greater social support Taiwanese women receive after C/S.
As with the earlier NHMRC (2000) review of the evidence of the association between C/S and PND, it seems that other variables, such as history of psychiatric illness and inadequate partner support, may mediate a relationship between obstetric stress, including C/S, and PND.

Premature birth has also been linked to the development of PND. Most very premature infants (less than 32 weeks gestation) have more difficult temperaments and behaviour problems (such as feeding and sleeping) and are more prone to delayed or abnormal cognitive development than full-term babies (Singer et al., 1999). A relationship between premature birth and PND has been reported in women from a low-socio-economic group, experiencing stressful life events, complicated labour, and having an infant in neonatal intensive care for an extended time (Miles, Holditch-Davis, Schwartz, & Scher, 2007; NHMRC, 2000; Ukpong et al., 2003). Davis, Edwards, Mohay, and Wollin (2003) conducted a total population study with 62 mothers of very preterm infants born at less than 32 week gestation a tertiary referral hospital in Australia and the aim was to examine the impact of very premature births on the development of PND. Information was obtained using a structured questionnaire completed at one month postpartum and the EPDS with a cut-off $\geq 12$. The findings revealed that 40% of mothers reported significant depressive symptoms on the EPDS. The authors reported that high maternal stress increased the likelihood of developing PND. Higher levels of education and an increased perception of support from nursing staff resulted in a decreased likelihood of PND. The authors used a small sample size (< 100) and, due to the nature of the study, were unable to assess maternal mood during pregnancy.

Logsdon, Davis and Birkimer et al. (1996) conducted a descriptive study with 37 mothers of preterm infants to assessed self-esteem and self-reported depressive symptoms. They assessed self-esteem and depressive symptoms prior to the infant’s discharge from neonatal intensive care unit and again at four weeks following discharge. They found that mothers who reported low self-esteem before discharge were more likely to have a depressed mood
after four weeks, even if their self-esteem score had improved. Hagan, Evans and Pope (2004) conducted a prospective, single blind, randomised and control study with 199 English-speaking mothers of very preterm infants admitted to neonatal units to test whether a cognitive-behaviour therapy intervention program reduced the prevalence of depression during the first year after birth. A six sessions cognitive-behaviour intervention program provided to the intervention group (n = 101) by a research midwife between week two and six postpartum. Women in the control group (n = 98) received standard care. Depression and anxiety occurring in the first year postpartum were assessed by a clinical psychologist at structured interview using the Schedule for Affective Disorders and Schizophrenia (SADS) at two weeks, two, six and twelve months. The authors found that 27% of women in the trial were diagnosed with minor or major depression in the 12 months following very preterm delivery (29% in the intervention group and 26% in the control group). They concluded that cognitive-behaviour therapy intervention program did not alter the prevalence of depression and that rates of depression and stress reactions are high in these mothers. Although the study used a randomised controlled design and a large sample size, the maternal mood was not assessed during pregnancy.

Similarly, Miles et al. (2007) conducted a longitudinal descriptive study in south-east and mid-west of California to investigate the level of depressive symptoms in mothers (n = 102) of preterm infants from birth through 27 months and to examine factors associated with depressive symptoms. They found that the mean depressive symptoms scores on the Centre for Epidemiologic Studies Depression Scale (CES-D) during hospitalisation were high and more than half mothers (63%) had scores of $\geq 16$ indicating risk of depression. They found that depressive scores decreased over time until six months and then were fairly stable. They also found that mothers reporting worry about the child’s health and reported greater maternal role alteration stress during hospitalisation had more depressive symptoms through the first year.
Most of the studies which examined the association between premature birth and PND, reported a positive association between them. Some limitations of the studies that are primarily related to researching this group of women were small sample sizes (< 100) and difficulties assessing maternal psychological status during pregnancy.

Further well-designed research is needed on the relationship between PND and premature delivery with a comparison with mothers of full-term infants. Routinely assessing maternal mood during pregnancy would facilitate research in this area.

**Single parenthood**

Single parenthood does not always predict of PND but it may interact with other risk factors such as, financial problems, lack of support, and unemployment to predict PND (Horowitz, Damato, Duffy, & Solon, 2005; Warner, Appleby, Whitton, & Faragher, 1996). Wickberg et al. (1996) conducted a study with Swedish women and found a positive link between single parenthood and PND. Single mothers mostly lack emotional and practical support which is essential to managing their responsibilities of caring for the baby alone, they may also have inadequate financial resources (Horowitz et al., 2005). As lack of social and socioeconomic support increase the risk for PND, single mothers are more vulnerable to PND than married mothers with adequate financial resources and supportive relationships (Horowitz et al., 2005; Limlomwongse & Liabsuetrakul, 2006; Marcus et al., 2003; Stowe et al., 2005). Nakku, Nakasi, and Mirembe (2006) reported that single mothers in Uganda were more likely to develop depression at six weeks postpartum using the Mini International Neuro-Psychiatric Interview (MINI).

**Possible risk factors**

The possible risk factors discussed in this section are the following: demographic factors and poor relationship with parents (NHRMC, 2000).
Demographic factors

Several studies have investigated demographic variables as possible risk factors for PND but the findings are inconsistent (O’Hara & Swain, 1996). For example, Alami et al. (2006) did not find a positive association between PND and demographic factors, in contrast to other studies (e.g. Chaaya et al., 2002; Da Costa et al., 2000; Green et al., 2006; Marcus, Flynn, Blow, & Barry, 2003). Maternal higher education has been reported to be a protective factor and lower age as a risk factor for depression (Bernazzani et al., 1997; Johnstone et al., 2001). Low occupational status with lower life satisfaction and lower social class were connected to other factors (e.g. infant low birth weight and disappointment with birth) that are linked with depression (Bergant et al., 1999; Bernazzani et al., 1997; Chaaya et al., 2002; Marcus et al., 2003).

Regarding age, both older and younger women are at increased risk (NHMRC, 2000). In one study, 53% of adolescent mothers reported a high level of depression symptoms (Hudson, Elek, & Campbell-Grossman, 2000). Similarly, some studies reported that younger women were more likely to develop PND (Abiodun, 2006; Kitamura et al., 2006). For example, Nakku et al. (2006) reported that young Uganda women were more likely to develop depression at six weeks postpartum. Factors associated with younger maternal age maybe unplanned pregnancy, limited or lack of social support, and illicit drug use (Barnett, Duggan, & Wilson, 1995). On the other hand, older maternal age (30 years and older) for primiparous women was a significant predictor of PND. This is may be related to increased maternal anxiety with the first child and difficulties in adjusting to parenting (NHMRC, 2000).

Regarding parity, no firm association has been found between parity and PND (Horowitz et al., 2005). Oweis (2001) reported in her study that the incidence of postpartum depression in primiparous Jordanian women is higher than the incidence reported in the literature. Similarly, Abiodun (2006)
reported that primigravida Nigerian women were more likely to develop PND. On the other hand, other researchers reported that married multiparous women are more likely to be depressed than childless married or single women (Forman et al., 2000; Righetti-Veltema et al., 1998). In several studies, social class, education, race, age or parity have not been associated with PND (Tammentie et al., 2002).

**Poor relationship with parents**

Women who complain of difficulties in their interactions with parents, a poor relationship with their own parents, or negative perception of the amount of care they received from their own parents are more likely to be depressed (NHMRC, 2000). Childhood separation from parents was more likely to lead to teenage pregnancies in single primiparous women (NHMRC, 2000). Furthermore, lack of support from the woman’s own parents in childhood, pregnancy and after the birth was a predictive factor for PND (NHMRC, 2000).

**Satisfaction with intrapartum care and support**

Satisfaction was defined in various ways, it could include satisfaction with the care provided as well as satisfaction with the experience of labour and birth (Waldenstrom et al., 2004). Satisfaction with childbirth is linked to the amount of support provided, the relationship between labouring women and care providers, involvement in decision making, and personal expectations about the birth experience (Abushaikha & Oweis, 2005; Hodnett, 2002).

Midwives’ support during labour is reported to improve childbirth outcomes. When midwives assist women to cope with the stress of labour using good interpersonal skills, women’s satisfaction with their childbirth experience increases. Furthermore, a companion in labour has a role in decreasing anxiety and depression among women. Wolman, Chalmers, Hofmeyr and Nikodem (1993) stated that women with a companion in labour are more likely to have low scores on anxiety and depression scales at six weeks
postpartum. Women who have a companion during labour and birth have significantly better obstetric outcomes with shorter labours, fewer complications, a lower caesarean rate, more contact with the infant immediately after birth, and fewer infants admitted to neonatal intensive care units (Willinck & Cotton, 2004).

Factors related to the dissatisfaction with intrapartum care as reported by Brown and Lumley (1994) were: insufficient information given to the women, perception that health care providers were unhelpful, lack of involvement in decision-making, and higher score of obstetric intervention. Brown and Lumley (1998b) reported in another study that factors related to women’s dissatisfaction with their care during labour were unhelpful care givers (midwives and doctors) and not having an active say in decisions.

Women’s dissatisfaction with their labour and birth experience is associated with depressed mood postpartum and in subsequent pregnancies, a request for caesarean section in a subsequent pregnancy, and unwillingness to have another baby. Waldenstrom et al. (2004) conducted a longitudinal cohort study with 2541 women to investigate the prevalence and risk factors of a negative birth experience. Data were collected by three questionnaires, which measured women’s global experience of labour and birth one year after the birth. Seven percent of the women had a negative birth experience. The risk factors of a negative birth experience were: (1) factors related to unexpected medical problems, such as emergency caesarean section, induction, augmentation of labour, and infant transfer to neonatal care; (2) factors related to women’s social life, such as unwanted pregnancy and lack of support from partner; (3) factors that may be easier to influence by health care providers, such as insufficient time given to the women’s own question at antenatal checkup, lack of support during labour, and administration of analgesia; (4) factors related to the women’s feelings during labour, such as lack of control and pain. Measures taken to enhance women’s experiences of their childbirth have concentrated on reducing labour pain by using effective analgesia and by increasing women’s ability to cope with labour,
such as offering of childbirth education classes during pregnancy, continuity of health care provider, support in labour, and homelike birth environment (Waldenstrom et al., 2004). Health care providers should plan and work to improve birth experiences of labouring women because when women report a positive birth experience their risk of developing PND is more likely to decrease.

**Socio-cultural risk factors of PND**

It has been claimed that PND is a culture-bound product of western societies (NHMRC, 2000). PND has been assessed in many countries and cultures. Using a screening and/or a clinical diagnostic tools, the prevalence of PND in developing countries such as in United Arab Emirates, Nigeria, Turkey, Pakistan, and Thailand appear to be higher than the prevalence in developed countries (Abiodun, 2006; Dindar & Erdogan, 2007; Husain et al., 2006; Green et al., 2006; Inandi et al., 2005; Piyasil, 1998). Lower prevalence of PND has been reported in Malaysia, Japan, and Malta (Kit, Janet, & Jegasothy, 1997; Kitamura et al., 2006; Felice et al., 2004).

A number of socio-cultural risk factors have been proposed for postnatal depression. Studies in developing countries have identified a significant trend towards depression with birth of a daughter when a son is desired. Controlling for the gender of previous children showed that mothers of female babies had a higher risk of PND. This may be an important indicator of gender discrimination and the social status of women. In Jordan, like other developing and Asian countries such as United Arab Emirates, Turkey, China, Nigeria, and India, boys are more desirable than are girls (Abiodun, 2006; Chandran et al., 2002; Ekuklu et al., 2004; Goldbort, 2006; Green et al., 2006; Nakku et al., 2006; Lee et al., 2004; Oweis, 2001). Traditionally in Jordan, a woman gains status when she gives birth to a male baby. However, the birth of a female baby is not celebrated as much and women who give birth to females usually continue to have more children until they give birth to a male
baby in order to gain social status (Khalaf & Callister, 1997; Oweis, 2001; Safadi, 2005).

Zhang et al. (1999) similarly showed that a husband’s desire for a boy child was significantly associated with PND in China. As well, Kitamura et al. (2006) reported that dissatisfaction with the sex of the newborn baby was associated with the development of PND among Japanese women. Similarly, Oweis (2001) found that Jordanian women who gave birth to males had significantly lower mean scores for postpartum depression than women who gave birth to females. In Jordan, preference for a male child is also associated with prenatal issues. In cases where the gender of the baby is known prenatally, males had the highest mean birth weights as compared with females (Al-Qutob, Mawajdeh, Allosh, Mehayer, & Majali, 2004). Another study found that Arab women who were told they were carrying a female generally reported psychological and physical exhaustion, which may have lead to changes in prenatal care, and adversely affected the health of the fetus (Al-Qutob et al., 2004).

Ahmed (1990) conducted a study in Egypt to investigate gender difference in child mortality. He found that a major cause of female excess mortality was that boys received favoured treatment preventing digestive and respiratory illnesses. He reported also that less educated mothers breastfed sons longer and waited more months after the birth of a son to have another child.

The preference for male children is deeply rooted in Indian society. Women who already had a female child faced greater stress because of their hope for the new infant to be a male. Where the second child is a female, the risk of depression is greater (Patel et al., 2002). Mothers may also be blamed for the birth of a girl child (Inandi et al., 2002). In India, a female child is cited as a heavy economic drain on the family (Rodrigues, Patel, Jaswal, & De Souza, 2003). This was due to the perception that most girls would ultimately be married and would not contribute economically to the family and that dowry payments would need to be made at the time of marriage. The boy, on the
other hand would one day be an earning member of the family and also eventually gain a dowry (Rodrigues et al., 2003).

A woman in the rural area in Jordan is expected to bear five children, including at least two sons, in fairly rapid succession (Kjeilen, 2005). Women gain status and security in their marital household by bearing children (Khalaf & Callister, 1997; Kjeilen, 2005; Safadi, 2005). According to a study conducted in early 1980s by Jordanian anthropologists Shami and Taminian in a poor squatter area in Amman, reproductive behaviour was subject to several factors (Kjeilen, 2005). If a woman had given birth to two or more sons, she might begin to space her pregnancies or stop bearing children for a while. Household structure (such as nuclear, extended, or multiple family) also appeared to be a crucial factor in determining fertility. The presence of other women in a household encouraged women to bear more children to improve their relative position in the household (Kjeilen, 2005).

Another risk factor has been the dissolution of traditional cultural rites and values in modern motherhood. In pre-industrial societies the postpartum period is patterned by elaborate customs and rituals, many of which mobilise social support and call attention to maternal vulnerability (Chien et al., 2006; Lee et al., 2004).

In Jordan, resting for 40 days after having a baby is custom. This custom allows women to obtain extra family support in the first 40 days after delivery (Nahas & Amasheh, 1999a). During this period, family members (usually the woman’s mother, sister, or mother-in-law) come to the house and stay with the new mother to take care of the baby, the house, and other children. According to this custom, women should be restricted to the home for 40 days after giving birth in order to recover from childbirth and gain strength again (Kim-Godwin, 2003; Nahas & Amasheh, 1999a). The event of childbirth is seen as consuming a lot of energy and the postpartum is considered to be crucial time for women’s energy and healthy recovery. Women are
encouraged to take a lot of rest and eat specific kinds of food (Kim-Godwin, 2003).

The new mothers are expected to do little more than sleep, eat, and become used to their new role in life. They can enjoy the very best dishes, which include chicken, meat, and other expensive food. During this period their mother-in-law and/or other relatives would take over their responsibilities, bring them meals, and attend to their comforts (Nahas & Amasheh, 1999a).

They also have to follow strict dietary rules. Mothers are encouraged to rest and eat “hot” food, such as chicken, egg, and meat as well hot drinks such as milk, boiled cinnamon and camomile to keep them warm and increase their milk supply (Kim-Godwin, 2003). They should not eat cold food or drinks because they believe that “their bones are still open”, and having cold drink and food would result in health problems such as arthritis and rheumatism (Kim-Godwin, 2003). From experience, Jordanian women should not pray, fast, and should not have sexual intercourse during the 40-days. These may be related to the belief of a potential contamination effect of the new mother associated with the delivery. These practices are also known in the Asian culture (Chien, Tai, Ko, Huang, & Sheu, 2006; Lee & Chung, 2007; Leung, 2001). For example, in Taiwan, women with lochia don’t go to temples in order not to offend the Gods (Chien et al., 2006).

A commonly cited example of a socio-protective postpartum custom is support practices (being assisted by a designated female relative or friend for more than four hours per day in the first month) (Lee et al., 2004). In most contemporary developing countries societies such as Asian societies, recently delivered women are still regarded as vulnerable, and are exempt from their usual household duties for an extended period (Grace, Lee, & Ballard, 2001). Such exemption is generally made possible by the continual presence of a designated elder female kin, most commonly the woman’s mother or mother-in-law. Supportive practices, consolidate and formalise postpartum support,
guarantees passage of child-rearing knowledge, and protects the mother from exhaustion and sleep deprivation (Lee et al., 2004).

Social anthropologists and cultural psychiatrists have long suggested that support practices may prevent social isolation and postnatal depression (Lee & Chung, 2007; Lee et al., 2004). For example, Chien et al. (2006) conducted a study to explore the association between adherence to doing-the-month practices and physical symptoms and depression among postpartum women in Taiwan. They interviewed 202 women at four to six weeks postpartum using Centre for Epidemiologic Studies Depression Scale (CES-D). Adherence to doing-the-month practices and severity of postnatal physical symptoms were measured using scales developed for this study. Probable PND based on the CES-D cut-off score of 15 was found in 61 (30.2%). Women who suffered PND had lower mean scores of adherence to doing-the-month practices. The findings revealed that adherence to doing-the-month practices was associated with lower severity of physical symptoms and lower scores of PND. On the other hand, these postpartum support practices bring in extended family members, such as in-laws, who may not be welcomed by the new mothers (Abiodun, 2006; Chen, 1999). For centuries, tense relationships between women and their mothers-in-law have been a source of household disharmony in Asian and many other developing societies. A qualitative phenomenological study conducted by Chan et al. (2002) found that the enriched social contact ritualised by support practice is not necessarily perceived as supportive. There were also reports of mother-in-law problems in association with postnatal depression in other cultures (Abiodun, 2006; Barrows & Barrows, 2002; Chandran et al., 2002; Goldbort, 2006; Green et al., 2006). During pregnancy and especially after birth of the baby, the parents and parents-in-law usually give a lot of advice and comments (Abiodun, 2006; Leung, Kung, Lam, Leung, & Ho, 2002). Some of these comments and traditional taboos are not compatible with the knowledge that well-educated pregnant women have gained from their own reading, and antenatal information from obstetricians and midwives. Conflicts may arise as
Conflict with in-laws was as important as spousal discord in determining postnatal emotional adjustment in Chinese women (Lee et al., 2004). Adverse in-law relationships, especially between mother and daughter-in-law, is an old conflict in Asian and Arab societies (Green et al., 2006; Lee et al., 2004). For instance, a Chinese national survey showed that tension with the mother-in-law was the third most common stressful event among married women (Zheng & Lin, 1994). A high percentage of Chinese couples considered the in-law relationships to be difficult (Lee et al., 2004). In another study in rural China, mother-in-law conflict was reported in nearly a third of young women who attempted suicide (Veronica, 2002). Dindar and Erdogan (2007) conducted a descriptive study to explore the prevalence and potential risk factors of PND among Turkish women. They assessed 679 mothers within their first year after delivery using EPDS and a risk factor questionnaire. Using a cut-off $\geq 12$, 26.6% of women developed PND. In their study, previous psychiatric illness, relationship problems with husband or mother-in-law, low economic status, giving birth to a baby girl, and previous loss of a baby were strong predictors of PND.

It is unsurprising that conflicts between mother-in-law and daughter-in-law are difficult to deal with in the clinical context (Lee et al., 2004). The depressed daughters-in-law and their families may regard the conflicts as family secrets that should not be disclosed to outsiders. Even when the daughter-in-law is willing to discuss the conflicts with health professionals, most mothers-in-law refuse to participate in counselling (Lee et al., 2004).
Table 2.1 specifically highlights cultural factors in Arab, Islamic and Asian countries where woman’s status and relationship to husband’s family are factors related to PND.

Table 2:1: Details of studies investigating issues relevant to the Jordanian context

<table>
<thead>
<tr>
<th>Authors, year, Country</th>
<th>Purpose of the study</th>
<th>Design &amp; sample</th>
<th>Measures &amp; timing of assessment</th>
<th>Incidence and risk factors of antenatal and/or postnatal depression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abiodun, 2006, Nigeria</td>
<td>To determine the prevalence and factors associated with the development of PND in a primary health care centres.</td>
<td>The study conducted with 360 women attending PHC postnatal clinics six weeks postpartum</td>
<td>EPDS used in the first-stage screening Present State Examination Schedule used for the 2nd screening</td>
<td>The prevalence of PND was 18.6% using a cut-off score nine. Factors associated with PND were primiparity, problems with mother-in-law, younger age, and giving birth of a female baby.</td>
</tr>
<tr>
<td>Chan and Levy, 2004, Hong Kong</td>
<td>To describe the experience of PND in women and to investigate the factors associated with the development of PND</td>
<td>A qualitative descriptive study with 35 women.</td>
<td>EPDS used to detect women with PND. Semi-structured open-ended interview about women’s experiences with PND.</td>
<td>Factors associated with the development of PND: trapped in the situation, ambivalence about the baby, uncaring husband, and controlling and powerful in-laws, with the latter two factors expressed by these women as a major contributing factors to their depression.</td>
</tr>
<tr>
<td>Chan, Levy, Chung, &amp; Lee, 2002, Hong Kong</td>
<td>To investigate the lived experience of a group of Hong Kong Chinese women diagnosed with PND.</td>
<td>A qualitative phenomenological study with 35 women diagnosed with PND</td>
<td>Semi-structured interview</td>
<td>Factors associated with PND were marital problems, in-laws conflict, trapped in the situation, and ambivalent towards the infant.</td>
</tr>
<tr>
<td>Chandran et al., 2002, India</td>
<td>To determine the incidence and risk factors for developing PND</td>
<td>Community-based epidemiological study with 359 women</td>
<td>The revised Clinical Interview Schedule (CIS-R), ICD-10 Questionnaire for the assessment of risk factors of PND were used in the last trimester of pregnancy and 6-12 weeks postpartum</td>
<td>Incidence of PND was 11%. Factors associated with the development of PND were relationship problems with mother-in-law and parents, lack of physical help, stressful life events during pregnancy, low income, and birth of daughter when a son was desired.</td>
</tr>
<tr>
<td>Danaci et al., 2002, Turkey</td>
<td>To investigate the epidemiological and cultural factors associated with PND</td>
<td>N = 257 mothers who gave birth in the previous 6 months</td>
<td>EPDS and questionnaire on a sociodemographic variables</td>
<td>14 % of mothers had PND. Factors associated with PND were living in a shanty, the number of living children, being an immigrant, previous psychiatric history, serious health problems in the baby, psychiatric illness in the husband, and having bad relationship with husband and parents-in-law.</td>
</tr>
<tr>
<td>Authors</td>
<td>To investigate the prevalence and factors associated with PND</td>
<td>Methods</td>
<td>Findings</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>------------------------------------------------------------</td>
<td>---------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>Dindar &amp; Erdogan, 2007, Turkey</td>
<td>Descriptive design and random survey N = 679 mothers within first year of birth EPDS with a cut-off score &gt;=12 Risk factors questionnaire used at two months</td>
<td>25.6% of women scored &gt;=12. Factors associated with PND: previous psychiatric illness, smoking, relationship problems with husband or mother-in-law, previous loss of a baby, lower economic status, dissatisfaction in social relations, and giving birth to a baby girl.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ekuklu et al., 2004, Turkey</td>
<td>To estimate the community prevalence of PND. N = 178 mothers at six weeks postpartum EPDS with a cut-off score of &gt;=12 Questionnaire to collect data on demographic information</td>
<td>The prevalence of PND was 40.4%. Factors associated with PND: low educational level, having health problems during a previous pregnancy, husband's unemployment, living in a rented house, unwanted pregnancy and preferences for a boy baby in the previous pregnancy, and female baby in previous delivery.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Felice et al., 2004, Malta</td>
<td>Prospective follow-up study Using questionnaires and interview N = 239 pregnant women recruited in St Luke's hospital, Malta at booking Detailed sociodemographic history, CIS-R (Maltese version) and EPDS (Maltese version) were used at booking CIS-R &amp; EPDS were used at 36 gestational weeks. CIS-R, EPDS and modified version of Social Maladjustment Schedule were used at eight weeks postpartum</td>
<td>Prevalence of depression was 15.5% at booking, 11.1% in the third trimester and 8.7% postpartum. Relationship problems with husbands and mother-in-law, family history and personal history of psychiatric illness were significantly associated with PND.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goldbort, 2006</td>
<td>Literature review of studies on PND conducted in different countries</td>
<td>The results revealed that the risk factors for PND share similar themes cross-culturally, with one notable exception which is the effect that the gender of the baby had on PND, for a higher value for male babies over females offspring was reported in literature from Turkey, India, and China.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green et al. 2006, United Arab Emirates</td>
<td>Prospective study Community based Follow-up Questionnaires 125 postpartum women recruited in a government maternity hospital in Abu Dhabi, United Arab Emirates Demographic questionnaire after giving birth EPDS (Arabic version) at three and six months postpartum</td>
<td>Prevalence of PND was 22% (using a cut of score of ≥13). Factors associated with PND: primiparity, old age at marriage, difficult relationship with mother-in-law, poor self body image, and no breast feeding.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>Objective</td>
<td>Study Design</td>
<td>Methodology</td>
<td>Findings</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>--------------------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Inandi et al., 2002, Turkey</td>
<td>To explore the prevalence and factors associated with the development of PND</td>
<td>Cross-sectional, multi-centre study with 2514 women in their first postpartum year</td>
<td>EPDS used with cut-off score &gt;=13 Designed questionnaire to investigate factors associated with PND</td>
<td>The percentage of women with EPDS &gt;=13 was 27.2%. PND was associated with unemployment, poor family relations, mental health problems, low marital age, low education, lack of medical services, giving birth of female baby, and problems with mother-in-law.</td>
</tr>
<tr>
<td>Kitamura et al., 2006, Japan</td>
<td>To explore the incidence and risk factors of both antenatal and postnatal depression</td>
<td>Multicentre study N = 290 women expecting their first baby</td>
<td>Using of DSM-III-R Major depressive episode during pregnancy and within three months postpartum</td>
<td>Incidence of antenatal depression was 5.6%. Factors associated with the development of antenatal depression: young age, negative attitude towards the current pregnancy. Incidence of PND was 5%. Factors associated with PND: dissatisfaction with sex of the baby and with emotional distress, and poor accommodation.</td>
</tr>
<tr>
<td>Lau &amp; Keung, 2007, Hong Kong</td>
<td>To investigate the correlates of antenatal depression among women during their second trimester of pregnancy</td>
<td>A cross-sectional study with 2178 women</td>
<td>EPDS with a cut-off score of &gt;14 Stryker Adjustment Checklist (SAC) to measure relationship with mother-in-law Dyadic Adjustment Scale (DAS) to measure marital relationship Designed questionnaire to measure socioeconomic and obstetric factors</td>
<td>The prevalence of antenatal depression was 9.9%. Factors associated with antenatal depression: younger age, personal or family history of psychiatric illness, marital problems, mother-in-law conflict, unplanned pregnancy, history of menstruation discomfort, and premenstrual mood change.</td>
</tr>
<tr>
<td>Lee et al, 2000, China</td>
<td>To investigate the prevalence and factors associated with PND</td>
<td>Prospective longitudinal study N = 220 Chinese women were consecutively recruited from university teaching hospital in Hong Kong between 1996 &amp; 1997</td>
<td>GHQ (Chinese version) on the second day after birth EPDS (Chinese version) &amp; GHQ (Chinese version) used at six months postpartum Risk factors questionnaire</td>
<td>12% of women scored &gt;12 on EPDS six weeks postpartum. Significant factors: Depression during pregnancy, elevated depression score at delivery, prolonged postnatal ‘blues’, temporary housing accommodation, financial difficulties, abortions, past psychiatric illness, spouse disappointment with gender of the baby.</td>
</tr>
<tr>
<td>Study</td>
<td>Objective</td>
<td>Methodology</td>
<td>Key Instruments</td>
<td>Findings</td>
</tr>
<tr>
<td>------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Lee et al., 2004, Hong Kong</td>
<td>To investigate the relationship of sociocultural risk factors and PND.</td>
<td>A prospective multivariate study N = 959 women. Women were examined at baseline at their first antenatal visit, in the last trimester of pregnancy, immediately after birth, and three months postpartum.</td>
<td>EPDS cut-off &gt;14 to determine women with PND. Index of Marital Satisfaction to measure marital satisfaction Social Readjustment Scale Medical Outcome Study Social Support Survey</td>
<td>The factors associated with PND were the same factors reported in the western studies. In-law conflict was found to be just as important as marital problems in determining PND.</td>
</tr>
<tr>
<td>Leung, 2001, Hong Kong</td>
<td>To assess incidence of PND and factors associated with it in particular, social support and stress</td>
<td>A longitudinal prospective study with 385 women who were recruited from five hospital at their third trimester and were followed up to six weeks then a sub-sample of 59 women from both depressed and non-depressed groups was included for in-depth interviews.</td>
<td>EPDS was used with a cut-off score &gt;=13 Postpartum Questionnaire to investigate risk factors for PND Postpartum Social Support Questionnaire Perceived Stress Scale</td>
<td>20% of participants scored 13 or above on the EPDS. Factors associated with PND: antenatal depression, social support, stress factors, and conflict with mother-in-law.</td>
</tr>
<tr>
<td>Oweis, 2001, Jordan</td>
<td>To determine demographic, cultural and intrapartum factors associated with the development of PND</td>
<td>N = 278 of primiparous women. Mothers were recruited from the three largest maternal and child health care centres in Irbid city</td>
<td>Instruments used in the study were the Bryanton Adaptation of the Nursing Support in Labour Questionnaire (BANSILQ) The Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ) The EPDS and a demographic data form</td>
<td>Factor associated with PND were perceived stress of childbirth, giving birth of a female baby, and low income.</td>
</tr>
<tr>
<td>Patel et al, 2002, Goa, India</td>
<td>To explore the prevalence and factors associated with PND</td>
<td>Prospective Follow-up study Community based N = 270 pregnant women recruited during third trimester</td>
<td>Interview at recruitment with GHQ (Konkani version), six to eight weeks, and six months postpartum EPDS (Konkani version) was used at six to eight weeks and six months postpartum Semi-structured interview for sociodemographic data, obstetric history, gender-based variables</td>
<td>Prevalence of PND was 23%. Risk factors: Psychological morbidity during pregnancy, economic deprivation and poor marital relationships, gender of the baby.</td>
</tr>
<tr>
<td>Zhang et al., 1999, China</td>
<td>To investigate the prevalence of PND and related factors</td>
<td>N = 866 women</td>
<td>Hospital Anxiety and Depression during pregnancy</td>
<td>The prevalence of PND was 15% using EPDS.</td>
</tr>
</tbody>
</table>
Factors associated with PND: marital problems, women’s health problems, health professionals’ attitudes during labour, anxiety and depression during pregnancy, and husband’s desired for boy child.

**Maternal self-efficacy**

Self-efficacy is defined by Bandura (1997) as confidence in one’s ability to organise and execute the actions needed to accomplish one’s goals. Whereas, parental self-efficacy is defined as beliefs or judgments about one’s competency or ability to be successful in the parenting role (Hess, Douglas, & Hussey-Gardner, 2004). This concept has been described using different terminology, including parental self-efficacy, maternal confidence, maternal self-esteem, maternal self-definition, and parental sense of competence (Hess et al., 2004).

Maternal feelings of efficacy have been associated with a number of adaptive parental outcomes, including an easier transition to motherhood, lower maternal depression, greater satisfaction with social support, and also as a buffer to stress (Jennings & Amy, 2004; Jomeen, 2004). Some studies have found that greater feelings of parenting efficacy are associated with greater parental competence and skill in specific parenting tasks, such as feeding, diapering, and play interactions for parents of infants as well as for parents of toddlers and preschool-aged children (Hess et al., 2004). On the other hand, low self-efficacy, including low persistence, low expectations of success, and feelings of shame rather than pride is associated with depression, anxiety, and reduced efforts at coping with problems in life (Agoub et al., 2005; Hall et al., 1996; Jennings & Amy, 2004).

Negative interactions, lack of intimacy and lack of social support in close relationships adversely affects self-esteem and is associated with subsequent PND (Jomeen, 2004). Several studies have concluded that fear of childbirth is not an isolated problem but is associated with women’s personal characteristics including self-esteem. This may lead women who fear
childbirth to request a caesarean section instead of normal birth which in turn increases likelihood of deterioration in mood and decreased self-esteem (Beck, 2001; Hayes et al., 2000; Hendrick et al., 1998; Waldenstrom et al., 2006). Some studies reported low self esteem with preterm delivery and conversely high self-esteem with higher birth weight babies (Jomeen, 2004).

It seems that self-esteem has an important role to play in women’s psychological well-being during pregnancy and in the transition to motherhood. The association between self-esteem and PND suggests that there is a need for further investigation.

**Theoretical perspectives of PND**

In general, various theoretical paradigms have been applied to understanding PND. They stem from such diverse frameworks as medical, feminist theory, attachment theory, interpersonal theory, and self-labelling theory (Beck, 2004). Although, many theories have tried to explain the aetiology of PND, there is no single theory that adequately explains the causes and nature of PND (Beck, 2004).

The traditional medical model has been the dominant theoretical perspective of PND. The medical model suggests that postnatal events are mediated by endocrine imbalance. PND according to this model is considered an illness and medical condition. PND indicates an individual pathology, and social or environmental conditions are rarely considered in its evolution (Beck, 2002; Hayes, Roberts, & Davare, 2000). In this model, clinicians focus on an individualistic approach. PND is perceived as a pathological condition which results from deficiencies in the individual (Mauthner, 1998). When clinicians see the mother as the main unit of pathology, they exclude the social, economic, and political context of her life (Mauthner, 1998). In the medical model, mothers are portrayed as passive individuals and biological factors act upon them (Beck, 2002; Mauthner, 1998).
Feminist theory opposes the medical model and rejects the link proposed between biology and women’s postnatal psychological distress (Beck, 2002). It suggests that terms such as “illness” hide the social nature of women’s problems (Hayes et al., 2000; Leitch, 2002; Nicolson, 1986). According to feminist writers PND is associated with the impossible standards of the motherhood mystique imposed by the medical model (Lazarre, 1997). Feminist theory view motherhood in a wider cultural and sociopolitical context and call for childbirth to be stripped of its masculine ideology and rather be seen through the eyes of mothers (Lazarre, 1997; Mauthner, 1998). Because childbirth occurs in many simultaneous contexts (medical, economic, and social), the mother’s reaction to it are shaped by all of them. The medical control of childbirth reinforces feminine helplessness and increase likelihood of PND (Beck, 2002)

According to attachment theory PND can develop when a mother’s attachment needs are not being met by her partner, whom she feels is inaccessible and unresponsive to her (Whiffen & Johnson, 1998). Originally this approach focuses on the importance of the strong emotional bond between baby and mother (Whiffen & Johnson, 1998). Attachment theory has been extended beyond the mother-infant relationship to explain adult relationships (Beck, 2002). An attachment theory framework proposed that fathers and mothers will turn to each other for support and reassurance when they experience anxiety during the period of transition to parenthood. When both of them are securely attached, they will respond to each other’s needs for support (Simpson et al., 1992). However, if either parent is insecurely attached or avoidant attached, problems can occur that may lead to PND (Simpson et al., 1992; Whiffen & Johnson, 1998).

Interpersonal theory views humans as essentially social beings whose personalities are determined by interpersonal experience rather than intrapsychic experience (Hayes et al., 2000). According to this theory new mothers have, during their role transition, numerous disruptions in their interpersonal relationships and have opposition between desired level of
support and actual level of support they receive (Beck, 2002; Hayes et al., 2000). Self-labelling theory suggests that there is a discrepancy between a mother’s feelings and society’s expectations of motherhood (Beck, 2002).

There are some popular explanations regarding causes of PND. Most recent studies relate PND to social factors such as lack of support from the family and/or partner (Abiodun, 2006; Andajani-Sutjahjo et al., 2007; Dankner et al., 2000; Dennis & Ross, 2006a; Green et al., 2006; Lee et al., 2004; Rahman, Iqbal, & Harrington, 2003), while other studies relate PND to socio-cultural factors such as medicalisation of childbirth which may interfere with sensitive care of the mother during postnatal period. Dissatisfaction with the labour and delivery process and care has been also associated with increased risk for PND. Other sources of culturally-based stress are standard hospital routines which disrupt feeding, social contact and rest; overmedication during labour and birth; and rapid discharge from the hospital (Abushaikha & Oweis, 2005; Hayes et al., 2000; Hiltunen, Raudaskoski, Ebeling, & Moilanen, 2004; Oweis & Abushaikha, 2004; Willinck & Cotton, 2004).

Cox et al. (1987) stated that PND is a product of western society because postnatal psychosocial support is lacking in such societies. Women from developed western countries who have given recently birth are usually given insufficient assistance in the postnatal period before resuming their expected roles. They are expected to independently care for their babies and families almost immediately after giving birth, and are usually alone and socially isolated as their partners return to work and extended family assistance stops (Hayes et al., 2000). Some researchers recognise that development of PND have been linked to childcare stressors, delivery of an infant at risk for medical problems, and difficult infant temperament (Agoub et al., 2005; Alami et al., 2006; Aydin et al., 2005; Dennis & Ross, 2006a; Hayes et al., 2000).

PND is also related to the genetic factors in individual vulnerability, it is important to note that previous psychiatric history in the woman and her family (including PND) and previous treatment for psychiatric illness,
associated with the development of PND (Hayes et al., 2000; McCoy et al., 2006). Attempts to relate PND to hormonal factors (estrogen, progesterone, thyroid hormone, prolactin, and other neuro-chemical products) have not yielded conclusive positive findings possibly because most studies have been methodologically flawed by inadequate sample size and inappropriate controls (Hayes et al., 2000). Beck (2001) stated that stressful life events and/or hormonal events can disrupt the delicate balance of brain biochemistry resulting in an emotional distress, such as postnatal depression.

**Conclusion**
It is probable that the illness is ordinarily a result of an interaction between emotional vulnerability, physical changes and possibly stressors, environmental stress and major life events. It seems clear that the risk factors of PND in different countries are the same but there are some factors that are more common in developing countries related to cultural differences. These risk factors are: gender discrimination and conflicts with mother-in-law.

**Purposes of the research study**

**First purpose**
The first purpose of this research study is to determine the incidence of antenatal and postnatal depression in a cohort of birthing women in Jordan. The present study utilised a prospective design with a large, representative sample of birthing women. The study also employed standardised measures to identify the incidence and adhered to the timeframe used and recommended by most of previous studies for measuring incidence of antenatal and postnatal depression.

**Second purpose**
The identification of contributing factors in the development of antenatal and postnatal depression requires further exploration. In previous studies that investigated incidence of antenatal and postnatal depression, several factors
were identified as placing women at risk for developing antenatal and/or postnatal depression. Briefly, these factors included demographic factors; obstetric history; parity; psychological factors of depression, anxiety, stress, and worry; lack of social support; personal and family history of psychiatric illness; unplanned pregnancy; stressful life events; marital problems; socio-cultural factors such as mother-in-law conflict and gender of the baby; poor parenting knowledge; low self-efficacy; intrapartum factors such as obstetric intervention and quality of care. Thus, the second purpose of the present study is to identify and discriminate amongst contributing factors of antenatal and postnatal depression.

1) It is hypothesised that development of antenatal and/or postnatal depression is influenced by antenatal variables (in the present study, antenatal variables related to all variables investigated during the third trimester of pregnancy). These variables include psychological factors of anxiety, stress, and worry; low level of social support; stressful life events; unplanned pregnancy; marital problems; mother-in-law conflict, poor parenting knowledge; and low maternal self-efficacy. 2) It is hypothesised that antenatal depression is a strong predictor of PND. 3) It is hypothesised that increased obstetric interventions during labour and birth are positively related to the development of PND. 4) It is hypothesised that a women’s perception of care received during labour and birth is negatively related to the development of PND. That is, the less satisfied a woman is with her care, the more likely she is to develop PND. 5) It is hypothesised that postnatal psychological factors of anxiety and stress are positively related to the development of PND. 6) It is hypothesised that social support is negatively related to PND. 7) It is hypothesised that the gender of the baby is associated with the development of PND. That is, the woman who gives birth to a female baby is more likely to develop PND.
CHAPTER 3

Method

The methodological considerations for the current longitudinal prospective study are outlined in the first section of this chapter. The setting of the study, time of data collection, participants’ section criteria, and size of the sample are discussed in section two. Section three discusses the methods of data collection. Descriptions of the instruments are outlined in section four. The three phases of the study are discussed in section five. Section six discusses the proposed statistical analysis used in the study, and the pilot study is discussed in the final section.

Design issues

The review of the literature identified several methodological weaknesses of other studies that investigated the incidence and associated factors of PND. One methodological weakness was the timing of the administration of measures. One such practice is to interview women immediately after birth when up to 80% of women experience transient mood disturbance (Johnstone et al., 2001; Righetti-Veltema et al., 1998). Furthermore, research instruments were not always standardised (Chan et al., 2002; Cooper & Murray, 1997); and some studies used only one standardised instrument to assess incidence and risk factors of PND (e.g., Ghubash & Abou-Saleh, 1997). Sample sizes in several studies have been small (Lee, Alexander, Chiu, & Chung, 2000; Werrett & Clifford, 2006); and some generalisations have been made from small samples (Ghubash & Abou-Saleh, 1997; Lee et al., 2000). A number of principles were therefore considered important in the design of the study to ensure enhanced methodological rigour in addressing the research questions of the study.

1. A representative sample of birthing women is required to determine the incidence of antenatal and postnatal depression.
2. The study design needs to be prospective in design to counter arguments regarding pre-existing psychological and social factors impacting on birth outcomes.

3. A longitudinal design over a specified time frame will enable the incidence and symptoms of antenatal and postnatal depression to be identified.

4. Standardised instruments for measuring the psychological health of participants will be used to improve reliability and validity.

5. The timing of data collection will enable the identification of participants who meet the criteria for antenatal and postnatal depression.

6. The use of more than one standardised screening tool will increase the sensitivity of detection of PND.

7. Sampling procedures taken during recruitment need to ensure that the sample is not skewed. In particular, steps need to be taken to minimize the number of women who are at high obstetric risk.

**Setting**

Recruitment took place in the antenatal clinics in the Princess Badeah teaching hospital and five health centres to maximise the representativeness of the final sample. Two health centres located in the urban areas of Irbid city while, the other three are located in the rural areas. Princess Badeah teaching hospital is located in the centre of Irbid city and it offers the maternity services to women from both the urban and rural areas of the city. Antenatal care is typified by a schedule of antenatal clinic visits. Antenatal clinics visits in the hospital are either to a high risk clinic or to the general clinic and care is offered by obstetricians. General clinic services are offered in the health centres and antenatal care is offered in conjunction with a general practitioner.

Irbid city is located in the northern part of Jordan. Irbid is the second largest city in Jordan after the capital Amman. The total population of Irbid is around 300,000. Irbid is an agricultural city but has a good number of industries. It is
fed by several springs (the Yarmuk River is the main water source) (Kjeilen, 2005).

Irbid consists of a large number of villages. In each village there is an elementary school (high schools are only in large villages), mosque, health centre, and post office. There is a general store found in each village and the owners are usually farmers from the same village (Kjeilen, 2005).

**Time of data collection**
Data for the present study were collected between November 2005 and August 2006.

**Participants**

**Inclusion criteria**
Women in the third trimester expecting their first or subsequent baby and between 18 and 45 years old were recruited into the study. In addition, potential participants were speak and read Arabic language, expected to remain in the area for a minimum of seven months after birth and were willing to participate in telephone interviews following childbirth.

**Exclusion criteria**
Pregnant women in first or second trimesters and women whose baby or fetus died.

**Sample size**
The sample size for the present study was determined by Cohen's (1988) formula. Cohen identified three levels for the effect of the sample size when using Pearson Product Moment Correlation: small 0.1, medium 0.3, and large 0.5. Based on this formula and the birth rate at Princess Badeah Teaching Hospital which was 9128 births in 2004, the sample size was determined to be 360 participants.
**Method of data collection**

Telephone interviews (or face-to-face interviews if ready access to a private telephone was unavailable) were chosen for data collection following discharge from hospital. A telephone interview approach was based on the success of previous studies that used telephone interviewing to gather potentially emotionally charged information in a sensitive way whilst achieving low attrition rates (Gamble, 2003). Telephone interviews have been used for diagnostic interviews and to administer an intervention (Creedy et al., 2000; Gamble, 2003). The use of the telephone to contact postpartum women is effective in providing women with one-to-one contact and is practical given the demands of early motherhood (Gamble, 2003).

**Description of instruments**

**Antenatal questionnaire**

In order to establish the representative nature of the sample a range of background data was obtained. Participants provided contact details and information on age, completed educational level and occupational status, due date of delivery and parity.

Women were asked to identify any previous obstetric/gynaecological complications including previous operative birth, breech birth, premature birth and haemorrhage and whether they have previously experienced a stillbirth, miscarriage or death of an infant/child.

The questionnaire also sought participants’ feelings regarding her current pregnancy, her relationship with her husband and mother-in-law, history of psychiatric illness including antenatal and postnatal depression, family history of psychiatric disorders (including antenatal and postnatal depression), and any stressful life events during current pregnancy and in the previous year. The antenatal questionnaire is shown in Appendix A.
Edinburgh Postnatal Depression Scale (EPDS)

The EPDS was developed by Cox et al. (1987). It was used by primary care health professionals to screen mothers for PND. As with all screening tools, the EPDS cannot in itself confirm a diagnosis of PND (Willinck & Cotton, 2004). The EPDS is a 10-items self-report measure. Each item is scored on a four-point scale (from zero to three), according to increased severity of the symptoms, minimum and maximum total scores being 0-30 respectively. The mother underlines one of four choices that best identifies how she has been feeling during the past week. Most women can complete the scale within five minutes (Horan-Smith & Gullone, 1998).

The EPDS with a cut-off score of > 12 has previously been shown to have high sensitivity, specificity and positive predictive power for PND (Cox et al., 1987; Johnstone et al., 2001). Evans et al. (2001) reported that a score of equal to or greater than 13 gave the best estimate of prevalence of antenatal and postnatal depression. Matthey, Barnett and Elliott (1997) stated that the cut-off points are different for different languages and cultures. Therefore, when language versions other than English are used, the scores should be interpreted carefully. EPDS also has been validated as a screening measure for depression during pregnancy. In the present study, scores of equal to or greater than 13 were indicative of depression during pregnancy and postpartum (Cox et al., 1987; Evans et al., 2001).

EPDS has been used widely in European-based studies of PND (Holden, Sagovsky & Cox, 1989; Wickberg & Hwang, 1996) and it has been validated for use in postpartum studies of women in several other countries (Areias et al., 1996; Miller et al., 2006; Montazeri et al., 2007; Werrett & Clifford, 2006). EPDS has been used in a Jordanian study of PND among primiparous women, the Cronbach’s alpha-reliability coefficient for internal consistency was 0.87. According to George and Mallery (2003) the acceptable value of Cronbach’s alpha is above 0.70. This means that EPDS is reliable for use in a
Jordanian study of childbearing women (Oweis, 2001). The EPDS is shown in Appendix B.

Maternity Social Support Scale (MSSS)

MSSS represents the social factors associated with PND. These factors are lack of family support; low friendship network; lack of help from partner/husband; conflict with partner/husband; feeling controlled by partner/husband; and feeling unloved by partner/husband. The social factors were combined in a six-items, self report, five-point Likert scale (Webster et al., 2000). Scoring for two-items “There is conflict with my partner/husband” and “I feel controlled by my partner/husband” are reverse scored.

The total possible score for the scale is 30, with scores categorised as low support (6-18), medium (19-24) and > 24 (adequate support) (Webster et al., 2000). MSSS is simple to administer, provides a useful dimension to prenatal assessment and gives an opportunity for the health care professionals to start discussing topics with the women, such as domestic violence, that are sometimes difficult to discuss (Webster et al., 2000). The Cronbach’s alpha for the MSSS was 0.74 during pregnancy and 0.70 postpartum (Gamble, 2003).

MSSS was chosen to be used in the current study because it assesses levels of support women receive from their husbands, families and friends as well as it assesses women’s relationships with their husbands. These two factors were assessed in the current study. In addition, the Cronbach’s alpha for the MSSS as reported in the pilot study was 0.87 indicating good internal consistency when used with this population. The MSSS is shown in Appendix C.

Cambridge Worry Scale (CWS)

The Cambridge Worry Scale (Statham et al., 1997) measures concerns and fears related to pregnancy, labour, caring of the baby, relationship and socio-
economic issues. It consists of 10-items rated on a six-point Likert scale (0-3 = less than major worry, 4-5 = major worry), with ‘your baby’s health at the moment’ being one example of ‘baby worry’ (Ohman, Grunewald, & Waldenstrom, 2003; Statham et al., 1997). Ratings for each item are summed to give a total score. This scale can be administered during pregnancy and postpartum, used with women and men, and can be modified to more accurately measure worry in a specific population (Ohman, Grunewald, & Waldenstrom, 2003; Statham et al., 1997). The CWS discriminated better between women with different reproductive histories than measures of State and Trait Anxiety and it is a reliable and valid tool for assessing the extent and content of worries in specific situations (Green, Kafetsios, Statham, & Snowden, 2003). During pregnancy, the Cronbach’s alpha for the CWS was 0.78 (Green et al., 2003). The CWS is shown in Appendix D.

Depression, Anxiety, and Stress Scale-21 Items (DASS-21)

The DASS is a set of three self-report scales, designed to measure depression, anxiety, and stress. Participants are asked to rate the degree to which each symptom was experienced over the last week on a four-point Likert scale from 0 (did not apply) to 3 (applied to me very much, or much of the time). Each subscale in the DASS-21 consists of seven items and scores are calculated by summing the responses for the relevant items (Lovibond & Lovibond, 1995).

The depression subscale consists of items that measure symptoms typically associated with dysphoric mood (e.g. worthlessness). The anxiety sub-scale includes items that are primarily related to physical arousal, panic attack and fear (such as trembling). The stress subscale consists of items that measure symptoms such as tension, irritability, and a tendency to overreact to stressful events. The DASS-21 has been tested with clinical and community groups. The Cronbach’s alpha for its sub-scales was 0.94 for depression, 0.87 for anxiety, and 0.91 for stress in a comparable study with childbearing women (Gamble, 2003). Miller et al. (2006) reported in their cross-sectional study with
325 primiparous women that Cronbach’s alpha for DASS sub-scales was 0.84 for depression, 0.77 for anxiety, and 0.86 for stress. Antony et al. (1998) reported that the DASS-21 differentiates anxiety from depression better than the state trait anxiety inventory-trait version (STAI-T).

Symptom severity scores for depression, anxiety, and stress are provided by the DASS-21. For depression a range of scores between 0-9 is considered normal, 10-13 considered mild depression, 14-20 mean moderate depression, 21-27 is consistent with severe depression and greater than 27 equal severe depression. The range of scores for anxiety are: normal (0-7), mild (8-9) is consistent with moderate anxiety (10-14), severe anxiety (15–19) and extremely severe anxiety is represented by a score of greater than 20. For stress, scores between 1-14 is in the normal range, 15-18 is mild, 19-25 is moderate, 26-33 is severe, and greater than 34 is extremely severe stress. The DASS-21 is shown in Appendix E.

**Perceived Knowledge Scale**

The Perceived Knowledge Scale was designed and used for quality assurance purposes in hospitals across New South Wales (Smedley, 1999). It is used to measure knowledge related to labour, care of infant and the role of a parent. Participants rate their perceived knowledge on 11 topics on a five-point Likert scale from one (very poor) to five (very good). The perceived knowledge scale consists of four topics related to labour and birth, one to hospital services, one to rights and responsibilities, and five to postnatal issues. The rating given to each item is summed to give a total score. It is shown in Appendix F.

**Perceived Self-Efficacy Scale (PSES)**

The Perceived Self-Efficacy scale is used to measure adjustment to parenthood (Reece, 1992). This self-report tool consists of 25-items about pre and postnatal parental expectations and perceived self-efficacy in relation to tasks they will perform in caring for their babies, their role as a parent, and
relationship with their partner. Participants rate their confidence on a scale of 0 (can not do) to 10 (certain can do) in their ability as a parent. Examples of statements to be rated by the parent are ‘I will be able to manage the feeding of my baby’ and ‘I will be able to tell when my baby is sick’. In the prenatal scale each statement has the prefix ‘I will’, with the postnatal scale being ‘I can’. The total score is calculated by summing the rating on each statement. Perceived self-efficacy scale has been validated for use during pregnancy and postpartum (Reece, 1992; Reece & Harkless, 1998). According to Reece (1992) the Cronbach’s alpha for Perceived Self-Efficacy was 0.91 when used at one month postpartum and 0.86 at three months postpartum. Similarly, Reece and Harkless (1998) reported that Cronbach’s alpha for Perceived Self-Efficacy was 0.92 during pregnancy and 0.97 in the postpartum period. It is shown in Appendix G.

Postnatal questionnaire

This questionnaire was developed and used by Gamble (2003). The questionnaire aim to identify the level of obstetric interventions and at the same time it measures women’s satisfaction with their labour and birth. The 33-items seek information on obstetric interventions and procedures (e.g. predelivery procedures and associated events of delivery such as episiotomy and suturing), the course of labour and birth (e.g. onset of labour, length of labour, pain relieving drug, mode of birth), the options and choices offered to women, their level of satisfaction with the information provided, the quality of interpersonal skills of the attending health professionals, and if they had a chance to talk to a health professionals about their feelings in relation to the birth.

The questionnaire was revised for use with Jordanian women. As some of the obstetric interventions and poor satisfaction with labour and birth were mentioned in many studies as a risk factors for PND, this questionnaire was used to investigate the relationship between level of obstetric interventions women experienced during labour and birth and their satisfaction with labour
and birth and the development of PND. This questionnaire is shown as Appendix H.

**Procedure**

**Phase 1: Pilot Study**

Before starting data collection for the major study, instruments were piloted to examine their validity with Jordanian women, determine the time required to complete each instrument and if any questions needed to be altered, added or removed from any instrument. The internal reliability of standardised instruments using Cronbach’s alpha was calculated.

**Setting**

The study was conducted in the antenatal clinics and postnatal ward at Princess Badeah Teaching Hospital in Irbid City.

**Time of data collection**

Data for pilot study was collected in August 2005.

**Selection criteria**

Pregnant women in the third trimester and postpartum women, who speak and read Arabic language, primigravida or multigravida and between 18 to 45 years old participated in the pilot study. Pregnant women in first or second trimesters and postpartum women whose baby or fetus had died were excluded.

**Sample size**

The pilot study was conducted with 20 pregnant women and 20 postpartum women.
Instruments
Instruments used in the present study and in the major study were translated into Arabic to minimise barriers of assessment with Arabic participants. The translated version of the instruments were back-translated to ensure content and semantic validity. Content validity was assessed by a panel of experts in nursing and midwifery who reviewed the items for clarity, relevance, comprehensiveness, understandability, and ease of administration.

Procedure for the pilot study
The researcher conducted the interviews of the pilot study at the antenatal clinics and postnatal wards. Midwives or nurses in each antenatal clinic and postnatal wards initially identified women who were in the last trimester of pregnancy and postpartum women who were in a stable condition, and asked if they would be interested in speaking to the researcher. The researcher then approached the woman and provided verbal and written information about the study and gained written consent. The women then interviewed to complete the survey tools. Pregnant women completed the antenatal survey tools. While, postpartum women completed the postpartum survey tools. The antenatal survey comprised the antenatal questionnaire, EPDS, MSSS, CWS, DASS-21, Perceived Knowledge Scale, and Perceived Self-Efficacy Scale. The postnatal survey comprised the postnatal questionnaire, EPDS, MSSS, and DASS-21. The interviews were conducted away from the general antenatal clinics and postnatal wards to provide as much privacy as possible and in the absence of the husband. Interviews involved determining time required to complete each measure, and assessing face validity of instruments by asking about the nature of the questions, clarity and if there were any questions that need to be removed or added to any instruments.

Results
The time required to complete each instruments were as follow: 10 minutes for prenatal questionnaire, three minutes for Maternity Social Support Scale, seven minutes for Edinburgh Postnatal Depression Scale, five minutes for the
Cambridge Worry Scale, five minutes for the Perceived Knowledge scale, 10 minutes for Depression, Anxiety, and Stress Scale-21, 10 minutes for Perceived Self-Efficacy Scale, and 25 minutes for the postnatal questionnaire.

The standardised instruments were assessed using Cronbach’s alpha for reliability. The Cronbach’s alpha coefficient normally ranges between zero and one (George & Mallery, 2003). However, there is no lower limit to the coefficient. The closer Cronbach’s alpha coefficient is to one (1.0) the greater the internal consistency of the terms in the scale (George & Mallery, 2003). According to George and Mallery (2003) the interpretation of the Cronbach’s alpha coefficient values are as follows: an alpha of >0.9 is excellent, > 0.8 is good, > 0.7 is acceptable, > 0.6 is questionable, > 0.5 is poor, and < 0.5 is unacceptable.

The Cronbach’s alpha for each instruments were as follows: 0.85 for the Edinburgh Postnatal Depression Scale, 0.87 for Maternity Social Support Scale, 0.89 for the Cambridge Worry Scale, 0.90 for Perceived Knowledge Scale, and 0.91 for the Perceived Self-Efficacy Scale. The reliability coefficient was calculated for each sub-scale of the DASS-21. The Cronbach’s alpha value was 0.83 for DASS-depression Sub-scale, 0.81 for DASS-anxiety Sub-scale, and 0.87 for DASS-stress Sub-scale. Based on the interpretation reported by George and Mallery (2003), all of the instruments piloted were good or excellent to be used in the major study.

All of the instruments were able to be understood by the women and they didn’t recommended any questions be added or removed from any instruments.
Phase 2: Recruitment and antenatal measures

The researcher conducted the first interview at the antenatal clinics. Midwives or nurses in each clinic initially identified women who were in the last trimester of pregnancy, and asked if they would be interested in speaking to the researcher. The researcher then approached the women and provided verbal and written information about the nature of the study. Immediately after written consent was obtained, participants then interviewed to complete the antenatal measures (in this way women were provided with the opportunity to have the meaning of any questions clarified). The interview took approximately 50 minutes to complete and comprised of the antenatal questionnaire, EPDS, DASS-21, MSSS, CWS, Perceived Self-Efficacy Scale and Perceived Knowledge Scale. The interview was conducted away from the general antenatal clinics in order to provide as much privacy as possible and in the absence of the husband. Administration of antenatal measures was a usual part of appointments with doctor/midwife. The researcher arranged with doctors and midwives in the participating clinics to provide an opportunity to conduct the interviews with the women before or after them.

Phase 3: Follow-up at six to eight weeks postpartum

At six to eight weeks after birth all participants were contacted by telephone (or visited for a face-to-face interview if ready access to a private telephone was unavailable) for the first postpartum interview. This included the postnatal questionnaire, EPDS, MSSS, DASS-21 and took approximately 45 minutes to complete. The timing of the data collection period was influenced by previous research which indicated that the perinatal vulnerability to depression begins before birth and extends beyond six weeks postpartum (Stowe et al., 2005).

Phase 4: Follow-up at six months postpartum

The final interview was conducted by telephone (or face to face if there was no telephone access) at six months postpartum using EPDS, MSSS and DASS-21 and took approximately 20 minutes. Studies using reliable
methodology, suggest that about 10% of mothers suffer from PND as assessed between three to six months postnatally, with a higher prevalence in the early postnatal period (closer to birth) (Boyce et al., 1993; Stowe et al., 2005).

**Ethical considerations**
Before administration of the survey participants received information verbally and in writing about the nature and purposes of the study and were notified of their right not to participate, ability to withdraw at any time without explanation, and to not answer any questions as they wish. Opportunities were provided for participants to ask questions at any stage. Participants were required to sign a consent form. The information sheet and consent form are presented in Appendix I.

The study did not propose to change or challenge participants in any way. The purpose was to determine the incidence and associated factors of antenatal and postnatal depression. The researcher (doctoral candidate), who has nursing and midwifery experience, conducted all interviews. No potential risks to women were associated with the participation in the study. It is not anticipated that individual participants would benefit except through having an opportunity to acknowledge their distress (if this is the case) and to obtain information about help that is available should they wish to use it. Any women identified as being in need of psychological assistance during the course of the study were referred to an appropriate clinic for full assessment and counselling would be offered.

Participants were provided their names on the personal details sheet only and a coding system was utilised on their particular questionnaire. In this way data did not contained any identifiable information.
The Human Research Ethics Committee at Griffith University gave approval to conduct the study dependent on approval from all participating centres. Approval from participating centres was obtained prior to data collection.

**Proposed statistical procedure**

Data were entered and analysed using SPSS version 11.5 (2000). Collected data were reviewed for completeness and consistency within a single data form and among data forms. The accuracy of data coding and computer entry were checked by comparing the computerised data with the original data for a random sample (10%) of the database. The distribution of each variable was reviewed for skewed or kurtotic distribution.

Frequencies, mean and standard deviations were calculated as appropriate on the demographic variables. The properties of the Edinburgh Postnatal Depression Scale (EPDS), Maternity Social Support Scale (MSSS), Cambridge Worry Scale (CWS), Depression, Stress, and Anxiety Scale-21 (DASS-21), Perceived Knowledge Scale (PKS), and Perceived Self-Efficacy Scale (PSES) were assessed using Cronbach’s alpha for reliability (internal consistency). The relationship between categorical variables were examined using Chi Square analysis.

To determine the incidence and severity of antenatal and postnatal depression among Jordanian women sub-scores and total scores on standardised measures were calculated. A repeated measures analysis of variance was used to examine the change in scores from third trimester to six to eight weeks and six months postpartum.

To determine the relationship between antenatal variables and the development of antenatal depression a series of stepwise multiple regression analyses were undertaken. As well, to determine relationship between antenatal variables, obstetrics interventions, and satisfaction with care during
labour and birth to the development of PND a series of stepwise multiple regression analyses were undertaken.

An alpha level of 0.05 was used for all statistical tests.
CHAPTER 4

Results: Demographics, obstetric events, measures and incidence of antenatal and postnatal depression

This chapter presents the analysis of some results and has three main aims. Firstly, through the use of descriptive statistics, a comparison of demographic characteristics of this sample with the available national figures has been undertaken to determine the representative nature of the sample. The results of measures in regard to parity, a measure of depression, anxiety, stress, worry, social support, perceived parenting knowledge, and perceived self-efficacy have been outlined to establish the pre-existing characteristics of the sample. Secondly, the chapter outlined the birth experience of women from Phase 2 of the study. The incidence of obstetric interventions during labour, birth, and the postpartum period has been presented and is also compared with the available National Perinatal Statistics Data (Department of Statistics and Macro International Inc, 2003). The participants’ perception of their intrapartum care has been reported. Thirdly, the reliability and validity of measures used in the present study have been established. Finally, the incidence of both antenatal and postnatal depression has been presented and compared with the incidence reported in different studies from both developed and developing countries. Therefore, this chapter addresses the sampling, validity, and reliability issues of the study in addition to the incidence of antenatal and postnatal depression before progressing to the main results in the next chapter.

Response rate
A total of 459 women were approached to participate in the study. Of these, 83 women refused to be involved stating that they were not interested in participating. No other reason was offered. Sixteen women commenced Phase one but chose not continue in the study. Data from these women were not included in the study. The total number of women completing Phase one was 360. A flow diagram (Figure 1) depicts information from the three phases
of the study (recruitment and antenatal measures, follow-up at six to eight weeks postpartum, and follow-up and analysis at six months postpartum) (Moher, Schulz, & Altman, 2001). Of the 360 women completing Phase one, seven women (2%) did not participate in Phase two because they could not be contacted by telephone or mail. Therefore, the total number of women completing Phase two was 353. All women completing Phase two of the study were successfully contacted at six months postpartum (Phase 3).

Figure 1: Response rates from the three phases of the study
**Demographic data**

Demographic characteristics are shown in Table 4.1. Available national figures for Jordan are shown for comparison. The sample was similar to the Irbid city birthing population for age and education.

The mean age of women in the sample was 30.36 years (range of 18-45 years, sd = 7.25 years) which is the same as the Irbid city population of birthing women. There was a slight increase in the number of women in the 20-24 year age group and a corresponding slight decrease in the 30-34 and 35-39 year age groups in the study sample.

The occupational status of participants reflects trends in the general population figures for women. The data for this study is more inclusive of the activities of childbearing women by including the categories of housewife and retirement. The largest proportion of participants (28.9%) listed “skilled work” as their occupation at the time of the survey, closely followed by office work (25.8%). The inclusion of the extra categories, particularly “office work”, may account for discrepancies in the figures for the Professional/associate professional work, home duties and unemployed categories. However, amongst the other categories contained in both data sets, the rates parallel each other.

Just under 40% of women had achieved a bachelor degree. A further (38.5%) had a diploma and (22.1%) of women had secondary education or less. Slightly fewer women in the sample had achieved a diploma compared with national sample.
Table 4:1: Demographic characteristics of participants compared with the National population

<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>Sample n (%)</th>
<th>National population* data %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age Group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 20 years</td>
<td>23 (6.5)</td>
<td>7.2</td>
</tr>
<tr>
<td>20 – 24</td>
<td>67 (19.0)</td>
<td>21.1</td>
</tr>
<tr>
<td>25 – 29</td>
<td>66 (18.7)</td>
<td>17.3</td>
</tr>
<tr>
<td>30 – 34</td>
<td>81 (22.9)</td>
<td>24.2</td>
</tr>
<tr>
<td>35 – 39</td>
<td>76 (21.5)</td>
<td>20.8</td>
</tr>
<tr>
<td>40 years and over</td>
<td>40 (11.3)</td>
<td>9.4</td>
</tr>
<tr>
<td>Total</td>
<td>353</td>
<td></td>
</tr>
<tr>
<td><strong>Occupational category</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skilled work</td>
<td>102 (28.9)</td>
<td>-</td>
</tr>
<tr>
<td>Office work</td>
<td>91 (25.8)</td>
<td>-</td>
</tr>
<tr>
<td>Professional/associate professional work</td>
<td>60 (17.0)</td>
<td>-</td>
</tr>
<tr>
<td>Home duties</td>
<td>44 (12.5)</td>
<td>-</td>
</tr>
<tr>
<td>Unemployed</td>
<td>56 (15.9)</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>353</td>
<td>-</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor (or more)</td>
<td>139 (39.4)</td>
<td>36.9</td>
</tr>
<tr>
<td>Diploma</td>
<td>136 (38.5)</td>
<td>41.3</td>
</tr>
<tr>
<td>Secondary or less</td>
<td>78 (22.1)</td>
<td>21.8</td>
</tr>
<tr>
<td>Total</td>
<td>353</td>
<td></td>
</tr>
</tbody>
</table>

* = Department of Statistics and Macro International Inc (2003)

**Obstetric details**

Selected obstetric characteristics are shown in Table 4.2. Available national birthing figures for Jordan are shown for comparison. There was a slightly higher percentage of multiparous women in the sample than in the national birthing population while the rate of nulliparous women were lower in the sample than in the national birthing population. Rates of spontaneous vaginal birth were higher in the sample than in the national birthing population. Rates of emergency and elective caesarean sections in the sample were lower than in the national birthing population however, rates of forceps/vacuum delivery were slightly higher in the sample than in the national birthing population.

Table 4:2: Obstetric characteristics of the sample

<table>
<thead>
<tr>
<th>Obstetric Characteristics</th>
<th>Participants n(%)</th>
<th>National birthing population %*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiparity</td>
<td>224 (63.5)</td>
<td>54.9</td>
</tr>
<tr>
<td>Spontaneous labour</td>
<td>209(58.3)</td>
<td>49.8</td>
</tr>
<tr>
<td>Emergency caesarean section</td>
<td>34 (10.6)</td>
<td>14.7</td>
</tr>
<tr>
<td>Elective caesarean section</td>
<td>33 (9.3)</td>
<td>16.3</td>
</tr>
<tr>
<td>Forceps/vacuum extraction</td>
<td>77 (21.8)</td>
<td>19.2</td>
</tr>
</tbody>
</table>
### Table

<table>
<thead>
<tr>
<th>Description</th>
<th>Frequency (%)</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Induced labour</td>
<td>94 (26.6)</td>
<td>NA</td>
</tr>
<tr>
<td>Lithotomy position</td>
<td>281 (87.8)</td>
<td>NA</td>
</tr>
<tr>
<td>Labour &gt;11 hours</td>
<td>171 (53.4)</td>
<td>NA</td>
</tr>
<tr>
<td>Labour more painful than expected</td>
<td>126 (39.4)</td>
<td>NA</td>
</tr>
<tr>
<td>Gas and Oxygen (nitrous oxide)</td>
<td>94 (29.4)</td>
<td>NA</td>
</tr>
<tr>
<td>Pethidine injection</td>
<td>62 (19.4)</td>
<td>NA</td>
</tr>
<tr>
<td>Gas and oxygen (nitrous oxide) and pethidine injection in labour</td>
<td>136 (42.5)</td>
<td>NA</td>
</tr>
<tr>
<td>Without pain killer during labour</td>
<td>28 (8.8)</td>
<td>NA</td>
</tr>
<tr>
<td>Unhappy with what was done to help relieve the pain during labour</td>
<td>134 (45.9)</td>
<td>NA</td>
</tr>
<tr>
<td>Number of vaginal examinations &gt;8</td>
<td>140 (43.7)</td>
<td>NA</td>
</tr>
<tr>
<td>Number of vaginal examinations &lt;=8</td>
<td>180 (56.3)</td>
<td>NA</td>
</tr>
<tr>
<td>Episiotomy</td>
<td>135 (47.2)</td>
<td>NA</td>
</tr>
<tr>
<td>Required sutures</td>
<td>146 (90.1)</td>
<td>NA</td>
</tr>
<tr>
<td>Very painful suturing</td>
<td>75 (50.3)</td>
<td>NA</td>
</tr>
<tr>
<td>Haemorrhage after the birth</td>
<td>80 (28)</td>
<td>NA</td>
</tr>
<tr>
<td>Postpartum complication for mother</td>
<td>45 (15.7)</td>
<td>NA</td>
</tr>
</tbody>
</table>

* = Department of Statistics and Macro International Inc (2003)
NA = Not available

### Dissatisfaction with care

Certain aspects of satisfaction with care were measured in the present study. Overall, most women were dissatisfied with the care they receive however, there are some areas with significant percentages of women expressing satisfaction. For instance, 192 women (54.4%) felt that the midwives were “not helpful at all” or “very little help”, and 113 women (38.7%) reported that the doctor was “not helpful at all” or “very little help”. Sixty-one women (17.3%) reported that the doctor was not present for the birth. In relation to their overall care, 91 women (25.8%) said their care was “very poor” or “poor”.

About a fifth of women (n = 76, 80.9%) were either given “some” information about why induction was necessary or not given any explanation. Most women (n = 266, 75.4%) felt they “sometimes” or “often” wanted more information while in labour and 109 women (30.9%) felt they were not kept fully informed about what was happening. Half the participants (n = 270, 76.5%) felt that to some extent, the doctors or midwives made decisions without taking their wishes into account. When asked if the doctors or midwives could have done anything differently or better, 298 women (84.4%) responded “yes, definitely” or “yes, possibly”.
Women were asked if they had talked with the hospital staff about how they felt about their birth experience. Only 136 (38.5%) of women reported that they had an opportunity to talk to staff about their feelings regarding the birth and 217 (61.5%) of women reported that they hadn’t. When asked if they would have liked to talk more to someone about how they felt about the birth; 304 women (86.1%) said “yes, definitely” or “yes, possibly”. Women were asked if there was anyone at the labour and/or birthing that they did not want to be there. Many women (n = 158, 44.8%) identified “yes” (doctors, nursing and midwifery students) and 195 (55.2%) identified “no”. When asked who would they prefer to present; 204 women (57.8%) said “mother”, 106 women (30%) said “husband”, five women (1.4%) said “sister” and 38 women (10.8) said “nobody”.

**Feeling during labour**

During the first postnatal interview women were asked about their feelings during labour (more than one response could be identified); 210 women (65.6%) reported that they felt worried, anxious or frightened when labour first began, 107 women (33.4%) reported that they were somewhat worried, anxious or frightened and three women (0.9%) reported that they were not worried, anxious or frightened. Just under half the women (n = 166, 47%) reported that they felt confident in labour; but 252 women (71.4%) felt out of control; 233 (66%) acknowledged that they felt frightened; and 242 women (68.6%) said that they felt helpless.

**Gender of the baby**

One hundred and thirty-seven women gave birth to a male baby (38.8%) and two hundred and sixteen women reported that they gave birth to a female baby (61.2%). This finding is not surprising given that the number of females in Jordan is higher than the number of males. In Jordan, there are 1,047,084 females and 941,220 males between 0-14 years (Central Intelligence Agency, 2005). However, infant mortality rates are 20.75 deaths/1,000 female alive birth and 13.75 deaths/1,000 males alive births (Central Intelligence Agency,
This may be related to the possibility of preferential care of male offspring (Al-Qutob et al., 2004; Sullivan, Adlakha, & Suchindran, 1983).

**Reliability of instruments**

The reliability of the six standardised instruments used in the study was reported in Chapter 3. The reliability attribute for the EPDS, DASS-21, MSSS, CWS, Perceived Knowledge Scale and PSES was tested using Cronbach’s alpha.

**Edinburgh Postnatal Depression Scale (EPDS)**

The Cronbach’s alpha value for the EPDS was calculated for each Phase of the study. For this sample, The Cronbach’s alpha value for the EPDS used antenatally and at six months postpartum was $r = 0.81$. At six to eight weeks postpartum, the Cronbach’s alpha value for the EPDS was $r = 0.83$.

**Depression, Anxiety and Stress Scale–21 items (DASS-21)**

The reliability coefficient was calculated for each sub-scale of the DASS-21 at the three time periods. The Cronbach’s alpha value for the DASS-depression sub-scale when it was used in pregnancy and at six months postpartum was $r = 0.82$. At six to eight weeks postpartum the Cronbach’s alpha value for the DASS-depression scale was $r = 0.83$.

DASS-anxiety scale used during pregnancy was $r = 0.80$. The Cronbach’s alpha value for the DASS-anxiety scale used at six to eight weeks postpartum was $r = 0.79$. At six months postpartum, the Cronbach’s alpha value for the DASS-anxiety scale was $r = 0.76$.

The Cronbach’s alpha value for the DASS-stress scale used antenatally and at six to eight weeks postpartum and at six months postpartum was $r = 0.88$. The internal consistency for each of the DASS-21 sub-scales was good ($\geq 0.8$), except for the use of the DASS-anxiety sub-scale administered at six to eight weeks postpartum and six months postpartum ($< 0.8$).
Maternity Social Support Scale (MSSS)

The Cronbach's alpha for the MSSS when used with participants in pregnancy and at six to eight weeks postpartum was $r = 0.90$. At six months postpartum, the Cronbach's alpha value for the MSSS was $r = 0.89$.

Cambridge Worry Scale (CWS)

The Cronbach's alpha value for the CWS when used with participants in pregnancy was $r = 0.90$.

Perceived Knowledge Scale

The Cronbach’s alpha for the Perceived Knowledge Scale when used with participants in pregnancy was $r = 0.94$.

Perceived Self-Efficacy Scale (PSES)

The Cronbach’s alpha value for the PSES used during pregnancy was $r = 0.93$.

Depression, anxiety, stress, worry, social support, parenting knowledge, and maternal self-efficacy

The results for the standardised instruments measuring depression, anxiety, stress, worry, social support, parenting knowledge and maternal self-efficacy are presented in this section. Table 4.3 presents the population norms for each of the psychometric tests (of the available studies from both developed and developing countries, including Arab countries who used the same instruments and reported the mean scores of the instruments) to facilitate the comparison with participants mean scores for these instruments at each of the three phases of data collection, which are presented in the text.
Table 4:3: Mean scores for population data and for this sample for EPDS, DASS-21, MSSS, Perceived Knowledge Scale and PSES

<table>
<thead>
<tr>
<th>Scale</th>
<th>Population norms</th>
<th>This sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPDS antenatally*</td>
<td>8.21</td>
<td>11.85</td>
</tr>
<tr>
<td>EPDS 4-6 weeks postpartum*</td>
<td>6.25</td>
<td>-</td>
</tr>
<tr>
<td>EPDS 0-8 weeks postpartum#</td>
<td>9.6</td>
<td>-</td>
</tr>
<tr>
<td>EPDS 6-8 weeks postpartum</td>
<td>-</td>
<td>11.22</td>
</tr>
<tr>
<td>EPDS 8 weeks postpartum+</td>
<td>12.7</td>
<td>-</td>
</tr>
<tr>
<td>EPDS 3-6 months postpartum#</td>
<td>10.3</td>
<td>-</td>
</tr>
<tr>
<td>EPDS 6 months postpartum+</td>
<td>11.9</td>
<td>11.44</td>
</tr>
<tr>
<td>DASS-depression antenatally*</td>
<td>6.26</td>
<td>9.07</td>
</tr>
<tr>
<td>DASS-depression 6-8 weeks postpartum</td>
<td>-</td>
<td>9.85</td>
</tr>
<tr>
<td>DASS-depression postpartum*</td>
<td>4.18</td>
<td>-</td>
</tr>
<tr>
<td>DASS-depression 6 months postpartum</td>
<td>-</td>
<td>9.71</td>
</tr>
<tr>
<td>DASS-anxiety antenatally*</td>
<td>6.24</td>
<td>7.80</td>
</tr>
<tr>
<td>DASS-anxiety 6-8 weeks postpartum</td>
<td>-</td>
<td>8.39</td>
</tr>
<tr>
<td>DASS-anxiety postpartum*</td>
<td>1.7</td>
<td>-</td>
</tr>
<tr>
<td>DASS-anxiety 6 months postpartum</td>
<td>-</td>
<td>8.63</td>
</tr>
<tr>
<td>DASS-stress antenatally*</td>
<td>11.05</td>
<td>12.66</td>
</tr>
<tr>
<td>DASS-stress 6-8 weeks postpartum</td>
<td>-</td>
<td>13.71</td>
</tr>
<tr>
<td>DASS-stress postpartum*</td>
<td>7.73</td>
<td>-</td>
</tr>
<tr>
<td>DASS-stress 6 months postpartum</td>
<td>-</td>
<td>13.37</td>
</tr>
<tr>
<td>DASS-Depression •</td>
<td>6.14</td>
<td>-</td>
</tr>
<tr>
<td>DASS-anxiety •</td>
<td>4.80</td>
<td>-</td>
</tr>
<tr>
<td>DASS-stress •</td>
<td>10.29</td>
<td>-</td>
</tr>
<tr>
<td>MSSS antenatally*</td>
<td>26.24</td>
<td>18.87</td>
</tr>
<tr>
<td>MSSS 4-6 weeks postpartum*</td>
<td>25.19</td>
<td>-</td>
</tr>
<tr>
<td>MSSS 6-8 weeks postpartum</td>
<td>-</td>
<td>18.25</td>
</tr>
<tr>
<td>MSSS 3 months postpartum*</td>
<td>25.45</td>
<td>-</td>
</tr>
<tr>
<td>MSSS 6 months postpartum</td>
<td>-</td>
<td>18.07</td>
</tr>
<tr>
<td>CWS antenatally</td>
<td>-</td>
<td>20.69</td>
</tr>
<tr>
<td>Perceived knowledge Scale antenatally</td>
<td>-</td>
<td>27.61</td>
</tr>
<tr>
<td>PSES antenatally</td>
<td>-</td>
<td>37.93</td>
</tr>
</tbody>
</table>

* (Gamble, 2003)  
+ (Aydin et al., 2005)  
# (Bugdayci et al., 2004)  
• (Lovibond & Lovibond, 1995)

Phase 1

Depression measured using EPDS

Participants completed the Edinburgh Postnatal Depression Scale (EPDS) following recruitment in the last trimester of pregnancy. The EPDS mean for this sample was 11.85 out of a possible total score of 30 (sd = 3.34, range = 7-28), which is higher than antenatal EPDS scores reported by Gamble (2003) with a mean of 8.21 (sd = 4.97, range = 0-26). Sixty-seven women (19%) had a total EPDS score of equal to or greater than 13 (range = 13-26).
Depression, anxiety, and stress measured using DASS-21

In Phase 1, participating women also completed the DASS-depression scale. In pregnancy the mean for this sample was 9.07 (sd = 4.69, range = 8-48), which is higher than the scores reported by Gamble (2003) with a mean of 6.26 (sd = 6.91, range = 0-40) and higher than the population norm for women (mean = 6.14, sd = 6.92) (Lovibond & Lovibond, 1995). Sixty-eight women (19.3%) scored greater than 13 on DASS-depression (above mild).

The DASS–anxiety scores for this sample are comparable to the scores reported by Gamble (2003). The antenatal mean for this sample 7.80 (sd = 3.22, range = 8-36) is a little higher than the DASS-anxiety scores reported by Gamble (2003) (mean = 6.24, sd = 6.03, range = 0-40) and higher than the population norm for females (mean = 4.80, sd = 5.03) (Lovibond & Lovibond, 1995). Antenatally, 51 women (14.4%) had anxiety scores >9 (above mild).

Antenatally, the DASS–stress mean scores for this sample was 12.66 (sd = 7.98, range = 8-64), this is little higher than the DASS-stress mean scores reported by Gamble (2003) (mean = 11.05, sd = 8.66, range = 0-42) and higher than the population norm of females (mean = 10.29, sd = 8.16) (Lovibond & Lovibond, 1995). During pregnancy 84 women (23.8%) had DASS-stress scores greater than 18 (above mild).

Social support measured using Maternal Social Support Scale

Participants completed the Maternity Social Support Scale (MSSS) following recruitment in the last trimester of pregnancy. The MSSS mean for this sample was 18.87 (sd = 5.94, range = 6-28), which is lower than the mean score of social support reported by Gamble (2003) (mean = 26.24, sd = 4.35, range = 6-30). During pregnancy 138 women (39.1%) had MSSS scores less than 19 (low support).
Worry measured using Cambridge Worry Scale

In Phase 1, participating women completed the Cambridge Worry Scale (CWS). The mean score for this sample is 20.69 (sd = 9.10, range = 6-37). Sixty-four women (18.1%) scored greater than three on CWS (major worry).

Parenting knowledge measured using Perceived Knowledge Scale
Participants completed the Perceived Knowledge Scale following recruitment in the last trimester of pregnancy. The mean score for this sample was 27.61 (sd = 10.67, range = 11-47). During pregnancy, 135 women (38.2%) scored less than 2.5 (low knowledge).

Maternal self-efficacy measured using PSES
Participants completed the Perceived Self-Efficacy Scale (PSES) following recruitment in the last trimester of pregnancy. The PSES mean for this sample was 37.93 (sd = 21.27, range =10-87). Two hundred and five women (58.1%) scored less than 37 (low self-efficacy).

Phase 2

Depression measured using EPDS
At six to eight weeks postpartum, the mean EPDS score was 11.22 (sd = 3.55, range = 6-26). This is higher than the score reported by Gamble (2003) with a mean of 6.25 (sd = 5.71, range = 0-29). This result is higher than the score reported by Bugdayci et al. (2004) with a mean of 9.6 (sd = 5.4). While, it is little lower than the score reported by Aydin et al. (2005) with a mean of 12.7 (sd = 6.4). Seventy-eight women (22.1%) scored ≥ 13 (range = 13-26) at six to eight weeks postpartum.

Depression, anxiety, and stress as measured using DASS-21
At six to eight weeks postpartum, the mean DASS-depression score for participants was 9.85 (sd = 5.50, range = 8-52), which is higher than the mean for the female population (mean 6.14, sd 6.92) (Lovibond & Lovibond,
At six to eight weeks postpartum, 80 participants (22.7%) scored above mild (i.e. >13).

At six to eight weeks postpartum, the mean DASS-anxiety score for women in the current study was 8.39 (sd = 3.78, range = 8-36), which is higher than the mean for the female population of 4.80 (sd = 5.03) (Lovibond & Lovibond, 1995). Postnatally, 80 women (22.7%) had anxiety scores above mild (i.e. >9).

At six to eight weeks postpartum, the mean DASS–stress score for participants had increased slightly to 13.71 (sd = 8.32, range = 8-64). The mean stress score for the female population is 10.29 (sd = 8.16) (Lovibond & Lovibond, 1995) which is lower than the mean score of this sample. At this stage 104 women (29.5%) had DASS–stress scores above mild (i.e. >18).

**Social support measured using Maternal Social Support Scale**

At six to eight weeks postpartum the mean MSSS score was stable at 18.25 (sd = 5.91, range = 7-28), which is lower than the mean MSSS score reported by Gamble (2003) (mean = 25.19, sd = 4.43, range = 9-30). At six to eight weeks postpartum, 150 women (42.5%) scored less than 19 (low support).

**Phase 3**

**Depression symptoms using EPDS**

At six months postpartum, the mean EPDS score was 11.44 (sd = 2.97, range = 7-24), with 75 women (21.2%) scored ≥ 13 (range = 13-24). This is a slight drop in the percentage of women scoring above the cut-off, however the mean score is still higher than the score reported by Bugdayci et al. (2004) with a mean of 10.3 (sd = 5.9) and it is nearly the same score reported by Aydin et al. (2005) with a mean of 11.9 (sd = 6.2).
Depression, anxiety, and stress measured using DASS-21

At six months postpartum, the mean DASS-depression score for participants was 9.71 (sd = 5.17, range = 8-52), which is higher than the mean scores reported by Gamble (2003) (mean = 4.18, sd = 6.86, range = 0-34) and higher than the mean for the female population (mean = 6.14, sd = 6.92) (Lovibond & Lovibond, 1995). At six months postpartum, 80 participants (22.7%) scored above mild (i.e. >13). The DASS-depression figures show a similar trend to the EPDS scores.

At six months postpartum, the DASS anxiety mean score for women in the present study was 8.63 (sd = 3.59, range = 8-36), which is higher than the mean score reported by Gamble (2003) (mean = 1.7, sd = 4.5, range = 0-36) and higher than the mean for female population of 4.80 (sd= 5.03) (Lovibond & Lovibond, 1995). Postnatally, 86 women (24.4%) had anxiety scores above mild (i.e. >9).

At six months postpartum, the DASS–stress scores for participants remained similar (mean = 13.37, sd = 8.23, range = 8-64), however the mean score for this sample is still higher than the mean score reported by Gamble (2003) (mean = 7.73, sd = 8.42, range = 0-42) and higher than the mean for female population of 10.29 (sd = 8.16) (Lovibond & Lovibond, 1995). At this stage 96 women (27.2%) had DASS–stress scores above mild (i.e. >18).

Social support measured using Maternal Social Support Scale

At six months postpartum, the mean MSSS score was stable at 18.07 (sd = 5.90, range =7-28) compared with the four to six week score (Phase 2). This is lower than the MSSS mean score reported by Gamble (2003) (mean = 25.45, sd = 4.25, range = 9-30). At six months postpartum, 143 women (40.5%) scored less than 19 (low support).
**Incidence of antenatal and postnatal depression**

Women were screened during the third trimester of pregnancy to determine if they were experiencing antenatal depression. The Edinburgh Postnatal Depression Scale (EDPS) was used in the present study with a score of $\geq 13$ to give the best estimation of the incidence of antenatal and postnatal depression (Evan et al., 2001). Women were asked to respond to items that come closest to how they have felt in the past seven days.

Of 353 women, 67 women (19%) reported scores indicating probable antenatal depression. At the six to eight week data collection point, 22.1% ($n = 78$) of participants scored $\geq 13$ on EPDS suggesting probable PND. At six months postpartum 21.2% ($n = 75$) of women reported cut-off scores indicating probable PND.

**Comparisons between antenatal and postnatal data**

The incidence of antenatal depression in the present study is similar to the incidence reported in Moroccan and Thailand studies (Alami et al., 2006; Limlomwongse & Liabsuetrakul, 2006). On the other hand, it is higher than the incidence reported in the developed countries (Bowen & Muhajarine, 2006b; Evans et al., 2001; Heron et al., 2004; Lau & Keung, 2007; Sutter-Dallay et al., 2004).

The incidence of PND for participants in the current study is higher than the range of postnatal depression consistently reported in western studies (Abbott & Williams, 2006; Josefsson et al., 2002; Thome, 2000). On the other hand, the incidence of PND in the present study is nearly the same incidence reported in some developing countries including Arab countries (Agoub et al., 2005; Chaaya et al., 2002; Green et al., 2006) and is lower than the incidence reported in the in Turkey, Nigeria, and Pakistan (Abiodun, 2006; Aydin et al., 2005; Bugdayci et al., 2004; Husain et al., 2006).

The mean scores for both EDPS and MSSS were nearly the same at six to eight weeks and six months postpartum and lower antenatally. The mean
score for anxiety was nearly the same at six to eight weeks postpartum and at six months postpartum and higher antenatally. The DASS-21 stress and DASS-depression showed the same trends in the mean scores for stress and depression antenatally, at six to eight weeks postpartum and at six months postpartum.

**Conclusion**

The chapter outlined the characteristics of this sample of birthing women and outcomes in relation to obstetric interventions; satisfaction with care; antenatal and/or postnatal psychological factors of depression, anxiety, stress, and worry; social support during pregnancy and after childbirth; perceived parenting knowledge during pregnancy; and antenatal perceived self-efficacy. The results indicated that the sample of women were representative of the birthing population; were have a high levels of depression, anxiety, and stress during the antenatal and postnatal periods (indicating that they were depressed, anxious, and stressed), and many were have a high levels of worry during pregnancy (indicating that they were worried); reported inadequate support during pregnancy and postpartum; felt poorly prepared for childbirth; and had low self-efficacy. There was some evidence of high rates of obstetric interventions during labour and birth such as the number of vaginal examinations, episiotomy and suturing. Similarly, use of nitrous oxide combined with pethidine injection was commonly used. The rate for spontaneous vaginal birth in this sample was higher compared with, the rate reported in the in 2003 Jordanian perinatal data. While figures for elective and emergency caesarean sections were lower in this sample than in 2003 perinatal data, there was a slight increase in the rate of instrument assisted deliveries in this sample than in 2003 perinatal data. An examination of the satisfaction items on postnatal questionnaire revealed that most of the women were dissatisfied with the care they received during labour and birth. The reliability of the standarised instruments used in the present study were established. The EPDS is widely used as a screening tool to detect antenatal and postnatal depression.
During pregnancy, 19% of women (n = 67) scored ≥13 on EPDS. At the six to eight week postpartum, 22.1% (n = 78) of participants scored ≥13 on EPDS suggesting probable PND. At six months 21.2% (n = 75) of women reported cut-off scores indicating probable PND. The incidence of antenatal and postnatal depression in the present study were higher than the incidence reported in the developed countries, however it is similar to the rates reported in the Arab countries and some non-Arab developing countries. The incidence of PND in the present study was lower than the incidence reported in Turkey (Aydin et al., 2005; Bugdayci et al., 2004).
CHAPTER 5

Results: Factors associated with antenatal and postnatal depression

Having established the representative nature of the sample, the reliability of the measures, and the incidence of both antenatal and postnatal depression, this chapter presents further analysis of the data according to the purposes of the research. Firstly, this chapter will identify factors that may contribute to the development of antenatal depression. A stepwise multiple regression analysis of certain antenatal variables related to the development of antenatal depression (AND) will be outlined. Secondly, certain antenatal factors that may contribute to the development of PND at six to eight weeks and six months will be identified. Intrapartum and postpartum factors that may contribute to the development of PND at six to eight weeks will be identified. Furthermore, a stepwise multiple regression analyses of certain antenatal, cultural, obstetric and satisfaction with care, intrapartum, and postpartum variables related to the development of PND will be outlined. Finally, intrapartum and postpartum factors that may contribute to the development of PND at six months will be identified.

Factors associated with antenatal depression

Demographic and obstetric factors

The demographic variables of education and occupation were not significantly associated with development of AND. Age was not statistically significant in the development of AND [$\chi^2 (1) 1.209, p = 0.272$]. There was no statistically significant association between parity and the development of AND [$\chi^2 (1) 0.134, p = 0.714$].

The previous obstetric events examined in relationship to the development of AND were previous caesarean section, forceps/vacuum, stillbirth,
abortion/miscarriage, haemorrhage, and premature birth. None of these variables were statistically associated with the development of AND.

**Psychological factors**

As in previous studies the association between existing psychological states and the development of AND was examined. The psychological states of anxiety, stress and worry were measured antenatally using the DASS-21 and CWS. Using the cut-off scores established in the validation studies of these instruments, a calculation of the relationship between antenatal psychological variables and antenatal depression was undertaken using a Chi-square analysis. Results are shown in Table 5.1.

<table>
<thead>
<tr>
<th>Psychological variable</th>
<th>$\chi^2$</th>
<th>df</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>DASS-anxiety</td>
<td>9.328</td>
<td>1</td>
<td>0.002*</td>
</tr>
<tr>
<td>DASS-stress</td>
<td>12.552</td>
<td>1</td>
<td>0.001*</td>
</tr>
<tr>
<td>CWS-worry</td>
<td>14.343</td>
<td>1</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

* = Statistically significant association

The antenatal DASS-anxiety scores of >9 (i.e. above mild) show a statistically significant association with AND [$\chi^2 (1) 9.328, p = 0.002$]. Similarly, antenatal DASS-stress scores of >18 (i.e. above mild) show a statistically significant association to AND [$\chi^2 (1) 12.552, p < 0.001$].

CWS scores were grouped in two categories: no major worry (0-3) and major worry (4-5). Analysis of these groups showed that women with major worry were more likely to develop antenatal depression [$\chi^2 (1) 14.343, p < 0.001$]. Further analysis conducted using each item of the CWS, found three items show a statistically significant association to AND. The items are “worry about labour and giving birth” [$\chi^2 (1) 27.597, p < 0.001$], “worry about relationship with my husband” [$\chi^2 (1) 14.343, p < 0.001$], and “worry about money problems” [$\chi^2 (1) 20.433, p < 0.001$].
Social support

Antenatal MSSS scores were grouped in three categories: low support (<19), medium support (19-24), and adequate support (>24). Analysis of these groups showed that women with low social support were more likely to develop AND [$\chi^2 (1) 35.836, p < 0.001$].

Two items on the MSSS measured possible indicators of domestic violence (Webster et al., 2000). The items were “There is conflict with my husband/partner” and “I feel controlled by my husband/partner”. Analysis of these items did show a statistically significant relationship to the development of AND. The results for the item “There is conflict with my husband/partner” is [$\chi^2 (2) 11.940, p = 0.003$]. For the item “I feel controlled by my husband/partner” the result is [$\chi^2 (2) 11.940, p = 0.003$].

Perceived parenting knowledge

Perceived parenting knowledge scores were grouped in three categories: poor (<2.5), adequate (2.5-3.49) and good (≥3.5). In this sample all women who scored positive to AND also reported poor parenting knowledge.

Maternal self-efficacy

Maternal self-efficacy scores were grouped in three categories: low self-efficacy (10-36), average self-efficacy (37-62) and high self-efficacy (63-88). In the present study all women who scored positive to AND had low self-efficacy.

Unplanned pregnancy

There was statistically significant association between unplanned pregnancy and the development of AND [$\chi^2 (2) 45.343, p < 0.001$]. Women who were unhappy about this pregnancy were more likely to report symptoms of AND.
History of psychiatric illness

History of psychiatric illness (including a previous episode of antenatal and postnatal depression) was not a statistically significant factor in the development of AND \( \chi^2 (1) 0.125, p = 0.724 \).

Family history of psychiatric illness

A family history of psychiatric illness (including antenatal depression and PND) was not a statistically significant factor in the development of AND \( \chi^2 (1) 1.806, p = 0.179 \).

Stressful life events

The stressful life events examined in relation to the development of AND were financial problems, changing relationships, moving home, death amongst any of the woman’s relatives and infertility. These variables were not statistically associated with the development of AND with the exception of financial problems \( \chi^2 (1) 10.881, p = 0.001 \).

Marital relationship

Women’s relationships with their husbands were grouped in five categories: very good, good, mixed, difficult, and very difficult. In the present study, there was a statistically significant association between women’s relationships with their husbands and the development of AND \( \chi^2 (4) 17.403 p = 0.002 \). Women reporting a very difficult relationship with their husbands were more likely to score positive for AND.

Relationship with mother-in-law

Women’s relationships with their mother-in-law were grouped in five categories: very good, good, mixed, difficult, and very difficult. In the present study, women’s relationship with their mother-in-law was a statistically significant factor in the development of AND \( \chi^2 (3) 15.806, p = 0.001 \).
Women reporting a very difficult relationship with their mother-in-law were more likely to develop AND.

**A model for the development of antenatal depression in Jordan**

The findings of the present study on significant factors associated with the development of antenatal and postnatal depression, certain antenatal variables were chosen and entered into a stepwise multiple regression. The following variables: DASS-anxiety score, DASS-stress score, maternal worry about financial problems, social support, perceived parenting knowledge, maternal self-efficacy, unplanned pregnancy, marital relationship, and women’s relationship with their mother-in-law were entered into a stepwise multiple regression as independent variables with the EPDS total score during pregnancy as dependent variable. Stepwise regression selects antenatal variables in terms of their competing ability to explain the given variance. This procedure is appropriate when theory does not favour one of the variables over another, as is the case here. Of the nine variables, two variables were excluded (social support and marital relationship) by using this procedure and seven retained as significantly predicting the development of antenatal depression. These seven factors accounted for approximately 83% ($r^2 = 0.834$) of variance in the development of antenatal depression found in this sample. The results of this analysis are shown below in Table 5.2.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Standardised Coefficients</th>
<th>t</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>DASS-stress score</td>
<td>0.414</td>
<td>5.238</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Relationship with mother-in-law</td>
<td>-0.184</td>
<td>-5.514</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>DASS-anxiety score</td>
<td>0.133</td>
<td>3.361</td>
<td>0.001</td>
</tr>
<tr>
<td>Unplanned pregnancy</td>
<td>-0.176</td>
<td>-2.556</td>
<td>0.001</td>
</tr>
<tr>
<td>Maternal self-efficacy</td>
<td>-0.266</td>
<td>-4.319</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Perceived parenting knowledge</td>
<td>-0.164</td>
<td>-3.376</td>
<td>0.011</td>
</tr>
<tr>
<td>Maternal worry about financial problems</td>
<td>0.084</td>
<td>2.468</td>
<td>0.014</td>
</tr>
</tbody>
</table>

As indicated in Table 5.2, five of the seven variables were statistically significant with the development of AND at the $p <= 0.001$ level. The other two factors, Perceived parenting knowledge ($p = 0.011$) and worry about
financial problems (p = 0.014) were somewhat less consistent than the other five factors, but remained statistically significant. Three of the seven variables (maternal worry about financial problems, DASS-anxiety score, and DASS-stress score) were positively associated with the development of antenatal depression. This means that women with high stress score, high anxiety score, and high worry score about financial problems were more likely to develop antenatal depression. The other four variables were negatively associated with the development of antenatal depression. This means that women with poor knowledge regarding labour, birth and mothering; low maternal self-efficacy; having a very difficult relationship with their mother-in-law; and unhappy about this pregnancy were more likely to develop antenatal depression.

**Antenatal factors associated with postnatal depression**

*Demographic and obstetric factors*

The demographic variables of education and occupation were not significantly associated with PND at six to eight weeks postpartum or at six months postpartum.

Age was not a statistically significant factor in the development of PND at six to eight weeks [χ² (1) 0.051, p = 0.821] and at six months postpartum [χ² (1) 0.333, p = 0.564].

Parity was not a statistically significant factor for the development of PND at six to eight weeks [χ² (1) 0.000, p =1.000] nor at six months postpartum [χ² (1) 0.653, p = 0.419] for PND.

No previous obstetric events were statistically significant relationship with PND at six to eight weeks or six months postpartum.
Psychological factors

A calculation of the relationship between antenatal psychological variables and PND was undertaken using a Chi-square analysis. Results are shown in Table 5.3.

Table 5.3: Association between antenatal depression, anxiety, stress and worry and PND at six to eight weeks and six months postpartum

<table>
<thead>
<tr>
<th>Antenatal psychological variables</th>
<th>6-8 weeks postpartum $\chi^2$</th>
<th>Significance</th>
<th>6-8 weeks postpartum $\chi^2$</th>
<th>Significance</th>
<th>Six months postpartum $\chi^2$</th>
<th>Significance</th>
<th>Six months postpartum $\chi^2$</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPDS-depression</td>
<td>6.205</td>
<td>0.013*</td>
<td>5.880</td>
<td>0.015*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DASS-depression</td>
<td>6.205</td>
<td>0.013*</td>
<td>16.333</td>
<td>&lt; 0.001*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DASS-anxiety</td>
<td>0.205</td>
<td>0.651</td>
<td>1.080</td>
<td>0.299</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DASS-stress</td>
<td>7.385</td>
<td>0.007*</td>
<td>2.253</td>
<td>0.133</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CWS-worry</td>
<td>1.282</td>
<td>0.258</td>
<td>0.333</td>
<td>0.564</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* = Statistically significant association

Antenatal EPDS-depression scores ≥13 showed a statistically significant association with PND at six to eight weeks [$\chi^2$ (1) 6.205, $p = 0.013$] and at six months postpartum [$\chi^2$ (1) 5.880, $p = 0.015$]. Similarly, antenatal DASS-depression scores ≥13 (i.e. above mild) showed a statistically significant association with PND at six to eight weeks [$\chi^2$ (1) 6.205, $p = 0.013$] and at six months postpartum [$\chi^2$ (1) 16.333, $p < 0.001$].

The antenatal DASS-anxiety scores of > 9 (i.e. above mild) did not show a statistically significant association to PND at six to eight weeks [$\chi^2$ (1) 0.205, $p = 0.651$] nor at six months postpartum [$\chi^2$ (1) 1.080, $p = 0.299$]. Antenatal DASS-stress scores of >18 (i.e. above mild) showed a statistically significant association to PND at six to eight weeks [$\chi^2$ (1) 7.385, $p = 0.007$] but not at six months postpartum [$\chi^2$ (1) 2.253, $p = 0.133$]. Antenatal worry of >3 (i.e. major worry) as measured by Cambridge Worry Scale did not show a statistically significant association to PND at six to eight weeks postpartum [$\chi^2$ (1) 1.282, $p = 0.258$] nor at six months postpartum [$\chi^2$ (1) 0.333, $p = 0.564$]. However, analysis conducted using each item of the scale, found three items that showed a statistically significant association with PND at six to eight weeks postpartum and at six months postpartum. Results for the item “worry about labour and giving birth” was $\chi^2$ (1) 8.667, $p < 0.003$ at six to eight weeks postpartum and at six months postpartum.
weeks postpartum and at six months was $\chi^2 (1) 4.813$, $p < 0.028$. For the item “worry about relationship with my husband” the result was $\chi^2 (1) 14.821$, $p < 0.001$ at six to eight weeks postpartum and $\chi^2 (1) 7.053$, $p < 0.008$ at six months postpartum. For the item “worry about money problems” the result was $\chi^2 (1) 11.538$, $p = 0.001$ at six to eight weeks postpartum and $\chi^2 (1) 12.813$, $p < 0.001$ at six months postpartum.

**Social support**

Antenatal social support as measured by the MSSS, did show a statistically significant relationship with the development of PND at six to eight weeks [$\chi^2 (2) 37.615$, $p < 0.001$] and at six months postpartum [$\chi^2 (2) 23.360$, $p < 0.001$]. Two items on the MSSS measured possible indicators of domestic violence (Webster et al., 2000). The items were “There is conflict with my husband/ partner” and “I feel controlled by my husband/ partner”. Analysis of these items showed a statistically significant relationship with the development of PND at six to eight weeks and six months postpartum. The results for the item “There is conflict with my husband/ partner” was $\chi^2 (4) 22.128$, $p < 0.001$ at six to eight weeks postpartum and at six months was $\chi^2 (4) 20.267$, $p < 0.001$. For the item “I feel controlled by my husband/ partner” the result was $\chi^2 (4) 19.564$, $p = 0.001$ at six to eight weeks and at six months was $\chi^2 (4) 14.267$, $p = 0.006$.

**Perceived parenting knowledge**

Poor parenting knowledge did show a statistically significant association with PND at six to eight weeks [$\chi^2 (2) 55.615$, $p < 0.001$] and at six months postpartum [$\chi^2 (2) 47.120$, $p < 0.001$].

**Maternal self-efficacy**

Maternal self-efficacy showed a statistically significant association with PND at six to eight weeks [$\chi^2 (2) 83.308$, $p < 0.001$] and at six months postpartum
Women with low self-efficacy were more likely to develop PND at six to eight weeks postpartum and at six months postpartum.

**Unplanned pregnancy**

There was a statistically significant association between unplanned pregnancy and the development of PND at six to eight weeks \( \chi^2 (2) 21.000, p < 0.001 \) and at six months postpartum \( \chi^2 (2) 24.320, p < 0.001 \).

**History of psychiatric illness**

History of psychiatric illness (including antenatal and postnatal depression) was not a statistically significant factor in the development of PND at six to eight weeks \( \chi^2 (1) 3.103, p = 0.078 \) nor at six months postpartum \( \chi^2 (1) 0.220, p = 0.639 \).

**Family history of psychiatric illness**

Family history of psychiatric illness (including antenatal depression and PND) was not statistically significant factor in the development of PND at six to eight weeks \( \chi^2(1) 0.051, p = 0.821 \) and at six months postpartum \( \chi^2 (1) 3.000, p = 0.083 \).

**Stressful life events**

Financial problems were statistically significant in the development of PND at four to six weeks \( \chi^2 (1) 13.128, p < 0.001 \) and at six month \( \chi^2 (1) 14.520, p < 0.001 \).

**Marital relationship**

There was a statistically significant association between women’s relationships with their husbands and the development of PND at six to eight weeks \( \chi^2 (4) 13.410, p = 0.009 \) and at six months postpartum \( \chi^2 (4) 15.867, p = 0.003 \). Women having a very difficult relationship with their husbands
were more likely to score positive for PND at six to eight weeks and at six months postpartum.

**Relationship with mother-in-law**

Women’s relationship with their mother-in-law was a statistically significant factor in the development of PND at six to eight weeks \[\chi^2 (3) 12.462, p = 0.006\] and at six months postpartum \[\chi^2 (4) 39.467, p < 0.001\]. Women having a very difficult relationship with their mother-in-law were more likely to develop PND at six to eight weeks and at six months postpartum.

**Intrapartum and postpartum factors and PND at six to eight weeks**

**Obstetric factors**

The obstetric variables associated with the development of PND at six to eight weeks are shown in Table 5.4.

<table>
<thead>
<tr>
<th>Obstetric variable</th>
<th>No. of women</th>
<th>(\chi^2)</th>
<th>df</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labour &gt;11 hours</td>
<td>41</td>
<td>5.063</td>
<td>1</td>
<td>0.024*</td>
</tr>
<tr>
<td>Number of vaginal examinations &gt;8</td>
<td>49</td>
<td>18.063</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Lithotomy position</td>
<td>58</td>
<td>42.250</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Episiotomy</td>
<td>32</td>
<td>15.034</td>
<td>2</td>
<td>0.001*</td>
</tr>
<tr>
<td>Required sutures</td>
<td>34</td>
<td>19.600</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Very painful suturing</td>
<td>22</td>
<td>26.243</td>
<td>3</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Labour more painful than expected</td>
<td>51</td>
<td>61.906</td>
<td>2</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Gas and oxygen (nitrous oxide) and pethidine</td>
<td>40</td>
<td>30.500</td>
<td>2</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Unhappy with what was done to help relieve the pain</td>
<td>40</td>
<td>29.094</td>
<td>2</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>haemorrhage after the birth</td>
<td>26</td>
<td>6.034</td>
<td>2</td>
<td>0.049*</td>
</tr>
</tbody>
</table>

* = Statistically significant association

Obstetric factors assessed but not associated with PND at six to eight weeks included elective caesarean section, emergency caesarean section, whether labour was induced, vacuum/forceps delivery and postpartum complication for mother.
Satisfaction with care

The aspects of satisfaction with care assessed in the present study were categorised as feeling informed, opportunities to talk about feelings, being involved in decisions, and feeling supported and/or cared for. There was a statistically strong relationship between variables measuring these aspects and PND at six to eight weeks. Women reporting PND also reported feeling poorly informed, not able to share their feelings about the birth, not being involved in decisions and feeling unsupported. The association between these satisfaction variables and the development of PND at six to eight weeks are shown in Table 5.5.

Table 5.5: Satisfaction variables associated with PND at six to eight weeks postpartum

<table>
<thead>
<tr>
<th>Aspect of satisfaction with care</th>
<th>$\chi^2$</th>
<th>df</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall poor quality of care</td>
<td>8.667</td>
<td>1</td>
<td>0.003*</td>
</tr>
<tr>
<td>Unhelpful doctors</td>
<td>6.667</td>
<td>1</td>
<td>0.010*</td>
</tr>
<tr>
<td>Wanted something done differently</td>
<td>49.282</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Wanted to talk more to someone about the birth</td>
<td>40.205</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Not always kept informed</td>
<td>6.205</td>
<td>1</td>
<td>0.013*</td>
</tr>
<tr>
<td>Decisions made without taking wishes into account</td>
<td>37.385</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Felt pressured to have baby quickly</td>
<td>14.821</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Felt labour was taken over by strangers and/or machines</td>
<td>11.538</td>
<td>1</td>
<td>0.001*</td>
</tr>
<tr>
<td>Doctors &amp; midwives not encouraging/ reassuring</td>
<td>5.128</td>
<td>1</td>
<td>0.024*</td>
</tr>
<tr>
<td>Attendance of anyone that they did not want to be their</td>
<td>22.615</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Wanted more information whilst in labour</td>
<td>43.128</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Wanted more information about why induction was necessary</td>
<td>15.696</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Not talked to any health professional about how they felt about what happened during labour and/or birth</td>
<td>5.128</td>
<td>1</td>
<td>0.024*</td>
</tr>
</tbody>
</table>

* = Statistically significant association

A further specific variable related to the provision of information was associated with PND at six to eight weeks. Participants who were unhappy with the amount of information regarding induction of labour were more likely to develop PND at six to eight weeks [$\chi^2 (1) 15.696, p < 0.001$]. At six to eight weeks postpartum, all the women who reported that the midwives/nurses were unhelpful during their labour and/or birth had developed PND.
Feelings during labour

In the present study, women who did not feel confident in labour were more likely to develop PND at six to eight weeks. Similarly, participants who felt a lack of control, expressed as not feeling “in control” or that they felt “out of control” were more likely to score positive for PND at six to eight weeks. Women who felt worried, frightened, or anxious when labour first began, or frightened in labour generally, were also more likely to develop PND at this time. A feeling of helplessness was also associated with PND at this time. Table 5.6 shows the association between these variables and the development of PND at six to eight weeks.

<table>
<thead>
<tr>
<th>Feelings/thoughts during labour</th>
<th>$\chi^2$</th>
<th>df</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worried, frightened or anxious when labour first began</td>
<td>5.063</td>
<td>1</td>
<td>0.024*</td>
</tr>
<tr>
<td>Not confident in labour</td>
<td>10.051</td>
<td>1</td>
<td>0.002*</td>
</tr>
<tr>
<td>Out of control</td>
<td>16.615</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Frightened</td>
<td>4.154</td>
<td>1</td>
<td>0.042*</td>
</tr>
<tr>
<td>Not in control #</td>
<td>6.205</td>
<td>1</td>
<td>0.013*</td>
</tr>
<tr>
<td>Helpless</td>
<td>11.538</td>
<td>1</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

# Questionnaire wording changed to indicate the association between not feeling “in control” and PND

* = Statistically significant association

Psychological factors

The psychological states of depression, anxiety and stress were measured at six to eight weeks postpartum using the EPDS and DASS-21. Using the cut-off scores established in the validation studies of these instruments, a calculation of the relationship between postnatal psychological variables and PND was undertaken using a Chi-square analysis. Results are shown in Table 5.7.

<table>
<thead>
<tr>
<th>Psychological variable</th>
<th>6-8 weeks postpartum</th>
<th>6-8 weeks postpartum</th>
<th>6-8 weeks postpartum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\chi^2$</td>
<td>df</td>
<td>Significance</td>
</tr>
<tr>
<td>DASS-depression</td>
<td>16.615</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>DASS-anxiety</td>
<td>6.205</td>
<td>1</td>
<td>0.013*</td>
</tr>
<tr>
<td>DASS-stress</td>
<td>27.128</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
</tbody>
</table>

* = Statistically significant association
DASS-depression scores ≥13 (i.e. above mild) showed a statistically significant association with PND at six to eight weeks as expected \[\chi^2 (1) 16.615, \ p < 0.001\]. DASS-anxiety scores of > 9 (above mild) showed a statistically significant association to PND at six to eight weeks \[\chi^2 (1) 6.205, \ p = 0.013\]. DASS-stress scores of >18 (i.e. above mild) showed a statistically significant association to PND at six to eight weeks \[\chi^2 (1) 27.128, \ p < 0.001\].

Social support

Social support as measured by the Maternity Social Support Scale at six to eight weeks postpartum showed a statistically significant relationship to PND. Those women with the low social support at this time were more likely to develop PND at six to eight weeks postpartum \[\chi^2 (2) 59.154, \ p < 0.001\].

Gender of the baby

In the present study, gender of the baby showed a statistically significant association to PND at six to eight weeks \[\chi^2 (1) 7.385, \ p < 0.007\]. Women who gave birth to a female baby were more likely to develop PND. Similarly, the variables indicating that the woman was “very unhappy” and “unhappy” about having a female baby showed a statistically significant association with PND at six to eight six weeks postpartum \[\chi^2 (1) 14.821, \ p < 0.001\].

Regression analysis of factors related to PND

The findings of the present study on significant factors associated with the development of antenatal and postnatal depression, certain antenatal, intrapartum, and postpartum variables were chosen to enter into a stepwise multiple regression. These variables: unplanned pregnancy, relationship with mother-in-law, stressful life events due to financial problems, antenatal depression, maternal self-efficacy, perceived parenting knowledge, postnatal social support score, postnatal DASS-stress score, dissatisfaction in regards to pain relief during labour, not always kept informed, decisions made without taking wishes into account, feeling pressured to have baby quickly, felt labour was taken over by strangers and/or machines, discouraging and non-
reassuring midwives and doctors and overall satisfaction with care were entered into a stepwise multiple regression as independent variables with the EPDS total symptom score as dependent variable. Of fifteen variables, six variables were excluded through this procedure and nine retained as significantly predicting the development of postnatal depression. These nine variables accounted for approximately 82% ($r^2 = 0.819$) of variance in the development of PND found in this sample. The results of this analysis are shown below in Table 5.8.

Table 5.8: Association between antenatal, intrapartum, and postpartum variables and PND

<table>
<thead>
<tr>
<th>Variable</th>
<th>Standardised Coefficients</th>
<th>t</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antenatal depression</td>
<td>0.214</td>
<td>3.786</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Unplanned pregnancy</td>
<td>-0.235</td>
<td>-4.592</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Very difficult relationship with mother-in-law</td>
<td>-0.194</td>
<td>-4.849</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Satisfaction with overall care</td>
<td>-0.145</td>
<td>-3.803</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Postnatal DASS-stress score</td>
<td>0.246</td>
<td>4.233</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Postnatal social support score</td>
<td>-0.123</td>
<td>-2.336</td>
<td>0.003*</td>
</tr>
<tr>
<td>Baby's sex</td>
<td>0.096</td>
<td>2.764</td>
<td>0.006*</td>
</tr>
<tr>
<td>Felt pressured to have baby quickly</td>
<td>-0.115</td>
<td>-2.992</td>
<td>0.006*</td>
</tr>
<tr>
<td>Perceived parenting knowledge</td>
<td>-0.100</td>
<td>-2.752</td>
<td>0.020*</td>
</tr>
</tbody>
</table>

* = Statistically significant association

As indicated in Table 5.8, five of the nine variables were statistically significant with the development of PND at the $p < 0.001$ level. The other four factors, postnatal social support ($p = 0.003$), baby's sex ($p = 0.006$), felt pressured to have baby quickly ($p = 0.006$) and perceived parenting knowledge ($p = 0.02$) were somewhat less consistent than the other five factors, but remained statistically significant. Three of nine variables (antenatal depression, postnatal DASS-stress score, and baby's sex) were positively associated with the development of PND. This means that women with high antenatal depression score, high postnatal stress score, and gave birth to a female baby were more likely to develop PND. The other six variables were negatively associated with the development of PND. This means that women with low postnatal social support; poor knowledge regarding labour, birth and mothering; having a very difficult relationship with their mother-in-law; unhappy about this pregnancy; felt pressured to have...
baby quickly; and dissatisfied with their overall care during labour and birth (their care was “very poor” or “poor”) were more likely to develop PND.

**Intrapartum and postpartum factors and PND at six months**

**Obstetric factors**

At six months postpartum, obstetric factors associated with development of PND at six months are shown in Table 5.9. One variable that was associated with PND at six to eight weeks (haemorrhaged after birth) was no longer associated with PND. The other obstetric factors measured but not statistically significantly associated with PND at six months were the same as at six to eight weeks. These were elective caesarean section, emergency caesarean section, whether labour was induced, vacuum/forceps delivery and postpartum complication for mother.

**Table 5:9: Obstetric variables associated with PND at six months postpartum**

<table>
<thead>
<tr>
<th>Obstetric variable</th>
<th>$\chi^2$</th>
<th>df</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labour &gt;11 hours</td>
<td>73.385</td>
<td>4</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Number of vaginal examinations &gt;8</td>
<td>6.785</td>
<td>1</td>
<td>0.009*</td>
</tr>
<tr>
<td>Lithotomy position</td>
<td>36.938</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Episiotomy</td>
<td>16.421</td>
<td>2</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Required sutures</td>
<td>16.941</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Painful suturing</td>
<td>16.710</td>
<td>2</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Labour more painful than expected</td>
<td>50.262</td>
<td>3</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Gas and oxygen (nitrous oxide) and pethidine</td>
<td>54.815</td>
<td>3</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Unhappy with what was done to help relieve the pain during labour</td>
<td>44.625</td>
<td>3</td>
<td>&lt; 0.001*</td>
</tr>
</tbody>
</table>

* = Statistically significant association

**Satisfaction with care**

At six months and at six to eight weeks postpartum, the pattern of association between variables was the same except for the variable indicating “unhelpful doctors” which was no longer statistically associated with PND at six months postpartum. The variables, “doctors and midwives always kept me informed” and “felt labour was taken over by strangers and/or machines” were statistically significant. The variable indicating unhappiness about the amount of information provided regarding induction of labour and attendance of anyone that they did not want to be in the labour and birth rooms remained statistically significant factors associated with PND at six months. The
variables which addressed satisfaction with doctors and midwives, overall satisfaction, whether they would have liked anything done differently, whether they wanted more information and the desire to talk more to someone about the birth remained statistically associated with PND at six months. In this way the overall picture is similar, with women who scored positive for PND at six months feeling poorly informed, not able to share their feelings about the birth, not being involved in decisions and feeling unsupported. The association between the variables measuring satisfaction with care and the development of PND at six months are shown in Table 5.10.

Table 5:10: Satisfaction variables associated with PND at six months postpartum

<table>
<thead>
<tr>
<th>Aspect of satisfaction with care</th>
<th>$\chi^2$</th>
<th>df</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall poor quality of care</td>
<td>5.880</td>
<td>1</td>
<td>0.015*</td>
</tr>
<tr>
<td>Unhelpful doctors</td>
<td>9.290</td>
<td>1</td>
<td>0.002*</td>
</tr>
<tr>
<td>Wanted something done differently</td>
<td>46.413</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Wanted to talk more to someone about the birth</td>
<td>34.680</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Not always kept informed</td>
<td>8.333</td>
<td>1</td>
<td>0.004*</td>
</tr>
<tr>
<td>Decisions were made without taking wishes into account</td>
<td>37.453</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Felt pressured to have baby quickly</td>
<td>4.813</td>
<td>1</td>
<td>0.028*</td>
</tr>
<tr>
<td>Felt labour was taken over by strangers and/or machines</td>
<td>11.213</td>
<td>1</td>
<td>0.001*</td>
</tr>
<tr>
<td>Doctors &amp; midwives not encouraging/ reassuring</td>
<td>5.880</td>
<td>1</td>
<td>0.015*</td>
</tr>
<tr>
<td>Attendance of anyone that they did not want to be their</td>
<td>24.653</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Wanted more information whilst in labour</td>
<td>8.720</td>
<td>2</td>
<td>0.013*</td>
</tr>
<tr>
<td>Unhappy with the amount of information regarding induction of labour</td>
<td>11.560</td>
<td>1</td>
<td>0.001*</td>
</tr>
<tr>
<td>Not talked to any health professional about how they felt about what happened during labour and/or birth</td>
<td>4.813</td>
<td>1</td>
<td>0.028*</td>
</tr>
</tbody>
</table>

* = Statistically significant association

At six months postpartum, all the women who reported that the midwives/nurses were unhelpful during their labour and/or birth had developed PND (EPDS > 12).

**Feelings during labour**

During the first postnatal interview women were asked about their feelings during labour. Table 5.11 shows the association between these variables and the development of PND at six months.
Table 5:11: Feelings during labour and PND at six months postpartum

<table>
<thead>
<tr>
<th>Feelings/thoughts during labour</th>
<th>χ²</th>
<th>df</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worried, frightened or anxious when labour first began</td>
<td>38.800</td>
<td>2</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Not confident in labour</td>
<td>8.333</td>
<td>1</td>
<td>0.004*</td>
</tr>
<tr>
<td>Out of control</td>
<td>22.413</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Frightened</td>
<td>4.813</td>
<td>1</td>
<td>0.028*</td>
</tr>
<tr>
<td>Not in control #</td>
<td>14.520</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Helpless</td>
<td>11.213</td>
<td>1</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

# Questionnaire wording changed to indicate the association between not feeling “in control” and PND
* = Statistically significant association

Participants who reported a lack of confidence in labour and those who felt worried, frightened or anxious when labour first began and frightened, and/or helpless in labour, and feelings of lack of control were more likely to develop PND at six months.

Psychological factors at six to eight weeks postpartum

Based on the cut-off scores established in the validation studies of DASS-21 and EPDS, a calculation of the relationship between postnatal psychological variables (measured at six to eight weeks postpartum) and PND-EPDS (measured at six months postpartum) was undertaken using a Chi-square analysis. Results are shown in Table 5.12.

Table 5:12: Association between depression, anxiety and stress (measured by DASS at six to eight weeks postpartum) and EPDS-depression at six months postpartum

<table>
<thead>
<tr>
<th>Psychological variable</th>
<th>6-8 weeks postpartum</th>
<th>6-8 weeks postpartum</th>
<th>6-8 weeks postpartum</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPDS-depression</td>
<td>22.413</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>DASS-depression</td>
<td>5.880</td>
<td>1</td>
<td>0.015*</td>
</tr>
<tr>
<td>DASS-anxiety</td>
<td>0.653</td>
<td>1</td>
<td>0.419</td>
</tr>
<tr>
<td>DASS-stress</td>
<td>9.720</td>
<td>1</td>
<td>0.002*</td>
</tr>
</tbody>
</table>

* = Statistically significant association

EPDS-depression scores ≥13 at six to eight weeks postpartum showed a statistically significant association with EPDS-depression at six months postpartum [$\chi^2 (1) 22.413, p < 0.001$]. Women who scored positive to PND according to EPDS at six to eight weeks were more likely to score positive to PND according to EPDS at six months postpartum.
At six to eight weeks postpartum, DASS-depression showed a statistically
significant association with EPDS-depression measured at six months
postpartum [$\chi^2 (1) 5.880, \ p = 0.015$]. Similarly, DASS-stress measured at six
to eight weeks postpartum showed a statistically significant association to
EPDS-depression at six months postpartum [$\chi^2 (1) 9.720, \ p = 0.002$]. DASS-
anxiety measured at six to eight weeks postpartum did not show a statistical
association to EPDS-depression measured at six months postpartum [$\chi^2 (1)
0.653, \ p = 0.419$].

Social support at six to eight weeks postpartum

Social support measured at six to eight weeks postpartum showed a
statistically significant association to EPDS-depression measured at six
months postpartum. Those women with the low social support at that time
were more likely to develop PND at six months postpartum [$\chi^2 (2) 34.640, \ p <
0.001$].

Psychological factors at six months postpartum

The psychological states of depression, anxiety, and stress were measured
also at six months postpartum. Using the cut-off scores established in the
validation studies of these instruments, a calculation of the relationship
between postnatal psychological variables and PND-EPDS was undertaken
using a Chi-square analysis. Results are shown in Table 5.13.

<table>
<thead>
<tr>
<th>Psychological variable</th>
<th>Six months postpartum</th>
<th>Six months postpartum</th>
<th>Six months postpartum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\chi^2$</td>
<td>df</td>
<td>Significance</td>
</tr>
<tr>
<td>DASS-depression</td>
<td>7.053</td>
<td>1</td>
<td>0.008*</td>
</tr>
<tr>
<td>DASS-anxiety</td>
<td>9.720</td>
<td>1</td>
<td>0.002*</td>
</tr>
<tr>
<td>DASS-stress</td>
<td>14.520</td>
<td>1</td>
<td>&lt; 0.001*</td>
</tr>
</tbody>
</table>

* = Statistically significant association

Postnatal DASS-depression scores $\geq$13 (i.e. above mild) showed a
statistically significant association with EPDS-depression at six months
postpartum [$\chi^2 (1) 7.053, \ p = 0.008$]. The postnatal DASS-anxiety scores of
$>9$ (i.e. above mild) did show a statistically significant association to PND at
six months postpartum [$\chi^2 (1) 9.720, p = 0.002$]. Similarly, postnatal DASS-stress scores of $>18$ (i.e. above mild) showed a statistically significant association to PND at six months postpartum [$\chi^2 (1) 14.520, p < 0.001$].

**Social support at six months postpartum**

At six months postpartum there was a statistically significant relationship between the level of social support and development of PND [$\chi^2 (2) 34.880, p < 0.001$]. Women with low social support were more likely to develop PND.

**Gender of the baby**

Sex of the baby showed a statistically significant association to PND at six months postpartum [$\chi^2 (1) 9.720, p < 0.002$]. Women who gave birth to a female baby were more likely to develop PND. Similarly, the variable indicating unhappiness about having a female baby showed a statistically significant association with PND at six months postpartum [$\chi^2 (2) 46.160, p < 0.001$].

**Conclusion**

Most of the antenatal factors under investigation were associated with the development of depression during pregnancy, at six to eight weeks postpartum, and at six months postpartum confirming work of previous researchers in this area. Similarly, most of postpartum factors were associated with the development of PND at six to eight weeks and six months postpartum. Obstetric intervention, poor care during labour, and negative feelings whilst in labour such as fear, helplessness and lack of control were associated with the development of PND at six to eight weeks and six months postpartum.

Personal and family history of psychiatric illness in the present study were not associated with the development of antenatal depression nor PND, while, women's difficult relationships with their mothers-in-law was associated with
the development of antenatal and postnatal depression. Giving birth to a female baby was associated with the development of depression at six to eight weeks and six months postpartum.
CHAPTER 6

Discussion

This prospective, multi-phase study of a representative cohort of birthing women was designed to determine the incidence and factors associated with the development of depression during pregnancy, at six to eight weeks postpartum and six months postpartum. This chapter will discuss the outcomes of the study, incidence of antenatal and postnatal depression, the factors found to be associated with the development of antenatal and postnatal depression. The findings will be examined in relation to contemporary literature on childbirth, antenatal and postnatal depression. Limitations of the study will also be discussed.

The present study has methodological strengths that have improved on those used in prior research in the field. Firstly, the prospective design allowed for a fuller and more accurate examination of the contribution of antenatal factors to the development of PND and avoided the inherent assumptions of retrospective attribution of psychological and social risk during pregnancy to adverse outcomes. Secondly, the sample was adequately representative of the Jordanian birthing population in terms of age, education and obstetric events which enable results to be generalised. Sample size permitted a range of statistical analysis with sufficient power. The sample comprised both nulliparous and multiparous women who had minimal obstetric risk for childbirth complications and excluded women at high risk. Finally, most of the research data were gathered during telephone interviews using standarised, psychometric instruments that allowed for both replication and comparisons to be drawn with the general population of women.

Incidence of antenatal depression

The first purpose of the present study was to determine the incidence of antenatal depression and the incidence of PND. Nineteen percent (19%) of women had a total EPDS scores of equal or greater than 13 (probable
antenatal depression) and 19.3% of women scored > 13 on DASS-depression (above mild). Antenatal depression has not received the same attention as postnatal depression in the health care community or in the media (Bowen & Muhajarine, 2006a). This may be related to the increased focus on the physical well-being of the mother and fetus during pregnancy or the misattribution of signs and symptoms of depression to the changes and emotions associated with pregnancy (Bowen & Muhajarine, 2006a; Kelly, Russo, & Katon, 2001). Bennett, Einarson, Taddio, and Koren (2004) reported in a systematic review of depressive symptoms during pregnancy prevalence rates between 7% and 24.6% in the first trimester, 9% to 48.9% in the second trimester, and 8.8% to 51.4% in the third trimester. Studies of antenatal psychopathology have mostly examined antenatal mood as a predictor of postpartum depression (Evans et al., 2001).

The incidence of antenatal depression varies from society to society. In Middle Eastern and Arab countries, just one study conducted in Morocco examined the prevalence of antenatal depression (Alami, Kadri, & Berrada, 2006). The prevalence of antenatal depression in the Moroccan study was 19.2% as assessed by the Mini International Neuropsychiatric Interview (MINI) (Alami et al., 2006). This is nearly the same rate reported in the present study. There are several cultural similarities between Morocco and Jordan in terms of gender preferences for the infant and potentially difficult relationships with mothers-in-law. The present study found that both these factors were associated with an increase risk of antenatal depression.

In contrast, some studies conducted in some developed and non-Arab developing countries that investigated the prevalence of antenatal depression as a predictor of PND reported a lower incidence of antenatal depression. For example, Sutter-Dallay et al. (2004) reported that during the third trimester of pregnancy, 5.8% of women in Bordeaux, France presented with a score >12 on the EPDS. In Turku, Finland, 7.7% of women screened positive on the EPDS with a cut-off point of 12/13 between 14-37 gestational weeks (Pajulo et al., 2001). Evans et al. (2001) reported that antenatal depression among
Scottish women at 32 gestational weeks was 13.5% (using a cut-off score of >12 of the EPDS). In Japan, the incidence of the DSM-III-R Major Depressive Episode during pregnancy was 5.6% (Kitamura et al., 2006). The low incidence of antenatal depression reported may be related to the good social support Japanese women received during their pregnancy. Alternatively, it may be that women experiencing mild to moderate depression were not identified. Similarly, the prevalence of antenatal depression during the second trimester among Hong Kong Chinese women was low (9.9%) using a cut-off score of >14 in the EPDS (Lau & Keung, 2007). The low incidence of antenatal depression was explained by the good social support women received during their pregnancy and the timing of screening.

In the Netherlands, 22% of women were depressed according to the Research Diagnostic Criteria (RDC) (Verkerk, Pop, Van Son, & Van Hech, 2003). The high rate of antenatal depression reported may be related to the instrument they used (RDC) and the timing of data collection whereby women were screened at any stage during pregnancy rather than during a specific period of pregnancy.

The incidence of antenatal depression in developing countries is higher than in developed countries. For example, antenatal depression during the last trimester of pregnancy in a rural area in Tamil, India was 16.2% using ICD-10 (Chandran, Tharyan, Muliyil., & Abraham., 2002). Limlomwongse and Liabsuetrakul (2006) reported that depression among Thai women (scores of 10 or more on the EPDS) was 20.5% during the third trimester of pregnancy. The high rate of antenatal depression among Thai women may be related to the low cut-off score used in the study. Felice, Saliba, Grech, and John (2004) reported that antenatal depression among Maltese women was 11.1% in the third trimester using a cut-off score of >12 on the ICD-10. They related the lower rates of antenatal depression among Maltese women to the good support women received during pregnancy.
Evans et al. (2001) reported that mean sores of depression were higher during the third trimester than first or second trimester of pregnancy, with a peak during third trimester. They also reported that a cut-off score above 12 is widely used to indicate probable depressive disorder and validation of the scale showed that all those found to have definite major depression when interviewed, had scored above 12 on EPDS.

The incidence of antenatal depression in the present study is mostly higher than the incidence reported in developed countries and some developing countries. In addition to the cultural and regional differences, the high incidence of antenatal depression in the present study may be related to the poor antenatal care women receive. In Jordan, care is concentrated on performing tests and measurements while other aspects of care such as information on the normal changes during pregnancy, minor and major discomforts of pregnancy, labour and birth process, preparation for parenthood and emotional support are neglected. Women are rarely involved in discussions about their social and psychological well-being. Providers only partially listen to pregnant women when they express ideas or reveal fears, and seldom encourage women to join discussions to find appropriate solutions to their problems (Al-Hiasat, 1999; Mawajdeh et al., 1995). There is also a deficit in the provision of health education and health behaviour advice (Al-Hiasat, 1999). In addition, high incidence of antenatal depression in the present study may be related to lack of women’s knowledge about antenatal depression thus women were not aware that they suffering the condition and in turn will not seek help for treatment. The unwillingness of Jordanian women to disclose feelings to others, especially health care providers, may be another reason for the high incidence of antenatal depression among Jordanian women. All of these may increase stress and reduce attendance for antenatal care and increase women risk of antenatal depression.
Incidence of postnatal depression

At six to eight weeks postpartum 22.1% (n = 78) of women scored ≥ 13 using EPDS and 22.7% (n = 80) scored above mild using DASS-depression. At six months postpartum, the incidence of PND was 21.2% (n = 75) using EPDS and 21.7% (n = 80) scored above mild using DASS-depression. The incidence of PND decreased slightly over the six months postpartum. The DASS-depression figures show a similar trend to the EPDS. However, the PND rate at six months is concerning because PND persisting to six months postpartum is likely to remain chronic and can have adverse effects not only on the mother, but also on the partner, the child’s developments and the well-being of the whole family (Cooper et al., 1999; Da Costa et al., 2000; Dennis & Ross, 2006a; Husain et al., 2006; Lee & Chung, 2007; Rahman, Harrington, & Bunn, 2002).

The incidence of PND varies from society to society. In general, the incidence of PND in the Middle East and some of non-Arab developing countries is higher than that in western countries (Bugdayci et al., 2004). Rates of PND ranged from 19%-34.6% for women living in various developing countries when measured between six weeks and six months postpartum (Abiodun, 2006; Aydin et al., 2005; Bugdayci et al., 2004; Chaaya et al., 2002; Dankner et al., 2000; Dindar & Erdogan, 2007; Green et al., 2006; Husain et al., 2006; Inandi et al., 2005). In contrast, rates of PND ranged from 5% -14% for women living in various developed countries when measured between six weeks and four months postpartum (Evans et al., 2001; Josefsson et al., 2002; Kitamura et al., 2006; Milgrom et al., 2005; Thome, 2000). In the present study, the incidence of PND is 21.2%. This rate is similar to the rate reported in studies conducted in Middle Eastern and some of Asian countries and less than rates reported in Turkey but higher than the rate reported in the developed countries.

The similarity in the incidence of PND found in the present study and other studies conducted in the Middle East and some of Asian countries may be related to cultural factors. Arab and Asian countries have similar cultures with
regard to social support for the mother following the birth, potential relationship difficulties with parents-in-law (in particular the mother-in-law) and desire for a male baby.

In the present study, the high rate of PND is mostly due to a negative childbirth experience perceived by women to be related to painful labour and birth, medical intervention, exposure to strangers, unsupportive health-care providers, and dissatisfaction with overall care during labour. The association between these variables and PND is similar to that reported in other studies (Brown & Lumley, 1998; Leung, 2001; Oweis, 2001; Small et al., 2003; Waldenstrom, Hildingsson, Rubertsson, & Radestad, 2004). In addition, the high incidence in the present study may be related to a lack of women’s knowledge about PND thus they are not aware that they are suffering PND and as a result they will not seek help for treatment. The unwillingness of women to disclose their feelings to health professionals because of the stigma attached to mental illness may be another reason for the high incidence of PND among Jordanian women.

Previous studies vary as to whether scores increase or diminish during the first year. For example, Wickberg and Hwang (1997) found that PND scores in Swedish women were higher at 8 weeks than at 12 weeks (12.5% and 8.3% respectively). An Australian study showed that PND scores dropped over the time from one month 11.3%; three months, 9.4%; and six months, 5.4% (Boyce et al., 1993). Similarly, in a cross sectional study of Nigerian postpartum women, Adewuya and Afolabi (2005) reported a high prevalence of PND in the first week (using Zung’s Self Rating Depression Scale), which declined in the fourth week, and then rose at 8 to 12 weeks postpartum. Green et al. (2006) reported that PND scores in Arab women from the United Arab Emirates were higher at three months than six months (22% and 12.5% respectively). Similarly, a study conducted in another Arab country (Morocco) reported that PND scores diminished over time (tools were administered between 2 to 36 weeks postpartum). At two to three weeks, the prevalence of
PND was 16.8%. At 12 weeks, the prevalence decreased to 14% then to 12% at 24 weeks and to 6% at 36 weeks (Alami et al., 2006).

Najman et al. (2000) stated that the prevalence of depression during pregnancy and at six months postpartum is less than during any other postnatal period. This is consistent with the present study as the incidence of depression in the antenatal period and at six months postpartum was less than at six to eight weeks postpartum. Other studies reported that the peak period for PND is 8 to 12 weeks postpartum (Adewuya & Afolabi, 2005; O'Hara & Swain, 1996).

On the other hand, studies conducted in Turkey reported that depression scores increased with the age of the baby (they tested between 0 to 15 months) and hypothesised this may be related to the fact that mothers receive a great deal of interest and support immediately following the birth but that this drops off over time (Bugdayci et al., 2004; Danaci et al., 2002). The present study found that Jordanian women also receive a great deal of attention immediately following the birth, which lessens over the next few months, but the level of postpartum depression remained relatively stable.

Incidence of depression, anxiety, and stress in pregnancy and postpartum
In the present study, scores that rise above the threshold for probable depression in the postpartum period are higher than late pregnancy. The same trend of higher scores in postpartum than late pregnancy was found for the other psychological variables of anxiety and stress. It seems postpartum period is more of an emotionally testing time for some women than late pregnancy.

Antenatal factors associated with antenatal and postnatal depression
Part one of the second purpose of the present study was to determine the association between antenatal and postnatal depression and the selected factors investigated during the last trimester of pregnancy. In the first instance
the contribution of a number of variables was investigated. An overview of the variables will be discussed in relation to the relevant literature in the following sections.

Of variables investigated during the third trimester of pregnancy, psychological factors of anxiety, stress, and worry (in particular, worry about labour and birth, women’s relationship with their husbands, and financial problems); social support; unplanned pregnancy; stressful life events due to financial problems, marital relationship; socio-cultural factor of women’s relationship with their mothers-in-law; perceived parenting knowledge; and maternal perceived self-efficacy were associated with the development of antenatal depression. The same variables were associated with the development of PND at six to eight weeks and at six months postpartum except level of anxiety. Level of stress during pregnancy was associated with development of PND at six to eight weeks postpartum but not at six months postpartum. On the other hand, antenatal depression was associated with the development of PND at six to eight weeks and six months postpartum.

Studies investigating the factors associated with antenatal depression reported that age, occupation and educational level were not associated with development of antenatal depression (Lau & Keung, 2007; Tychey et al., 2005). In relation to parity both multiparous and nulliparous women were at risk of developing antenatal depression (Lau & Keung, 2007; Pajulo et al., 2001).

Regarding the impact of age and parity on the development of PND, the picture from different studies is somewhat mixed. In relation to parity, no firm association has been found between parity and PND (Horowitz, Damato, Duffy, & Solon, 2005). Glasser et al. (1998) found that parity was not associated with PND among Israelis and new immigrant women. In contrast, other studies reported that primigravida women were more likely to develop PND (Abiodun, 2006; Oweis, 2001). Similarly, Green et al. (2006) found that 22% of Arab women were depressed (scored $\geq$13) and the factors associated
with PND were parity (primiparous women had higher depression scores than did multiparous women), older age and a poor relationship with mother-in-law. Other researchers report that married, multiparous women are more likely to be depressed than childless married or single women (Forman et al., 2000).

Regarding age, both older and younger women are at increased risk of PND (NHMRC, 2000). Some studies reported that younger maternal age was a associated with the development of PND (Abiodun, 2006; Hudson et al., 2000; Kitamura et al., 2006; Nakku et al., 2006). Other studies reported that older maternal age (35 years old) in first time mothers was a significant predictor of PND and this is may be related to increased maternal anxiety with the first child and difficulties in adjusting to parenting (NHMRC, 2000). The present study found no association between demographic factors of age; occupation; level of education, and parity and the development of antenatal and postnatal depression.

Evidence suggests that women who experience depression during pregnancy have a much higher chance of developing PND (Goldbort, 2006; Inandi et al., 2005; Kitamura et al., 2006; Lee et al., 2004; Lee & Chung, 2007; Rahman, Iqbal, & Harrington, 2003). Depressed mood during pregnancy was a moderate-strong predictor of PND (Johnstone et al., 2001; Josefsson et al., 2002). Ingram and Taylor (2007) reported that women with high antenatal EPDS scores were significantly more likely to have PND symptomatology. Similarly, the present study found an association between antenatal depression and postnatal depression. Women who reported antenatal depression were more likely to develop PND.

Anxiety is common and often co-morbid with depression but mostly neglected in studies of pregnancy and the postpartum period (Heron et al., 2004). Limited studies have investigated the association between anxiety during pregnancy and antenatal and postnatal depression (Heron et al., 2004). Most studies examining the relationship between anxiety and antenatal and postnatal depression confirm that anxiety during pregnancy is a strong
predictor of both antenatal and postnatal depression (Andersson et al., 2004; Sayil et al., 2006; Sutter-Dallay et al., 2004). For example, Liabsuetrakul et al. (2007) found that anxiety during pregnancy was associated with the development of antenatal depression as well anxiety during pregnancy and postpartum was associated with the development of PND. A clinically significant comorbid anxiety was experienced by around 50% of pregnant and postpartum women (Ross et al., 2003). Sayil et al. (2006) reported that women with a higher anxiety levels were more likely to develop PND. The present study found a positive relationship between anxiety and antenatal depression. Women who scored above mild in the DASS-anxiety scale were more likely to have higher depression scores in EPDS ($\geq 13$) during pregnancy. Antenatal DASS-anxiety scores in the present study were not associated with the development of PND. This may be related to the suggestion that the antenatal measurement of anxiety using DASS-anxiety is problematic due to the physiological changes of pregnancy in addition to the low reliability of DASS-anxiety when used in pregnancy (Gamble, 2003).

Worry seems to be inseparably linked to the affective responses of depression and anxiety (Affonso, Liu-Chiang, & Mayberry, 1999). When individuals become involved in the thoughts of hopelessness about the future, depression becomes the prevalent emotion (Affonso et al., 1999). In contrast, when individuals think about past loss or future disasters and attempts to cope with or avoid such future events, the predominant emotion is anxiety (Affonso et al., 1999). There are very few studies examining the impact of worry on the development of antenatal and postnatal depression. Worry was found to be one of the eight most intense and frequent symptoms of depression in American childbearing women, as measured by a standarised clinical interview. In their study of American women, Affonso et al. (1999) reported that many women experienced worry, anxiety and depression during early pregnancy that continued throughout the postpartum. Other studies reported that many women experience worry during the last trimester of pregnancy and this worry usually disappears in the postpartum period (Jinadu & Daramola, 1990). Very limited studies investigated the association between
antenatal worry and development of antenatal and postnatal depression. Green et al. (2003) investigated the association between women’s worry during pregnancy and the development of antenatal depression. They screened pregnant women at 35 gestational weeks using EPDS and the Cambridge Worry Scale (CWS). They found a strong positive association between worry during pregnancy and antenatal depression. Leung (2001) reported that antenatal worry was associated with development of PND among Hong Kong Chinese women. The present study found that worry about labour and birth, relationship with their husbands, and financial problems were associated with the development of antenatal and postnatal depression. Women who reported high worry scores (four or five) were more likely to have EPDS scores of $\geq 13$.

Various epidemiological studies have identified data suggesting that the major aetiological factors of antenatal and postnatal depression are largely of social nature (Dankner et al., 2000; Glasser et al., 1998; Lee & Chung, 2007; Rahman et al., 2003). The social and psychological events encountered by the mother during pregnancy are considered a likely source of antenatal and postnatal depression (Felice et al., 2004). Receiving social support through relatives and friends during pregnancy is thought to be a protective factor against developing depression either during pregnancy or after childbirth (Robertson et al., 2004). Studies which investigated factors associated with antenatal and postnatal depression confirm that a lack of social support especially from a partner/husband during pregnancy is a strong predictor of antenatal and postnatal depression (Bowen & Muhajarine, 2006b; Inandi et al., 2005; Ingram & Taylor, 2007; Lau & Keung, 2007; Pajulo et al., 2001; Willinck & Cotton, 2004). In China, Japan, and Malta, low prevalence of antenatal and/or postnatal depression may be related to the adequate social support received during pregnancy and postpartum (Felice et al., 2004; Kitamura et al., 2006; Lee & Chung, 2007). In the current study, inadequate social support especially from women’s husbands was associated with the development of antenatal and postnatal depression.
The capacity of social support to promote health is becoming increasingly well-recognised (Hodnett et al., 2002). According to Ogrodniczuk (2004) support from a partner is most important to maternal well-being. Women who receive good support from their partners are more likely to experience an easier, more satisfied transition to motherhood, be less stressed, enjoy their infants more and experience less overt signs of depression six weeks after birth (Ogrodniczuk, 2004; Reece, 1995). Conversely, low social support and high levels of stress and anxiety are linked to fear of childbirth (Saisto, Salmela-Aro, & Nurmi, 2001) and more negative cognitive appraisal of delivery (Zar, Wijma, & Wijma, 2001). Social support is important in relieving the negative effects of stress experienced by mothers following childbirth and reducing depressive symptoms (Ogrodniczuk, 2004; Swenden & Mazure, 2000). In Jordan, fathers are not expected to provide either psychological support or child care after birth as their only responsibility is financial (Safadi, 2005). Jordanian women experiencing a lack of support from their husbands may be at increased risk of developing both antenatal and postnatal depression.

A previous history of psychiatric disorders in the present study was not associated with antenatal and postnatal depression. These findings are similar to the findings reported by Verkerk et al. (2003) and Chandran et al. (2002). They also found that a previous history of depression was not associated with development of antenatal depression. In contrast, other studies reported that a previous history of depression was a predictor of antenatal depression (Bacchus et al., 2004; Bernazzani et al., 1997; Bonari et al., 2004; Bowen & Muhajarine, 2006a; Felice et al., 2004). The results of two meta-analyses by Beck (2001) and O’Hara and Swain (1996) found that a previous history of depression (pre-pregnancy depression, AN depression, and PND) was a moderate to strong predictor of subsequent postpartum depression. Subsequent studies similarly report that women with a previous history of PND are at increased risk of developing PND in the current pregnancy (Aydin et al., 2005; Dindar & Erdogan, 2007; Inandi et al., 2005; Lee & Chung, 2007).
The present study did not find a relationship between family history of psychiatric illness and development of antenatal and postnatal depression. Similarly, some other studies reported no association between family history of depression or other emotional disorders and development of postnatal depression (Chandran et al., 2002; Hopkins, Marcus, & Campbell, 1984; O'Hara & Swain, 1996; Troutman & Cutrona, 1990). However, Freeman et al. (2005) and Johnstone et al. (2001) found an increased risk of PND with a family history of psychiatric illness. Felice et al. (2004) stated that family history of psychiatric illness was associated with antenatal depression.

One of the difficulties in establishing a positive previous history of mental illness is that it requires women to be aware that they suffered from depression in past pregnancies or/and after the birth and they be willing to disclose this information. The same issue is present regarding a family history of psychiatric illness as it requires women to be aware of the mental health problems of relatives, and to be willing to disclose this information. Jordanian women are not aware of depression in general, during pregnancy and after childbirth. This may be partly because there is a focus on the provision of physical care and a deficit in provision of health education or psychological care (Abushaikha & Oweis, 2005; Al-Hiasat, 1999).

To date there is no study investigating attitudes towards mental illness in Jordan. Studies in some Arab countries have reported that people with a mental illness suffer from stigma (Al-Adawi, Al-Ghafry, & Burke, 2002; Kadri, Manoudi, Berrada, & Moussaoui, 2004; Takriti, 2004). The stigma has a pernicious impact on the patient and his/her family, as it obliges them to remain socially isolated (Al-Adawi et al., 2002; Kadri et al., 2004).

Kadri et al. (2004) conducted a study with 100 Moroccan families with a mentally ill member to investigate their attitudes and behaviour toward the patient, and their perception of stigma. They found that most families suffer from stigma and discrimination. Families also reported feeling neglected, especially by neighbours and relatives, and feeling that people are afraid of
them. A study by Haj-Yahia (1999) investigated the attitudes of a Plaestinian population toward mentally ill patients. He found that people have negative attitudes towards mentally ill persons. These attitudes include: unwillingness to work with or for a mentally ill person, unwillingness to rent an apartment to mentally ill person, unwillingness to spend time with a mentally ill person, and strong desire to maintain a social and emotional distance from them. In Jordan, as in other Arab countries mentioned above, mental illness is expected to be highly stigmatised because the mentally ill person is viewed as a shameful reflection on the family. The lack of knowledge about mental illness might be a factor generating and aggravating stigma against persons with mental illness and their families. It is therefore highly likely that Jordanian childbearing women are less likely to report any personal and family history of psychiatric illness.

Unplanned or unwanted pregnancy in the present study was associated with development of antenatal and postnatal depression. This is consistent with other studies which confirm that unwanted pregnancy is associated with antenatal and postnatal depression (Csatornai et al., 2007; Kitamura et al., 2006; Lau & Keung, 2007; Nakku et al., 2006; Sayil et al., 2006).

Identification of an unplanned or unwanted pregnancy as a risk factor for antenatal and postnatal depression should be interpreted cautiously. It does not measure the women’s feelings towards the growing fetus but merely the circumstances in which the pregnancy occurred. Jordanian couples usually prefer to defer a subsequent pregnancy if their last child is still less than one year old and if they have financial difficulties (Safadi, 2005). An extensive literature search showed a lack of published articles about parents’ attitudes toward unwanted pregnancy in Jordan.

One study in Egypt on attitudes towards an unwanted pregnancy by Kader and Maklouf (1998) found that 35% of men and 75% of women in the sample did not want additional births while others said they wanted to postpone pregnancy. Among couples in which both partners did not want another child,
the main reasons were the high cost of bringing up a child, the need for parental time and attention, women’s health problems that might negatively affect the child, and “bad” timing. The authors reported that parents of unwanted pregnancy tended to be anxious and upset and 17% of women with unwanted pregnancy attempted pregnancy termination.

Jordan and Egypt have cultures similar and it is likely that attitudes toward unwanted pregnancy would be the same. In addition, it is known that some women having an unwanted pregnancy will not attend antenatal clinics or take care of themselves (Mawajdeh et al., 1995). An unwanted pregnancy increases women’s risk of antenatal and postnatal depression, and family planning programs should give childbearing women good education and counselling to help them understand how to use contraceptives effectively and reduce the risk of unsafe abortion.

Stressful life events are reported in many studies as a predictor of antenatal and postnatal depression. Women who reported stressful life events before or/and during pregnancy are more likely to develop antenatal and postnatal depression (Bowen & Muhajarine, 2006b; Bugdayci et al., 2004; Dindar & Erdogan, 2007; Goedde, 2003; Horowitz et al., 2005; Oweis, 2001). In the present study, women with stress due to financial problems were more likely to have a higher depression scores during pregnancy than those without financial problems. Women with financial problems may be concerned about the increase in family expenses associated with a new baby than those with good financial status. The findings of the present study are similar to many other studies which also report that women who have financial problems are more likely to develop antenatal and postnatal depression (Andajani-Sutjahjo et al., 2007; Dindar & Erdogan, 2007; Goedde, 2003; Horowitz & Goodman, 2004; Inandi et al., 2005).

Marital conflicts and lack of partner support are commonly cited variables associated with the development of antenatal and postnatal depression (Abbott & Williams, 2006; Aydin et al., 2005; Bowen & Muhajarine, 2006b;
Dindar & Erdogan, 2007; Green et al., 2006; Lau & Keung, 2007; Lee & Chung, 2007). This is similar to the findings of the current study. Women who reported difficult or very difficult relationships with their husbands were more likely to develop antenatal and postnatal depression. A meta-analysis of 84 studies published in the 1990s by Beck (2001) revealed that a poor marital relationship is one of the 13 predictors of postpartum depression.

To date, no study conducted within western societies have investigated the association between a woman’s relationship with her mother-in-law and the development of antenatal and/or postnatal depression. Many studies in developing countries have found association between a difficult relationship with the mother-in-law and development of antenatal depression and postnatal depression (Abiodun, 2006; Dindar & Erdogan, 2007; Green et al., 2006; Lau & Keung, 2007). This is similar to the findings of the present study.

Traditional postpartum rituals, such as “doing the 40 days” is not necessarily protective against PND (Green et al., 2006). In the postpartum period, conflict between new mothers and their mothers-in-law may occur when two parties have different opinions about baby care and postpartum practices. Refusal of the care offered by mothers-in-law and refusal to follow certain postpartum rituals may be labelled as unfilially (Abiodun, 2006; Lee & Chung, 2007). In Jordan, care from the mother-in-law is not welcomed by many women and this custom exerts a negative impact on women’s emotional and psychological well-being and was associated with an increased risk of PND (Safadi, 2005).

Mothers-in-law in Jordan often have a great deal of influence over all aspects of a woman’s life and consequently the lives of their children (Khalaf & Callister, 1997; Safadi, 2005). Therefore, having a good relationship with the mother-in-law is important to Jordanian women but could lead to depression if it is difficult. In Jordan, a good relationship with the mother-in-law is important to the success of the marital relationship because sons remain closely tied to their family of origin, sometimes continuing to live with and even work within
the family business their entire lives (Khalaf & Callister, 1997). In the present study, there was an association between women’s relationships with their mother-in-law and with their husbands. Women who reported difficult or very difficult relationships with their mothers-in-law were more likely to have difficult or very difficult relationships with their husbands. Previous studies of Muslim and eastern women have also found a strong association between women’s relationships with their mothers-in-law and their husbands (Chandran et al., 2002; Danaci et al., 2002; Green et al., 2006; Lee & Chung, 2007; Leung, 2001).

Knowledge related to labour, birth and motherhood was protective of depression. In the current study, women with good reported knowledge of labour and birth, their rights and responsibilities during labour and birth, physical changes after the birth, and caring and feeding of their babies were less depressed antenatally and postnatally than were those with poor knowledge. There are several possible reasons behind this finding. When Jordanian women become pregnant they only receive physical care during their pregnancy, and no formal information about pregnancy, childbirth, the postnatal period, or child care. Thus, the source of information for Jordanian women typically comes from significant women in their families or from their friends who have experience of pregnancy, childbirth, and early parenting (Abushaikha & Oweis, 2005; Safadi, 2005). The information they receive is usually based on personal experience rather than being scientifically based. Therefore, when Jordanian women (in particular primiparous women) go through the pregnancy, they are relatively unprepared and may carry with them the fears and concerns of other women (Safadi, 2005). This lack of preparation may increase the level of stress they experience and lead to loss of control during childbirth and possibly contribute to an increase risk of PND.

Antenatal preparation for the childbirth may modify negative effects of birth and act as a protective factor against PND (Abbott & Williams, 2006; Chaaya et al., 2002). While many studies have investigated the relationship between maternal preparation for the childbirth and development of PND (e.g.,
Goedde, 2003; Oweis, 2001), the current study found an association between maternal knowledge during pregnancy and development of antenatal depression and PND. Childbirth education is a tool used to inform women about anatomy and physiology of pregnancy, labour, coping strategies and parenthood (Abushaikha, 2007). It can help pregnant women to prepare mentally and physically for childbirth and to decide on pain relief measures to cope with pain during labour (Abushaikha, 2007). Childbirth education gives the pregnant woman an opportunity to form a supportive network with others in a similar situation and help women to learn skills to cope with labour (Spiby et al., 1999).

Some studies have found a significant beneficial effects of childbirth education on the quality of birth and postpartum experiences, including less use of drugs for pain relief during delivery, shorter labour, less instrumental delivery, adoption of healthy behaviours and less maternal anxiety and depression (Abbott & Williams, 2006; Chaaya et al., 2002; Molzan-Turan & Say, 2003; O'Meara, 1993). In contrast, several studies in widely varying settings have failed to find a positive effect of childbirth classes in reducing psychological distress or increasing satisfaction with the birth experience (Fabian, Radestad, & Waldenstrom, 2005; Hayes, Muller, & Bradley, 2001; Langer, Victoria, & Farnot, 1996; Sheehan, 1999). Gagnon and Sandall (2007) conducted a Cochrane systematic review to assess the effect of individual or group antenatal education for childbirth or parenthood, or both on knowledge acquisition, anxiety, sense of control, pain, labour and birth support, breastfeeding, infant-care abilities, and psychological and social adjustment. Nine trials, involving 2284 women, were included and 37 studies were excluded. They found that three of the studies showed beneficial effects on knowledge gained. Length of labour was found to be shorter in those receiving prenatal education in one study. Benefits to attachment and satisfaction with maternal role preparation were found in very small studies. No differences were found in any other outcomes assessment. The ninth and largest of the included studies, examining an educational and social support intervention to increase vaginal birth after C/S, showed similar rates of vaginal
births after C/S. The authors concluded that the effects of general antenatal education for childbirth or parenthood, or both, remain largely unknown. Individualised prenatal education directed toward avoidance of a repeat caesarean birth does not increase the rate of vaginal birth after caesarean section.

Another Cochrane systematic review was conducted by Horey, Weaver and Russell (2004) to examine the effectiveness of information about caesarean section. Two randomised controlled trails, involving 1451 women, were included. One study used a program of prenatal education and support, and the other used cognitive therapy to reduce fear. The results revealed that approximately 70% of women attempted vaginal delivery in both trial groups and although Caesarean delivery rates were higher than expected (40%) the researchers concluded that prenatal education about C/S does not reduce rates of C/S.

In Jordan, there no health policies or practices addressing antenatal education classes. As a result, the impact of childbirth education on the psychological status and birth experiences of Jordanian women is unknown and research on this topic is required. The form the childbirth education should take, how it should be delivered, and how it should be integrated into other components of care needs to be developed within the Jordanian cultural context and in consultation with women and their families.

Maternal feelings of self-efficacy have been associated with a number of adaptive parental outcomes, including an easier transition to motherhood, lower maternal depression, greater satisfaction with social support, and also as a buffer to stress (Jennings & Amy, 2004; Jomeen, 2004). In contrast, low self-efficacy is associated with depression, anxiety, and reduced efforts at coping with problems in the life (Agoub et al., 2005; Beck, 2001; Hall, Kotch, Browne, & Rayens, 1996; Jennings & Amy, 2004).
To date, no study has investigated an association between maternal self-efficacy and antenatal depression. In the current study maternal self-efficacy was associated with development of antenatal depression. Women who reported low self-efficacy were more likely to score $\geq 13$ in EPDS. Few studies have investigated the association between maternal self-efficacy and PND. Dilmore (2004) and Montgomery (2000) found a significant inverse relationship between PND and maternal confidence. As well, low maternal self-efficacy was a predictor of PND among Hong Kong Chinese women (Leung, 2001). Similarly, in a study with 594 postpartum women, Dennis and Ross (2006b) reported that low self-efficacy were associated with the development of PND. Postpartum depression interferes with mother’s ability to care for her infant and to build confident skills in specific parenting tasks, such as feeding, diapering, and play interactions between mother and infant (Hess et al., 2004; Montgomery, 2000). In the present study self-efficacy was associated with PND. Women who reported high postpartum depression scores had low self-efficacy. Jordanian women experiencing low self-efficacy in the present study may affect their ability to perform special tasks regarding newborn care. This may be a result of poor antenatal preparation for parenting and a low level of postpartum social support. Low self-efficacy may increase Jordanian women levels of anxiety and stress which in turn may increase their risk of developing PND.

**Intrapartum and postpartum variables associated with PND**

The intrapartum and postpartum variables discussed in this next section relate to obstetric events and intervention, satisfaction with care, feelings in labour, postpartum social support, postpartum psychological factors of anxiety and stress, and gender of the baby.

**Obstetric events and intervention**

There is limited data relating to the impact of obstetric factors on the development of PND (Parker, 2004). The findings of available studies regarding the effect of obstetric variables on postpartum depression are
mixed, with some studies reporting that women who have more obstetric intervention have increased risk of PND (Bergant et al., 1999; Yoshida et al., 1997) and other studies not fully supporting this (Chandran et al., 2002; Feinman, 1997; Forman et al., 2000; Johnstone et al., 2001; Josefsson et al., 2002). Women who report having had a traumatic delivery (including all delivery types, women’s experience of her delivery, pain, feelings of loss of control, powerless and fear) have increased risk of PND and increased risk of developing PTSD which may mimic PND (White, Matthey, Boyd, & Barnett, 2006). Medicalisation of childbirth, including the high level of technological intervention during birth, gives rise to postpartum distress and depression (Abbott & Williams, 2006). Green, Coupland and Kitzinger (1990) reported that women who had longer and or more difficult childbirth experiences were less likely to have positive psychological outcomes.

In the present study 10 obstetric variables were associated with PND at six to eight weeks and nine of these were consistently associated with PND at six months postpartum. This confirms that obstetric intervention in this group of women is strongly associated with the development of PND at six to eight weeks postpartum and six months postpartum. These findings are similar to the findings of other studies involving women who have experienced obstetric or gynaecological procedures (Agoub et al., 2005; Chaaya et al., 2002; Goedde, 2003; Oweis, 2001; Tamaki et al., 1997; Yoshida et al., 1997).

Several obstetric factors were recognised to be associated with postpartum depression such as complications during pregnancy and early postpartum or difficult labour (Agoub et al., 2005; Alami et al., 2006; Bergant et al., 1999; Oweis, 2001). Mothers who experienced a difficult and painful labour in the present study reported significantly more depressive symptomatology.

The pattern that seems to emerge is the association between highly medicalised childbirth and development of postpartum depression. Women with high depression scores often have been subjected to a range of interventions. For instance, increased number of vaginal examinations,
episiotomy and painful suturing, use of the lithotomy position during the birth (Roberts, Tracy, & Peat, 2000), or fear/anxiety associated with a lengthy labour (Goedde, 2003; Leung, 2001; Oweis, 2001).

Patel et al. (2005) reported that caesarean section does not protect against postnatal depression. While Chaaya et al. (2002) stated that caesarean section decreased the risk of PND among Lebanese women compared with vaginal birth which increased the risk. Boyce and Todd (1992) reported a significant relationship between caesarean section and developing PND at three months. They reported also that women in their study who experienced an emergency caesarean section had more than six times the risk of developing PND. In contrast, other studies found no significant association between elective or emergency caesarean section and development of PND (Carter, Frampton, & Mulder, 2006; Johnstone et al., 2001; Forman et al., 2000; Warner et al., 1996). Similarly, the present study found no association between elective or emergency caesarean section and development of PND.

In Jordan, pethidine and nitrous oxide are commonly used pain relieving drugs during labour and birth. Doctors judge the need to use pharmacological pain relief based on their assessment of a woman’s needs (Abushaikha & Oweis, 2005). Most women have a vaginal birth and instrumental birth give birth in the lithotomy position, and an episiotomy is performed on all primigravida women and most multiparous women in both public and private sectors after administration of local anaesthesia.

In the present study, most of the women reported long and painful labours, many vaginal examinations, lithotomy position during the birth, episiotomy and painful suturing. All of these factors increase the level of pain, stress and discomfort among women during labour and birth, which in turn increases the risk of PND. In Jordan, most women expect their overall childbirth experience to be difficult and painful (Abushaikha & Oweis, 2005; Oweis & Abushaikha, 2004). Oweis (2001) reported that long, difficult, and painful labour was associated with the development of PND among Jordanian women. Similarly,
Chaaya et al. (2002) reported that normal vaginal birth increases the risk of PND among Lebanese women. This is related to the fact that Lebanese women see normal birth as a source of stress, fear and pain. Abushaikha and Oweis (2005) assessed labour experiences and labour pain intensity among low-risk Jordanian women who delivered vaginally using the Numeric Pain Intensity Scale (NPIS) (with ratings ranging from 0-10). They found that the majority of women did not receive pain relief. Eighty-one women reported pain intensity levels of \( \geq 8 \) on the NPIS. The mean pain intensity level during the second stage of labour was 8.83. A negative expectation of childbirth, lack of support, and the routine use of lithotomy position during the birth contributed to high level of pain for Jordanian women during the second stage of labour (Abushaikha & Oweis, 2005). In the present study, more than half of the women reported that their pain and discomfort during labour and birth were much worse than they expected or a little worse than they expected. These women were more likely to develop PND. Similarly, some other studies reported that painful labour and birth increased the risk of PND (Goedde, 2003; Leung, 2001; Oweis, 2001).

In the present study women who received either nitrous oxide or pethidine injection were more likely to develop PND as were women who were very unhappy or unhappy with the pain relief received during labour and birth. Hiltunen et al. (2004) reported in their study that mothers who received epidural/paracervical block during birth spent less time in the delivery room than mothers who used the nitrous oxide/acupuncture or mothers with no pain relief and had shorter labours than mothers without pain relief. They stated also that the adjusted risk of depressive scores at the first postnatal week was decreased in mothers who received epidural/paracervical blockade compared with mothers with no pain relief. Saisto et al. (2001) reported that inadequate pain relief was associated with disappointment and a negative birth experience. Inadequate pain relief increase women’s risk for negative experience of childbirth which in turn increased women’s risk of developing PND.
Labour pain results from the interactions between psychological and physiological factors (Lowe, 2002). Psychological factors, such as anxiety, fear, stress, and loss of control all contribute to labour pain (Lowe, 2002). Physiological factors, include uterine contraction, dilatation and effacement of the cervix contribute to labour pain (Lowe, 2002).

In the Arab-Islamic culture, pain is not considered a divine punishment for sins but it’s a test of faith (Abushaikha & Oweis, 2005). Therefore, Muslims are required to endure pain with patience, as a sign of strong faith, in return for God’s forgiveness (Abushaikha, 2007). In Jordanian culture, the labour experience is consider a natural process and women should endure the pain during childbirth in the belief that they will be rewarded for their patience from God (Allah) (Abushaikha & Oweis, 2005). Traditionally, Jordanian women use various coping methods to deal with pain during labour. These coping methods include physiological, spiritual, psychological, and cognitive methods (Abushaikha, 2007). Physiological coping methods include breathing, relaxation, changing position, and moving around. Spiritual coping methods include praying, reading Quran (the Holy book of Islam), and having confidence in God. Psychological coping mechanisms include crying, screaming, pulling hair out, verbalising pain, and visualisation. Cognitive coping methods include things such as following instruction of health care providers (e.g., correct bearing down) (Abushaikha, 2007).

According to Abushaikha (2007) physiological coping was the most common labour pain coping method used by Jordanian women. This was followed by psychological coping such as crying, screaming, pulling hair out, and verbalising pain. Spiritual coping was the third coping methods used by Jordanian women while, cognitive methods were the least common. Childbirth education would empower Jordanian women through providing necessary culturally-sensitive knowledge about labour pain and different coping methods. This would encourage them to choose more effective and culturally acceptable methods such as changing position, breathing exercise, praying, reading the Quran, and distraction instead of ineffective methods such as
pulling out hair, screaming and crying (Abushaikha, 2007). Effective coping with labour pain has been linked to a lower level of labour pain, increased self-confidence, more positive labour outcomes, and greater satisfaction with childbirth experience (Callister, Khalaf, Semenic, Kartchner, & Vehvilainen-Julkunen, 2003).

In the field of midwifery, the main professional goal has been to ensure a safe and positive labour experience with minimal pain and discomfort (Faucher & Brucker, 2000). To achieve this goal, care givers may utilise both pharmacological and non-pharmacological interventions to relieve or decrease pain during labour and birth (Faucher & Brucker, 2000). Pharmacological interventions include the use of different analgesia (e.g. pethidine, nitrous oxide, and epidural) and anaesthesia to decrease or alleviate labour pain (Faucher & Brucker, 2000). Non-pharmacological interventions are usually provided by midwives through childbirth education, labour preparation, and continuous care and support during labour and birth (Lowe, 2002; Simkin & O'Hara, 2002).

Effective labour pain management has been linked to maternal childbirth satisfaction and good birth outcomes which in turn decreases the risk of PND (Waldenstrom et al., 2004). Satisfaction with childbirth has been linked to the amount of support provided, the positive and nurturing relationship between labouring women and health care providers, client involvement in decision-making process and personal expectations of the birth experience (Waldenstrom et al., 2004).

In the current study, most women reported receiving ineffective pharmacological pain management during labour and non-pharmacological pain management before and during labour and birth. They were not provided with childbirth education during pregnancy and reported a lack of psychological support from health care providers during labour and birth. Ineffective labour pain management was associated with the development of PND in the present study.
Perceptions of care

Satisfaction with care is not just an emotional response but an evaluation of an emotion that is determined by stepping back from the situation (Bramadat & Driedger, 1993). A positive birth experience is not simply having a healthy baby but includes perceptions by the woman of her situation. Satisfaction with care is a multidimensional concept and increasingly recognised as synonymous with being “in control” (Green et al., 1999).

A number of studies have examined overall satisfaction with maternity care. Gamble (2003) reported that women were more likely to be satisfied with their care if they had access to unbiased information, making decisions concerning interventions, trusting the health care professionals, feeling respected, and trusting that the right treatment and care will be provided. According to Drew, Salmon, and Webb (1989) important needs for women in childbirth include involvement in choices, explanations of procedures, physical comfort, and relationship to caregivers. Waldenstrom, Borg, Olsson, and Wall (1996) reported that support from midwives, pain, duration of labour, expectation of the birth, involvement and participation in the birth process and surgical procedures were the factors that contributed to women’s satisfaction with the overall birth experience. Women who reported good support from midwives, also experienced a less painful and shorter labour, were involved in decision-making, and informed about their labour progress, were more likely to be satisfied with their overall birth experience and were less likely to develop PND (Abushaikha & Oweis, 2005; Safadi, 2005; Waldenstrom et al., 2004).

Similarly, Seguin, Therrien, Champagne, and Larouche (1989) conducted a study with 938 women from the Montreal area to evaluate variability in levels of satisfaction four to seven months following birth. Five dimensions of women’s satisfaction were identified. They were the labour and birth itself (e.g. pain intensity, length and difficulty of labour, and complication of labour), midwifery care, medical care, participation in decision-making process, and information received. Women who reported less painful, shorter, and
uncomplicated labour; good midwifery and medical care; involvement in decision-making regarding care; and receiving information about procedures during their labour were more satisfied with their childbirth. However, labour procedures or interventions during labour (electronic fetal monitoring, forceps, induction of labour, and episiotomy) were not associated with the different dimensions of satisfaction with childbirth. Scant attention has been given to dissatisfaction with childbirth. The available research identified that a lack of empathy by staff, lack of information, and reduced role in decision-making were related to dissatisfaction in labour and birth (Brown & Lumley, 1994; Creedy, 1999; Gamble, 2003).

In the present study, questions were asked to measure various dimensions of satisfaction with care such as feeling supported and cared for, informed, involved in decisions. The majority of women were dissatisfied with their care. However, a statistically consistent relationship was found between dissatisfaction with these aspects of care and the development of PND at six to eight weeks postpartum. At six months postpartum the same overall dimensions of satisfaction or control were also strongly associated with PND.

Feeling supported and cared for is a recurring theme in the literature and central to the helping roles of caregivers. A positive relationship between social support (from family as well as caregivers) and health has been suggested in the literature (Oweis, 2001). It has been found to be associated with a positive appraisal of the birth experience and can assist coping and exert beneficial effects on various health outcomes (Fenwick, Gamble, & Mawson, 2003). It can also be one of the ways in which women feel they are retaining control (Gibbins & Thomson, 2002).

Social support is known to be advantageous to mothers during labour and birth (Hodnett et al., 2002). In a theoretical article by Hodnett (1997), she argued that the goal of midwifery support during labour and birth is to help women to achieve their wishes through offering attention to their emotional needs, championship, and active help. She also identified five general
categories of support that women reported were helpful during labour and birth. These are support from partner/husband, emotional support, advocacy, information, and comfort measures. Good labour support has been found to be effective in decreasing the need for analgesia, reducing the length of labour, decreasing the rate of operative vaginal delivery, decreasing the caesarean section rate, accelerating the mothers’ recovery, improving maternal-infant bonding and reducing maternal depression and anxiety in the first six weeks postnatally (Hodnett, 1996; Hodnett, 2002; Mosallam et al., 2004).

Tarkka and Paunonen (1996) conducted a study with 200 Finnish women to examine their experiences of labour in connection with social support. Women responded to Norbeck’s Social Support Questionnaire. They found that each woman reported an average of seven support persons, including partner/husband, a relative, and close friends. They found also that support networks were the main source of emotional support, aid, and affirmation for mothers. They add that nurse-midwife support was the main source of emotional support for women during their labour and contributed to a positive birth experience. Allen (1998) found that eliciting practical and emotional support from staff and partners was associated with reduced distress. Other researchers have studied partner support during labour and found that women who perceived that their partners were less supportive in labour were more likely to have PND at four weeks postpartum (Leung, 2001; Wolman et al., 1993).

Gjerdinen, Froberg, and Fontaine (1991) stated that social support needs change from pregnancy, through labour and birth, and into the postnatal period. During pregnancy, emotional and tangible support is related to the well-being of expectant mother. Emotional support was reported to be the most important during labour and birth, and informational support in the form of antenatal and postnatal education was found to decrease maternal physical complications and improve mental health during pregnancy and the postpartum period. Furthermore, they reported that mothers who received
support from companions during labour and birth experienced fewer complications and less postpartum depression. Leung (2001) reported that low support and stress from helpers were associated with PND.

In the current study, questions were asked about the overall quality of care, the helpfulness of doctors and midwives, whether doctors and midwives were encouraging and reassuring and if opportunities to talk about their feelings were provided to ascertain if women felt supported and cared for. Women who provided negative responses to questions related to support and caring were more likely to develop PND at six to eight weeks and six months postpartum. This finding is supported by other studies, which reported that women who perceived staff as unsupportive were more likely to develop PND (Goedde, 2003; Oweis, 2001).

Women accompanied by a companion throughout labour and birth, report feeling more competent as mothers and have lower depression scores than women not accompanied by a companion (Mosallam et al., 2004; Wolman et al., 1993). In Jordan, women’s husbands, mothers, relatives, and friends are usually not allowed to accompany them during their labour and birth (Abushaikha & Oweis, 2005; Safadi, 2005). This may be related to the fact that maternity units of the public hospitals are small, crowded and not well organised (usually more than one woman in the labour room as well in the delivery room) (Abushaikha & Oweis, 2005; Oweis, 2001). The absence of companions is most likely to increase Jordanian women’s levels of stress during childbirth and increase their risk of PND. In the present study, around half of women reported that they would like to be accompanied by their mothers during labour. Mosallam et al. (2004) conducted a study with 400 mothers delivered vaginally within two months to determine their attitudes and preference regarding psychological support during childbirth in the United Arab Emirates. They found that a birth attendant continuously accompanied 237 (59.3%) women. In most cases, the birth attendant was the woman’s mother (59.5%) followed by woman’s sister (31.2%). Others birth companions were friends (7.2%), other family members (1.3%) and the woman’s husband
(0.8%). For women who had no birth companion (n = 163), they reported that they would mostly prefer their mother as a birth companion (25.8%) followed by their sister (16.6%).

In Arab countries, the woman’s mother was the most commonly preferred non-professional companion during labour. This is probably a reflection of the differences in family structure, ties and relationships. There are also religious and socio-cultural barriers in Arab societies to the presence of males, even a woman’s husband, during labour and birth when the woman is partially exposed (Mosallam et al., 2004).

Feeling informed is also central to a positive birth experience. Many authors have reported that women want information that is accurate and sensitively communicated (Gibbins & Thomson, 2002; Lavender & Walkinshaw, 1998; VandeVusse, 1999). Information provision is an essential prerequisite for feeling involved in decisions and therefore feeling in control. In the current study, women who identified that they did not feel informed during labour were more likely to develop PND. Similarly, feeling involved in decisions is a vital contributor to levels of satisfaction and feeling in control. Women in the present study were asked if decisions were made without taking their wishes into account and 76.5% “agreed strongly” or “agreed”. Women who reported that decisions were made without taking their wishes into account were more likely to develop PND. In the birthing units in Jordan, the health care providers (doctors and midwives) usually make decisions without taking the women’s wishes into account (Abushaikha & Oweis, 2005; Al-Hiasat, 1999; Mawajdeh et al., 1995). This may lead to high level of dissatisfaction with the care received and subsequent distress.

Women also reported dissatisfaction about the number of people attending the birth. In Jordan, most of the public hospitals are teaching hospitals and are usually crowded by medical, nursing, and midwifery students. Medical and midwifery students are allow to attend labour and birth as well perform procedures on the labouring women without their agreement. Labouring
women can not refuse attendance of students at the labour and birth if they have been admitted to a teaching hospital. Exposure to strangers, painful labour, and increased medical intervention, contributed to negative birth experiences as reported by Jordanian women (Safadi, 2005). In the present study, exposure to strangers contributed to negative childbirth experiences which in turn increased women’s risk of developing PND.

Other studies have shown that women value having their choices respected, taking an active part in their labour and being able to make and be included in decision making during labour (Gibbins & Thomson, 2002; VandeVusse, 1999). In the present study, only 38.5% (n = 136) of women reported opportunities to talk to staff about their feelings regarding the birth, but the majority (n = 304, 86.1%) wanted to talk more to someone about how they felt about the birth. Other questions could have been asked to determine if women wanted more information about the factual aspects of labour and birth, such as a chronology of what happened or why certain actions were taken. However, the focus of this question was on the women’s opportunities to express their feelings as an initial step in processing and integrating their birth experience.

Findings of the present study indicate that many women are given insufficient time to process their birth experience. Gamble (2003) reported a similar low priority given to women’s postpartum emotional care, with only 13.7% of women reporting that staff asked how they felt after the birth. Creedy (1999) found that a similar low priority was given to women’s postpartum emotional response to labour and birth, with only 14% of women reporting that staff asked how they felt after the birth. She also found that less than half (49.7%) of the participants were encouraged to ask questions about the labour and birth (Creedy, 1999). After childbirth, women need to talk about it and recapture the whole experience by talking with midwives and/or obstetricians about the labour process. They may have a sense of loss if they are not able to remember the whole experience. Health professionals (midwives and
obstetricians) need to show interest in discussing experiences with the women, to affirm them and show appreciation of their efforts.

Midwives in Jordan are required to attend to many labouring women simultaneously. This makes it difficult for them to provide individualised quality care to all women during labour and birth. In fact, Jordanian midwives may care for as many as 10 labouring women at one time. Furthermore, midwives provide functional midwifery care with one midwife admitting the labouring women, another assessing the fetal heart rate and progress of labour, a different one assessing maternal vital signs, and a fourth one attending the birth of the baby (Abushaikha & Oweis, 2005; Safadi, 2005). Therefore, usually more than one midwife provides care to women during labour and birth. This model of care, while far from ideal, may have affected responses in the present study. If one midwife was perceived as unhelpful, the women may have evaluated the performance of all midwives as unhelpful.

It may be that quality of care is a mediating factor in the development of PND. Women who felt dissatisfied with decisions made by staff about their care, perceived that they were not consulted or respected, felt wronged by delivery staff or did not retain control were more likely to develop PND (Goedde, 2003; Leung, 2001; Oweis, 2001). Conversely, the care of a midwife and/or doctor who is kind, respectful, informative, and “on-side" may be emotionally protective (Beech, 2000). The literature supports the therapeutic impact of a positive relationship between patients and caregivers, highlighting an independent improvement in health outcomes if the care provider is warm, supportive, friendly and reassuring (Di Blasi, Harkness, Ernst, Georgiou, & Kleijnen, 2001).

Feelings whilst in labour

There was a positive association between feeling worried, frightened or anxious when labour first began and PND at six to eight weeks and six months postpartum. This finding seems at odds with the lack of association
between antenatal DASS-stress scores and DASS-anxiety scores and PND, particularly antenatal anxiety scores. However, they may not be contradictory findings. It may be that women have specific concerns about their baby or their health or are worried about their ability to cope with labour for a range of social, emotional, and physical reasons. It may be that health care providers failed to provide reassurance at this early stage, at the time of induction or admission to hospital. These factors may not be identified using DASS-anxiety and DASS-stress as these scales measure anxiety and stress as general states. The timing of data collection may also account for the positive association with feeling worried, frightened or anxious when labour first began and PND at six to eight weeks and six months postpartum but no association between antenatal anxiety scores and PND at both times. It may be that anxiety levels increase leading up to the beginning of labour and are not as pronounced when measured in late pregnancy. Recall bias may also have influenced answers to this question. A woman experiencing a difficult and painful birth may retrospectively view the whole experience more negatively.

Women in the current study who reported feeling less confident while in labour and less in control were more likely to develop PND at six to eight weeks and six months postpartum. Similarly, women who reported being out of control, frightened and/or helpless were more likely to have developed PND at six to eight weeks and six months postpartum. Loss of control as reported by Waldenstrom et al. (2004) means loss of physical control or self control, as well loss of control of the actions of health professionals, such as involvement in decision making. Chan, Levy, Chung, and Lee (2002) reported that women who experience helplessness and loss of control during their labour and birth were more likely to develop PND. In another study, Allen (1998) found feeling out of control in labour was associated with higher levels of distress which in turn increases risk of PND. The association between being out of control, helplessness, feeling worried, frightened, anxious and less confident while in labour and PND at six months may be an indication of the difficult labour and birth these women experienced. At six to eight weeks
and six months postpartum, feelings in control were not statistically associated with the development of PND.

**Postpartum social support**

Social support is a multidimensional concept (Robertson et al., 2004). According to Dennis and Ross (2006a) there are various types of social support, e.g., instrumental support (practical help in term of assistance in tasks), informational support (include advice, suggestions, and feedback), and emotional support (expression of care and esteem). A lack of postnatal social support has been consistently been demonstrated to be an important modifiable risk factor for PND (Dennis & Letourneau, 2007; Liabsuetrakul et al., 2007). The postpartum period is an important time where the mother is provided extra support by family members in many developing societies. Breakdown of social support may be an important contributing factor to the high rates of PND in these societies (Husain et al., 2006). The main sources of social support in relation to PND are partner support and support from family (Dennis & Ross, 2006a; McVeigh, 2000; Robertson et al., 2004). Lemola et al. (2007) reported in their study that mothers who were dissatisfied with support from their partners were at increased risk for PND in the first five months after delivery. Similarly, Sayil et al. (2006) reported that women who were dissatisfied with partner support (emotional and practical support) were more likely to develop PND. The partner is an important source of emotional and practical support and women who received good support from their partners were more likely to experience an easier, more satisfied transition to motherhood, enjoy their infants more, and experience less stress (Dennis & Ross, 2006a; Ogrodniczuk, 2004; Reece, 1995). Leung (2001) reported that social support factors (particularly emotional and material support, importance of support, family support, and dissatisfaction with support) were predictive of PND. Similarly, in a cross-sectional study with 1350 postpartum Turkish women, Inandi et al. (2005) reported that women who received low social support from their families and close friends were more likely to score >=13 on the EPDS. As well, nearly all studies have shown a positive association
between PND and postnatal social support (Abbott & Williams, 2006; Agoub et al., 2005; Aydin et al., 2005; Lee & Chung, 2007; Leung et al., 2005; Limlomwongse & Liabsuetrakul, 2006; Wiggins et al., 2005). Similarly, the present study found a strong association between postpartum social support and development of PND. Women who experienced low postpartum social support were more likely to develop PND. In Jordanian culture, the only responsibility of a woman’s husband is financial support. They are not expected to provide their wives with social support or practical support (Safadi, 2005). Jordanian women are required by custom to look after themselves, their children and their husbands. In addition, they are responsible for all of the house duties even if they are working outside the home or in agriculture. These responsibilities, compounded by the absence of emotional support from spouses, may increase Jordanian women’s level of stress and in turn increase their risk of developing PND.

Regarding postpartum family support, Jordanian women receive social support and practical support from the female members of their birth family and/or their husbands’ family immediately after childbirth until 40 days postpartum (Nahas & Amasheh, 1999a). During this period, new mothers obtain extra family support (usually from their mothers, sisters, or mother-in-laws) from these female family members coming to stay at their house to take care of the baby, the house, and other children (Kim-Godwin, 2003; Nahas & Amasheh, 1999a). The only responsibility of new mothers during this period is to take care of themselves (Kim-Godwin, 2003; Nahas & Amasheh, 1999a). After 40 days postpartum, the social support from her family will not be available and the new mothers have to resume their responsibilities in looking after their children, their houses and their husbands in addition to themselves. This may increase their levels of stress and increase their risk of developing PND especially, if they feel incompetent in looking after the new baby and/or managing what is expected from them.
Anxiety and stress at six months postpartum

Women with PND at six months postpartum had statistically significant higher mean scores for anxiety and stress on the DASS-21 at six months postpartum than women without PND. This picture is similar to the results reported in other studies showing a high incidence of comorbid psychological disorders among individuals with PND (Abbott & Williams, 2006; Adewuya & Afolabi, 2005; Dennis & Ross, 2006b; Heron et al., 2004; Leung, 2001; Miller et al., 2006; Ross et al., 2003; Stuart et al., 1998). Stress is a distinct negative emotional state that includes impaired function and chronic arousal (Miller et al., 2006). Miller et al. (2006) reported an association between stress, anxiety and PND. Similarly, Hung (2007) conducted a study with 526 Taiwanese women to investigate the association between postpartum stress and anxiety and the development of PND. Stress, anxiety and depression were measured at the first, third, and fifth weeks postpartum using the Stress Scale, the Zung’s Self-Rating Depression Scale and Anxiety Scale. The results indicated that postpartum stress and anxiety were important predictors of postpartum depression at the three points in time. In a population based sample of 594 women, Dennis and Ross (2006b) found evidence linking stress to the development of PND. Similarly, Leung’s (2001) prospective longitudinal study with 385 Hong Kong Chinese women found an association between social support, stress (including global stress and specific childcare stress level), antenatal depression and postnatal depression. Postpartum depression, stress and social support were assessed with EPDS, Postpartum Questionnaire, Postpartum Social Support Questionnaire, Perceived Stress Scale and the Childcare Stress Inventory. Women were recruited at their last trimester and were followed up at six weeks postpartum. They found that 20% of women scored >=13 on the EPDS.

Few studies have examined the occurrence of anxiety symptoms in the postpartum period (Adewuya & Afolabi, 2005; Heron et al., 2004). Adewuya and Afolabi (2005) conducted a cross-sectional study with 632 postpartum women in Nigeria to investigate the association between anxiety and
depression during the postpartum period. They investigated women’s anxiety and depression at week 1, 4, 8, 12, 24, and 36 postpartum using Zung’s Self Rating Anxiety and Depression Scales. The findings revealed a high comorbid anxiety and depression. PND was associated with postpartum anxiety. Similarly, in a cross-sectional study with 325 postpartum primiparous women, Miller et al. (2006) reported that 7% of women were both depressed and anxious according to DASS-21. Liabsuetrakul et al. (2007) reported that anxiety during the postpartum period was a strong predictor of PND among Thai women. This is supported by the findings of the present study with postpartum anxiety showing an association with PND. In the present study, high anxiety and stress scores postpartum may be related to low self-efficacy and lack of social support. In the postpartum period mothers need to understand their infant’s unique patterns of crying, feeding, sleeping, and other behaviour. If mothers feel they are not achieving their maternal tasks, they may view themselves as a failure. Challenges to a mother’s self confidence may increase postpartum stress (Hung, 2007). A lack of social support may affect women’s ability to view herself as competent and capable of carrying out her role responsibilities, which may raise levels of stress and anxiety (Hung, 2007). Hung et al. (2005) reported that low scores of stress among Taiwanese postpartum women were related to the good social support they received from their parents, husbands, and parents-in-law. Support protects mothers from the adverse effects of stressful postpartum events. Women’s families, husbands, and friends can provide them with the major source of feedback on how they are fulfilling the role of mother.

Gender of the baby

Studies conducted within western societies have found no association between gender of the baby and postpartum depression. However, recent studies on the developing countries such as India, China, Turkey, United Arab Emirates, Jordan suggest that disappointment with the gender of the baby, specifically if the baby is a girl, is significantly associated with developing PND (Abiodun, 2006; Dindar & Erdogan, 2007; Goldbort, 2006;
Green et al., 2006; Kitamura et al., 2006; Nakku et al., 2006; Oweis, 2001). Therefore, the parents reaction to the gender of the baby may be a potential risk factor for PND within certain cultural groups.

The high incidence of postnatal depression found in the present study may be explained by the socio-cultural background combined with poor care of Jordanian women. Findings indicate that most women who gave birth to a male baby reported significantly lower PND scores than women who gave birth to females. Given that a cut-off score of 13 or greater was considered reflective of PND, this finding indicated that, for the most part, women who had male babies were not depressed. Gender of the baby was a variable in the development of PND in the current study.

The finding that levels of depression varied dependent on the gender of the baby was not surprising in the present study of Jordanian women. In the Jordanian tradition, the birth of a baby is a special event and is celebrated. Traditionally, Jordanian women gain status when they give birth to a male baby, and they pour immense energy into his upbringing. However, the birth of a female baby is not celebrated as much and women who give birth to females usually continue to have more children until a male child is born in order to gain social status (Adams, 1994; Safadi, 2005). In Jordan, gender differences in the value of children exist, with sons being more highly valued than daughters (Khalaf & Callister, 1997; Safadi, 2005). The possibility exists, therefore, that women in the present study who gave birth to a daughters were disappointed because they did not achieve social status through this birth and therefore, developed PND. In addition, mothers of female babies may continue to worry about the outcome of their next pregnancy in terms of the gender of the baby. In addition to the reasons mentioned above, Arab parents may have preference for boys because the net economic productivity of boys exceeds that of girls as boys play differential economic role as farm workers and wage earners (Al-Qudsi, 1998). Remittances to parents may be smaller from daughters than sons and, accordingly, boys may be better 'old
age insurance’ value for parents than girls. Boys also maintain the family line (Al-Qudsi, 1998).

**Limitations**

There are several limitations of the present study. These are concerned with data collection procedures, sampling, and the investigation of associated factors in the development of antenatal and postnatal depression. Recommendation for future research will be presented.

The data collection processes may have been a potential limitation in the present study. Phase 2 and 3 data were collected by telephone interviews. While there are inherent advantages of telephone interviews over other data collection methods such as postal surveys, the present study could have conducted telephone interviews and then face-to-face interviews with a matched sample of women who scored $\geq 13$ in EPDS to ensure the validity of the data collection procedure.

The study sample was representative in relation to age, and education, and comparable to the general birthing population on a range of perinatal events. However, the sample could have included privately insured women. The inclusion of privately insured women may have affected the results of the present study as this group of women are known to experience a much higher rates of obstetric intervention during labour and birth than women in the public sector (Safadi, 2005). On the other hand, women using the private sectors may be satisfied with the care they receive during labour and birth (Oweis, 2001). Women in private hospitals usually receive continuous care from a nurse and/or midwife as well from their own private doctor and sometimes a family member is present (Oweis, 2001). In contrast, women in public hospitals mostly receive inconsistent, fragmented care and a woman’s family are not allow to attend the labour and birth (Abishaikha & Oweis, 2005; Oweis, 2001; Safadi, 2005).
The results of the present study can not be generalised to western cultures. Women from developed countries, for example, have different opportunity to disclose their feelings and discuss personal and possibly painful or difficult events. As well, issues such as, the control exerted over women by parents-in-law, the lack of antenatal classes, and female gender differences are related specifically to Arab culture.

In the present study, gender of the baby was associated with the development of postnatal depression. However, the study could have investigated the impact of knowing the gender of the baby during pregnancy on the development of antenatal depression. The high percentage of females babies compared to males babies may have had an effect on the incidence of PND among Jordanian women.

Other limitations may include, misinterpretation of items because the scales were developed in a different culture, recall bias, and unwillingness to report on emotional issues for fear of stigma. The use of the telephone for data collection was also dependent on a command of conversational Arabic and excluded women with low levels of Arabic competency.

**Conclusion**

Postnatal and antenatal depression are important public health problems which have a negative impact on the mother, infant and the whole family. The present study identified a 19% incidence of antenatal depression, 22.1% incidence of PND at six to eight weeks postpartum, and 21.2% incidence of PND at six months postpartum. Most of the antenatal factors under investigation did influence the development of both antenatal and postnatal depression. Personal and family history of psychiatric illness was not associated with the development of antenatal and postnatal depression. This may be related to a lack of awareness of psychiatric illnesses among Jordanian women and/or unwillingness to admit that they or their family have a psychiatric illness because of stigma. Women’s difficult relationship with
their mother-in-law was associated with the development of antenatal and postnatal depression. Most mother-in-laws in Jordan have a significant influence on their sons lives after marriage. Therefore, women are obligated to obey their mother-in-law and respect them in order to maintain a good relationship with their husband and to live a stable life.

High levels of obstetric intervention and the experience of inadequate care compounded the sense of fear that emerges in relation to themselves and/or their baby. The present study contributes to our understanding of the impact of obstetric intervention and nature of care provided during labour and birth as contributing factors to PND. The relationship between obstetric interventions and poor care during childbirth and development of PND has not been well investigated by previous studied conducted in the Arab countries.

Perception of care items in the postnatal questionnaire revealed a lack of attention to the emotional aspects of care, support during labour and birth, and the provision of information. A high level of obstetric intervention was associated with PND as was dissatisfaction with maternity care. The provision of adequate care during the postpartum period is therefore crucial in the identification of emotional distress. Opportunities need to be provided for women to talk through the birth experience, gain a better understanding of sequences of events, and to express their feelings and fears in relation to the birth.

Postpartum anxiety and stress were associated with the development of PND. This confirms the high incidence of comorbid psychological disorders among individuals with PND (Abbott & Williams, 2006; Gamble, 2003; Leung, 2001; Miller et al., 2006).

Giving birth to a female baby was associated with PND. In the Arab culture, gender differences in the value of children exist, and sons are more valued than daughters. This is related to the following reasons, economic productivity
of boys exceeds that of girls, remittances to parents may be larger from sons than daughters, boys maintain family line and they may be better ‘old age insurance value’ for parents than girls (Al-Qudsi, 1998).
CHAPTER 7

Conclusion

In the past two decades there has been progressive research into PND. Although some variables such as lack of social support, stressful life events, and difficult marital relationship seem consistently associated development of PND. The effect of socio-cultural factors such as baby gender preferences, conflict with mother-in-law, inhibition of discussion and expression of emotional distress; and the effect of medicalisation of childbirth for some women have only recently been documented. This chapter highlights the major findings of the present study and outlines the conclusions drawn from this work.

**Incidence of antenatal and postnatal depression**

The present study confirmed the presence of high rates of antenatal and postnatal depression among Jordanian women. The incidence of both antenatal and postnatal depression is clinically significant with 19% of women developed depression during pregnancy, 22.1% scored $\geq 13$ in EPDS at six to eight weeks postpartum, and 21.2% of women scored $\geq 13$ in EPDS at six months postpartum.

The incidence of antenatal and postnatal depression in the present study is higher than the rates reported in the western countries such as England, Japan, and Hong Kong (Evans et al., 2001; Kitamura et al., 2006; Lau & Keung, 2007) while, lower than the rates reported in Turkey. On the other hand, the incidence of both antenatal and postnatal depression in the present study is nearly the same as rates reported in earlier studies in the Arab countries such as Morocco, Lebanon, and United Arab Emirates (Alami et al., 2006; Chaaya et al., 2002; Green et al., 2006) and some of non-Arab developing countries such as Thailand, Pakistan, and Nigeria (Abiodun, 2006; Husain et al., 2006; Limlomwongse & Liabsuetrakul, 2006). Similarities in the rate of antenatal and postnatal depression may be related, in part, to the
same cultural background of the these countries such as desire for a male baby and difficult relationships with mothers-in-law, also links to social status of women in these countries.

**Jordanian social and cultural context and postnatal depression**

In Jordan, the social context in which women live seems to play a more prominent role in the development of PND than in western countries. Although improved education and growing economic independence of younger women have improved their status, continued control by parents-in-law, gender preferences, and an inability to use family planning engender a sense of powerlessness in women (Safadi, 2005). This is compounded by cultural beliefs about the expression of emotions, and a health care system focussed on physical illness detection and treatment; a medical model.

**Relationship with parents-in-law**

Jordanian women are expected to be agreeable towards their parents-in-law by accepting, or appearing to accept, their recommendations. If women and their parents-in-law have incompatible and contrasting value systems it may be hard to make life adjustments and problems may result. Hence, women may struggle to cope in their relationships with their mother-in-law. They may experience feelings of depression if they feel they fall short of fulfilling traditional and expected roles (Green et al., 2006; Lee et al., 2004). In the present study, women’s relationship with their mother-in-law was associated with the development of both antenatal and postnatal depression. Women who reported a difficult relationship with their mother-in-law were more likely to develop antenatal and postnatal depression and may more likely to be depressed generally regardless of childbirth.

It is unsurprising that conflict between women and their mothers-in-law are difficult to deal with in the clinical context. This is related to the fact that most Jordanian women and their family may regard the conflicts as family secrets that should not be disclosed to outsiders.
Gender preferences and fertility control

In regards to gender preferences in Jordan, after marriage the woman’s status is marginal and immediate pregnancy is an essential in order for her to integrate into the new family dynamics (Abushaikha & Oweis, 2005; Safadi, 2005). Becoming a mother gives women a higher status in the family and titular recognition as in calling her “um” which means “the mother of” and followed by the boy’s name (not girl’s name) (Nahas & Amasheh, 1999a; Safadi, 2005). When a woman gives birth to a girl baby, she is not allowed to take a rest period and her status will be insecure until gives birth to a boy baby. Most Jordanian women can not use any family planning method without their husbands’ permission. Such bias and the limited control women have over their reproductive health or life may make pregnancy a stressful experience for some women which in turn increases their risk of developing antenatal and postnatal depression.

Cultural beliefs regarding the expression of emotional distress

In the present study, the incidence of both antenatal and postnatal depression was high. This may be related to an unwillingness to disclose feelings especially to health care providers and therefore assistance is not provided (Nahas, Hillege, & Amasheh, 1999b). Family members and health care professionals actively discourage women from expressing their feelings as it is unacceptable to disclose symptoms of depression or discuss emotional difficulties with people external to the family (Nahas & Amasheh, 1999a). Nahas and Amasheh (1999a) reported that Jordanian women consider postnatal depression an internal weakness. The importance of fulfilling the traditional gender role resulted in women’s failure to disclose emotional problems for fear of others perceiving that they were unable to perform their role as a wives and mothers.

In Arab countries, stigma, shame, and the fear of being labelled a mentally ill were significant factors in women’s decision to withhold expression of their emotional problems (Al-dawi et al., 2002; Kadri et al., 2004). To reduce
stigma, public education about these conditions, the signs and symptoms, and sources of assistance may increase awareness and clarify common misconception about antenatal and postnatal depression. In addition, open discussion about antenatal and postnatal depression may help reduce the stigma associated with these conditions and encourage women to seek help. Health care providers should provide women with the opportunity and encouragement to talk in-depth about their feelings, including ambivalent and difficult feelings.

**Model of maternity services delivery**

Maternity services are currently focused on screening and treating complications of childbearing. Most of the births in either the public or private hospitals are performed by resident doctors or obstetricians. The midwives role is to take women’s vital signs, apply cardiotocographs and assist doctors in conducting the delivery. Labour and birth is also associated with many obstetric interventions such as an increased number of vaginal examinations, episiotomy, and painful sutures. The caregivers are not regarded as supportive and helpful during pregnancy, birth, or postpartum and health practitioners rarely provide emotional care, or antenatal and/or postpartum education. Women are not involved in decision making regarding their care and the health professionals are the primary decision-makers who judge if procedures during pregnancy, birth, and postpartum are warranted.

**Implications for policy and management, practice, education and research**

The incidence of antenatal and postnatal depression is clinically significant and will be adversely affecting women, their infants and other children, marital and family relationships, and the wider community. Primary prevention strategies should be a first priority in reducing the incidence of antenatal and postnatal depression and should focus on factors associated with the development of these conditions. In Jordan, this involves significant reorientation of maternity services and social changes to begin to address the
social determinants of emotional health problems and has several implications for health service management, clinical practice, maternity health care professional education and future research.

Implications for health service management

In Jordan, there is universal access to maternity services that provides monitoring and, if necessary, intervention for physical complications of childbearing. As a result maternal and infant mortality rates have dropped markedly since the early 1980’s (Safadi, 2005). However, there is also the routine use of many medical interventions and other practices that are not based on evidence and may be contributing to physical and psychological morbidity. It is timely to build on the successful implementation of universal access to maternity care and reform maternity services to more adequately address the social determinants of PND and implement evidence based practice. This may involve reorienting and expanding services, addressing workforce issues, and public education.

Reorienting and expanding services

Public services are already largely provided in community settings (e.g. community health centres) however they are focussed on screening and treating physical complications. A social model of health is concerned with issues of social identity such as gender, ethnicity, education, occupational status, wealth and geographical location. It does not reject the medical model, but adds another layer to the complexity of health (Mahnken, 2001).

Based on the findings from the present study, the Ministry of Health should expand the scope of women’s health care programs (which are currently geared toward reproductive health especially family planning) to include postnatal care, health promotion, parenting support and education, and perinatal mental health. While this may include identifying those women needing referral to specialist counselling services and an effective referral mechanism for depressed postpartum women to clinical psychologists/
psychiatrists /counsellors, preventative measures should be developed and tested. Jordanian women may respond well to interventions which build on the strong links between women family members such as community based support programs.

**Maternity workforce**

Strengthening the midwifery profession is important in developing a strong primary maternity service. To achieve this, the role and scope of midwifery practice should reflect the international definition of the midwife and not be restricted to attending to doctors orders and performing a limited range of procedures such as assessing women’s blood pressure and monitoring the fetal heart rate. Expanding the midwives role to include emotional care is essential and demedicalising care may improve women’s mental health. Increase numbers of women receiving their care from midwives provides a means through which to offer an expanded range of services.

In the Jordanian context, there may be opportunities for health worker programs or training for mothers or mother-in-laws that may be used to expand services to women’s homes and local communities in providing practical and social support, and health education. Simultaneously, the role of doctors needs reorientation to better use their skills in assisting women at high risk or those who have developed complications.

There are significant barriers to workforce reform including the low social status of midwifery profession compared with the medical profession, low wages and the opportunity to earn 3-4 times more if they relocate to work in the Gulf countries. The relatively low status of midwifery influences the number of students enrolled in midwifery programs which in turn contributes to the shortage of midwives.

For doctors, after obtaining their specialist qualification, most of them resign from the public sector to earn a higher income by opening a private clinic or
leaving Jordan to work overseas. While it can be beneficial for individuals and the health care system to have health workers gain experience in other countries there are moral issues in the movement of health workers from relatively poor countries to wealthier countries. Strategies to address the loss of qualified health workers from Jordan should be considered.

Attention needs to be given to the nurse or midwife/patient ratio in the labour and delivery units and community clinics. Increasing the amount of time midwives can devote to each woman during antenatal appointments, during labour and birth and in providing postpartum care may improve the quality of physical and emotional care provided by midwives.

Public education
A public education campaign about the essential components of maternity care, the quality of maternity services, women’s rights as patients, and the roles of medical, midwifery and other maternity service workers should be implemented.

In Jordan the status of the medical profession is higher than for the nursing or midwifery professions. As a consequence, most of Jordanian women prefer to receive their care from doctors. Private obstetric care is relatively cheap making access easy for pregnant women. In addition, receiving care from a private obstetrician gives Jordanian women high social status. These issues need to be addressed through public education.

Implications for clinical practice
The most important changes for clinical practice in the reduction of perinatal mental health problems are the implementation of evidence based practice and culturally competent care. Practices that are not evidenced-based and/or not culturally appropriate should stop. For example, obstetric interventions such as routine episiotomy, and practices such as lithotomy position for normal birth and use of continuous electronic fetal monitoring on well women
are not supported by the best-available evidence. The use of obstetric interventions can invoke stress and fear. It is not only the use of interventions but the poor communication and inadequate information that seemed be part of the culture of maternity care in Jordan that seemed particularly disturbing for birthing women.

One of the strategies to implement evidence based practice is the commitment and funding of continuing professional development (CPD) for health workers. The present study highlights the need for CPD for health care providers. This should specifically include opportunities to learn about perinatal mental health prevention, assessment, and management.

Mental health care must be integrated into maternal health care. Following training, midwives should incorporate the assessment of depression into routine antenatal and postpartum visits to identify women at risk. This approach would promote the early detection and treatment of depression. Inclusion of assessment tools for PND and screening for women is recommended during pregnancy, six to eight weeks postpartum and six months postpartum. The Edinburgh Postnatal Depression Scale used in the current study has been established for use with Arabic women including Jordanian women.

Culturally appropriate practices should be implemented. The involvement of women’s female relatives such as mother, sister, or mother-in-law in maternity care was devalued in the “modernisation” of Jordan when ideas from the ‘west’ dominated policy and service delivery design (Abushaikha & Oweis, 2005; Safadi, 2005). Home based care was discontinued in favour for clinic and hospital based care and should be revisited. Policies should be reviewed to at least allow a female support person such as the woman’s mother, sister, or friend to provide continuous support to labouring women.

The development and initiation of culturally appropriate antenatal education may help Jordanian women better adapt to pregnancy, birth, and parenting.
As there are conflicting results regarding the benefits of childbirth education, research exploring the impact of antenatal education on Jordanian women’s birth experience is required. Information about prevention, prevalence, onset, symptoms, possible duration of postnatal depression, and its impact on women, their babies and families as a whole should be provided to women during pregnancy. The education should be simple, consistent, manageable, and meaningful to the women.

Traditional postnatal customs should be encouraged when they can be implemented in ways that women find supportive and nurturing of themselves and their babies. Flexibility and respect for women’s preferences should be considered in planning postpartum support.

**Implications for education of maternity health care professionals**

Mental and emotional health care has received scant attention in the medical and midwifery curricula. This may contribute to poor mental health outcomes for childbearing women.

A variety of midwifery education programs are offered; a three-year direct entry Graduate Diploma in Midwifery; a 12-month post-basic Diploma of Midwifery program; and a Bachelor of Midwifery program which established in 2002. Although midwifery educators in Jordan use American and British textbooks to develop course content, the concepts of postpartum depression receives minimal attention. There is limited knowledge about the incidence of postnatal depression in Jordan. Jordanian midwifery curriculum is still based on the medical model with more emphasis on the physiological needs than the psychological needs of women.

Findings of the present study can be incorporated in midwifery curricula to teach future Jordanian midwives the effect of the stress of childbearing on the psychological outcomes of women. To ensure that students and registered midwives become knowledgeable and skilled in providing emotional care,
they need to be explicitly taught how their action and the quality of maternity care impact on the psychological wellbeing of childbearing women.

Midwifery courses can be designed to include material related to women’s mental health before and after birth, such as pathophysiology, diagnosis, and treatment of antenatal and postnatal depression, the assessment of the psychological status of women during the antenatal as well as the postnatal period, and training on the use of screening tools.

Similar recommendations apply to medical curricula however midwives and other health worker providing primary care from community settings are better placed to provide mental health promotion, prevention, assessment and early interventions for childbearing women (Mahnken, 2001).

**Implications for research**

The main areas for future research are drawn from the recommended changes to service delivery models, clinical practice and education of maternity care professionals. Research into the development and implementation of strategies and model of service delivery aimed and promoting childbearing women’s emotional health from conception to one year postpartum may yield valuable results on how best to minimise distress for Jordanian women. Services based on the principles of primary health care of partnership, public participation and community development may hold more promise than the commonly implemented ‘screen and treat’ approach.

Future research may investigate the effectiveness of public health campaigns and evaluate the impact of changes to midwifery and medical curricula to include a greater emphasis on mental health, patient rights and evidence based practice.

As mentioned, future research should investigate women’s need for information about pregnancy, childbirth, and parenting and how best to
provide the information. There is opportunity to design, explore and test innovative interventions that tap into the cultural norms associated with care in the community by women family members of the pregnant woman and new mother.

**Conclusion**

In conclusion, the incidence of antenatal and postnatal depression was high among this sample of Jordanian women and indicated that a lack of empowerment, domination of a medical model of maternity service delivery, and cultural beliefs regarding the expression of emotional stress played a significant role in the development of antenatal depression and/or postnatal depression.

This prospective longitudinal study used a quantitative approach to identify factors associated with development of depression during pregnancy and after childbirth. In addition to the risk factors identified by the western studies, this study, identifies a strong association between obstetrics interventions, satisfaction with postnatal care, gender of the baby, relationship with mothers-in-laws and the development of PND. This study provided insights into ways to improve health service management, clinical practice, health provide education and research to address the emotional needs of women and address the high rate of postnatal depression among Jordanian women.

It is hoped that this study will impact on the midwifery profession to better prevent and manage PND in Jordanian society and reduce the adverse effects of PND on women, their families and the broader community.
APPENDIX A: ANTENATAL QUESTIONNAIRE

1. Name:...................................................................................................................

2. Mail Address:........................................................................................................
...........................................................................................................
Contact phone number
During the day: ..................................During the evening: ................................
Mobile phone:.................................
Alternative contact number (e.g. your mother):…………

3. How old are you?

Day    Month    Year

4. What is the highest educational level you have achieved?
...............................................................................................................................

5. What is your occupation?
.............................................................................................................................

6. What is your expected or due date for the birth?

Day    Month    Year

7. When you first knew you were pregnant, how did you feel?
1. □ Overjoyed
2. □ Pleased
3. □ Mixed feelings
4. □ Not very happy
5. □ Very unhappy
6. □ No particular feelings

8. a) Is this your first baby?
1. □ Yes, first baby (go to Q8c)
2. □ No

b) If NO, how many babies have you had before? (Please include any that were stillborn after 20 weeks of pregnancy)
1. □ One baby
2. □ Two babies
3. □ Three babies
4. □ Four babies or more
c) Previous obstetric history. (*Please tick all that apply*)

1. ☐ Caesarean
2. ☐ Forceps or vacuum delivery
3. ☐ Stillbirth
4. ☐ Abortion/miscarriage
5. ☐ Premature birth (baby born before 37 weeks pregnancy)
6. ☐ Haemorrhage after the birth
6. ☐ None of these

Q9. Have you had any psychiatric illness including antenatal and postnatal depression?

1. ☐ Yes
2. ☐ No

10. Have any of your family had any psychiatric illness including antenatal and postnatal depression?

1. ☐ Yes
2. ☐ No

11. How is the relationship between you and your husband?

1. ☐ Very good
2. ☐ Good
3. ☐ Mixed
4. ☐ Difficult
5. ☐ Very difficult

12. How is the relationship between you and your mother-in-law?

1. ☐ Very good
2. ☐ Good
3. ☐ Mixed
4. ☐ Difficult
5. ☐ Very difficult

13. Stressful life events in the last year. (*Please tick ALL that apply*)

1. ☐ Financial problems
2. ☐ Changing relationships
3. ☐ Change home
4. ☐ Death in any of women relatives
5. ☐ Infertility
6. ☐ Other (*please mention*)
7. ☐ Not applicable
APPENDIX B: EDINBURGH POSTNATAL DEPRESSION SCALE (EPDS)

How Are You Feeling?

At this first visit, I would like to know how you are feeling. Please underline the answer that comes closest to how you have felt in the past seven days. Not just how you feel today.

Here is an example already completed

I have felt happy:
- Yes, all the time
- Yes, most of the time
- No, not very often
- No, not at all

This would mean: “I have felt happy most of the time” during the past week.

Please complete the other questions in the same way.

1. I have been able to laugh and see the funny side of things
   - As much as I always could
   - Not quite as much now
   - Definitely not so much now
   - Not at all

2. I have looked forward with enjoyment to things
   - As much as I ever did
   - Rather less than I used to
   - Definitely less than I used to
   - Hardly at all

3. I have blamed myself unnecessarily when things went wrong
   - Yes, most of the time
   - Yes, some of the time
   - Not very often
   - No, never

4. I have been anxious or worried for no good reason
   - No, not at all
   - Hardly ever
   - Yes, sometimes
   - Yes, very often

5. I have felt scared or panicky for no very good reason
   - Yes, quite a lot
   - Yes, sometimes
   - No, not much
   - No, not at all
6. Things have been getting on top of me
   Yes, most of the time I haven’t been able to cope at all
   Yes, sometimes I haven’t been coping as well as usual
   No, most of the time I have coped quite well
   No, I have been coping as well as ever

7. I have been so unhappy that I have had difficulty sleeping
   Yes, most of the time
   Yes, sometimes
   Not very often
   No, not at all

8. I have felt sad or miserable
   Yes most of the time
   Yes, quite often
   Not very often
   No, not at all

9. I have been so unhappy that I have been crying
   Yes, most of the time
   Yes, quite often
   Only occasionally
   No, never

10. The thought of harming myself has occurred to me
    Yes, quite often
    Sometimes
    Hardly ever
    Never
APPENDIX C: MATERNITY SOCIAL SUPPORT SCALE (MSSS)

For each of the following statements, please **tick one box** which shows how you feel about the support you have right now.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Always</th>
<th>Most of the time</th>
<th>Some of the time</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. I have good friends who support me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. My family is always there for me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. My husband helps me a lot</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. There is conflict with my husband</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. I feel controlled by my husband</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. I feel loved by my husband</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX D: CAMBRIDGE WORRY SCALE (CWS)

Please look at the list below and tell us what, if any, are your worries at the moment. The list is not meant to give you more things to worry about!

For each of the following statements, please tick one box which shows how much of a worry it is to you, from 0 if it is not a worry, to 5 if it is something which you are extremely worried about.

<table>
<thead>
<tr>
<th>Statement</th>
<th>No major worry</th>
<th>Major worry</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Your baby’s health at the moment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Labour and giving birth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Caring for your baby</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Feeding your baby</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Your own health during pregnancy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Your sex life</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G. Your relationship with your husband</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H. Your housing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I. Money problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J. Employment problems</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX E: DEPRESSION ANXIETY AND STRESS SCALE–21 (DASS-21)

Please read each statement and circle a number 0,1,2, or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:
0 Did not apply
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of the time
3 Applied to me very much, or much of the time

<table>
<thead>
<tr>
<th>Statement</th>
<th>Rating Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I found it hard to wind down</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>2. I was aware of dryness of my mouth</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>3. I couldn’t seem to experience any positive feeling</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>4. I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>5. I found it difficult to work up the initiative to do things</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>6. I tended to over-react to situations</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>7. I experienced trembling (eg, in the hands)</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>8. I felt that I was using a loss of nervous energy</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>9. I was worried about situations in which I might panic and make a fool of myself</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>10. I felt that I had nothing to look forward to</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>11. I found myself getting agitated</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>12. I found it difficult to relax</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>13. I felt down-hearted and blue</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>14. I was intolerant of anything that kept me from getting on with what I was doing</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>15. I felt I was close to panic</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>16. I was unable to become enthusiastic about anything</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>17. I felt I wasn’t worth much as a person</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>18. I felt that I was rather touchy</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>19. I was aware of the action of my heart in the absence of physical exertion (e.g. heart rate increase, missing a beat)</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>20. I felt scared without any good reason</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>21. I felt that life was meaningless</td>
<td>0 1 2 3</td>
</tr>
</tbody>
</table>
APPENDIX F: PERCEIVED KNOWLEDGE SCALE

Please *tick the box* which indicate how would you describe your understanding/ knowledge of the following issues

<table>
<thead>
<tr>
<th></th>
<th>Very poor 1</th>
<th>Poor 2</th>
<th>Fair 3</th>
<th>Good 4</th>
<th>Very good 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Your labour and birth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Pain relief strategies for labour</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Medical intervention in labour</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Hospital services and facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Your rights and responsibilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Your physical changes after the birth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Your feelings after baby is born</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Caring for your baby</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Feeding your baby</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Your life as a mother</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX G: PERCEIVED SELF-EFFICACY SCALE (PSES)

The following statements describe what some mothers-to-be believe about their abilities to take care of their infants. After reading each statement, please circle the number that you feel most closely describes how you feel about yourself in relation to parenting. These are statement about beliefs, so there are no right or wrong answers.

1. I will be able to manage the feeding of my baby.
   Cannot do 1 2 3 4 5 6 7 8 9 10
2. I will be able to manage the responsibility of my baby.
   Cannot do 1 2 3 4 5 6 7 8 9 10
3. I will always be able to tell when my baby is hungry.
   Cannot do 1 2 3 4 5 6 7 8 9 10
4. I will be able to deal effectively with the baby when he/she cries for "no reason".
   Cannot do 1 2 3 4 5 6 7 8 9 10
5. I will be able to tell when my baby is sick.
   Cannot do 1 2 3 4 5 6 7 8 9 10
6. I will be able to tell when to add different food items to my baby’s diet.
   Cannot do 1 2 3 4 5 6 7 8 9 10
7. I will be able to manage my household as well as before, while caring for the baby.
   Cannot do 1 2 3 4 5 6 7 8 9 10
8. When I think the baby is sick, I will be able to take his/her temperature accurately.
   Cannot do 1 2 3 4 5 6 7 8 9 10
9. I will be able to give my baby a bath without him/her getting cold or upset.
   Cannot do 1 2 3 4 5 6 7 8 9 10
10. **I will** work without my concerns about working or not working once baby arrives.  
Cannot **do** | Moderately | can | certain  
0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10  

11. **I will** be able to keep my baby from crying.  
Cannot **do** | Moderately | can | certain  
0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10  

12. **I will** be able to maintain my relationship with my husband during this year.  
Cannot **do** | Moderately | can | certain  
0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10  

13. **I will** be able to meet all the demands placed on me once the baby arrives.  
Cannot **do** | Moderately | can | certain  
0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10  

14. **I will** easily be able to get the baby and myself out for a visit to early Childhood Health Centre.  
Cannot **do** | Moderately | can | certain  
0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10  

15. **I will** have good judgement in deciding how to care for the baby.  
Cannot **do** | Moderately | can | certain  
0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10  

16. **I will** be able to make the right decisions for my baby.  
Cannot **do** | Moderately | can | certain  
0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10  

17. **will** be able to get the baby on a good night-time routine.  
Cannot **do** | Moderately | can | certain  
0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10  

18. **I will** be able to give the baby the attention he/she needs.  
Cannot **do** | Moderately | can | certain  
0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10  

19. **I will** be able to hire a baby sitter when I need one.  
Cannot **do** | Moderately | can | certain  
0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10  

20. **I will** be able to tell what my baby likes and dislikes.  
Cannot **do** | Moderately | can | certain
21. I will be able to sense my baby’s mood. Cannot do Moderately certain can do can
0 1 2 3 4 5 6 7 8 9 10
22. I will be able to show my love for my baby. Cannot do Moderately certain can do can
0 1 2 3 4 5 6 7 8 9 10
23. I will be able to calm my baby when he/she is upset. Cannot do Moderately certain can do can
0 1 2 3 4 5 6 7 8 9 10
24. I will be able to support my baby during stressful times. Cannot do Moderately certain can do can
0 1 2 3 4 5 6 7 8 9 10
25. I will be able to stimulate my baby by playing with him/her. Cannot do Moderately certain can do can
0 1 2 3 4 5 6 7 8 9 10
APPENDIX H: POSTNATAL QUESTIONNAIRE

1. Date of birth:_________________ 2. Baby’s sex: ____________

3. How did you feel about the baby being a boy/girl?
1. □ Very happy
2. □ Happy
3. □ Mixed
4. □ Unhappy
5. □ Very unhappy

I would like to ask you some questions about your experiences and the care you received when you were in labour and during the birth of your baby.

4. Now, thinking about the day or night when you went into hospital and had your baby, were the staff when you arrived at the hospital:
1. □ Very friendly and welcoming
2. □ Fairly friendly and welcoming
3. □ Not very friendly and welcoming
4. □ Can’t remember/don’t know
5. □ Not applicable - baby born at home or on the way to hospital

5. How did your labour begin?
1. □ It started by itself, with pains/contractions and/or waters breaking (go to Q7)
2. □ It was started off, or induced by a doctor or midwife (go to Q6)
3. □ No labour (elective caesarean) (go to Q 20)

6. a) If your labour was started off (induced) or speeded up (augmented) by your doctor or midwife, did you feel satisfied with the information given to you about why this was necessary?
1. □ Yes, happy with the information given (go to Q7)
2. □ No, given some information, but would have liked more
3. □ No, not given any explanation
4. □ Not applicable - labour was not induced or augmented by doctor/s or midwives (go to Q 7)

b) If you would have liked more information, what would you have liked to know more about?

7. Did you feel worried, anxious or frightened when your labour first began?
1. □ Yes, definitely
2. □ Yes, somewhat
3. □ No, not at all

8. How soon after your labour began was your baby born?
1. □ Within 3 hours
2. □ At least 3 but less than 6 hours later
3. □ At least 6 but less than 12 hours later
4. □ At least 12 but less than 24 hours later
5. □ At least 24 but less than 36 hours later
6. ☐ 36 or more hours later

9. Would you describe your pain or discomfort during labour and birth as: (Please tick ONE)
   1. ☐ Much worse than expected
   2. ☐ A little worse than expected
   3. ☐ About what you expected
   4. ☐ A little better than you expected
   5. ☐ Much better than you expected
   6. ☐ Uncertain (didn’t know what to expect)

10. During labour did you do any of the following to help you deal with the contractions? (Please tick ALL that apply)
   1. ☐ Move around or try different positions
   2. ☐ Use relaxation or breathing exercises
   3. ☐ Other (Please describe)

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

11. a) During labour, did you use any of the following to help relieve the pain? (Please tick ALL that apply)
   1. ☐ Gas and oxygen (Nitrous oxide)
   2. ☐ Injection of pethidine (or pain killing drug)
   3. ☐ Not sure (go to Q13)
   4. ☐ None of these (go to Q13)
   5. ☐ 1 + 2

b) Please fill in the columns that apply to you (if none apply go to Q 13)

<table>
<thead>
<tr>
<th>(1) While you were using this, how much did it help to relieve the pain?</th>
<th>Gas and oxygen</th>
<th>Pethidine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very much</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>A bit</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Not much at all</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(2) Did you feel under any pressure to use this form of pain relief?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, a lot</td>
</tr>
<tr>
<td>Yes, a bit</td>
</tr>
<tr>
<td>No, not at all</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(3) How do you feel now about having used this method of pain relief?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pleased about it</td>
</tr>
<tr>
<td>Mixed</td>
</tr>
<tr>
<td>No particular feelings</td>
</tr>
<tr>
<td>Other, please say what</td>
</tr>
</tbody>
</table>
12. So overall, thinking about what was done to help relieve the pain during labour, were you:
1. Very happy
2. Happy
3. Mixed
4. Unhappy
5. Very unhappy

13. a) During labour, did the doctor or midwife do an internal vaginal examination to check how your labour was progressing and/or to check the position of the baby’s head?
1. Yes
2. No (go to Q14)
3. Not sure (go to Q14)

b) If you answered YES, how many times was a vaginal examination done by the doctor or midwife?
   Number of times 

14. What position were you in when your baby was born?
1. IF CAESAREAN BIRTH, PLEASE TICK (go to Q20)
2. Lying on my back
3. Sitting
4. In Lithotomy position
5. Other position (please describe)

15. Would you liked to have been in another position for birth?
1. Yes, definitely
2. Yes, possibly
3. No, not really

16. a) Did the doctor use forceps or a vacuum extractor to help the baby out?
1. Yes, forceps
2. Yes, vacuum extractor
3. No, neither (go to Q17)
4. Not sure (go to Q17)

b) How did you find having the doctor help the baby out in this way?

17. Did you haemorrhage after the birth?
1. Yes, lost more blood than expected
2. ☐ Just bled a normal amount
3. ☐ Not sure

18. Did the placenta (afterbirth) come away readily, or did the doctor have to remove it manually (by putting his/her hands into your vagina)?
1. ☐ Placenta (afterbirth) came away readily
2. ☐ Doctor removed placenta manually
3. ☐ Not sure

19. a) Did you have an episiotomy?
1. ☐ Yes, I had an episiotomy
2. ☐ No, but I had a tear
3. ☐ No, didn’t have an episiotomy or tear (go to Q20)

b) Did you have stitches?
1. ☐ Yes, had stitches
2. ☐ No (go to Q20)

c) How painful was it while they were doing the stitches?
1. ☐ Very painful
2. ☐ Fairly painful
3. ☐ Not very painful
4. ☐ Not at all painful

20. Did you know any of the midwives/nurses who cared for you during labour and birth, before you had your baby?
1. ☐ Yes, very well
2. ☐ Yes, but not very well
3. ☐ No, didn’t know them

21. How many midwives/nurses looked after you altogether during your labour and the birth?

<table>
<thead>
<tr>
<th>Number of midwives</th>
</tr>
</thead>
</table>

22. Which of the people listed below were with you at any time …
(a) .. during labour?
(b) .. at the birth?

Please fill in BOTH columns and tick all those that apply

<table>
<thead>
<tr>
<th></th>
<th>(a) .. during labour</th>
<th>(b) .. at the birth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midwife/nurse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital doctor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student doctor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student midwife/nurse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anaesthetist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paediatrician</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please say who)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

23. a) Was anyone there you did not want to be there?
1. ☐ Yes
2. ☐ No (go to Q24)
b) Who would you rather liked to be there?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

24. a) Did anything happen during your labour and/or the birth that you would have liked more information about at the time?
   1. Yes, often wanted more information
   2. Yes, sometimes wanted more information
   3. No, never wanted more information (go to Q25)

b) What would you have liked more information about?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

25. Some of the things women have said about their care in labour and birth are listed below. We would like to know whether you would say the same things about the care you received at the birth of your baby.
   Please tick ONE box on EACH LINE to show whether you agree or disagree.
   a) The midwives and doctors always kept me informed about what was happening and made an effort to explain anything I didn't understand.
      1. Agree strongly
      2. Agree
      3. Uncertain
      4. Disagree
      5. Disagree strongly
      6. Not applicable

   b) Several times decisions were made by the doctors or midwives without my wishes being taken into account.
      1. Agree strongly
      2. Agree
      3. Uncertain
      4. Disagree
      5. Disagree strongly
      6. Not applicable

   c) I felt pressured to have the baby quickly.
      1. Agree strongly
      2. Agree
      3. Uncertain
      4. Disagree
      5. Disagree strongly
      6. Not applicable

   d) I felt my labour and/or the birth was taken over by strangers and/or machines.
      1. Agree strongly
      2. Agree
      3. Uncertain
4.  □ Disagree
5.  □ Disagree strongly
6.  □ Not applicable

e) The midwives and doctors were very encouraging and reassuring.
1.  □ Agree strongly
2.  □ Agree
3.  □ Uncertain
4.  □ Disagree
5.  □ Disagree strongly
6.  □ Not applicable

26. Which of the following words would you use to describe yourself while you 
were in labour? *(Please tick ALL that apply)*
1.  □ Confident
2.  □ Out of control
3.  □ Frightened
4.  □ In control
5.  □ Helpless

27. In general during your labour and/or the birth, did you find the 
midwives/nurses: *(Please tick ONE)*

<table>
<thead>
<tr>
<th></th>
<th>Very helpful</th>
<th>Fairly helpful</th>
<th>Some help</th>
<th>Very little help</th>
<th>No help at all</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

28. In general during your labour and birth, did you find the doctor(s): *(Please tick ONE)*

<table>
<thead>
<tr>
<th></th>
<th>Very helpful</th>
<th>Fairly helpful</th>
<th>Some help</th>
<th>Very little help</th>
<th>No help at all</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

PLEASE TICK THIS BOX IF A DOCTOR WAS NOT PRESENT  □

29. On balance, thinking about what happened to you and what the midwives 
and/or doctors did, how would you describe your care in labour and birth?

<table>
<thead>
<tr>
<th></th>
<th>Very good</th>
<th>Good</th>
<th>Mixed</th>
<th>Poor</th>
<th>Very poor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

30. a) Is there anything you think the doctors or midwives should have done 
differently or better during your labour and/or the birth?
1.  □ Yes, definitely
2.  □ Yes, possibly
3.  □ No, not really *(go to Q31)*

b) If YES, please describe what you think might have been done differently or 
better.
31. Since your baby was born, have you talked to a doctor, nurse or other health professional about how you felt about what happened during your labour and/or the birth?
1. ☐ Yes, I have talked to a doctor/midwife who was present during labour or at the birth
2. ☐ Yes, to doctor/midwife/nurse/other who was not present
3. ☐ No, none

32. a) Would you have liked to have talked more to a doctor/midwife/nurse or someone else at the hospital about how you felt about what happened?
1. ☐ Yes, definitely
2. ☐ Yes, possibly
3. ☐ No, not really (go to Q33)

b) If YES, who would you most like to have talked to?

33. Please describe any things about your care during labour and/or the birth that you are …
(a) particularly happy with
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

(b) particularly unhappy with
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
APPENDIX I: INFORMATION AND CONSENT FORMS

Griffith University Letterhead

Information sheet

Study title: Incidence and factors associated with postnatal depression in Jordanian women

Investigator: Khitam Ibrahem Mohammad, PhD candidate, Faculty of Nursing, Jordan University of Science & Technology. Ph 001196227409172

Supervisor:
1. Dr Jenny Gamble, School of Nursing & Midwifery, Griffith Health at Griffith University. Ph 61+7+33821083

2. Professor Debra Creedy, School of Nursing & Midwifery, Griffith Health at Griffith University. Ph 61+7+55529229

Institution: Griffith University

Antenatal and postnatal depression are prevalent mood disorders associated with pregnancy and childbirth. We are interested in your pregnancy and birthing experiences and the impact of these experiences on your life. The study will be conducted to investigate the incidence and factors associated with postnatal depression in Jordanian women. Your information in this study may assist in the future development of appropriate strategies for the prevention, diagnosis and treatment of depression during pregnancy and after birth.

Pregnant women in the third trimester, who are primi or multigravida, between 18 to 40 years old, expected to remain in the area for a minimum of 7 months after birth and are able to participate in telephone interviews following
childbirth are able to participate in the study. Whereas, pregnant women in the first or second trimesters and women at high obstetric risk are unable to participate in the study.

Midwives in each antenatal clinic in the selected centres and hospital will initially identify women who meet the inclusion criteria and will invite them to participate in this study. If you meet the inclusion criteria and agree to participate in this study you will be asked to answer a set of questions on three occasions. The first occasion will occur following consent to participate. This interview will be conducted in person at the antenatal clinic. The second occasion will occur between six to eight weeks after the birth of your baby and the third occasion will occur when your baby is six months old. At these times, you will be contacted by phone to arrange a convenient time for the interviews. These interviews will be conducted through the phone and will take approximately 45 minutes for the first interview and 20 minutes for the second interview. Your consent and willingness to participate will be sought at each stage of this study. No potential risks associated with the participation in this study.

All information will be treated in the strictest confidence and no names will be used. You will be asked to provide a contact address and phone number on a separate information sheet. You will be given a code number for the study. All questionnaires will be identified only by this code number and you will be asked not to write your name on any of the questionnaires. Only group data, from which no individual could be identified, will be published. These measures are to ensure that your privacy is protected. The questionnaires and the personal details sheet will be kept separately in a secure place. On completion of the study I will send participants a brief and simple report on the findings.

You do not have to be involved in the study unless you wish to and you are free to leave the study at any time without explanation. I would be pleased to answer any questions you may have. If you are willing to be involved please complete the attached consent form.
Consent form

Study title: Incidence and factors associated with postnatal depression in Jordanian women

Investigator: Khitam Ibrahim Mohammad, PhD candidate, Faculty of Nursing, Jordan University of Science & Technology. Ph 001196227409172

Supervisor:
1. Dr Jenny Gamble, School of Nursing & Midwifery, Griffith Health at Griffith University. Ph 61+7+33821083

2. Professor Debra Creedy, School of Nursing & Midwifery, Griffith Health at Griffith University. Ph 61+7+55529229

Institution: Griffith University

I…………………………………………..acknowledge that the study has been explained to me and any questions have been answered to my satisfaction. I understand that I may withdraw my agreement to participate in the study at any time.

I understand that if I wish to participate in this study I will be asked to complete a set of questions on three occasions. The first occasion will occur following consent to participate. This interview will be conducted in person at the antenatal clinic. The second occasion will occur between six to eight weeks postpartum and third occasion will occur when my baby is six months old. I will contacted by phone to arrange a convenient time for the interviews in the second and third occasion which will be conducted through the phone. The first telephone interview will take around 45 minutes to complete the questions and the second telephone interview will take 20 minutes. My
consent and willingness to participate will be sought at each stage of this study. I understand that there are no potential risks associated with the participation in this study.

I understand that any information collected is for the purpose of research and will be treated with the strictest confidence. I have been assured that no information about the study will be published in a form that would reveal my identity.

You may contact us on the phone numbers listed above if you have any complaints about the conduct of the research or wish to raise any concerns. Alternatively you can raise your concerns with the University's Research Ethics Officer, Office for Research, Bray Centre, Griffith University, Kessels Road, Nathan, Qld 4111, telephone (07) 3875 6618.

........................................... ...........................................
Signature of Participant Date

...........................................
Printed name
REFERENCES


Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: conceptual and strategic


Gagnon, A. J., & Sandall, J. (2007). Individual or group antenatal education for childbirth or parenthood, or both (review). *Cochrane Database of Systematic Reviews, (3)*, 1-56.


