AN EXPLORATION OF THE FACTORS INFLUENCING THE PREVALENCE OF ANTENATAL EMOTIONAL DISTRESS

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DECLARATION

I declare that I am the sole author of this thesis and that the work contained herein is my own. This thesis, or any part of it, has not been submitted for any other degree or professional qualification.

Signed.
Helen Wright

Date 19.10.07..

ABSTRACT

Introduction: Postnatal Depression (PND) has traditionally been, and often remains, the focus when considering maternal emotional distress which occurs around the birth of a child. There is now growing evidence of the need to widen this focus to include the antenatal period and to consider other psychological difficulties in addition to depression. There is also now evidence that antenatal anxiety and stress may have a negative impact on the foetus, pregnancy outcome and later child development. Identifying emotional distress within the antenatal period would provide an opportunity to potentially minimise these effects, provide early intervention and reduce the risk of postnatal distress. The aim of this study was to explore the factors influencing antenatal distress in order to inform the development of preventative interventions for women at risk.

Methods: The study used a cross-sectional survey design in a sample of antenatal women (N=302) to investigate the prevalence and factors influencing depression, anxiety and stress symptomatology. A between-group design was used to investigate the difference between individuals with and without symptomatology and to study the difference in levels of emotional distress across the trimesters of pregnancy. The questionnaire included measures of emotional distress (the EDS[1] and DASS-21[2]), social support (the SOS[3]) and distress from life events (an adapted version of the LTE[4]).

Results: 17.2% were identified as suffering from depression symptomatology (as measured by the EDS), 24.5% as having anxious symptomatology and 24.5% as having stress symptomatology (as measured by the DASS-21). Analysis revealed that a lack of support from a partner, mother, *and* an 'other' (typically a sibling or friend) were significant predictors of symptomatology. There were different predictive factors for antenatal women with children and primiparous women. Information was also obtained about antenatal women's preferences for healthcare support with emotional distress.

Conclusions: The need to widen the focus from 'PND' to perinatal distress was demonstrated. Interventions with an interpersonal focus may prove particularly effective as lack of social support (from a range of individuals) appears to be a significant predictor of antenatal emotional distress.

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[1] Edinburgh Depression Scale (Cox *et al.*, 1987)

[2] Depression Anxiety and Stress Scales (Lovibond & Lovibond, 2004)

[3] Significant Others Scale (Power *et al., 1988)*

[4] List of Threatening Experiences (Brugha *et al.*, 1985)

1. INTRODUCTION

1.1 OVERVIEW

This Introductory chapter presents the background to the current study and is organised into four main sections:

- A Widening of Focus: from Postnatal Depression to Perinatal[5] Distress
- The Impact of Perinatal Distress
- The National & Local Context
- The Rationale for the Current Study and Research Questions

[5] 'Perinatal' is used in this thesis to refer to the antenatal period and one year postpartum

1.2 A WIDENING OF FOCUS: FROM POSTNATAL DEPRESSION TO PERINATAL DISTRESS

One day, I was lying in the bath and thinking, "If I just slipped under the water, it would be over and I would be free." It was my way out - an escape route. I didn't buy big packets of nappies as I wasn't going to be around to use them. I didn't buy any baby clothes as I wouldn't be around to dress my son. I was going away. I was either going to die or just run away.

(Aitken, 2006, p.63)

'Postnatal Depression' (PND) has traditionally been, and often remains, the focus when studying maternal emotional difficulties which arise around the birth of a child (Austin, 2004). This section will therefore take this as a starting point before presenting the rationale for widening this focus.

1.2.1 DEFINING POSTNATAL DEPRESSION

Although the term 'postnatal depression' is often used generically to describe all mental disorders which occur during the postpartum (the period following the birth of a child), it specifically refers to a 'non-psychotic unipolar illness' (Henshaw & Elliot, 2005). This is quite distinct from 'puerperal psychosis,' which describes the often abrupt postpartum onset of severely disturbed mood and behaviour, typically present with psychotic experiences, such as hallucinations and delusions. This is a rare condition which has a prevalence of one in every 500 to 1000 births (Steiner *et al.*, 2003). In addition, puerperal psychosis differs markedly in terms of duration, time of onset and recurrence (Pope, 2000). PND is also clearly distinguished from the 'baby blues' (also known as 'postnatal blues' or 'maternity blues') as these are of a lesser severity and duration (Beck, 2006). These are experienced by up to 80% of mothers, depending on the diagnostic criteria used (Kammerer *et al.*, 2006). 'Puerperal psychosis' and the 'baby blues' are not the focus of this thesis.

In order to receive a clinical diagnosis of PND a woman would need to meet the criteria according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (American Psychiatric Association, 1994). The criteria are that used for 'Major Depressive Disorder' (see Appendix 1) but are given the specifier, 'With Postpartum Onset' if its onset is within the first four weeks following the birth of a child.

From a research perspective, the criterion of 'Major Depressive Disorder' is often used to identify individuals with PND. In clinical practice, however, there tends to be an allowance for a longer period of postpartum symptom development than is specified by the DSM-IV. Indeed, the Scottish Intercollegiate Guidelines (SIGN, 2002) on PND specify that it is an illness 'occurring during the first postnatal year' (p.2).

In order to set the context for this thesis it is necessary to explore the concept of 'PND' a little further. If the same diagnostic criteria are used for 'Postpartum Depression' as 'Major Depressive Disorder,' the question arises: are they distinct diagnoses? If they are, then one would expect differences in prevalence, onset, clinical presentation and aetiology. Each of these factors will now be examined.

1.2.2 PREVALENCE

Due to varying methodologies, different studies estimate prevalence rates of PND ranging from 8% - 35% (Milgrom *et al.*, 2006). Low prevalence figures arise when samples include only those women who have sought psychiatric treatment in the first postnatal year and are therefore likely to be severely depressed (e.g. Dalton, 1971). The high prevalence estimates of up to 35% occur when symptom checklists, rather than diagnostic criteria, are used (Campbell & Cohn, 1991). A meta-analysis of 59 studies (N=12,810) found the average prevalence rate of PND to be 13% (O'Hara & Swain, 1996). Although significant, the

absolute difference between prevalence studies which used self-report measures versus diagnostic interviews was relatively small (12% and 14% respectively). This is similar to the rate suggested in other meta-analyses (Whiffen, 1992) and in the SIGN Guidelines (2002) which states that 'for every 1000 live births, 100-150 women will suffer a depressive illness' (p.1).

There are several factors to consider alongside these studies which may introduce biased prevalence estimates. These studies do not include the significant number of women who do not ask for help, hide their difficulties or ignore community surveys (Milgrom *et al.*, 2006). A study by Whitton *et al.* (1996) revealed that of 78 women who met the diagnostic criteria for depression only 32% believed they were depressed. This suggests that women, in particular primiparous women, may ascribe their difficulties to a normal part of childbearing. In addition, women may minimise their negative feelings because they want to fit into a culture where the birth of a child is celebrated as a highly positive event (Whiffen, 1992). Of those who do respond, many may not suffer symptoms severe enough to meet the criteria for major depression, despite experiencing significant disruption and distress (Pope, 2000). For these reasons, the reported incidence of PND may be underestimated.

Despite these factors, it is generally accepted that the prevalence of PND lies between 10-15% (SIGN, 2002). Consequently, is this rate different from the rate of depression in the general population? Milgrom *et al.* (2006) argue that the evidence suggesting that the postpartum is a high risk time for women's mental health is referring only to the increased risk of developing a first episode psychosis (rather than a major depressive episode) following childbirth compared to other times. Indeed, initial research which reported an increased prevalence of PND compared to non-postpartum depression for women, has subsequently been contradicted since several studies have found non-significant differences in the

prevalence of both minor and major depression of women in the postpartum and non-postpartum period (Pope, 2000).

There are only three studies which have included a comparison control group of non-childbearing women (Gavin *et al.*, 2005). Cooper *et al.* (1988) compared the non-psychotic psychiatric disorder rates of 483 women, with prevalence rates from a female community sample across three time points in the postnatal period. The comparison group were not currently pregnant and had not delivered or been pregnant in the previous 12 months. They were also of similar age, parity and social class. They found that there were no differences between the two groups in the point prevalence rates (at 3, 6 and 12 month postpartum) nor in the incidence of non-psychotic psychiatric disorders in the first postnatal year (15.1%). A controlled prospective study completed by O'Hara *et al.* (1990) found no difference between rates of major or minor depression between childbearing women (N=182; 10.4%) and a matched non-childbearing group (7.8%). Cox *et al.* (1993) screened 232 women at six months postpartum and compared them with a matched control group. They also found there was no significant difference in the six month point prevalence or in the six month prevalence between the postpartum and control groups (13.8% and 13.4% respectively). A recent high quality systematic review (Gavin *et al.*, 2005) also concluded that the available evidence does not support the hypothesis that there is a difference in prevalence rates of depression between childbearing and non-childbearing women.

Although some women may be more susceptible to develop depression during the postnatal period, others, who view the perinatal life events favourably, may be less likely to suffer from such difficulties. Prevalence studies may, therefore, be a somewhat crude measure of such details. Overall, however, the evidence does

not suggest differing prevalence rates for PND compared with depression at other times.

1.2.3 ONSET

The three studies described in section 1.2.2 which compared the prevalence of depression among childbearing women with a control group of non-childbearing women, also investigated the onset of PND. Cooper *et al.* (1988) reported that 50% of PND cases develop within the first three months and 75% by six months postpartum. O'Hara *et al.* (1990) also found that for the majority of cases onset was within the first three months postpartum. The small numbers in this study, however, mean that the results must be interpreted with caution. Interestingly, they found that there was no difference in time of onset of depression between the childbearing and non-childbearing control group who were friends with the childbearing women. This raises the possibility that women may falsely attribute the onset of depression to the birth as this is a significant reference point. Cox *et al.* (1993) found that there was a threefold increase in the rate of onset of depression in the first five weeks after the birth compared with a matched non-childbearing control group. This may have been a more reliable finding as the childbearing group and control group did not know each other.

Other research has suggested that the onset of 'postnatal' depression may be during the *antenatal* period. In general, rates of depression during pregnancy have been found to be at least as high as those typically reported in the postpartum (Whiffen, 1992; Green & Murray, 1994). More recent large longitudinal studies have continued to support this finding. Green (1998) measured antenatal and postnatal depression symptoms in 1272 women using the Edinburgh Postnatal Depression Scale (EPDS). Of the women who scored above the cut-off in the postnatal period, 38% had scored above the cut-off during the antenatal period. Evans *et al.* (2001) studied depression symptoms (also using the EPDS) through

the antenatal and postnatal period in a cohort of 14,000 women as part of the Avon Longitudinal Study for Parents and Children (ALSPAC; Golding *et al.*, 2001). They compared symptom scores at 18 and 32 weeks gestation and 8 weeks and 8 months postpartum. Of the women who completed the measures at all four time points (N=9028), 11.8% scored above the cut-off at 18 weeks, 13.5% at 32 weeks, 9.1% at 8 weeks postpartum and 8.1% at 8 months postpartum. Despite some study limitations (in particular, the sole reliance on self-report measures), their findings suggest that depression is at least as common during pregnancy as after childbirth.

Heron *et al.* (2004) examined the rates and stability of depression from the antenatal to postnatal period for 8323 women as part of a large prospective study. They found that 43.7% of women with high levels of depression symptomatology in the postnatal period also reported elevated levels during the antenatal period.

In all of these larger studies, estimates are likely to be rather crude, as they rely on self-report measures of depression symptoms (rather than using diagnostic interviews) at a limited number of time points pre- and post-birth. This means that they may miss those who become depressed during the latter part of pregnancy, those who remit during pregnancy or those who have separate depressive episodes in the ante- and postnatal period (Whiffen, 1992). Despite these limitations, the recent evidence which highlights the prevalence of depression during the antenatal period suggests that the term *postnatal* depression may be something of a misnomer (Green, 1998).

These studies suggest that for a large percentage of women, onset of 'Postnatal' Depression may be in the antenatal period. For others, the life event, 'giving birth' and the adjustment to motherhood may be a precipitating factor for the development of depression within the initial weeks postpartum. Alternatively,

other women will develop PND later in the postpartum year. The findings to date highlight a discrepancy with DSM-IV diagnostic criteria which specifies onset as four weeks postpartum. The SIGN Guidelines (2002), which define PND as a depressive episode which occurs within the first postnatal year, reflect the onset period generally accepted within clinical practice. Further large longitudinal studies investigating symptoms using clinical interviews prior to pregnancy and throughout the perinatal period would lead to firmer conclusions.

1.2.4 CLINICAL PRESENTATION

If PND is a distinct diagnosis from non-postnatal depression, one might expect cases to show a different clinical presentation (Whiffen, 1992). Pitt (1968), who originally described 'PND' (referred to as 'atypical depression following childbirth') supported this view. He claimed that it was mild, often without several of the 'classical' symptoms of depression, and also reported higher levels of anxiety and irritability.

Other studies have supported the notion that PND is relatively mild by identifying a higher rate of minor rather than major depressive disorders during the postnatal period (O'Hara *et al.*, 1990; Whiffen, 1992). Whiffen & Gotlib (1993) compared a sample of postnatal women diagnosed with depression (N=77) and a non-postnatal depressed group (N=32). They found that only 30% of the postnatal group met the criteria for major depression compared with 47% of the non-postnatal depressed group. Limitations of this study, however, included the use of different recruitment procedures for the groups (although there were no significant demographic differences found) and small numbers in the control group. Conclusions should not therefore be drawn from this study.

O'Hara *et al.* (1990) argue that using diagnosis as a measure of clinical presentation and as an index of psychological distress is rather insensitive. They

therefore compared several self-report and interview-based measures of depression symptoms between childbearing (N=179) and matched control non-childbearing depressed groups. They found that women in the childbearing sample suffered from higher levels of depression symptoms. As one might expect, the most dramatic differences appeared to be in relation to the physical changes associated with pregnancy and childbirth and were therefore reflected in higher somatic scores on the Beck Depression Inventory (BDI). Nevertheless, other scales with less emphasis on the somatic symptoms of depression still reflected a significant increase in symptoms. These were most pronounced at three weeks postpartum but reduced considerably by six weeks postpartum.

In addition, Milgrom *et al.* (2006) suggest that stresses related to the presence of an infant are likely to make coping with symptoms of depression during the postnatal period particularly difficult. They also found that women with PND may continue to have ongoing sub-clinical symptomatology for longer than is typical with depression in the general population. Studies are therefore somewhat divided on whether the severity of postnatal depression is different from depression at other times.

As mentioned in section 1.2.1, the DSM-IV criteria for a diagnosis of PND is the same as that used for a major depressive disorder because the clinical features have not been found to be significantly different. Equally, anxiety and stress are commonly found to co-exist with depression in the postnatal period (as is found with depression at other times) (Miller *et al.*, 2006).

In terms of clinical presentation, therefore, there does not appear to be a significant difference between PND and non-PND. There is a need, nonetheless, for rigorous assessment strategies to distinguish depressive symptoms from changes which are part of the normal postnatal adjustment (Pope, 2000).

1.2.5 AETIOLOGY

The aetiology of PND will now be discussed to determine whether this distinguishes it from the aetiology of depression at other times.

1.2.5.1 BIOLOGICAL FACTORS

Several researchers have hypothesised that a biological model explains the development of PND. The main biological perspective is based on the considerable hormonal changes which occur during the perinatal period (Kammerer *et al.*, 2006). Specifically, levels of sex hormones (such as oestrogen and progesterone) rise substantially during pregnancy and then drop suddenly in the postpartum period. A causal link with mood disturbance has been proposed because these hormones act on regions of the brain which are involved in the control of mood. For example, studies have shown that the sex hormone, oestradiol, regulates levels of serotonin which has been strongly implicated in mood disturbance (Kammerer et *al.*, 2006). Further support for this hypothesis comes from the known link between hormonal changes and premenstrual syndrome (Steiner *et al.*, 2003). In addition to the change in levels of sex hormones, there is also a considerable increase in plasma corticotrophin releasing hormone (CRH) and an increase in cortisol during pregnancy, followed by a sharp drop in the postpartum period (Kammerer *et al.*, 2006). These hormones have been associated with the neurobiology of both stress and depression (Steiner *et al.*, 2003). Studies, however, have not shown a clear link between changes in levels of hormones and postnatal mood disturbance (Steiner *et al.*, 2003). In addition, this hypothesis does not account for the women who develop PND more than six weeks after delivery. Nonetheless, it seems likely that vulnerable women may have a different sensitivity to the changes in hormones during the perinatal period (Kammerer *et al.*, 2006).

Another biological perspective suggests that, as in mood disorders at other times, the disturbance of neurotransmitters that occurs during pregnancy, plays a role in the development of PND (Taylor *et al.*, 1996). In addition, an association between thyroid dysfunction and the onset of PND has been demonstrated (Harris, 1993). The literature suggests that for approximately one percent of postnatal women, disturbed mood is associated with transient thyroid dysfunction (Steiner *et al.*, 2003).

The research investigating the biological aetiology of PND has focused on the first few weeks postpartum and so does not account for PND which develops after this time. At present, the evidence for a biological model of PND remains unclear. Most researchers and clinicians agree, however, that perinatal mood difficulties are probably best explained by a combination of biological and psychosocial risk factors. This is consistent with the aetiology of non-postnatal depression (Harris, 2001).

1.2.5.2 PSYCHOSOCIAL MODELS

There is substantial literature looking at the psychosocial risk factors implicated in the development of PND. A meta-analysis by Robertson *et al.* (2004), which included over 24,000 subjects, found the following factors to be the strongest predictors of PND: experiencing stressful life events during pregnancy or early in the postpartum period, low levels of social support and a previous history of mental health problems (particularly depression or anxiety during pregnancy). These results are supported by three previous systematic reviews (O'Hara & Swain, 1996; Beck, 1996; Wilson *et al.*, 1996). Each of these risk factors will be discussed in turn.

1.2.5.2.1 LIFE EVENTS

The relationship between stressful life events and the onset of a depressive episode is well established (Brown & Harris, 1978). Events such as the death of a close relative, moving house, serious illness or divorce, are all known to cause stress and potentially trigger depression in individuals who have no history of affective disorder. It is therefore not surprising that life events have also been found to be a risk factor for PND. Indeed, the pregnancy and birth itself can be viewed as stressful events (Holmes & Rahe, 1967) which may lead to depression. Most studies, however, have looked at the effects of additional events experienced during the perinatal period. Retrospective studies may lead to over-reporting of events as participants attempt to link a stressful event with the onset of the illness, therefore the most reliable data within this area of research comes from prospective studies. O'Hara & Swain (1996) conducted a meta-analysis which included prospective life event data from over 1000 subjects. They found a strong to moderate association between experiencing a stressful life event and the onset of PND.

1.2.5.2.2 SOCIAL SUPPORT

The relationship between low levels of social support and the development of depression is also well established (Brown & Harris, 1978). In particular, depression appears to be prevented or its effects minimised by support from social network members (Power, 1988). The meta-analysis conducted by Robertson *et al.* (2004) found similar evidence of an association between social support and the onset of PND. There was consistent evidence that low emotional and practical support during pregnancy was associated with the development of PND. In particular, they found evidence that social isolation during pregnancy was a strong risk factor for depression symptomatology during the postnatal period. They highlighted the need to consider both objective and subjective measures of social

support, which again is consistent with findings from the non-postpartum depression literature (Power & Champion, 1988).

1.2.5.2.3 PAST HISTORY OF DEPRESSION

It is worth considering that if PND is a distinct diagnosis which is related to factors surrounding the birth of a child then studies should distinguish postnatally depressed women who have a history of affective disorders from women whose *initial* episode occurs in the postnatal period. If PND occurs mostly in women who are vulnerable to such difficulties, then it is likely that the postnatal events are similar to other life stressors which can precipitate a depressive episode (Whiffen, 1992).

In fact, numerous studies have shown considerable support for a strong correlation between PND and a previous history of a depressive episode (e.g. O'Hara & Swain, 1996). The importance of the inter-play between a psychiatric history and other life events has also been demonstrated (O'Hara *et al.*, 1991).

Robertson *et al.* (2004) also found a strong correlation between PND and a previous history of a depression, including experiencing depression or anxiety during the antenatal period. Specifically, they found that higher levels of antenatal anxiety predicted the level of postnatal depression symptomatology. This was further supported by Heron *et al.* (2004) who studied the course of anxiety and depression through pregnancy and the postnatal period in a large UK community sample (N=8323). They also found that antenatal anxiety predicted postnatal depression at eight weeks and eight months, even after controlling for depression during pregnancy.

It appears, therefore, that women with a history of clinical depression and anxiety (prior to and during the antenatal period) are more vulnerable to a further episode in the postnatal period.

Section 1.2.5 has highlighted that risk factors for PND are generally no different to the risk factors for depression at other times (SIGN, 2002). There is also a general consensus that it is often a complex interaction of biological and psychosocial factors that leads to the development of PND (Milgrom *et al.*, 2006). Attempts to present a biopsychosocial model of PND have been made (Milgrom *et al.*, 2006; Ross *et al.*, 2004), but the diversity and complexity of factors have meant that, to date, these have had limited empirical testing.

CONCLUSION OF SECTION 1.2

This section has explored the concept of 'PND': the traditional focus when studying emotional distress around the birth of a child. It is clear, however, that its definition, prevalence, clinical presentation and aetiological risk factors do not distinguish it from depression at other times. If PND is not a distinct diagnosis, then what about the spectrum of other psychological difficulties during the perinatal period? Indeed, there is a growing dissatisfaction with the narrow focus on 'depression' during the perinatal period (Austin, 2004) which has led to other psychological difficulties, which are often comorbid with depression (Belzer & Schneier, 2004), being relatively ignored (Miller *et al.*, 2006). Reviews of cases presenting during the perinatal period suggest that women suffer from the same spectrum of psychological difficulties as are seen at other times (e.g. Matthey *et al.*, 2003). The concepts of anxiety and stress, in particular, are often subsumed within a diagnosis of 'postnatal depression' (Fisher *et al.*, 2002).

In conclusion, the term 'postnatal depression' appears to be somewhat of a misnomer (Green, 1998) as a significant proportion of women develop these difficulties during the *antenatal* period (Evans *et al.*, 2001). Furthermore, the continued use of the term 'postnatal depression' has 'potentially serious consequences' (NICE, 2007, p.69) as there is a risk that it is used as a label for any psychological difficulties and that it reinforces the view that PND is different from depression at other times. There is, however, the beginning of a shift away from this narrow concept to an awareness of a greater spectrum of psychological difficulties and the impact of these across the perinatal period (Austin, 2004).

1.3 THE IMPACT OF PERINATAL DISTRESS

...the things desired by the mother are often found impressed on the members of the child which the mother carries at the time of the desire. So it is concluded that one and the same soul governs the bodies and that the same body nourishes both.

(Leonardo Da Vinci in his 'Quaderni', as cited in McMurrich, 1930, p.233)

The rationale behind widening the focus from 'PND' to 'perinatal distress' has been presented. This section will present the evidence highlighting the significant impact of psychological difficulties during the perinatal period. Psychological problems at any time in a person's life can have a devastating long-term impact on an individual and his or her relationships. This impact is significantly increased, however, when these difficulties occur during the perinatal period due to the presence of a foetus or infant. For the purpose of this thesis, this section will focus specifically on the research highlighting the impact of anxiety, stress and depression during both the antenatal and postnatal period.

1.3.1 THE IMPACT OF PSYCHOLOGICAL DIFFICULTIES DURING THE *ANTENATAL* PERIOD

Ferreira (1965) stated that 'the belief that the emotional attitude and behaviour of the pregnant woman may affect the child she carries is apparently as old as the human race' (p. 108). Indeed, the importance of emotional factors during pregnancy was recognised as far back as 400 B.C. in Hippocratic writings (Huizink *et al.*, 2004). More recently there has been growing scientific evidence that maternal antenatal psychological difficulties have a direct impact on the foetus and on later child development. Much of this has grown out of the work over the past decade by David Barker and his colleagues, who have found substantial evidence of a relationship between adult mortality (and morbidity) and foetal life events (Barker, 1992). This has become recognised as *foetal programming* which describes how 'the environment *in utero* can alter the development of the foetus during particular sensitive periods, with a permanent effect on the phenotype' (Van den Bergh *et al.*, 2005, p.238). The focus of work looking at the underlying mechanisms of this relationship has mostly been on maternal nutrition, but there is also evidence that the stress experienced by the mother may impact the development of the foetus's hypothalamic-pituitary-adrenal (HPA) -axis (Matthews, 2002; Henry *et al.*, 1994) which is an integral part of the stress system itself (Huizink *et al.*, 2004).

The *foetal programming* hypothesis is convincingly supported by parallel work using animal models,which has identified a link between antenatal stress, HPA-axis dysfunction and behavioural consequences in the offspring. These animal models have allowed researchers to isolate stress from other lifestyle factors that are typically present in human behaviour. Such studies (e.g. Schneider *et al.*, 1999) have found strong evidence that antenatal stress among non human primates impacts the developing foetus, resulting in a long-term adverse outcome on attention, neuromotor functioning and ability to cope in novel and stress-inducing

environments (e.g. increased anxiety). The potential underlying mechanisms of this observation are discussed further below (see section 1.3.1.5).

The relevance of these findings to humans is supported by a growing body of research demonstrating a relationship between maternal antenatal psychological difficulties and foetal behaviour as well as the later development of the child. There are, however, obvious complicating factors in such research and it is vital that studies obtain sufficient control of genetic and postnatal environmental factors to allow the factors being investigated to be attributed conclusively to prenatal variables (Joffe, 1969). This evidence is presented below alongside the methodological considerations.

1.3.1.1 THE IMPACT OF ANTENATAL MATERNAL STRESS AND ANXIETY ON THE HUMAN FOETUS

Ultrasound techniques provide a non-invasive opportunity to observe the impact of maternal stress and anxiety on foetal behaviour, and thus, by proxy, foetal brain development (Huizink *et al.*, 2004). This is of particular interest as foetal behaviour has been found to predict infant behaviour, such as irritability, state regulation and reaction to frustration and restraint in the first year of life (DiPietro *et al.*, 2002).

Studies in this field, however, have found contrasting results. Some report a positive correlation between foetal motor activity and maternal anxiety (e.g. Van den Bergh, 1990), while others have found no such relationship but suggest the possibility of an effect on foetal heart rate (Sjostrom *et al.*, 2002).

The inconsistent findings, however, are likely to reflect the significant methodological differences between studies, including differences in the definition of 'high anxiety', differing outcome measures and the comparison of foetal activity during different sleep or waking states. A review of twelve

ultrasound observation studies conducted by Van den Bergh *et al.* (2005) concludes that 'a link between antenatal maternal mood and ultrasonographically observed foetal behaviour is well established' (Van den Bergh *et al.*, 2005, p.243); however, the underlying mechanisms remain unclear.

1.3.1.2 THE IMPACT OF ANTENATAL MATERNAL STRESS AND ANXIETY ON PREGNANCY OUTCOME

Despite the many possible confounding variables, the association between antenatal maternal stress and adverse birth outcomes is supported by a growing evidence base. Studies have looked at the impact of both subjective self reported 'stressors' and naturally occurring stressful life events (such as natural disasters).

In a population based study, Lou *et al.* (1994) followed 2382 women through their pregnancy and compared a group who had inadequate social support and were experiencing moderate to severe stressful life events with a control group of non-stressed pregnant women who had intact social support. They found that both antenatal stress and smoking contributed significantly and independently to a shorter gestational age, lower birth weight and smaller head circumference (when corrected for birth weight). Overall, their results suggested that stress had a similar size of effect to smoking.

Studies looking at the impact of stress caused by naturally occurring disasters (such as an earthquake and the unexpected death of an older child) were also found to have an adverse affect on birth outcome. These outcomes included shorter gestational length (Glynn *et al.*, 2001) and increased risk of congenital malformations (Hansen *et al.*, 2000). The benefit of these studies is that they demonstrate the effect a single major event that is randomly distributed across woman at all stages of pregnancy. There were, however, methodological limitations with the Glynn *et al.* (2001) study. They had small numbers (N=40) and used an un-validated measure of stress. The Hansen *et al.* (2000) study

benefited from large numbers (N=3355) by collecting the data from national registers. Their findings showed good support for the hypothesis that severe emotional stress may cause congenital malformations.

Overall, the majority of studies have found a link between maternal psychological problems and complications during pregnancy, although often in a 'somewhat non-specific way' (Glover, 1997, p.105). The most frequent results support a link between antenatal stress or anxiety and shortened gestational length or low birth weight (e.g. Dunkel-Schetter, 1998; Copper *et al.*, 1996; Hedegaard *et al.*, 1993).

1.3.1.3 THE IMPACT OF ANTENATAL MATERNAL STRESS AND ANXIETY ON CHILD DEVELOPMENT

Van den Bergh *et al.* (2005) reviewed 17 prospective studies (14 of which were independent) from the past two decades, which assessed maternal anxiety or stress during pregnancy and later child development. Overall, antenatal maternal anxiety or stress was linked to a range of regulation problems at the cognitive, behavioural and emotional levels. A recent review of the evidence (Talge *et* al., 2007) suggested that approximately 15% of the variance in emotional and behavioural problems could be accounted for by antenatal stress or anxiety. These findings, however, must be examined closely to determine whether they demonstrate a direct impact of antenatal maternal stress or anxiety that is not mediated by other factors such as smoking, postnatal psychological states or methodological issues such as rater bias.

Three studies (Lou *et al.*, 1994; O'Connor, Heron, Golding *et al.*, 2002; O'Connor *et al.*, 2003) have used large numbers (N=3021, N=7448 and N=6493 respectively) and have controlled for a range of postnatal and antenatal confounding factors.

The Lou *et al.* (1994) study (described above in section 1.3.1.2) controlled for maternal age, gestational age, educational level, social support, smoking, alcohol, tranquillizers and the gender of the child. An external observer used the Prechtl Neurological Score Inventory on the infants aged 4-14 days and found a significant reduction in scores was associated with moderate to severe levels of maternal antenatal stress.

O'Connor, Heron, Golding *et al.* (2002) aimed to test the hypothesis that antenatal maternal anxiety predicts behavioural problems at four years of age. Their study was part of the ALSPAC study (Golding *et al.*, 2001), which is a prospective longitudinal study of all pregnant women living in Avon, UK, who gave birth between April 1991 and December 1992. An estimated 85-90% of the population participated through postal questionnaires. Of the initial respondents, 7448 were included in the final sample. They measured maternal anxiety (using the anxiety items from the Crown-Crisp Experiential Index) and depression (using the Edinburgh Postnatal Depression Scale) at 18 and 32 weeks gestation and at four time points in the postnatal period (8 weeks, 8 months, 21 months and 33 months). They controlled for a range of potentially confounding variables, including; antenatal and postnatal depression, postnatal anxiety, obstetric factors (e.g. gestational age, birth weight, mode of delivery and first or later-born status), smoking, alcohol, socio-economic status, maternal education and maternal age. They also controlled for the level of maternal concern about the baby (as maternal anxiety might have been a response to a suspected problem with the foetus). They used the Strengths and Difficulties Questionnaire (SDQ) to measure conduct problems, emotional problems and hyperactivity/inattention among the children at four years of age.

O'Connor, Heron, Golding *et al.* (2002) found a significant link between maternal antenatal anxiety and a range of disturbances in children's behavioural

and emotional functioning at four years of age. These effects were maintained (in most instances) when the confounding variables were controlled for (including postnatal anxiety and depression). They also found a significant link between high maternal antenatal anxiety at 32 weeks gestation and emotional problems in boys and girls and a significant association with hyperactivity/inattention in boys and conduct problems in girls. The 'total' emotional/behavioural scores for boys and girls were also significantly correlated with high maternal antenatal anxiety at 32 weeks gestation. These findings are similar to the findings from animal models which show a specific link between antenatal maternal stress and later development problems with offspring (Schneider *et al.*, 1999).

O'Connor *et al.* (2003) extended the above study to examine whether the link between antenatal anxiety and later child behavioural and emotional problems persisted through to middle childhood (81 months). Follow-up analysis revealed that, despite controlling for the numerous confounding variables (as described above), antenatal anxiety was similarly predictive of medium-term behavioural and emotional difficulties.

O'Connor *et al.* (2003) conclude that antenatal anxiety was associated with the total behavioural and emotional difficulties score (as measured by the validated SDQ) for boys and girls after controlling for antenatal, obstetric, psychosocial risks, postnatal depression and anxiety. Including multiple assessments of postnatal anxiety as a covariate reduced the magnitude of the effect to some extent, but it remained clinically and statistically significant.

Although there are some methodological limitations with the above studies (such as selective attrition and reporter bias) they are unlikely to have changed the differential prediction from the antenatal period. The role of genetic influences is also somewhat neglected, but O'Connor, Heron, Golding *et al.* (2002) argue

that, again, this is unlikely to account for the specific relationship between maternal *antenatal* anxiety and later child behavioural/emotional difficulties despite controlling for multiple confounding variables. The role of attachment, specifically the potential impact of an insecure attachment between mother and child, was also not considered in this study. In light of the strong evidence supporting the impact of an insecure attachment on behavioural and emotional functioning, it appears that this is a confounding variable that needs to be considered. V. Glover concurred with this (personal communication, 19 February, 2007) and reported that a recent study has explored the role of attachment (by using the Strange Situation Test) but results are not yet available.

Other smaller studies which have used standardised measures of anxiety and controlled for a range of antenatal and postnatal confounding variables have found similar results to the above larger scale studies (Brouwers *et al.*, 2001; Huizink *et al.*, 2002, 2003; Laplante *et al.*, 2004).

1.3.1.4 THE IMPACT OF ANTENATAL MATERNAL DEPRESSION ON THE HUMAN FOETUS, PREGNANCY OUTCOME AND CHILD DEVELOPMENT

Despite the tendency to focus on depression during the postnatal period, far less research has been conducted into the impact of maternal antenatal depression than of maternal anxiety (Van den Bergh *et al.*, 2005). A summary of the main findings to date are presented below.

Studies suggest that depressed women are more likely to have complications during pregnancy and birth, including a higher rate of placental abnormalities (Jablensky *et al.*, 2005), pre-eclampsia (Kurki *et al.*, 2000), spontaneous abortion (Sugiura-Ogasawara *et al.*, 2002), and premature delivery (Jesse *et al.*, 2003; Field *et al.*, 2004; Dayan *et al.*, 2006). Field *et al.* (2004) also found that newborns of depressed mothers are at a greater risk of having low birth weight and are in the bottom tenth percentile for size.

A number of studies have looked at the impact of maternal depression on infant behaviour shortly after birth. Abrams *et al.* (1995) used the Brazelton neonatal behaviour assessment scale within 24 hours after the birth. They found that newborns of depressed mothers (N=47) scored lower on the orientation index, showed less motor tone and activity and were more irritable. This was supported by Field *et al.* (2004) who used the same behaviour assessment and found that newborns of depressed mothers had lower orientation, motor, habituation, range of state, autonomic stability and depression scores. A study by Lundy *et al.* (1996) found that newborns of depressed mothers showed less attentiveness and fewer facial expressions in response to modelled facial expressions.

Studies have also looked at biochemical and physiological profiles of newborns from depressed versus non-depressed mothers. Lundy *et al.* (1999) recruited 63 pregnant women (36 of whom were classified as 'depressed') and found that the newborns of the depressed mothers had biochemical profiles which mimicked those of their mothers (showing higher cortisol and norepinephrine levels). In a prospective, longitudinal study Field *et al.* (2004) repeatedly assessed mother's antenatal and postnatal biochemical results, neonatal biochemical results, vagal tone and EEG activation. Again, newborns of the antenatally depressed mothers had higher cortisol levels and lower dopamine and serotonin levels (measured within 24 hours of delivery) mimicking the maternal antenatal biochemistry profile. They also found that infants of the depressed mothers (and the mothers themselves) had significantly greater relative right frontal EEG activation and lower vagal tone. Low birthweight and prematurity did not significantly affect these outcomes when antenatal depression was accounted for.

Field *et al.* (2006) reviewed the research on the effect of antenatal depression on the foetus and newborn. While there is evidence of a negative impact (as presented above), they argue that this is likely to be confounded by moods that

are comorbid with depression, such as antenatal anxiety. Recent research has demonstrated an effect independent of anxiety (Dayan *et al.*, 2006; Monk *et al.*, 2004), but further research is required to demonstrate that the impact of antenatal depression is not the result of these antenatal factors.

In addition, the long-term impact of antenatal depression on infant behaviour and emotion has not been demonstrated. As part of the ALSPAC study (N=7144), O'Connor, Heron & Glover (2002) found that antenatal anxiety and *not* antenatal depression was associated with behavioural and emotional problems of the children at four years of age. Postnatal depression was, however, found to have an additive independent effect. Their follow-up study (O'Connor *et al.*, 2003) of the children aged 81 months continued to support the finding that antenatal maternal anxiety rather than depression presents a risk to the later behaviour and emotional development of the offspring.

1.3.1.5 POSSIBLE UNDERLYING MECHANISMS

Animal models have provided valuable clues to understanding the potential underlying mechanisms by which antenatal psychological difficulties may impact the foetus's postnatal development. Research with nonhuman primates and other animals has shown that antenatal stress can cause long-lasting dysfunction of the HPA-axis (e.g. Henry *et al.*, 1994) and affects the number of dopamine receptors in the brain (Roberts *et al.*, 2004). The intricacies of the transduction of stress to the foetus, however, are only partly understood. Huizink *et al.* (2004) consider three possible mechanisms: firstly, that offspring development may be impacted as a result of *in utero* exposure to high levels of maternal stress hormones which cross the placenta and blood-brain barriers. This was supported by Gitau *et al.* (1998) who found that human maternal cortisol levels were linearly related to foetal concentrations of cortisol. Although there is individual variation in the placenta's ability to block maternal cortisol, they found that maternal cortisol

accounted for about 40% of the variance in foetal levels. Interestingly, a change in maternal cortisol levels of only 10-20% led to a doubling of the foetal concentrations. A second possible mechanism is that maternal stress may lead to an increase in production of stress hormones by the placental cells. Paradoxically, this has been found to increase the levels of maternal stress hormones. A third potential mechanism outlined by Huizink *et al.* (2004) suggests that maternal stress may lead to a reduction in blood flow to the placenta because the stress hormones (cortisol and catecholamines) are known to affect vessel tone. A study by Teixeira *et al.* (1999) found that highly anxious women had a significant reduction of uterine blood flow in the final trimester of pregnancy compared to a low anxiety group.

O'Connor *et al.* (2005) support the first two of these mechanisms by proposing that antenatal anxiety and stress heightens activation of the maternal HPA-axis (thus releasing cortisol) which the placenta subsequently struggles to fully metabolise. They add that, in addition, this may promote the production of placental stress hormones (e.g. glucocorticoids). The combination of these processes leads to increased foetal exposure of stress hormones, thus influencing the developing HPA-axis. Based on this hypothesis, O'Connor *et al.* (2005) studied the long-term impact of antenatal anxiety on the HPA-axis functioning of pre-adolescent children and have found the first evidence in humans to support this. This study provides the strongest evidence to date that antenatal stress and anxiety is associated with a long-lasting influence on the HPA-axis of human offspring; evidence which is well-supported in animal models. Further replication, however, is necessary due to the small sample size and other methodological shortcomings.

The evidence base with regard to the stage of gestation at which the effects of antenatal maternal anxiety or stress are most pronounced is currently

inconclusive. Indeed, stress and anxiety have been shown to have long term effects at several stages of pregnancy (e.g. Glynn *et al.*, 2001; O'Connor *et al.*, 2003). This may, however, be due to methodological differences between studies. Specifically, the use of different measures, the gestational timing of the measurements, the intensity and duration of the anxiety or stress may all lead to different results. Factors not controlled for may also be relevant.

To summarise, the studies to date looking at the impact of maternal antenatal psychological difficulties on the human foetus, on pregnancy outcomes and later child development have controlled for a range of confounding variables and appear to support the idea that *foetal programming* by antenatal psychological stressors is occurring in humans, as in the animal models. This research, however, is in its infancy and further replication of the above studies is needed before firm conclusions can be drawn. Methodological issues need to be addressed and there is a need for longitudinal studies using repeated validated psychological assessments during the antenatal period.

1.3.2 THE IMPACT OF PSYCHOLOGICAL DIFFICULTIES DURING THE *POSTNATAL* PERIOD

The evidence demonstrating the impact of psychological difficulties during the antenatal period has been presented above; this section will now consider the postnatal impact. Due to the traditional focus on PND, the majority of this research has focused on depression rather than on other psychological difficulties during this time. The research detailing the impact on the mother, infant and partner will now be presented:

1.3.2.1 IMPACT ON THE MOTHER

Mothers suffering from psychological difficulties, such as depression, during the postnatal period often have additional concerns regarding their ability to care for their infant (NICE, 2007). Fortunately, it is very rare for a mother to lose custody of her child, but studies have demonstrated other ways that PND may impact on the mother.

A few studies have followed up women who have suffered from PND for several years after the initial episode (Whiffen, 1990; Phillips & O'Hara, 1991). Whiffen (1990) reports that the correlation between the PND scores during the postnatal period and at follow-up two years later was .46 and a later study reported a correlation of .42 after four years (Phillips & O'Hara, 1991). This suggests that there is a degree of stability in depression symptomatology over time.

Milgrom & McCloud (1996) examined the impact of PND on women in terms of their feelings about themselves. This longitudinal study found that at twelve months follow-up, postnatally depressed women continued to rate themselves as being more depressed, more fatigued, less active, more anxious, more angry and more confused than a control group of non-depressed mothers. In addition, if left

untreated, women may remain depressed for many years. As with non-postnatal depression, PND also carries a risk of suicide (NICE, 2007).

1.3.2.2 IMPACT ON THE INFANT

The impact of PND on the infant's social, emotional and behavioural development is well documented and particular attention has been paid to the impact on the mother-infant relationship (Murray & Cooper, 1997). The evidence of the impact on development during early infancy, later infancy, early childhood, will be presented prior to exploring possible mediating factors.

1.3.2.2.1 EARLY INFANCY

Studies have examined the interaction between depressed mothers and their infants and found that these mothers show fewer positive facial expressions, more negative expressions, less frequent vocalisations and spend less time looking at the infant and providing tactile or kinaesthetic stimulation (Field, 1984). Behavioural differences between six to seven month old infants of depressed and non-depressed mothers have also been observed (Field *et al.*, 1990). This study looked specifically at the synchrony between the mother and child's behaviour as this has been found to be an important aspect of harmonious interaction. They found that the depressed mothers and infants were more likely both to be in 'negative behaviour states' than 'positive behaviour states.'

Less than optimal interactions between depressed mothers and their infants appear to be worsened in the context of socio-economic disadvantage. Two studies found less severe disturbances in the mother-infant interactions between the infants of depressed and well mothers from low risk samples (Field *et al.*, 1990; Murray, Fiori-Cowley *et al.*, 1996). Therefore, the presence of PND in the context of socio-economic disadvantage appears to be particularly damaging.

Studies have also looked at the impact of PND on infant behaviour independently of interactions with the mother (Cutrona & Troutman, 1986; Whiffen & Gotlib, 1989). They found an association between maternal depressed mood and difficult infant behaviour. These infants were more tense, less content and coped less well with stress.

1.3.2.2.2 LATER INFANCY

Several studies have also looked at the impact of PND on the cognitive and emotional development of 12-21 month old children.

A study by Lyons-Ruth *et al.* (1986) found an association between PND and poorer cognitive development of 12-18 month old infants, even after controlling for maternal IQ. This finding was supported by Murray (1992) who, in addition, found a more complex interaction between maternal depression and infant gender, with boys' cognitive scores being lower than girls. Both these studies found that this association remained when they controlled for current depression.

The impact of PND on emotional development has been studied by looking at the quality of the infant's interpersonal skills, the infant's attachment to the mother and the level of the infant's behavioural difficulties (Murray & Cooper, 1997).

Stein *et al.* (1991) found that infants of depressed mothers demonstrated a reduced quality and lower level of interaction compared with a control group of infants. In particular, they showed less concentration, more negative responses and were less sociable with a stranger. These difficulties were found to remain when the maternal depression had remitted.

Several studies have looked at the quality of infant-mother attachment using standardised measures (Lyons-Ruth *et al.*, 1986; Murray, 1992). These have found an association between high levels of depression and insecure

(predominantly avoidant) infant attachment at both 12 and 18 months. Martins & Gaffan (2000) analysed the results of seven studies comparing attachment styles of infants of depressed and non-depressed mothers. The samples were predominantly free of risk factors other than maternal depression. After removing one outlier study, their meta-analysis showed that infants of depressed mothers were significantly less likely to have secure attachment patterns and had a marginally increased likelihood of having avoidant or disorganised insecure attachments.

Murray (1992) found that mothers who had experienced PND were also more likely to report behavioural difficulties with their children, such as problems with eating, excessive temper tantrums or separation difficulties.

1.3.2.2.3 EARLY CHILDHOOD

The studies looking at the longer-term impact of PND on children's cognitive development are less consistent. Some studies found an association between maternal depression and lower cognitive scores of four to five year old children (e.g. Cogill *et al.*, 1986) but additional factors, such as maternal education level, appear to be involved. Sharp *et al.* (1995) found that the impact of PND was affected by the gender of the child; finding that boys of postnatally depressed women scored one standard deviation lower than controls on standardised tests of cognitive assessments (after controlling for a range of other variables). A study by Murray, Hipwell *et al.* (1996), however, found no adverse effect of PND on the children's cognitive functioning even in a high risk sample. They found, however, that early insensitive maternal interactions were associated with poorer cognitive development. Several other factors were also found to be related to cognitive performance, including stimulation at home and social class.

There is, however, stronger evidence that maternal PND may impact later child emotional and social development. Long-term follow up studies have found that children of mothers who suffered from PND had increased symptoms of anxiety and depression (Essex *et al.*, 2001), increased conduct difficulties and hyperactive behaviour (Sinclair & Murray, 1998). O'Connor, Heron & Glover (2002) examined the hypothesis that the impact of PND on children's later behavioural and emotional development is explained by *antenatal* maternal mood. As part of the ALSPAC study, they followed a large cohort of women (N=7144) from pregnancy until their children were 47 months of age. They found, in addition to the impact of antenatal anxiety (see section 1.3.1.3) that PND (measured at eight weeks and eight months postnatally) was associated with children's behavioural and emotional problems. This association remained when they controlled for a range of potential confounding factors. Although there were some limitations to this study (in particular the influence of reporter bias), the study has significant strengths, including its size and prospective longitudinal design.

1.3.2.3 MEDIATING FACTORS

Having presented the evidence suggesting a negative impact of PND on children's development, the mechanisms mediating this association will now be explored.

Murray *et al.* (2003) discuss four processes that are likely to impact on child cognitive development. They suggest that maternal depressive responses might make it difficult for an infant to connect their behaviour with events in the environment, may interfere with the infant's capacity to sustain attention, may distress the infant (and thus interfere with their cognitive development) and may have an adverse impact on the infant's ability to make self / other distinctions.

Different processes have been proposed to explain the impact of PND on the emotional (and behavioural) development of a child. A significant finding from

the literature is that it is the problematic interaction between a mother and child, rather than the exposure to the maternal depression symptomatology *per se* which has the greatest impact on the child (Murray & Cooper, 1997; Johnson *et al.*, 2001).

Studies have suggested that there are two distinct ways in which maternal depression can disrupt the mother-infant interaction (Dawson *et al.*, 2001). Due to a preoccupation with her own feelings and difficulties, some mothers may find it hard to tune into their infant's needs, causing her to miss cues and appear disinterested (Murray *et al.*, 2003). Alternatively, mothers suffering from depression may become intrusive in their manner: over-stimulating the infant or persisting in gaining the infant's attention while failing to recognise discomfort (Murray *et al.*, 2003). It is clear how the above problematic interaction patterns might lead to the formation of an insecure attachment since it is well evidenced that responsive and sensitive interactions are crucial for the development of a secure attachment relationship. It is important to highlight, however, that not all depressed mothers will have such interaction difficulties and that this appears to be influenced by other risk factors (Murray *et al.*, 2003).

1.3.2.4 IMPACT ON THE PARTNER

The impact of PND on the marital relationship or partner must also be considered. O'Hara *et al.* (1990) found that childbearing depressed women suffered from higher levels of social (particularly marital) maladjustment. These differences did not reduce over time and were at their most marked at nine weeks postpartum. The findings suggest that marital difficulties may be associated with PND more than with depression at other times. Milgrom *et al.* (2006) suggest that PND may aggravate problems that were present during the antenatal period, since relationship difficulties have been described as a risk factor for PND.

In addition, partners of women with PND may themselves start to develop mood difficulties (Milgrom & McCloud, 1996). Matthey *et al.* (2003) measured rates of depression (major and minor) and anxiety (including disorders of panic, adjustment, generalised anxiety and phobia) among first-time mothers *and* fathers. They suggested that one in ten partners of women with postnatal difficulties will also have difficulties.

CONCLUSION OF SECTION 1.3

The evidence supports the conclusion that anxiety and stress during the antenatal period have a significant impact both on the foetus and on later child development while depression has a significant impact on the mother, infant and partner during the postnatal period. Many of the studies looking at the impact of postnatal factors have failed to consider antenatal difficulties, although those that have suggest that antenatal anxiety *and* postnatal depression both increase the risk of emotional and behavioural difficulties in children (O'Connor, Heron & Glover, 2002). There is a need for further research which considers a range of potential confounding factors and considers the separate and likely additive impact of antenatal *and* postnatal psychological difficulties. The current evidence, however, points to the need for clinical interventions to focus on psychological difficulties during the antenatal period, rather than waiting until after the birth. This is not only because of the demonstrated impact of antenatal anxiety and stress, but also because antenatal anxiety and depression have been found to be significant risk factors for postnatal difficulties. If a woman is suffering from antenatal anxiety, stress or depression, which are all known to be common co-morbid difficulties (Lovibond & Lovibond, 1995), waiting to see what happens in the postnatal period would seem to be inappropriate. The high level of health service contact during the antenatal period offers an excellent opportunity for early clinical intervention.

1.4 THE NATIONAL & LOCAL CONTEXT

This guideline really puts antenatal and postnatal mental health on the map and says to health care professionals and women that it is time to take mental health during this period seriously...

(Dr Thomson, General Practitioner, Press Release, NICE, 2007, p.3)

The evidence demonstrating a significant negative impact of 'perinatal distress,' in particular maternal depression, anxiety and stress, has been outlined in section 1.3. Section 1.4 now describes what guidelines are in place at a national and local level to minimise this impact, specifically during the antenatal period.

1.4.1 NATIONAL GUIDELINES

Until recently, national guidelines tended to focus on PND and have neglected to widen the focus to include other mental health problems or to include the antenatal period (e.g. *The National Service Framework for Mental Health*; DoH, 1999). Fortunately, things have begun to improve and the publication, *Women's Mental Health: Into the Mainstream* (DoH, 2002), recognises the significance of women's perinatal mental health by acknowledging that 'vulnerable mothers can be identified at (the) antenatal stage (and) early intervention may be effective' (p.88). There is still a tendency within this document, however, to focus on PND. For example, it refers to the requirement set by *The National Service Framework for Mental Health* (DoH, 1999) to develop protocols for the management of PND. In addition, although at some points it moves away from the narrow focus on depression and recognises that 'any type of (mental health) disorder may occur', the context is clearly postnatal rather than antenatal. Nonetheless, it supports the need for the development of formal agreements between maternity, primary care and specialist mental health services. It also highlights the benefit of a care pathway approach for all pregnant women from the

first antenatal appointment, covering mental health promotion, early intervention for vulnerable mothers and follow-up.

The DoH stipulates that NHS standards should be set by the National Institute for Health and Clinical Excellence (NICE). This is an independent organisation which produces guidance developed by a range of experts. In 2007 the NICE guidelines, *Antenatal and Postnatal Mental Health,* were updated. These recent recommendations recognise the need to widen the focus from PND to perinatal mental health problems and make explicit that 'the term "postnatal depression" is often used inappropriately as a general term for any perinatal mental disorder' (p.4). They set key priorities for the prediction and detection of perinatal mental health problems. These state that at a woman's first contact with services during the antenatal and postnatal period, healthcare professionals should enquire about a past or previous severe mental illness, previous treatment by a psychiatrist or specialist mental health team and a family history of perinatal mental illness. In addition, at a woman's first contact with primary care, at her first antenatal appointment (usually around four to six weeks gestation) and postnatal visit (usually three to four months postpartum), healthcare professionals should ask two questions to identify possible depression:

1. During the past month, have you often been bothered by feeling down, depressed or hopeless?
2. During the past month, have you often been bothered by having little interest or pleasure in doing things?

They state that a third question should be considered if the woman answers 'yes' to both of the initial questions:

3. Is this something you feel you need or want help with?

They also state that healthcare professionals 'may consider the use of self-report measures such as the Edinburgh Postnatal Depression Scale (EPDS), Hospital Anxiety and Depression Scale (HADS) or Patient Health Questionnaire-9 (PHQ-9) as part of a subsequent assessment or for the routine monitoring of outcomes' (p.13).

The NICE guidelines also state that there is evidence to support the use of targeted psychosocial interventions for women who have sub-threshold symptoms of depression or anxiety. They suggest that if this is in the absence of a previous history of depression or anxiety then they should be offered regular informal individual or group-based support. If the woman has a history of depression or anxiety then they should be offered individual brief psychological treatment such as Interpersonal Therapy (IPT) or Cognitive Behavioural Therapy (CBT). If a woman requires psychological treatment the guidelines recommend that she should be seen within one month of the initial assessment and no longer than three months afterwards.

In Scotland, the publication, *Delivering for Mental Health* (Scottish Executive, 2006), recognises the need for services during the antenatal and postnatal periods. It focuses mostly on the provision of specialist perinatal services for severe mental health issues (such as puerperal psychosis) but also highlights that local Health Boards are responsible for developing care pathways for delivery of community perinatal services.

The Scottish Intercollegiate Guidelines Network (SIGN) aims to reduce the variation in healthcare practice and outcome, by producing evidence based national clinical guidelines. It produced a guideline, *Postnatal Depression and Puerperal Psychosis,* in June 2002. As the title implies, the focus is on the postnatal period and depression (as well as on puerperal psychosis). These guidelines

include a section on 'Antenatal Screening' but this is with a view to predicting PND, rather than the need to assess psychological difficulties during the antenatal period. As a result, because 'no antenatal tool has been devised which will accurately predict those who go on to develop postnatal depression' (p.5) they imply that there is no evidence to support antenatal screening. They therefore fail to recognise the benefit of antenatal screening for the detection of current difficulties.

The recent NICE guidelines represent a significant step in the right direction, recognising the danger of referring exclusively to 'postnatal depression' and the need to consider the wider range of perinatal mental health problems. They also highlight the impact of psychological difficulties during the postnatal and antenatal periods. The suggestion of routine screening during both antenatal and postnatal periods also appears to be an improvement. The method of screening (e.g. to ask two or three specific questions related to mood), however, raises a new concern. Firstly, these questions have not been validated for use within the perinatal period (NICE, 2007). Secondly, the questions are again specific to depression. Therefore, despite the conscious step away from this narrow focus, they then take a step backwards. Thirdly, the requirement that women must feel both 'down' and anhedonic before being asked if they feel they require help appears rather stringent. Indeed, Coyne & Mitchell (2007) raise this point in a recent letter to the British Medical Journal. They question whether these new guidelines are actually going to discourage the detection of difficulties.

This section has outlined the national guidelines in place in relation to perinatal mental health. It is acknowledged, however, that every NHS Trust cannot be expected to implement every guideline immediately following publication (SIGN, 2002). The research for this thesis takes place within the context of NHS Fife.

Therefore, the question arises: what are the Fife antenatal procedures which aim to prevent or reduce the impact of perinatal mental health problems?

1.4.2 THE LOCAL CONTEXT

There are three teams of Community Midwives (N=35) across the region of Fife. These provide the majority of the antenatal care within Fife, which has in the region of 3772 annual births (ISD Scotland, 2005). At the first antenatal appointment (the 'booking visit'), the midwives currently complete a risk factor checklist with all pregnant women. This was developed by a local steering group, based on the risk factors listed in the SIGN guidelines (2002) and asks eight questions:

1. Any personal mental health problems (current/previous)?
2. Any family mental health problems (current/previous)?
3. Any previous pregnancy losses?
4. Adverse life events (e.g. bereavement, domestic abuse, relationship problems, loss of employment, bullying at school etc.)?
5. Family support unavailable?
6. Social support unavailable?
7. Two or more children under 5 years old?
8. Unhappy childhood?

A woman is given one point for every 'yes' answer and a total score is calculated. These scores are used to highlight cause for concern and the tool is used as a way of introducing the topic of PND. The routine use of the Edinburgh Postnatal Depression Scale (EPDS) was stopped due to time pressure at the antenatal appointments and because of its lack of predictive validity for PND.

At present, if a women is found to be having emotional difficulties during the antenatal period, additional 'listening visits' are offered. Depending on the severity, direct referrals are also made to the Community Psychiatric Nurses. Referrals to Clinical Psychology are less common and tend to come via the general practitioner (GP).

The focus within Fife currently remains on the detection of risk factors for PND. This does include a question enquiring about 'current mental health problems', but is worded in such a way that unless a woman has a definite diagnosis, she is unlikely to say, "Yes". The term, 'mental health problem' is also likely to limit the use of this question as someone with, for example, symptoms of anxiety, is not necessarily going to equate this with 'having a current mental health problem.'

Although midwives are encouraged to enquire about the emotional well-being of women throughout pregnancy, there are no formal protocols or screening tools used. This is likely to lead to variation between midwives. In addition, midwives are not trained to detect mental health difficulties and so may be unaware of symptoms which may be associated with a psychological problem, especially those other than depression.

The Fife Clinical Psychology Department currently has limited involvement with the antenatal care provided to women in Fife. Psychology referrals are received but these appear to be from GPs rather than direct from the midwives.

1.5 THE RATIONALE FOR THE CURRENT STUDY & RESEARCH QUESTIONS

...at home, no one hears you scream.

(Aitken, 2006, p.161)

The final section of this introductory chapter draws on the information presented in sections 1.2-1.4 in order to present the rationale for the current study. This leads on to the specific research questions the thesis aims to answer.

An opportunity for preventing or reducing the impact of perinatal mental health difficulties within Fife is currently being missed. From a clinical psychology service perspective, the consequence of psychological difficulties being left untreated during the antenatal period is likely to lead to an increase in the number and severity of cases referred postnatally to both the Adult and Child specialties.

The new NICE guidelines (2007) propose the use of two screening questions which focus specifically on depression. The current practice in Fife does not include a formal screening tool and although many midwives are likely to enquire about emotional well-being, there is likely to be inconsistency in practice, so that psychological difficulties (such as anxiety and stress) may be being missed. In order to highlight the need for greater awareness of antenatal distress, the first research question is:

1. What is the prevalence of depression, anxiety and stress symptomatology during the antenatal period among pregnant women in Fife?

Evidence to date suggests that there is no significant difference in levels of psychological difficulties across the trimesters of pregnancy. Yet, current practice

in Fife and NICE guidelines recommend only screening at the first antenatal appointment. In order to determine the levels of symptomatology across pregnancy, a second research question is:

2. Is there a difference in levels of depression, anxiety or stress symptomatology across the trimesters of pregnancy?

Research has suggested that two of the main psychosocial risk factors for PND are experiencing distressing life events and low levels of social support. Greater understanding of the influence of such risk factors on the development of antenatal distress could facilitate early screening and help tailor preventative interventions accordingly for women 'at risk.' Research question three is:

3. What are the psychosocial risk factors influencing antenatal depression, anxiety and stress symptomatology in pregnant women from Fife?

Obtaining a measure of the level of stressful life events and social support factors, particularly among women with depression, anxiety and stress symptomatology during the antenatal period would also help to underline the need for early clinical intervention to minimise the risk of postnatal psychological difficulties.

Section 1.2 focused on the need to widen the focus from depression to include other psychological difficulties, particularly those found to be commonly comorbid with depression, such as anxiety and stress. Section 1.3 also emphasised the growing evidence of the negative impact of antenatal stress and anxiety. If anxiety and stress symptomatology were to be formally screened during the antenatal period, in addition to depression symptoms, there would be a need for a validated screening tool. The Depression Anxiety Stress Scales (DASS; Lovibond & Lovibond, 1995) have been well validated with both normal and

clinical samples, but not with an antenatal sample. This study therefore aims to examine the validity of the DASS by comparing it against a validated antenatal measure, the Edinburgh Depression Scale (EDS; Cox *et al.*, 1987) in a sample of pregnant women. The use of the EDS, as a measure of 'antenatal distress,' as opposed to a pure depression measure will also be examined. The fourth research question is:

4. What is the reliability and validity of the DASS-21 & EDS as measures of antenatal distress?

In order to consider what interventions might be acceptable to pregnant women in Fife, research question five is:

5. What interventions would pregnant women in Fife find acceptable if they needed support with emotional issues?

The above question will also be used to explore what interventions are suggested by women who are currently suffering from symptoms associated with depression, anxiety and stress.

2 METHODOLOGY

2.1 OVERVIEW

The background to the present study and posed research questions were reported in section 1. This section aims to describe the methodology used in the research. It outlines the study design and provides details of the ethical considerations. The characteristics of the participants, including the inclusion and exclusion criteria, and a brief description of the total sample, are described. The psychometric properties of the measures used are presented alongside the rationale for their selection. In addition, there is a description of the overall design of the questionnaire. Finally, the research procedure, the power analysis used to estimate the number of participants and an outline of the statistical analysis are presented.

2.2 DESIGN

A quantitative methodology was chosen to answer the research questions. The study used a cross-sectional survey design in a sample of antenatal women across all trimesters of pregnancy. A questionnaire collected demographic information and included self-report measures of depression, anxiety, stress, social support and life events (discussed further in section 2.5).

The cross-sectional design was used to investigate the prevalence of depression, anxiety and stress symptoms and to look at the factors influencing the symptomatology. It was also used to investigate what health service support options antenatal women would like available.

In addition, a between-group design was used to investigate the difference between individuals with and without symptoms and to investigate the difference in levels of emotional distress across the trimesters of pregnancy.

2.3. ETHICAL CONSIDERATIONS & APPROVAL

The research was approved by the NHS Research Ethics Committee and the NHS Fife Research and Development Team (see Appendix 2). In conducting this research, there were several key ethical issues to consider:-

The responsibility of the researcher to respond to women describing significant levels of distress was an important ethical consideration. In order to address this issue, a procedure was set up which is described in section 2.8. This ensured that concerns were raised (and where possible discussed) with the women, details of support options were provided and the GP and Community Midwife were kept informed of the above.

In order to follow the above procedure, the questionnaires could not be anonymous. This raised a further two ethical issues: storage of personal details and consent to hold such information. It was agreed that a detachable front sheet of the questionnaire would be used to collect identifying details, which could be removed and stored separately from the rest of the data. An identification number was used to match the questionnaire with the detachable sheet. In order to ensure that the participant had read and understood the above information they were asked to sign a declaration of consent which was included at the start of the questionnaire.

A further ethical issue was that the questionnaire was designed to discuss topics and issues that might have been sensitive or upsetting for participants. In light of this, the participant information sheet (see Appendix 3) clearly specified that if a

participant was emotionally affected by any content in the questionnaire, then they were advised to speak to their Midwife or GP. It also specified that the participant could contact the researcher if they wanted advice on where to seek support.

Finally, it was made explicit by the Midwives handing out the questionnaires and in the participant information sheet (see Appendix 3) that the participants were under no obligation to complete the questionnaire and that failure to do so would not impact on their antenatal care.

2.4 PARTICIPANTS

2.4.1 INCLUSION AND EXCLUSION CRITERIA

The Fife Community Midwives distributed the questionnaires during standard antenatal appointments to participants who satisfied the following inclusion and exclusion criteria: Women had to be aged 18 and above and receiving routine antenatal care in the Fife region of Scotland. Participants were excluded if they suffered from a cognitive impairment, a learning disability or were non-English speaking. These were all known factors to the Midwives as part of their provision of antenatal care.

2.4.2 TOTAL SAMPLE

The final sample included 302 women with a mean age of 29.2 (SD=5.6). A self-report questionnaire of this design is likely to lead to under-representation of less literate subjects within the sample.

2.5 MEASURES AND RATIONALE FOR THEIR SELECTION

Each of the following measures are included in Appendix 4.

2.5.1 MEASURES OF SYMPTOMATOLOGY

2.5.1.1 EDINBURGH POSTNATAL DEPRESSION SCALE (EPDS)

The Edinburgh Postnatal Depression Scale (EPDS) is a 10-item self-report scale which was developed by Cox *et al.* (1987) in order to screen for Postnatal Depression in the community. This was needed due to the lack of reliability of other depression scales which included somatic items resulting from normal physiological changes during pregnancy rather than depression (Cox & Holden, 2005).

The scale presents women with 10 statements (such as, 'I have been able to laugh and see the funny side of things') and they are asked to indicate which of the four provided answers comes closest to how they have felt in the past week. Items are scored from 0 to 3, the total score ranging from 0 to 30 respectively. Recommended 'cut-off' scores range from 9-15 (out of 30). These are discussed in more detail below.

The ten-item scale was originally validated by Cox *et al.* (1987) with a sample of 84 mothers using the Research Diagnostic Criteria (RDC) for depressive illness obtained through psychiatric interview. Using a cut-off of 12/13 the scale identified all women with a definite major depression and two out of the three women with a probable major depression. Four of the eleven women with a definite minor depression were given a false-negative score. There were eleven false positives; six of whom had several depression symptoms but did not meet RDC for clinical depression. Three women with other psychiatric diagnosis all scored below the cut-off. The sensitivity of the EPDS was found to be 86% and the specificity was 78%. The researchers recommended that if a lower cut-off of 9/10 was used, it would reduce the rate of failing to detect women with depression to less than 10%. They found the split half reliability of the EPDS to be

.88. Murray & Carothers (1990) validated the EPDS on a larger community sample (N=702) with women six weeks postpartum. Similar to the above study, EPDS scores were validated against structured psychiatric interviews which determined RDC for depression. Using the 12/13 cut-off, the EPDS was shown to have a specificity of 96% and a sensitivity of 68%.

Since its original development, several studies have compared the performance of the EPDS with other depression questionnaires for postnatal use. It has repeatedly been found to have higher sensitivity and specificity than other well recognised depression scales such as the Beck Depression Inventory (e.g. Harris *et al.*, 1989).

The EPDS has also been validated to screen for depression during the antenatal period. Murray & Cox (1990) administered the EPDS to 100 women between 28 and 34 weeks gestation. A standardised psychiatric interview was used to derive RDC diagnoses of major and minor depression which were then compared with the EPDS. 6% of the women were diagnosed as having RDC major depression and 8% as having RDC minor depression.

They found that the EPDS 14/15 cut off had 100% sensitivity and 96% specificity for major depression. Using the 12/13 cut off for identifying major depression, the sensitivity was 100% and specificity was 87%. **Table 2.1** presents the sensitivity and specificity of the EPDS over a range of cut-off scores using the RDC for *major* depression as caseness criterion.

Table 2.1 Performance of the EPDS using RDC for major depression as criterion

EPDS cut-off	Sensitivity	Specificity
11/12	100	79
12/13	100	87
13/14	100	94
14/15	100	96

Murray & Cox (1990) found that for all (major and minor) depression, the cut-off of 12/13 had a sensitivity of 64% and specificity of 90%. The lower sensitivity (of 64%) occurred because only three of the eight cases of RDC minor depression were correctly identified. Lowering the cut-off to 10/11 increased the sensitivity to 71% but generated a large number of false positives. **Table 2.2** presents the sensitivity and specificity of the EPDS over a range of cut-off scores using the RDC for *major and minor* depression as caseness criterion:

Table 2.2 Performance of the EPDS using RDC for major and minor depression as criterion

EPDS cut-off	Sensitivity	Specificity
10/11	71	72
11/12	64	80
12/13	64	90
13/14	57	95
14/15	57	98

Murray & Cox (1990) recommend that the 12/13 cut off should be used for screening for all (major and minor) depression during the antenatal period. They state that although this results in lower sensitivity, this is likely to be because it is relatively easy as a pregnant woman to meet RDC caseness for minor depression.

Subsequent longitudinal studies have also used the EPDS during the antenatal period for comparing and exploring rates of antenatal and postnatal depression (Green & Murray, 1994; Evans *et al.*, 2001; Josefsson *et al.*, 2001).

Due to the term 'Postnatal' within the 'EPDS' title, the scale is often referred to as the Edinburgh Depression Scale (EDS) when used in the antenatal period (Murray & Cox, 1990). The title, 'EDS' will be used from this point forward in the thesis.

The EDS was chosen as an appropriate measure of depression symptoms due to its validation within an antenatal sample. Although lacking the rigour of a clinical diagnosis, the EDS has been shown to be a valid way of measuring antenatal dysphoria (Green & Murray, 1990).

2.5.1.2 DEPRESSION ANXIETY STRESS SCALES (DASS-21)

Lovibond & Lovibond (1995) originally aimed to develop a questionnaire to assess core symptoms of anxiety and depression while trying to provide maximum discrimination between the two subscales. During the development of the scale, a third factor emerged which included items relating to difficulty relaxing, agitation and irritation. This led to the development of the Depression Anxiety Stress Scales (DASS), which comprise three subscales designed to measure the negative affective states of depression, anxiety and stress.

Lovibond & Lovibond (2004) state that the depression scale measures, '...dysphoria, hopelessness, devaluation of life, self-depreciation, lack of interest/involvement, anhedonia, and inertia'; the anxiety subscale assesses '...autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect'; the stress scale measures '...difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive and impatient' (p1.). Of particular relevance to this study, is the lack of conventional somatic symptoms of depression included in the scale (such as disturbance of appetite and sleep, lack of energy and interest in sex). Lovibond & Lovibond (2004) found that these symptoms failed to contribute to the depression factor in clinical and non-clinical samples.

Exploratory and confirmatory factor analyses of the DASS items have consistently found the three-factor structure (depression, anxiety and stress) in large non-clinical (Lovibond & Lovibond, 1995) and clinical (Brown *et al.*, 1997) samples.

Convergent and discriminant validity of the DASS has also been repeatedly demonstrated (Brown *et al.*, 1987; Lovibond & Lovibond, 1995). Crawford & Henry (2003) tested its validity by administering the DASS to a UK non-clinical sample (N=1771) and correlating the measure with the Hospital Anxiety and Depression Scale (HADS), the Personal Disturbance Scale (sAD) and the Positive and Negative Affect Schedule (PANAS). The DASS depression scale correlated strongly with the HADS depression scale (r=.66) and the sAD depression scale (r=.78). The DASS anxiety scores also demonstrated high convergent validity. Similar to other self-report scales the discriminant validity was less robust due to the high significance of the between-construct correlations (e.g. DASS depression and HADS anxiety). Crawford & Henry (2003) reported high levels of internal consistency; the alpha values were .95 for depression, .90 for anxiety and .97 for stress.

The DASS-21 is a brief version of the original (42 item) DASS which consists of seven items for each of the three dimensions (depression, anxiety and stress). Participants are asked to indicate the degree to which they experienced each state (such as 'I found it hard to wind down') over the past week. They are provided with a four-point scale which is used to derive a total score for each subscale. Scores for each subscale are then multiplied by two prior to interpretation (Lovibond & Lovibond, 2004). Scores can be placed in severity ratings provided by Lovibond & Lovibond (2004): '*normal*', '*mild*', '*moderate*', '*severe*' or '*extremely severe*'.

Similar to the full DASS, confirmatory factor analyses have indicated that a three-factor model for the DASS-21 is also supported (Antony *et al.*, 1998; Clara *et al.*, 2001; Henry & Crawford, 2005). The validity of the DASS-21 has been tested by correlating it with other measures of depression and anxiety (Henry & Crawford, 2005; Antony *et al.*, 1998). **Table 2.3** presents the correlations reported by

Antony *et al.* (1998) between the DASS-21 subscales and the Beck Depression Inventory (BDI), the Beck Anxiety Inventory (BAI) and the State-Trait Anxiety Inventory – Trait Version (STAI-T):

Table 2.3 Correlations of the DASS-21 subscales with other measures of anxiety and depression

	DASS-21 Stress	DASS-21 Depression	DASS-21 Anxiety
DASS-21 Depression	.57		
DASS-21 Anxiety	.72	.46	
BDI	.69	.79	.62
BAI	.70	.51	.85
STAI-T	.68	.71	.55

High levels of internal consistency of the DASS-21 have also been reported in several studies across a range of samples. These are presented in **Table 2.4**:

Table 2.4: Reported alpha values for the DASS-21 subscales across a range of samples

	Sample	N	Depression α	Anxiety α	Stress α
Lovibond & Lovibond (2004)	Student	717	.81	.73	.81
Clara *et al.* (2001)	Psychiatric Outpatients	439	.92	.81	.88
Henry & Crawford (2005)	UK Adult non-clinical	1794	.88	.82	.90
Miller *et al.* (2006)	Postnatal Women	325	.84	.77	.86

Miller *et al.* (2006) administered the EPDS and DASS-21 to a postnatal sample (N=325) as part of a larger cross-sectional study. Their study aimed to assess the prevalence of postnatal distress and to conduct a preliminary investigation into the potential use of the EPDS and DASS-21 in the postnatal period. Their analysis compared the classifications of women according to the EPDS and DASS-21. Although the purpose of this study was not to validate the DASS for postnatal use, it appeared to be a useful instrument for this purpose.

The DASS-21 was selected as a measure in the present study on the basis of its reliability, validity and, for pragmatic reasons, its brevity. Of further relevance to the present study was the scale's development for both clinical and non-clinical populations and its use of dimensional rather than categorical conceptions of depression, anxiety and stress. This complemented the cross-sectional design of the present study. In addition, however, the scale provides recommended cut-offs which allow individuals to be classified according to severity; thus complementing the between groups design of the study. A final rationale for the use of the DASS-21 in the present study was that it excludes many of the traditional somatic items of depression which have been found to be unreliable within an antenatal population (Cox *et al.*, 1987).

2.5.2 MEASURE OF SOCIAL SUPPORT

2.5.2.1 SIGNIFICANT OTHERS SCALE (SOS)

The Significant Others Scale (SOS) was originally developed by Power *et al.* (1988) to measure emotional and practical support functions across a range of people. Two versions of the scale have been developed; one which specifies seven individuals (e.g. spouse/partner, mother, father, closest brother or sister, other brother or sister, closest son or daughter and best friend) and another version in which the respondent can choose who to specify as the key individuals to be rated. In addition, however, the scale can be used more flexibly in order to vary the type and number of individuals included in the support measure (Johnston *et al.*, 1995).

In the present study, the SOS was adapted to include three named individuals; husband or partner, mother and father. In addition, the respondent was asked to specify one 'other' important person in their life who they were asked to rate. Each individual is rated for actual emotional support ('Can you trust, talk to

frankly and share your feelings with this person?' and 'Can you lean on and turn to this person in times of difficulty?'), actual practical support ('Does he/she give you practical help?' and 'Can you spend time with him/her socially?') and ideal emotional and practical support ('What rating would your ideal be?'). Each of these items are rated using a seven-point scale ranging from one ('never') to seven ('always'). These ratings provide actual and ideal scores as well as a discrepancy score between the two. The discrepancy score provides a measure of likely satisfaction with the specified individual. Scores can be explored at an individual level (e.g. mean actual emotional support from mother) as well as at an overall level (e.g. mean actual emotional support from all individuals). The respondents are requested to leave a section blank if a source of support does not exist for them.

The criterion validity of the SOS was tested by Power *et al.* (1988) who compared the scores of three groups ('non cases', 'non-depressed cases' and 'depressed cases') assigned according to their level of psychopathology on the General Health Questionnaire (GHQ-28). They found that groups did not differ in terms of actual practical and emotional support, but the depressed group showed significantly higher ideal and discrepancy scores for both practical and emotional support. Power *et al.* (1988) suggested that this supports the proposal that depressed people tend to have higher expectations of themselves and others. A further longitudinal study found that levels of support predicted symptoms of depression over six months (Power, 1988).

Power *et al.* (1988) also demonstrate that the SOS has satisfactory reliability. They found test-retest reliability over a six month period to range from .73 to .83 across the four summary support scores (actual practical, ideal practical, actual emotional and ideal emotional).

The SOS was selected as a measure in the present study on the basis of its reliability, validity and flexibility. This flexibility allowed the length of the measure to be kept to a minimum, while enabling the researcher to measure support from key individuals during the antenatal period.

2.5.3 MEASURE OF LIFE EVENTS

The measure of life events used in the present study was adapted from the List of Threatening Experiences (LTE) developed by Brugha *et al.* (1985). They obtained a history of life events (using a semi-structured interview and life event inventory) from a random sample of 310 men and women from the UK general population and 74 psychiatric patients. They found that 12 event categories accounted for 77% of life events with an aetiologically significant rating of marked or moderate long-term threat. This rating was thought to distinguish events most likely to be significant to the development of depression (Brown & Harris, 1978). Brugha & Cragg (1990) assessed the reliability and validity of the questionnaire version of the LTE (LTE-Q) in a study of 50 psychiatric patients and informants. They found that the test-retest reliability coefficient for a minimum of one event occurring in the previous three months was .88. They also found good agreement with informant information. They assessed concurrent validity of the LTE-Q with a semi-structured life events interview and demonstrated high specificity (.74) and sensitivity (.89). The test-retest reliability of the LTE has also been tested with a postnatal sample and was found to be .67 over three months postpartum (Ayers, 2001).

In the present study, an additional four items were added to the LTE (12 item) scale. These were taken from the Life Events Inventory (Cochrane & Robertson, 1973) and included; 'an increase in arguments with partner', 'trouble or behaviour problems with children', 'moving house' and 'immediate family member has difficulties with drugs or alcohol'. A fifth item was added which

allowed the respondent to specify one 'other' significant life event. The main themes specified as 'other events' by the total sample are included in Appendix 5.

As in the LTE, participants were asked to read each of the seventeen statements and indicate whether they had occurred within the past six months. If they indicated 'Yes' they were then asked to indicate the degree of distress they experienced as a result of the situation. The distress was rated on a scale of one ('not at all distressing') to four ('extremely distressing'). The scale enabled two scores to be calculated; a total number of life events (by totalling up the *number* of life events which had occurred) and a life event distress score (which calculated a mean score of the degree of distress experienced from life events in the past six months).

The LTE was used as a basis for the life events measure in the present study due to its reliability, validity and brevity. In particular, its use has been demonstrated in an antenatal sample (Ayers, 2001). The additional items were added as it was felt that these were potentially aetiologically significant stressors during the antenatal period.

2.6 DESIGN OF FULL QUESTIONNAIRE

The full questionnaire was produced in booklet format and included a front cover page. As explained above in section 2.3, the first page (which included a statement of consent and necessary contact details) was perforated so that it could be easily removed and stored separately. An identification number was placed on both the perforated sheet and the main body of the booklet to allow the two to be matched if necessary. The questionnaire was printed on lilac paper to help it stand out from other household paperwork. The full questionnaire layout and design can be viewed in Appendix 4.

2.7 OTHER INFORMATION COLLECTED IN THE QUESTIONNAIRE

2.7.1 DEMOGRAPHIC INFORMATION

Demographic information on age, marital status, employment status, ethnicity, qualifications, parity and stage of pregnancy (in gestational weeks) was collected.

2.7.2 CURRENT SUPPORT

A question was included which enquired about whether a respondent was receiving professional support in addition to their routine medical and antenatal care. This was to help the researcher to assess whether an individual was receiving adequate professional support (see section 2.3).

2.7.3 DESIRED SUPPORT OPTIONS

A question was also included which asked: 'If you wanted support with emotional issues (such as low mood or anxiety) during your pregnancy, which of the following would you consider?' A list of options was provided which included support options currently available in Fife (such as speaking to a Midwife) and options which could potentially be developed (such as attending a therapy group for women with similar difficulties).

2.8 PROCEDURE

Discussions with the Clinical Co-ordinator of the Fife Community Midwives regarding the research methodology were commenced during the early stages of the present study. Prior to finalising the research methodology a further discussion took place with the Clinical Co-ordinator and a Community Midwife to ensure that the research procedure would be acceptable and feasible for the Midwives within the time available.

The researcher arranged to meet with each of the three Community Midwife teams in Fife to give an informal presentation about the forthcoming research. These meetings were arranged and attended by the Clinical Co-ordinator of the Fife Community Midwives. A research information sheet was also distributed at this meeting (see Appendix 6). This provided an opportunity for the Community Midwives to raise any concerns or questions. Following this, the questionnaires were hand delivered to the three teams and the researcher spent time answering further individual queries. Throughout the research, regular contact was maintained with the Community Midwife teams.

The questionnaires were placed inside sealed A4 envelopes with a verbal instruction (for the Midwife) attached to the front (see Appendix 7). This was provided to limit the variability in instructions given to potential participants and to remind Midwives of the exclusion criteria for participant recruitment (see section 2.4.1.). In addition to the questionnaire, the envelope contained a participant invitation letter (see Appendix 8), a participant information sheet (see Appendix 3) and a stamped addressed envelope. The Community Midwives did not need to wait for the women to complete the questionnaire during antenatal appointments as a stamped addressed envelope was provided.

Each Community Midwife in Fife (N=35) was given approximately 30 questionnaires to distribute. There was some variation in this amount to adapt to the teams' varying clinical caseloads. In order to distribute the questionnaires to an even spread of antenatal women across the trimesters of pregnancy, the 30 questionnaires (given to each Midwife) were bundled together into 3 groups of 10 and were labelled according to which appointment they were to be distributed. Each midwife was instructed to distribute 10 questionnaires to women at the 'booking' visit (first trimester appointment), 10 questionnaires to women at the 22nd week appointment (second trimester appointment) and 10 questionnaires to

women at any of the third trimester appointments (these occur every two weeks until the birth). After one month of data collection it became clear that there was a larger proportion of questionnaires from women in their third trimester being returned. This was likely to have been due to the higher number of third trimester appointments. In addition, it was possible that women in their third trimester of pregnancy were less likely to be working and therefore, more likely to complete and return the questionnaire. For this reason, the researcher requested that the remaining questionnaires be distributed at the first and second trimester appointments only. Data collection continued for one further month.

As described in section 2.3, the researcher had an ethical responsibility to respond to women describing significant levels of distress. This level was determined by recommended cut-off points (12 on the EDS, in the 'moderate or above' range on the DASS-21 or any individual indicating suicidal ideation). Initial contact was made via telephone if possible. This allowed the researcher to raise any concerns about the reported symptoms and to discuss available support options if necessary (such as speaking to their GP, Midwife, using self-help material or being referred to the Fife Clinical Psychology department). If the respondent could not be contacted via telephone, written correspondence was sent (see Appendix 9 for an example template). In addition, with the respondent's consent, written correspondence was sent to their GP and Midwife (see Appendix 9 for an example template). It was agreed with the Ethics Committee that if consent was not given, but the level of concern was high, then the researcher would have to act according to her duty of care and contact the participant's Midwife and GP regardless. This scenario did not arise. The above procedure was explained in the participant information sheet (see Appendix 3) distributed with the questionnaire.

2.9 POWER ANALYSIS

The necessary sample size calculation was based on Cohen's (1992) recommendations for correlation calculations, multiple regression and analysis of variance (ANOVA). The t-test for the significance of a product moment correlation coefficient r, requires a minimum sample size of 85 to find a medium effect size at the 95% significance level. The F test of the multiple regression with eight independent variables (e.g. depression score, age, marital status, work status, qualifications, partner emotional support, partner practical support and life event score) requires a minimum sample size of 107 to find a medium effect size at the 95% significance level. One-way Analysis of Variance of three groups (e.g. the first, second & third trimesters of pregnancy) requires a minimum sample size of 156 (52 per group) to find a medium effect size at the 95% significance level.

Due to the reliance on other people (e.g. the Fife Community Midwives) to distribute the questionnaires it was expected that only a percentage of the questionnaires would actually be handed out. It was estimated that if 1000 questionnaires were given to the Community Midwives, 60% of these would be distributed (N=600). Response rates from postal surveys tend to be relatively low (Abramson & Abramson, 1999). If 30% of the questionnaires (N=600) were returned, the estimated number of participants would be 180. This would therefore be a sufficient sample size to achieve the recommended power level of .8 (Cohen, 1992).

2.10 STATISTICAL ANALYSIS

The data were analysed using Statistical Package for the Social Sciences (SPSS) for Windows (Version 14.0). Frequencies and descriptive statistics were conducted on demographic variables and to determine the prevalence of depression, anxiety and stress symptoms. The data were inspected for skew and kurtosis using a frequency distribution and the Kolmogorov-Smirnov test. This revealed a

positively skewed distribution which remained following logarithm, reciprocal and square root transformations. The analysis was therefore conducted on the untransformed data which is accepted when using clinical measures in a non-clinical sample drawn from the general population (Crawford & Henry, 2003).

Parametric tests were used to consider differences in mean scores between groups since they are more powerful and robust to violations of their assumptions and, therefore, may be less likely to commit Type II errors (Clark-Carter, 2004). Where assumptions of parametric tests were violated, a non-parametric Mann-Whitney test was performed. Non-parametric Pearson's chi-squared analysis was also used to identify differences between categorical variables.

Prior to multivariate analyses, Pearson correlations were examined between all variables and symptom scores from the EDS and DASS-21. Following this, the sequential enter method of multiple regression was used to explore the factors influencing antenatal distress. Further details of analyses are provided at appropriate points in section 3.

Multiple comparisons of data may result in Type I errors occurring. For this reason, the alpha level can be adjusted to a more stringent level (Field, 2006). The use of multivariate analysis, however, prevents the error effects of multiple comparisons. The alpha level was therefore retained at .05 throughout the analysis to ensure that all potentially significant variables were explored prior to the multivariate analysis (Tabachnick & Fidell, 2006).

3 RESULTS

3.1 OVERVIEW

The methodology of the present study was reported in section 2. This section aims to present the research findings. The characteristics of the total sample are explored: the response rate, demographics, symptomatology, level of social support and life events. This includes an investigation into co-morbidity of depression, anxiety and stress and the difference in symptoms across the trimesters of pregnancy. The difference in demographics, social support and life events between women, with and without significant levels of symptoms, is reported. The results are then expanded to explore the risk factors influencing antenatal distress using multivariate analysis. The reliability and validity of the EDS and DASS-21 are reported. The final section presents the results showing the desired service support options (for antenatal emotional distress) as reported by the antenatal women of Fife.

3.2 RESPONSE RATE & SAMPLE SIZE

One thousand questionnaires were delivered to the Community Midwives in Fife for distribution (see section 2.8 for further details). At the end of the data collection period 131 undistributed questionnaires were collected from the Community Midwives. The estimated number of questionnaires, therefore, distributed by the Community Midwives to antenatal women was 869 (e.g. 1000-131=869). Three hundred and four women responded to the questionnaire, which means that the approximate response rate was 35% (e.g. 304/869 x 100 = 35%). Two of the returned questionnaires were excluded as the participants did not meet the inclusion criteria (one had had her baby and one was under 18 years of age). This resulted in a final sample size of 302 antenatal women.

3.3 DEMOGRAPHIC CHARACTERISTICS OF THE TOTAL SAMPLE

The following demographic characteristics are presented in a summary table (**Table 3.1**) at the end of this section.

3.3.1 AGE CHARACTERISTICS

The mean age of the total sample was 29.2 (SD 5.6; range 18 to 43; median 29).

3.3.2 STAGE OF PREGNANCY (BY GESTATIONAL WEEKS)

The mean stage of pregnancy (measured in gestational weeks) of the total sample was 25.0 (SD 10.4; range 7 to 40; median 25).

3.3.3 STAGE OF PREGNANCY (BY TRIMESTER)

Forty-three percent (N=130) of the total sample were in the third trimester of pregnancy, 33% (N=99) were in the second trimester and 23% (N=70) were in the first trimester. One percent (N=3) of the total sample did not provide this information. This is illustrated in **Figure 3.1**:

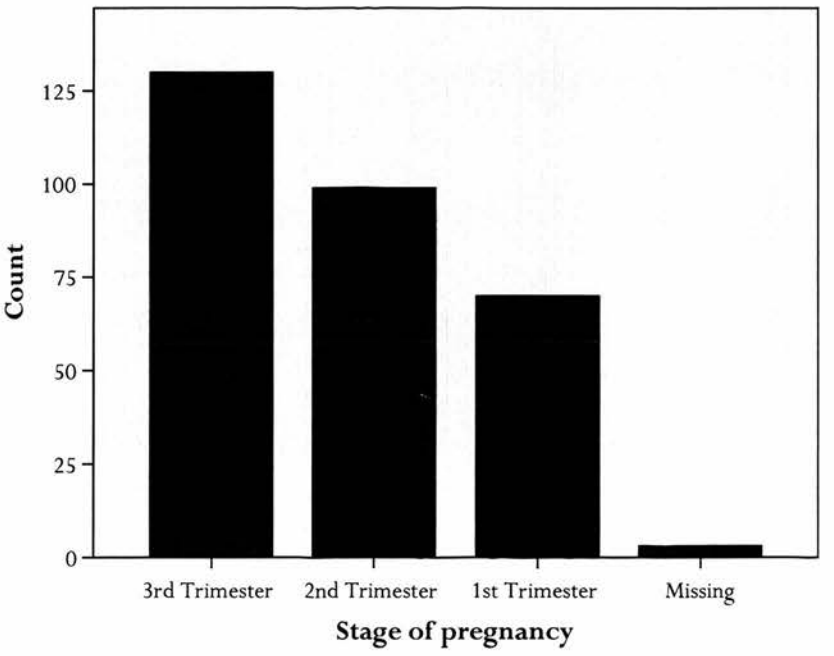

Figure 3.1: Stage of pregnancy of the total sample

3.3.4 MARITAL STATUS

Eighty-seven percent (N=264) of the total sample were either married or co-habiting, 10% (N=29) were single, 1% (N=4) were separated from their partner and less than 1% (N=1) were divorced. This information was not provided by 1.3% (N=4). This is illustrated in **Figure 3.2:**

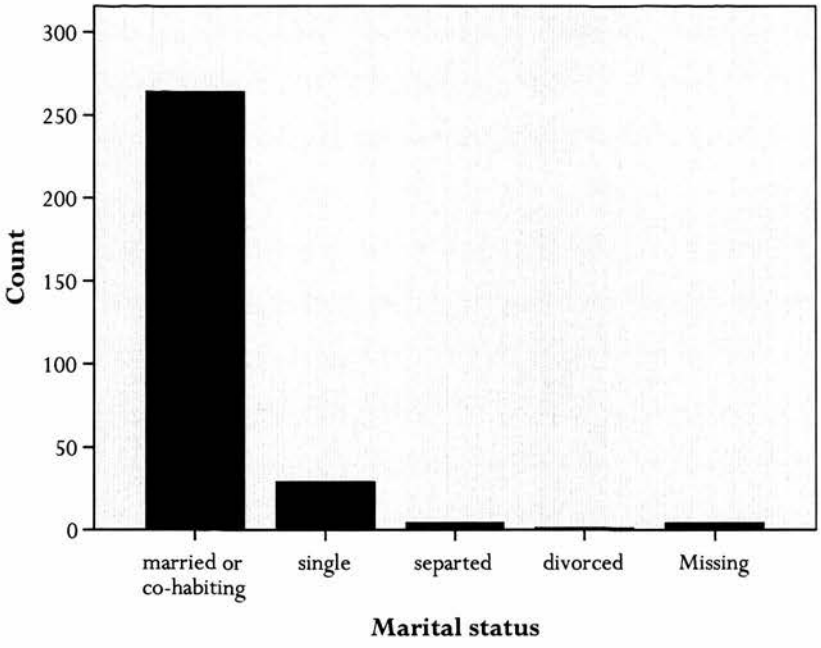

Figure 3.2: Marital status of the total sample

3.3.5 ETHNIC ORIGIN

Ninety-eight percent (N=297) of the total sample were of a white ethnic origin, less than 1% (N=1) were of a Pakistani ethnic origin and less than 1% (N=1) were an 'other ethnic group'. One percent (N=3) of the total sample did not provide this information.

3.3.6 EMPLOYMENT STATUS

Forty-seven percent (N=143) of the total sample were in full time employment, 27% (N=80) were in part time employment, 13% (N=39) looked after the home or family, 6% (N=18) were unemployed, 5% (N=14) classified themselves as being a student or in further education and 1% (N=3) were permanently sick or disabled. Two percent (N=5) of the total sample did not provide this information. This is illustrated in **Figure 3.3**:

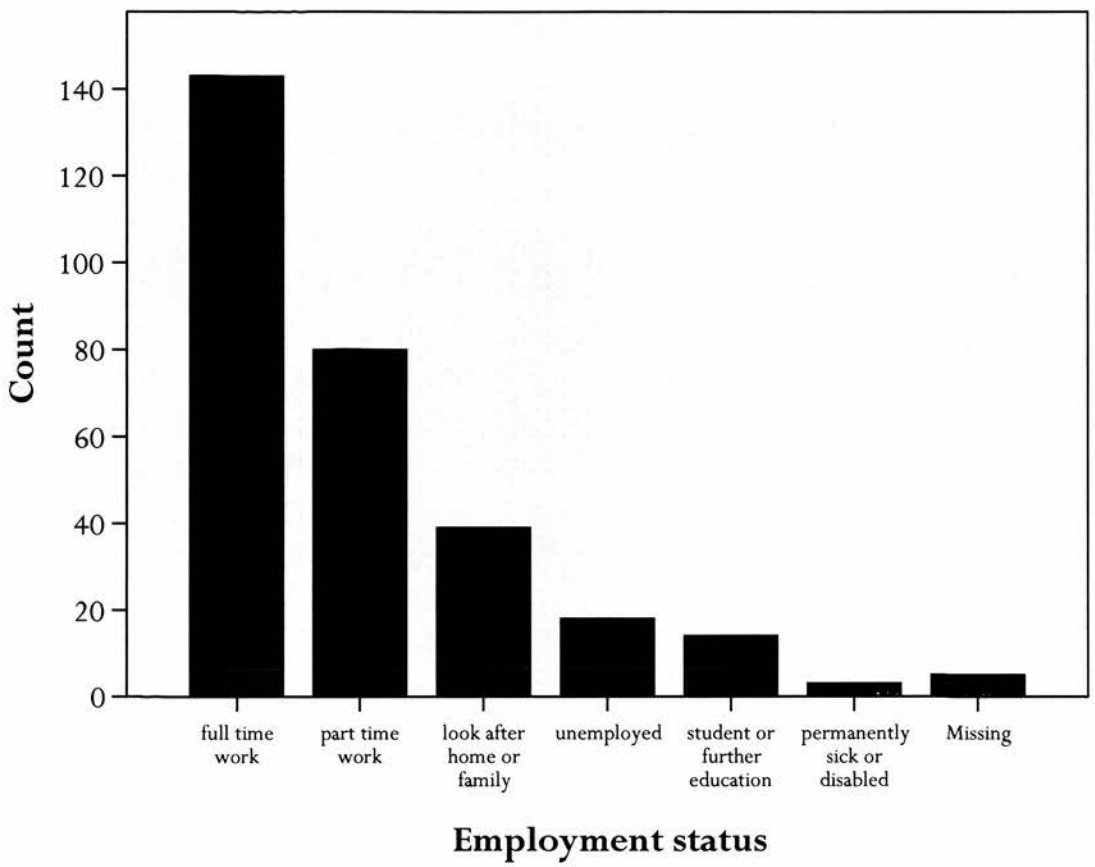

Figure 3.3: Employment status of the total sample

3.3.7 EDUCATION LEVEL

Thirty-seven percent (N=111) of the total sample had obtained vocational or further education qualifications, 33% (N=98) had a university degree, 15% (N=44) had standard grades or 'O' grades, 11% (N=34) had Highers or 'A' levels, 2% (N=6) had no qualifications and 2% (N=5) had 'other' qualifications. One percent (N=4) of the total sample did not provide this information. This is illustrated in **Figure 3.4**:

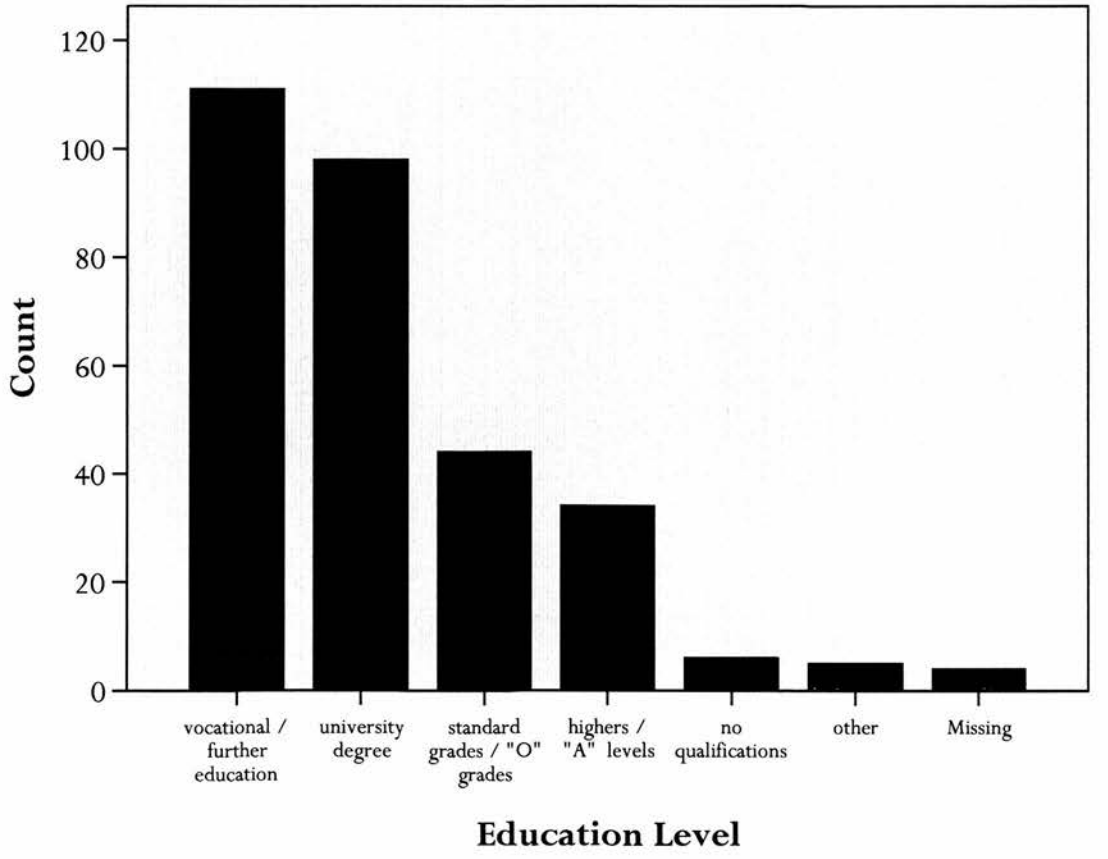

Figure 3.4: Education level of the total sample

3.3.8 PARITY

Fifty-one percent (N=154) of the total sample had children and 48% (N=145) were primiparous women. 1% (N=3) of the total sample did not provide this information. This is illustrated in **Figure 3.5**:

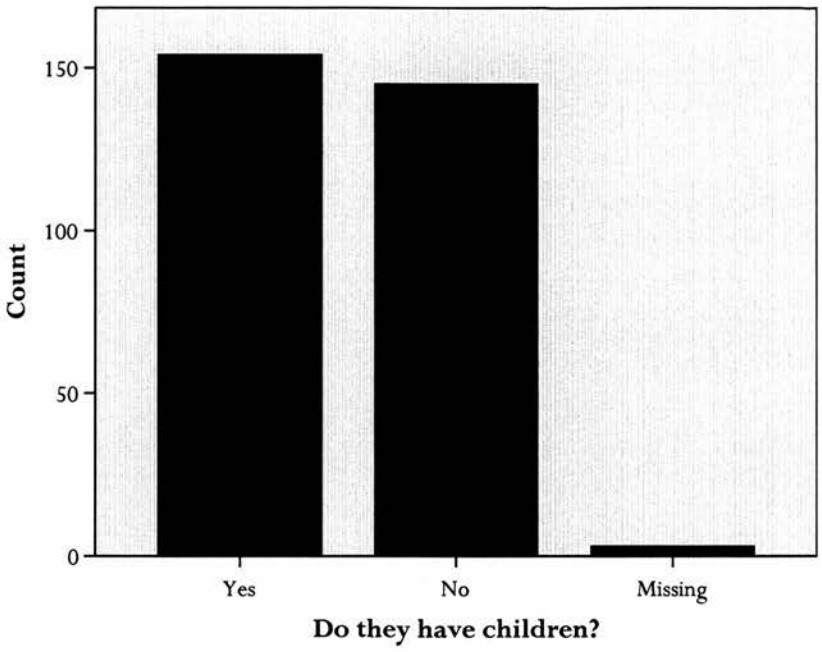

Figure 3.5: Does the total sample have children?

3.3.9 SUMMARY TABLE OF DEMOGRAPHICS

Table 3.1 presents the demographic characteristics of the total sample consisting of 302 pregnant women attending antenatal clinics in Fife:

Table 3.1: Demographic characteristics of the total sample

	Mean	SD	Minimum	Maximum	Median
Age (N=293)	29.2	5.6	18	43	29
Gestational Weeks (N=299)	25.0	10.4	7	40	25
		N		%	
Stage of Pregnancy					
1st Trimester		70		23	
2nd Trimester		99		33	
3rd Trimester		130		43	
Unknown		3		1	
Marital Status					
Married of Cohabiting		264		87	
Single		29		10	
Separated		4		1	
Divorced		1		< 1	
Unknown		4		1	
Ethnic Origin					
White		297		98	
Pakistani		1		< 1	
Other ethnic group		1		< 1	
Unknown		3		1	
Employment Status					
Full time work		143		47	
Part time work		80		27	
Look after home or family		39		13	
Student or further education		14		5	
Permanently sick or disabled		3		1	
Unemployed		18		6	
Unknown		5		2	
Education Level					
University degree		98		33	
Vocational/ further education		111		37	
Highers or 'A' levels		34		11	
Standard grades or 'O' grades		44		15	
Other qualifications		5		2	
No qualifications		6		2	
Unknown		4		1	
Children					
Yes		154		51	
No		145		48	
Unknown		3		1	

3.4 SYMPTOMATOLOGY OF THE TOTAL SAMPLE

3.4.1 DEPRESSION SYMPTOMATOLOGY

3.4.1.1 EDINBURGH DEPRESSION SCALE (EDS)

Three hundred and one respondents from the total sample (N=302) completed the EDS. The mean EDS score was 6.2 (out of a possible 30 points) (SD 5.2; range 0 to 25; median 5) (see **Table 3.2**).

Table 3.2: Descriptive statistics of the EDS scores

EDS SCORES (N=301)	
Mean	6.2
SD	5.2
Minimum	0
Maximum	25
Median	5
Skewness	1.092
Standard Error of Skewness	0.140
Kurtosis	0.748
Standard Error of Kurtosis	0.280

Visual inspection of the scores (see **Figure 3.6**) revealed that they were positively skewed. The values of skewness (1.092) and kurtosis (0.748) also indicate a positively skewed and leptokurtic distribution. (The values should be zero in a normal distribution; Field, 2006). In addition, Kolmogorov-Smirnov tests revealed that the distribution deviated significantly from a normal distribution, $D(301)=0.16$, $p<.001$. As mentioned in section 2.10, this is to be expected in a non-clinical sample drawn from the general population (Crawford & Henry, 2003).

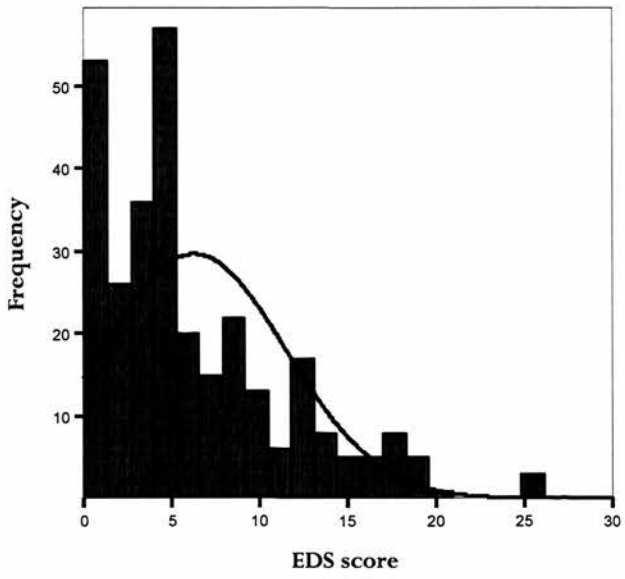

Figure 3.6: The distribution of the EDS scores for the total sample

Twenty-three point six percent (23.6%) of respondents scored 10 or above on the EDS, indicating possible depression symptoms. Seventeen point two percent (17.2%) of respondents scored 12 or above on the EDS. This is the recommended antenatal cut-off for identifying major *and* minor depression (Murray & Cox, 1990). Eleven point six (11.6%) of respondents scored 14 or above on the EDS. This is the recommended antenatal cut-off for identifying major depression (Murray & Cox, 1990). These results are presented in **Table 3.3**.

Table 3.3: Respondents scoring above the EDS cut-offs

EDS SCORES	%	*N*
EDS ≥ 10	23.6	71
EDS ≥ 12	17.2	52
EDS ≥ 14	11.6	35

3.4.1.1 DASS-21 DEPRESSION SCALE

One hundred percent of respondents from the total sample (*N*=302) completed the DASS-21 depression scale. Scores from the DASS-21 are multiplied by 2 to

ensure consistent interpretation with the full DASS-42 scale (Lovibond & Lovibond, 2004). The mean DASS-21 depression score was 5.4 (out of a possible 42 points) (SD 6.8; range 0 to 40; median 3.0) (see **Table 3.4**). Lovibond & Lovibond (1995) found similar results from the DASS-21 depression scale in a female normative sample (N=1870; mean 6.1; SD 6.9).

Table 3.4: Descriptive statistics of the DASS-21 depression scores

DASS-21 DEPRESSION SCORES	
Mean	5.4
SD	6.8
Minimum	0
Maximum	40
Median	3.0
Skewness	2.161
Standard Error of Skewness	0.140
Kurtosis	5.768
Standard Error of Kurtosis	0.280

Visual inspection of the scores (see **Figure 3.7**) revealed that they were positively skewed. The values of skewness (2.161) and kurtosis (5.768) also indicate a positively skewed and leptokurtic distribution. In addition, Kolmogorov-Smirnov tests revealed that the distribution deviated significantly from a normal distribution, $D(301)=0.24$, $p<.001$.

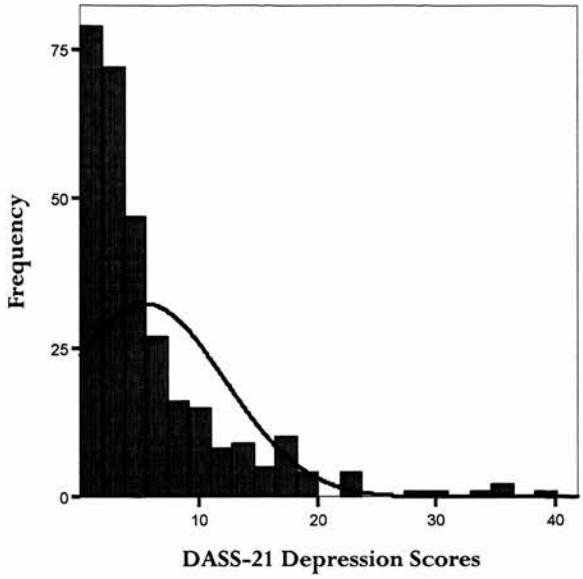

Figure 3.7: The distribution of the DASS-21 depression scores for the total sample

Lovibond & Lovibond (2004) suggest severity ratings for the DASS-21 which range from 'mild' (a score of 10 or above) to 'extremely severe' (a score of 28 or above). Twenty point two percent of respondents scored in the 'mild or above' range, 12.6% of respondents scored in the 'moderate or above' range, 3.3% of respondents scored in the 'severe or above' range and 2.0% of respondents scored in the 'extremely severe or above' range on the DASS-21 depression scale (see **Table 3.5**).

Table 3.5: Respondents scoring above the DASS-21 depression scale cut-offs

DASS-21 DEPRESSION SCORES	%	*N*
≥ 10 ('Mild or above')	20.2	61
≥ 14 ('Moderate or above')	12.6	38
≥ 21 ('Severe or above')	3.3	10
≥ 28 ('Extremely Severe or above')	2.0	6

3.4.2. ANXIETY SYMPTOMATOLOGY

3.4.2.1 DASS-21 ANXIETY SCALE

One hundred percent of respondents from the total sample (N=302) completed the DASS-21 anxiety scale. The mean DASS-21 anxiety score was 5.1 (out of a possible 42 points) (SD 6.5; range 0 to 34; median 4) (see **Table 3.6**). Lovibond & Lovibond (1995) found similar results from the DASS-21 anxiety scale in a female normative sample (N=1,870; mean 4.8; SD 5.0).

Table 3.6: Descriptive statistics of the DASS-21 anxiety scores

DASS-21 ANXIETY SCORES	
Mean	5.1
SD	6.5
Minimum	0
Maximum	34
Median	4.0
Skewness	2.076
Standard Error of Skewness	0.140
Kurtosis	4.724
Standard Error of Kurtosis	0.280

Visual inspection of the DASS-21 anxiety scores (see **Figure 3.8**) revealed that they were positively skewed. The values of skewness (2.076) and kurtosis (4.724) also indicate a positively skewed and leptokurtic distribution. In addition, Kolmogorov-Smirnov tests revealed that the distribution deviated significantly from a normal distribution, $D(301)=0.24$, $p<.001$.

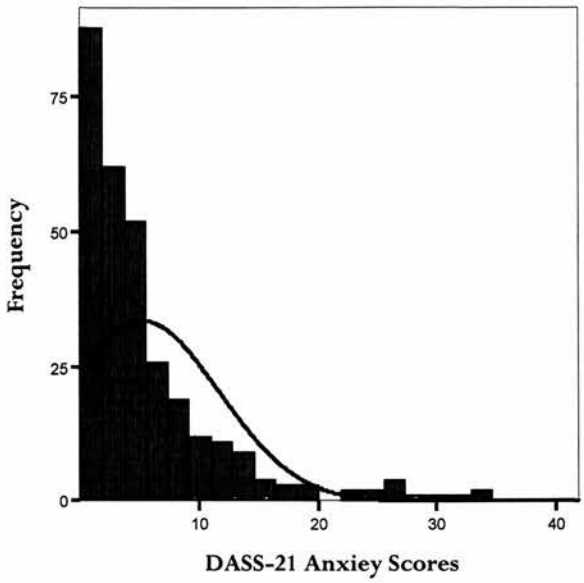

Figure 3.8: The distribution of the DASS-21 anxiety scores for the total sample

Twenty-four point five percent (24.5%) of respondents scored in the 'mild or above' range, 18.2% of respondents scored in the 'moderate or above' range, 7.6% of respondents scored in the 'severe or above' range and 5.3% of respondents scored in the 'extremely severe or above' range on the DASS-21 anxiety scale (see **Table 3.7**).

Table 3.7: Respondents scoring above the DASS-21 anxiety scale cut-offs

DASS-21 ANXIETY SCORES	%	*N*
≥ 8 ('Mild or above')	24.5	74
≥ 10 ('Moderate or above')	18.2	55
≥ 15 ('Severe or above')	7.6	23
≥ 20 ('Extremely Severe or above')	5.3	16

3.4.3 STRESS SYMPTOMATOLOGY

3.4.3.1 DASS-21 STRESS SCALE

One hundred percent of respondents from the total sample (N=302) completed the DASS-21 stress scale. The mean DASS-21 stress score was 10.5 (out of a possible 42 points) (SD 8.6; range 0 to 42; median 8.0) (see **Table 3.8**). Lovibond & Lovibond (1995) found similar results from the DASS-21 stress scale in a female normative sample (N=1870; mean 10.3; SD 8.2).

Table 3.8: Descriptive statistics of the DASS-21 stress scores

DASS-21 STRESS SCORES	
Mean	10.5
SD	8.6
Minimum	0
Maximum	42
Median	8.0
Skewness	1.082
Standard Error of Skewness	0.140
Kurtosis	0.935
Standard Error of Kurtosis	0.280

Visual inspection of the scores (see **Figure 3.9**) revealed that they were positively skewed. The values of skewness (1.082) and kurtosis (0.935) also indicate a positively skewed and leptokurtic distribution. In addition, Kolmogorov-Smirnov tests revealed that the distribution deviated significantly from a normal distribution, $D(301)=0.16$, $p<.001$.

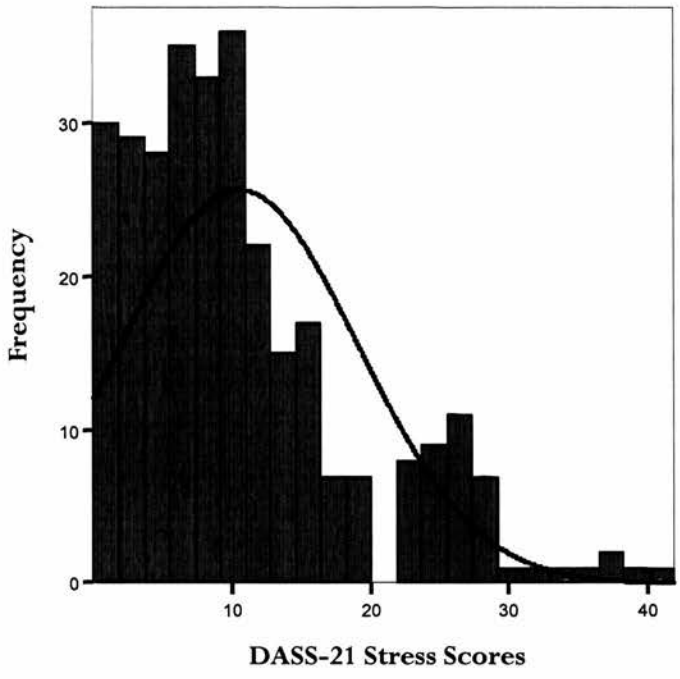

Figure 3.9: The Distribution of the DASS-21 stress scores for the total sample

Twenty-four point five percent (24.5%) of respondents scored in the 'mild or above' range, 16.6% of respondents scored in the 'moderate or above' range, 8.6% of respondents scored in the 'severe or above' range and 2.0% of respondents scored in the 'extremely severe or above' range on the DASS-21 stress scale (see **Table 3.9**).

Table 3.9: Respondents scoring above the DASS-21 stress scale cut-offs

DASS-21 STRESS SCORES	%	*N*
≥ 15 ('Mild or above')	24.5	74
≥ 19 ('Moderate or above')	16.6	50
≥ 26 ('Severe or above')	8.6	26
≥ 34 ('Extremely Severe or above')	2.0	6

3.4.4 SUMMARY TABLE OF EDS & DASS-21 SYMPTOMATOLOGY SCORES

Table 3.10 presents a summary of the symptom scores (as measured by the EDS and DASS-21) for the total sample. The recommended EDS antenatal cut-off of

12 (Murray & Cox, 1990), produces a prevalence rate (of 17.2%) which is most similar to the prevalence rate found using the 'mild or above' classification of the DASS-21 depression scale (20.2%).

Table 3.10: Summary of EDS and DASS-21 scores of the total sample

EDS SCORES:	%	*N*
EDS ≥ 10	23.6	71
EDS ≥ 12	17.2	52
EDS ≥ 14	11.6	35
DASS-21 SCORES:	%	N
Depression:		
'Mild or above'	20.2	61
'Moderate or above'	12.6	38
'Severe or above'	3.3	10
'Extremely Severe or above'	2.0	6
Anxiety:		
'Mild or above'	24.5	74
'Moderate or above'	18.2	55
'Severe or above'	7.6	23
'Extremely Severe or above'	5.3	16
Stress:		
'Mild or above'	24.5	74
'Moderate or above'	16.6	50
'Severe or above'	8.6	26
'Extremely Severe or above'	2.0	6

3.4.5 NON-NORMAL DISTRIBUTION & OUTLIERS

As mentioned in section 2.10, it is expected that scores from measures of depression, anxiety and stress will produce non-normal distributions when used in a non-clinical population. The data were transformed using Naperian logs plus one [ln(x) + 1] yet remained non-normal. Further transformations using reciprocals and square roots were conducted but these were unable to transform the data to a normal distribution. Nonetheless, results were compared based on the raw and transformed data but there was no change in significance (see section 3.10). The analysis was therefore conducted on the untransformed data. Outliers in the sample were also inspected but were included in further analysis as these were deemed to be clinically significant cases.

3.4.6 THE CO-MORBIDITY OF DEPRESSION, ANXIETY & STRESS

This section presents the proportion of women who had 'pure' depression, anxiety and stress symptoms and the proportion that had co-morbid difficulties. The EDS cut-off of 12 (the recommended antenatal cut-off; Murray & Cox, 1990) and the DASS-21 'mild or above' cut-offs were used.

Figure 3.10 shows that of the 52 women who score 12 or above on the EDS, 4 (7.7%) described 'pure' depression symptoms. Seven (13.5%) scored above the cut off on the DASS-21 anxiety subscale. Six (11.5%) scored above the cut-off on the DASS-21 stress subscale. Thirty-five (67.3%) of the women scored above the EDS cut-off *and* above the DASS-21 anxiety and stress subscale cut-offs.

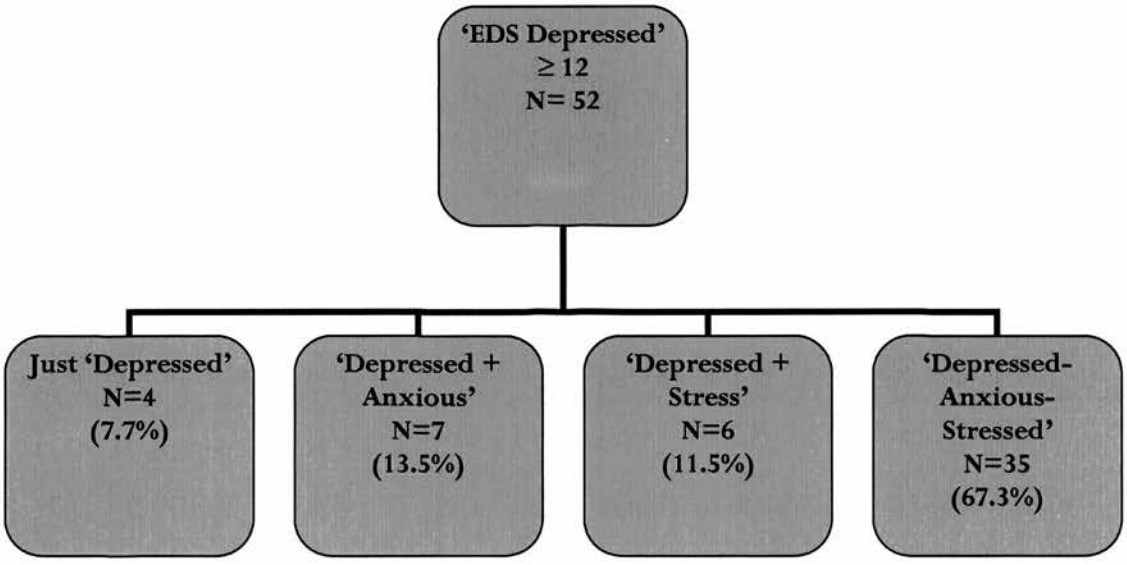

Figure 3.10: The co-morbidity of women scoring above the EDS cut-off

An exploration into the co-morbidity of depression, anxiety and stress was repeated using the DASS-21 depression scale and revealed similar results. This is included in Appendix 10.

Figure 3.11 shows that of the 74 women who score in the 'mild or above' range (≥ 8) on the DASS-21 anxiety subscale, 22 (29.7%) described 'pure' anxiety symptoms. Six (8.1%) scored above the cut off on the DASS-21 depression subscale and 12 (16.2%) scored above the cut-off on the DASS-21 stress subscale. Thirty-four (45.9%) of the women scored above the DASS-21 anxiety, depression *and* stress subscale cut-offs.

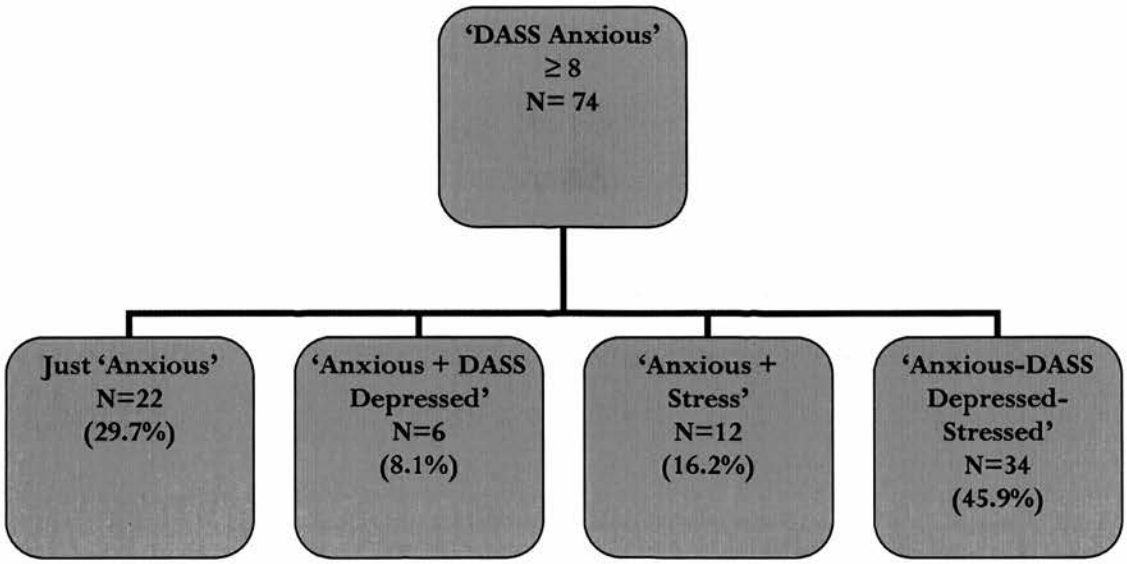

Figure 3.11: The co-morbidity of women scoring above the DASS-21 anxiety subscale cut-off

Figure 3.12 shows that of the 74 women who score in the 'mild or above' range (≥15) on the DASS-21 stress subscale 20 (27.0%) described 'pure' stress symptoms. Eight (10.8 %) scored above the cut off on the DASS-21 depression subscale and 12 (16.2%) scored above the cut-off on the DASS-21 stress subscale. Thirty-four (46.0%) of the women scored above the DASS-21 anxiety, depression *and* stress subscale cut-offs.

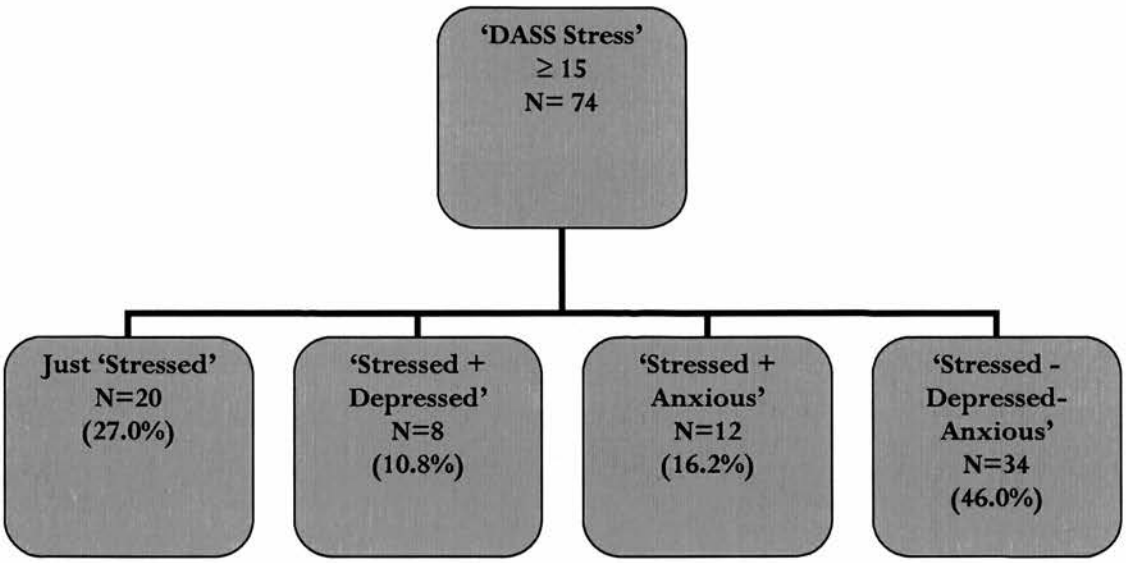

Figure 3.12: The co-morbidity of women scoring above the DASS-21 stress subscale cut-off

3.4.7 SYMPTOMATOLOGY ACROSS THE STAGES OF PREGNANCY

3.4.7.1 IS THERE A DIFFERENCE IN LEVELS OF DEPRESSION SYMPTOMATOLOGY ACROSS THE STAGES OF PREGNANCY?

The mean EDS scores were 6.3 for women in the first trimester of pregnancy, 5.5 in the second trimester and 6.8 in the third trimester (see **Table 3.11**).

Table 3.11: EDS means and standard deviations across the trimesters of pregnancy

	1st Trimester (*N*=70)	2nd Trimester (*N*=98)	3rd Trimester (*N*=130)
EDS SCORES			
Mean	6.3	5.5	6.8
SD	5.0	5.0	5.5

One-way independent ANOVA showed that there was **no significant effect** on depression symptoms (as measured by the EDS) across the trimesters of pregnancy, $F(2, 295)=1.82$, $p=.165$. This analysis was repeated using the DASS-21 depression scale (see Appendix 11), achieving the same results.

3.4.7.2 IS THERE A DIFFERENCE IN LEVELS OF ANXIETY SYMPTOMATOLOGY ACROSS THE STAGES OF PREGNANCY?

The mean DASS-21 anxiety subscale scores were 5.4 for women in the first trimester of pregnancy, 4.1 in the second trimester and 5.9 in the third trimester (see **Table 3.12**).

Table 3.12: DASS-21 anxiety subscale means and standard deviations across the trimesters of pregnancy

	1st Trimester (*N*=70)	2nd Trimester (*N*=99)	3rd Trimester (*N*=130)
DASS-21 ANXIETY			
Mean	5.4	4.1	5.9
SD	6.7	5.1	7.3

Levene's test of homogeneity of variance was significant ($F=4.78$, $p<.05$) which means that the variances are significantly different and an assumption of ANOVA has been violated. For this reason the Welch F test was used. This showed that there was **no significant effect** on anxiety symptoms (as measured by the DASS-21) across the trimesters of pregnancy, $F(2, 170.89)=2.60$, $p=.078$.

3.4.7.3 IS THERE A DIFFERENCE IN LEVELS OF STRESS SYMPTOMATOLOGY ACROSS THE STAGES OF PREGNANCY?

The mean DASS-21 stress subscale scores were 10.6 for women in the first trimester of pregnancy, 10.1 in the second trimester and 11.0 in the third trimester (see **Table 3.13**).

Table 3.13: DASS-21 stress subscale means and standard deviations across the trimesters of pregnancy

	1st Trimester (*N*=70)	2nd Trimester (*N*=99)	3rd Trimester (*N*=130)
DASS-21 STRESS			
Mean	10.6	10.1	11.0
SD	8.9	8.1	8.8

One-way independent ANOVA showed that there was **no significant effect** on stress symptoms (as measured by the DASS-21) across the trimesters of pregnancy, $F(2, 296)=0.276$, $p=.759$.

The difference in the *prevalence*[6] of depression, anxiety or stress symptoms across the stages of pregnancy was also examined. As above, no significant differences were found. This analysis is included in Appendix 12.

3.4.8 SUMMARY OF SYMPTOMATOLOGY OF TOTAL SAMPLE

Section 3.4 has presented the symptomatology of the total sample as measured by the EDS and DASS-21. The main findings were:

- 17.2% of the total antenatal sample were suffering from depression symptoms as measured by the EDS.
- 24.5% of the total antenatal sample were suffering from 'mild or above' anxiety symptoms as measured by the DASS-21.
- 24.5% of the total antenatal sample were suffering from 'mild or above' stress symptoms as measured by the DASS-21.

[6] The percentage of women falling above the recommended cut-offs

- 29.7% of 'anxious' women had 'pure' anxiety symptoms.
- 27.0% of 'stressed' women had 'pure' stress symptoms.
- There was no significant difference found in symptoms across the trimesters of pregnancy.

3.5 SOCIAL SUPPORT (AS MEASURED BY THE SOS) OF THE TOTAL SAMPLE

3.5.1 SUPPORT FROM HUSBAND (OR PARTNER)

Two hundred and eighty-seven respondents completed the 'Partner or Husband' section of the SOS. Fourteen respondents left the section blank, indicating that they did not have a partner or husband available for support. There were data missing for one respondent.

The mean actual emotional support, ideal emotional support and discrepancy in emotional support from husband (or partner) was 6.4, 6.9 and 0.5 respectively. The mean actual practical support, ideal practical support and discrepancy in practical support from husband (or partner) was 6.1, 6.7 and 0.6 respectively. These results are presented in **Table 3.14.**

Table 3.14: SOS scores - emotional and practical support from a husband (or partner)

HUSBAND (OR PARTNER)				
Social Support Score	**Mean**	**SD**	**Minimum**	**Maximum**
Actual Emotional	6.4	1.0	2.0	7.0
Ideal Emotional	6.9	0.3	5.0	7.0
Emotional Discrepancy	0.5	0.9	0.0	5.0
Actual Practical	6.1	1.1	1.0	7.0
Ideal Practical	6.7	0.5	4.5	7.0
Practical Discrepancy	0.6	0.8	0.0	4.0

3.5.2 SUPPORT FROM A MOTHER

Two hundred and five respondents completed the 'Mother' section of the SOS. Sixteen respondents left the section blank, indicating that their mother was not available for support.

The mean actual emotional support, ideal emotional support and discrepancy in emotional support from a mother was 5.8, 6.6 and 0.7 respectively. The mean

actual practical support, ideal practical support and discrepancy in practical support from a mother was 5.6, 6.3 and 0.7 respectively. These results are presented in **Table 3.15.**

Table 3.15: SOS scores - emotional and practical support from a mother

MOTHER				
Social Support Score	**Mean**	**SD**	**Minimum**	**Maximum**
Actual Emotional	5.8	1.5	1.0	7.0
Ideal Emotional	6.6	0.8	1.0	7.0
Emotional Discrepancy	0.7[7]	1.2	0.0	6.0
Actual Practical	5.6	1.6	1.0	7.0
Ideal Practical	6.3	1.0	1.0	7.0
Practical Discrepancy	0.7	1.2	0.0	6.0

3.5.3. SUPPORT FROM A FATHER

Two hundred and forty-one respondents completed the 'Father' section of the SOS. Fifty-eight respondents left the section blank indicating that their father was not available for support.

The mean actual emotional support, ideal emotional support and discrepancy in emotional support from a father was 5.2, 6.1 and 1.0 respectively. The mean actual practical support, ideal practical support and discrepancy in practical support from a father was 5.0, 5.9 and 0.9 respectively. These results are presented in **Table 3.16.**

[7] Apparent discrepancy in figures due to rounding

Table 3.16: SOS scores - emotional and practical support from a father

FATHER				
Social Support Score	**Mean**	**SD**	**Minimum**	**Maximum**
Actual Emotional	5.2	1.6	1.0	7.0
Ideal Emotional	6.1	1.1	1.0	7.0
Emotional Discrepancy	1.0	1.3	0.0	6.0
Actual Practical	5.0	1.8	1.0	7.0
Ideal Practical	5.9	1.2	1.0	7.0
Practical Discrepancy	0.9	1.2	0.0	6.0

3.5.4 SUPPORT FROM AN 'OTHER'

Two hundred and seventy-six respondents completed the 'Other' section of the SOS. Twenty-two respondents left the 'Other' section blank indicating that they did not have an 'other' person available for support.

The mean actual emotional support, ideal emotional support and discrepancy in emotional support from an 'other' was 6.2, 6.6 and 0.4 respectively. The mean actual practical support, ideal practical support and discrepancy in practical support from an 'other' was 5.8, 6.3 and 0.5 respectively. These results are presented in **Table 3.17.**

Table 3.17: SOS scores - emotional and practical support from an 'other'

'OTHER'				
Social Support Score	**Mean**	**SD**	**Minimum**	**Maximum**
Actual Emotional	6.2	1.0	1.5	7.0
Ideal Emotional	6.6	0.6	3.0	7.0
Emotional Discrepancy	0.4	0.8	0.0	5.5
Actual Practical	5.8	1.3	1.0	7.0
Ideal Practical	6.3	0.9	3.0	7.0
Practical Discrepancy	0.5	0.8	0.0	4.5

'OTHER' SOURCES OF SUPPORT

Respondents were asked to list one 'other' person who was important in their life. One hundred and twenty-four (41.1%) respondents stated their 'other' source of support to be a sibling. One hundred and seventeen (38.7%) stated their 'other' source of support as a friend. Thirty-two (10.6%) respondents named a variety of other sources of support, such as mother-in-law or cousin. These results are presented in **Table 3.18**:

Table 3.18: Sources of support listed under 'other' on the SOS

'OTHER' SOURCE OF SUPPORT		
	N	%
'Other' source of support not available	22	7.3
Sibling	124	41.1
Friend	117	38.7
Other	32	10.6
Missing Data	7	2.3

3.5.5 TOTAL SUPPORT SCORES

Total support scores are calculated as the mean support score from partner (or husband), mother, father and one 'other' source of support. These are included in Appendix 13.

3.5.6 SUMMARY OF SOCIAL SUPPORT OF THE TOTAL SAMPLE

Section 3.5 has presented the level of social support of the total sample as measured by the SOS. **Table 3.19** provides a summary of these results:

Table 3.19: Summary of (SOS) social support scores for the total sample

SUMMARY OF SOCIAL SUPPORT SCORES			
		Mean	**SD**
Actual Emotional	Husband (or Partner)	6.4	1.0
	Mother	5.8	1.5
	Father	5.2	1.6
	'Other'	6.2	1.0
Ideal Emotional	Husband (or Partner)	6.9	0.3
	Mother	6.6	0.8
	Father	6.1	1.1
	'Other'	6.6	0.6
Emotional Discrepancy	Husband (or Partner)	0.5	0.9
	Mother	0.7	1.2
	Father	1.0	1.3
	'Other'	0.4	0.8
Actual Practical	Husband (or Partner)	6.1	1.1
	Mother	5.6	1.6
	Father	5.0	1.8
	'Other'	5.8	1.3
Ideal Practical	Husband (or Partner)	6.7	0.5
	Mother	6.3	1.0
	Father	5.9	1.2
	'Other'	6.3	0.9
Practical Discrepancy	Husband (or Partner)	0.6	0.8
	Mother	0.7	1.2
	Father	0.9	1.2
	'Other'	0.5	0.8

3.6 LIFE EVENTS OF TOTAL SAMPLE

3.6.1 DISTRESS FROM LIFE EVENTS

Two hundred and ninety-nine respondents completed the Life Events measure. The scores which rated level of distress caused by the life events were summed to produce a total life events score for each respondent. The mean total life event score was 4.0 (SD 4.6; range 0 to 20; median 2.0). This is presented in **Table 3.20:**

Table 3.20: Descriptive statistics of the Life Events scores

DISTRESS FROM LIFE EVENTS	
Mean	4.0
Standard Deviation	4.6
Minimum	0
Maximum	20
Median	2.0
Skewness	1.4
Standard Error of Skewness	0.141
Kurtosis	1.841
Standard Error of Kurtosis	0.281

The distribution of the Life Event scores is presented in **Figure 3.13:**

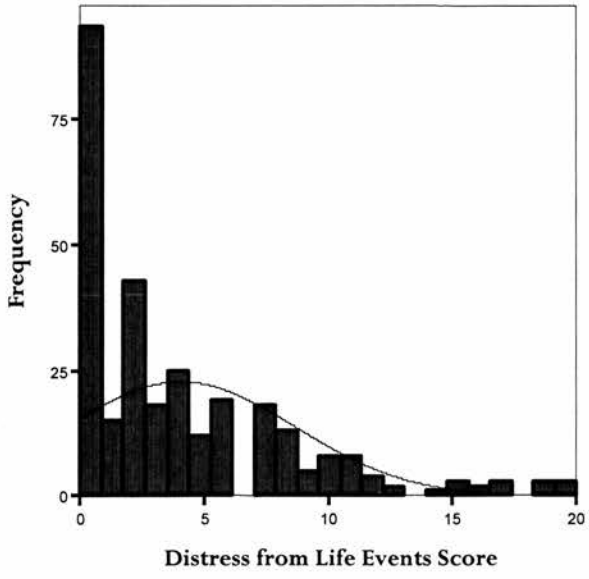

Figure 3.13: The distribution of the Life Events scores

3.6.2 NUMBER OF LIFE EVENTS

The number of life events that an individual experienced in the past six months was also calculated. The mean number of life events was 1.5 (SD 1.6; range 0 to 7; median 1.0). This is presented below in **Table 3.21:**

Table 3.21: Descriptive statistics of the Number of Life Events

NUMBER OF LIFE EVENTS	
Mean	1.5
Standard Deviation	1.6
Minimum	0
Maximum	7
Median	1.0
Skewness	1.2
Standard Error of Skewness	0.141
Kurtosis	1.0
Standard Error of Kurtosis	0.281

These results were similar to those reported by Ayers (2001) in a postnatal sample (mean 1.17; SD 1.3; range 0 to 6). The distribution of the Number of Life Events is presented in **Figure 3.14:**

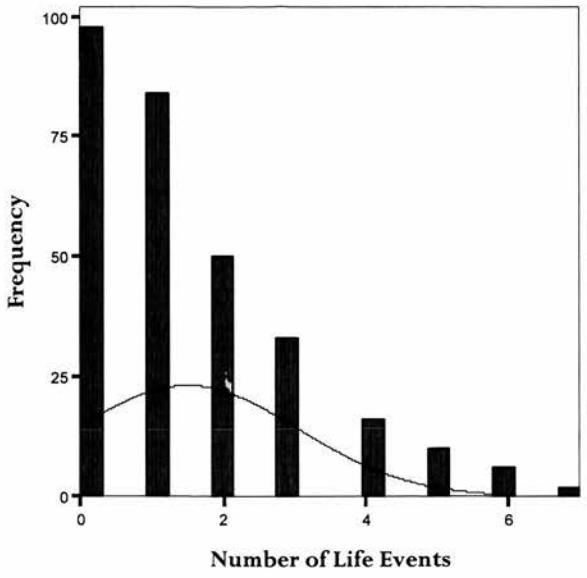

Figure 3.14: The distribution of the Number of Life Events scores

3.6.3 FREQUENCY OF LIFE EVENTS ITEMS

Appendix 14 includes a table presenting the frequencies of the responses to the Life Event items included in the measure.

3.6.4 SUMMARY OF LIFE EVENTS OF TOTAL SAMPLE

Section 3.6 has presented the life event scores of the total sample. **Table 3.22** provides a summary of these results:

Table 3.22: Summary of Life Event scores of the total sample

SUMMARY OF LIFE EVENT SCORES				
	Mean	**SD**	**Minimum**	**Maximum**
Distress from Life Events	4.0	2.0	0	20
Number of Life Events	1.5	1.0	0	7

3.7 DIFFERENCES BETWEEN GROUPS

The characteristics of the total sample have been presented in sections 3.2 to 3.6. Section 3.7 explores the differences in these characteristics between antenatal women with and without significant levels of symptoms.

3.7.1 DEFINITION OF GROUPS

Self-report measures cannot be used to confirm diagnoses of depression or anxiety. Scores above recommended cut-offs, however, have been widely used to indicate probable depression or anxiety (Evans et al., 2001). In order to compare the demographic characteristics, social support and life events of women suffering from differing levels of symptoms, the total sample will be split into groups according to these cut-offs. **Table 3.23** displays the group labels, the definition of these groups and the number of women in each group.

Table 3.23 Definition of groups

Group label	Definition	*N*	%
EDS Depressed	EDS ≥ 12	52	17.3
EDS Not Depressed	EDS < 12	249	82.7
DASS Depressed	DASS-21 depression ≥ 10 ('mild or above' classification)	61	20.2
DASS Not Depressed	DASS-21 depression < 10 ('normal' classification)	241	79.8
Anxious	DASS-21 anxiety ≥ 8 ('mild or above' classification)	74	24.5
Not Anxious	DASS-21 anxiety < 8 ('normal' classification)	228	75.5
Stressed	DASS-21 stress ≥ 15 ('mild or above' classification)	74	24.5
Not Stressed	DASS-21 stress < 15 ('normal' classification)	228	75.5

3.7.2 DIFFERENCE IN DEMOGRAPHIC CHARACTERISTICS BETWEEN *EDS DEPRESSED* VS *EDS NOT DEPRESSED* GROUPS

The mean score of the *EDS Depressed* group (*N*=52) was 15.5 (out of a possible 30). The mean score of the *EDS Not Depressed* group (*N*=249) was 4.3. The descriptive statistics are presented in **Table 3.24**.

Table 3.24: Descriptive statistics of the *EDS Depressed* and *EDS Not Depressed* group scores

	EDS Depressed (*N*=52)	*EDS Not Depressed* (*N*=249)
Mean	15.5	4.3
SD	3.2	3.0
Minimum	12	0
Maximum	25	11
Median	15	4

The following demographic characteristics of the *EDS Depressed* group and *EDS Not Depressed* group are presented in a summary table (**Table 3.25**) in section 3.7.2.9.

3.7.2.1 AGE

The mean age of women in the *EDS Depressed* group (26.1) was lower than the mean age of women in the *EDS Not Depressed* group (29.8).

This difference was **significant** $t(290)=4.48$, $p < .001$; which represents a small to medium effect size (Cohen, 1992) $r=.25$. (See Appendix 15 for formulas used to calculate effect size).

3.7.2.2 STAGE OF PREGNANCY (BY GESTATIONAL WEEKS)

The mean stage of pregnancy, measured by gestational weeks, of the *EDS Depressed* group (27.0) was greater than the mean stage of pregnancy of the *EDS Not Depressed* group (24.5).

This difference was **not significant** t(296)=1.57, p =.118.

3.7.2.3 STAGE OF PREGNANCY (BY TRIMESTER)

Of the women in the *EDS Depressed* group 21% were in the first trimester of pregnancy, 25% were in the second trimester and 54% were in the third trimester. Of the women in the *EDS Not Depressed* group 24% were in the first trimester, 35% were in the second trimester and 42% were in the third trimester.

A 2 x 3 χ^2 test was conducted to compare the proportions of women in the first, second or third trimesters of pregnancy among the depressed and not-depressed groups. There was **no significant difference** in the proportions of stage of pregnancy between the groups ($\chi^2_{(2)}=2.846$, $p=.248$, $N=298$).

3.7.2.4 MARITAL STATUS

Of the women in the *EDS Depressed* group 77% were married or co-habiting, 24% were single (this was collapsed to include the 2% who were separated and 2% who were divorced). Of the women in the *EDS Not Depressed* group, 91% were married or co-habiting, 9% were single (this was collapsed to include the 1% of women who were separated).

A 2 x 2 χ^2 test was conducted to compare the proportions of women who were married or single among the depressed and not-depressed groups. There was a **significant difference** in the proportions of marital status between the groups ($\chi^2_{(1)}=8.866$, $p=.003$, $N=297$).

3.7.2.5 ETHNIC ORIGIN

One hundred percent of the women in the *EDS Depressed* group were of a white ethnic origin. Of the women in the *EDS Not Depressed* group 99% were of a white ethnic origin and less than 1% were of an 'other' ethnic origin.

There were not sufficient numbers of women of a non-white ethnic origin to run any statistical analysis. It appears, however, that there was **no significant difference** in the proportions of ethnic origin between the depressed and not depressed groups.

3.7.2.6 EMPLOYMENT STATUS

Of the women in the *EDS Depressed* group 65% were working (either in full-time employment, part-time employment or as a student or in full time education), 35% were not working (including women looking after the home or family, permanently sick or disabled or unemployed). Of the women in the *EDS Not Depressed* group 83% were working and 17% were not working.

A 2 x 2 X^2 test was conducted to compare the proportions of women working and not working among the depressed and not-depressed groups. There was a **significant difference** in the proportions of employment status between the depressed and not depressed groups ($X^2_{(1)}=8.61$, $p=.003$, $N=296$).

3.7.2.7 EDUCATION LEVEL

Of the women in the *EDS Depressed* group 20% had a university degree, 48% had vocational qualifications or further education, 10% had Highers (or 'A' levels) and 22% had Standard Grades (or 'O' levels) or a lower level of education (including 'no qualifications'). Two percent ($N=4$) women specified that they had an 'other' level of education, but did not specify what this was. It was therefore not possible to combine this category with another in order to increase the expected

frequency. An assumption of chi-square analysis is that the expected frequency of a variable must be greater than five. For this reason the 'other' category was excluded from the analysis.

Of the women in the *EDS Not Depressed* group, 36% had a university degree, 36% had vocational qualifications or further education, 12% had Highers (or 'A' levels) and 16% had Standard Grades (or 'O' levels) or a lower level of education. 1% (N=1) specified that they had an 'other' level of education. As above, this was excluded from the analysis.

A 2 x 4 X^2 test was conducted to compare the proportions of women with a university degree, vocational or further education, Higher or Standard Grade (or less) level of education among the depressed and non-depressed groups. There was **no significant difference** in the proportions of education level between the depressed and not depressed groups ($X^2_{(3)}=5.734$, $p=.122$, $N=292$).

3.7.2.8 PARITY

Of the women in the *EDS Depressed* group, 50% had children and 50% did not have children. Of the women in the *EDS Not Depressed* group, 52% had children and 48% did not.

A 2 x 2 X^2 test was conducted to compare the proportions of women with or without children among the depressed and not-depressed groups. There was **no significant difference** in the proportions of women with or without children between the groups ($X^2_{(1)}=0.71$, $p=.879$, $N=298$).

3.7.2.9 SUMMARY OF DEMOGRAPHICS COMPARING THE *EDS DEPRESSED* AND *EDS NOT DEPRESSED* GROUPS:

Table 3.25: Summary table comparing the demographic characteristics of the *EDS Depressed* and *EDS Not Depressed* groups

	***EDS Depressed* (N=52)**		***EDS Not Depressed* (N=249)**	
	N	**Mean (SD) (SE)**	***N***	**Mean (SD) (SE)**
Age* **	51	26.1 (5.98) (0.84)	241	29.8 (5.30) (0.34)
Stage of Pregnancy (Gestational Weeks)	52	27.0 (10.57) (1.47)	246	24.5 (10.32) (0.66)
	N	**% (of group)**	***N***	**% (of group)**
Stage of Pregnancy (Trimester)				
1st Trimester	11	21	59	24
2nd Trimester	13	25	85	35
3rd Trimester	28	54	102	42
**Marital Status ** **				
Married or Cohabiting	39	77	224	91
Single (incl separated and divorced)	12	24	22	9
Ethnic Origin				
White	52	100	244	99
Other ethnic group	0	0	2	1
**Employment Status ** **				
Working (incl student)	33	65	203	83
Not Working	18	35	42	17
Education Level				
University degree	10	20	87	36
Vocational/ further education	24	48	87	36
Highers (or 'A' levels)	5	10	29	12
Standard grades (or 'O' levels) or less (incl 'no qualifications')	11	22	39	16
Children				
Yes	26	50	128	52
No	26	50	118	48
Unknown				

***Note* * p<.05, **p <.01, *** p <.001**

The full demographic characteristics of the *EDS Depressed* and *EDS Not Depressed* groups are provided in Appendix 16.

3.7.3 DIFFERENCE IN DEMOGRAPHIC CHARACTERISTICS BETWEEN *DASS DEPRESSED* VS *DASS NOT DEPRESSED* GROUPS

The mean DASS-21 depression subscale score of the *DASS Depressed* group (*N*=61) was 16.5 (out of a possible 42). The mean DASS depression subscale score of the *DASS Not Depressed* (*N*=241) group was 2.6. The descriptive statistics are presented in **Table 3.26:**

Table 3.26: Descriptive statistics of the *DASS Depressed* & *DASS Not Depressed* groups scores

	DASS Depressed **(*N*=61)**	***DASS Not Depressed*** **(*N*=241)**
Mean	16.5	2.6
SD	7.1	2.4
Minimum	10	0
Maximum	40	8
Median	14	2

The demographics of the *DASS Depressed* and *DASS Not Depressed* groups were compared as in section 3.7.2. A summary table comparing the group's demographics is provided in Appendix 17. As with the *EDS Depressed* and *EDS Not Depressed* groups, significant differences were found between age, marital status and employment status. In addition, a **significant difference** was found between the education level of the *DASS Depressed* and *DASS Not Depressed* groups ($X^2_{(3)} = 8.398$, $p = .038$, $N = 293$).

3.7.4 DIFFERENCE IN DEMOGRAPHIC CHARACTERISTICS BETWEEN *ANXIOUS* VS *NOT ANXIOUS* GROUPS

The mean DASS-21 anxiety subscale score of the *Anxious* group (N=74) was 14.4 (out of a possible 42). The mean DASS anxiety subscale score of the *Not Anxious* group (N=228) was 2.1. The descriptive statistics are presented in **Table 3.27:**

Table 3.27: Descriptive statistics of the *Anxious* and *Not Anxious* groups scores

	Anxious (N=74)	*Not Anxious* (N=228)
Mean DASS Anxiety score	14.4	2.1
SD	7.0	2.1
Minimum	8	0
Maximum	34	6
Median	12	2

The demographics of the *Anxious* and *Not Anxious* groups were compared as in section 3.7.2. A summary table comparing the group's demographics is provided in Appendix 18. As with the *EDS Depressed* and *EDS Not Depressed* groups, significant differences were found between age, marital status and employment status. A **significant difference** was also found between the proportions of education level between the *Anxious* and *Not Anxious* groups ($X^2_{(3)}=9.632$, $p=.022$, $N=293$). Of the women in the *Anxious* group, 40.5% had children and 59.5% did not have children. Of the women in the *Not Anxious* group, 55.1% had children and 44.9% did not. This was also found to be a **significant difference** ($X^2_{(1)}=4.733$, $p=.030$, $N=299$).

3.7.5 DIFFERENCE IN DEMOGRAPHIC CHARACTERISTICS BETWEEN *STRESSED* VS *NOT STRESSED* GROUPS

The mean DASS-21 stress subscale score of the *Stressed* group (*N*=74) was 23.0 (out of a possible 42). The mean DASS stress subscale score of the *Not Stressed* group was 6.5. The descriptive statistics are presented in **Table 3.28:**

Table 3.28: Descriptive statistics of the *Stressed* and *Not Stressed* groups scores

	Stressed (*N*=74)	*Not Stressed* (*N*=228)
Mean	23.0	6.5
SD	6.3	4.2
Minimum	16	0
Maximum	42	14
Median	22	6

The demographics of the *Stressed* and *Not Stressed* groups were compared as in section 3.7.2. A summary table comparing the group's demographics is provided in Appendix 19. As with the *EDS Depressed* and *EDS Not Depressed* groups, significant differences were found between the employment status of the two groups. The mean age of women in the *Stressed* group (mean 28.2; SD 6.2) was lower than the mean age of women in the *Not Stressed* group (mean 29.5, SD 5.4), but this difference was **not significant** t(291)=1.78, p =.076. In addition, although a higher percentage of women in the *Stressed* group were single (17.6% v 9.4%) this was also found to be **not significant** ($X^2_{(1)}=3.694$, $p=.06$, $N=298$).

3.7.6 SUMMARY OF DEMOGRAPHIC DIFFERENCES BETWEEN GROUPS

Table 3.29 presents a summary of sections 3.7.2 to 3.7.5, showing the significant differences in demographic characteristics between the groups.

Table 3.29: Significant differences in demographic variables between the groups

	EDS Depressed vs *EDS Not Depressed*	*DASS Depressed* vs *DASS Not Depressed*	*Anxious* vs *Not Anxious*	*Stressed* vs *Not Stressed*
Age	***	**		
Gestational Weeks				
Trimester				
Marital Status	**	***	**	
Ethnic Origin				
Employment	**	***	**	**
Education		*	*	
Children			*	

Note * p<.05, **p <.01, *** p <.001

3.7.7 DIFFERENCE IN LEVEL OF SOCIAL SUPPORT BETWEEN *EDS DEPRESSED* AND *EDS NOT DEPRESSED* GROUPS

3.7.7.1 SUPPORT FROM HUSBAND (OR PARTNER)

Table 3.30 presents the social support from a husband (or partner) (as measured by the SOS) for the *EDS Not Depressed* and *EDS Depressed* groups. Independent t-tests were used to calculate whether there were significant differences between the groups. Where the assumption of homogeneity of variance was violated, Welch's t-test was used. There was **no significant difference** in Ideal Emotional Support from a husband (or partner) between the groups. All other support scores were **significantly different** between the groups.

Table 3.30: Parametric analysis showing the difference between support from a husband (as measured by the SOS) for the *EDS Depressed* and *EDS Not Depressed* groups

SUPPORT FROM HUSBAND (OR PARTNER)

Social Support Score	Group	Mean	SD	SE	t-test	r
Actual Emotional ***	*EDS Not Depressed*	6.59	0.85	0.06	t(54.04)=4.50,	.5
	EDS Depressed	5.63	1.41	0.20	p<.001	
Ideal Emotional	*EDS Not Depressed*	6.88	0.31	0.02	t (59.77)=1.72,	
	EDS Depressed	6.78	0.38	0.06	p=.09	
Emotional Discrepancy***	*EDS Not Depressed*	0.33	0.73	0.05	t(53.64)=4.41,	.5
	EDS Depressed	1.15	1.25	0.18	p<.001	
Actual Practical***	*EDS Not Depressed*	6.21	0.92	0.06	t(54.46)=3.86,	.5
	EDS Depressed	5.35	1.49	0.21	p<.001	
Ideal Practical*	*EDS Not Depressed*	6.71	0.46	0.03	t(57.69)=2.06,	.3
	EDS Depressed	6.51	0.62	0.09	p=.044	
Practical Discrepancy***	*EDS Not Depressed*	0.52	0.72	0.05	t(54.75)=3.75,	.5
	EDS Depressed	1.16	1.14	0.16	p<.001	

Note *** p< .05, ** p < .01, *** p <.001; r= Effect Size**

As there were two assumptions of parametric tests broken in the above analysis (homogeneity of variance and equal group size), non-parametric tests were also run. The Mann-Whitney non-parametric test found that the *EDS Depressed* group's Ideal Emotional Scores (*Mdn* =7.0) became **significantly different** from the *EDS Not Depressed* group's scores (*Mdn*=7.0), U=4947.0 p<.05, r =-.13; which represents a small effect size. All other significant differences remained. The results of the non-parametric tests suggest that the significant results were not an artefact of heterogeneity of variance or unequal group sizes (*N*'s). **Table 3.31** presents further details of this analysis.

Table 3.31: Non-parametric analysis showing the difference between support from a husband (as measured by the SOS) for the *EDS Depressed* and *EDS Not Depressed* groups

SUPPORT FROM HUSBAND (OR PARTNER)				
Social Support Score	**Group**	**Median**	**Mann-Whitney**	**r**
Actual Emotional ***	*EDS Not Depressed*	7.0	U=3132.0, p<.001	-.33
	EDS Depressed	6.0		
Ideal Emotional*	*EDS Not Depressed*	7.0	U=4947.0 p<.05	.13
	EDS Depressed	7.0		
Emotional Discrepancy***	*EDS Not Depressed*	0.0	U=3255.5, p<.001	-.33
	EDS Depressed	0.8		
Actual Practical***	*EDS Not Depressed*	6.5	U=3611.5, p<.001	-.25
	EDS Depressed	5.8		
Ideal Practical*	*EDS Not Depressed*	7.0	U=4784.5 p<.05	-.12
	EDS Depressed	6.75		
Practical Discrepancy**	*EDS Not Depressed*	.05	U=3733.5, p<.001	-.24
	EDS Depressed	1.0		

***Note* * p< .05, ** p < .01, *** p <.001; r = Effect Size**

The parametric analyses were re-run to include age, marital status and employment as covariates because these variables were found to be significantly different between the groups (see section 3.7.6). The significance of the results from the parametric analysis did not change. **Table 3.32** presents further details of the analysis.

Table 3.32: ANCOVA parametric analysis showing the difference between support from a husband (as measured by the SOS) for the *EDS Depressed* and *EDS Not Depressed* groups

SUPPORT FROM HUSBAND (OR PARTNER)				
Social Support Score	**Group**	**Co***	**Change (Y/N)**	**ANCOVA**
Actual Emotional ***	*EDS Not Depressed* *EDS Depressed*	Marital	N	F(1,273)=24.99, p<.001
Ideal Emotional	*EDS Not Depressed* *EDS Depressed*	None	N	F(1,273)=0.291, p>.05
Emotional Discrepancy***	*EDS Not Depressed* *EDS Depressed*	Marital	N	F(1,273)=28.28, p<.001
Actual Practical***	*EDS Not Depressed* *EDS Depressed*	Marital, Age	N	F(1,273)=21.84, p<.001
Ideal Practical*	*EDS Not Depressed* *EDS Depressed*	None	N	F(1,273)=5.178, p<.05
Practical Discrepancy***	*EDS Not Depressed*	Marital, Age	N	F(1,273)=20.15, p<.001

***Note* * p< .05, ** p < .01, *** p <.001; Co* = Significant Covariates; Change (Y/N) = Change in significance from original parametric analysis in Table 3.30 (Yes/No)**

3.7.7.2 SUPPORT FROM MOTHER

Table 3.33 presents the social support from a mother (as measured by the SOS) for the *EDS Not Depressed* and *EDS Depressed* groups. There was **no significant difference** between the *EDS Depressed* and *EDS Not Depressed* groups maternal Ideal Emotional Support or Discrepancy in Practical Support. All other support scores were **significantly different** between the groups.

Table 3.33: Parametric analysis showing the difference between support from a mother (as measured by the SOS) for the *EDS Depressed* and *EDS Not Depressed* groups

SUPPORT FROM MOTHER

Social Support Score	Group	Mean	SD	SE	t-test	r
Actual Emotional**	*EDS Not Depressed*	6.01	1.31	0.09	t(61.47)=3.66,	.4
	EDS Depressed	5.02	1.84	0.26	p=.001	
Ideal Emotional	*EDS Not Depressed*	6.60	0.74	0.05	t(58.78)=1.73,	
	EDS Depressed	6.30	1.19	0.17	p=.09	
Emotional Discrepancy**	*EDS Not Depressed*	0.61	1.10	0.07	t(63.96)=3.22,	.4
	EDS Depressed	1.28	1.40	0.20	p=.002	
Actual Practical**	*EDS Not Depressed*	5.70	1.52	0.10	t(283)=2.90,	.2
	EDS Depressed	4.99	1.80	0.25	p=.004	
Ideal Practical**	*EDS Not Depressed*	6.34	0.92	0.01	t(283)=2.74,	.2
	EDS Depressed	5.92	1.30	0.18	p=.007	
Practical Discrepancy	*EDS Not Depressed*	0.67	1.18	0.08	t(283)=1.46,	
	EDS Depressed	0.94	1.22	0.17	p=.146	

Note * p< .05, ** p < .01, *** p <.001; r=Effect Size

Non-parametric tests were run (as in section 3.7.7.1) and the *EDS Depressed* group's Ideal Emotional Scores (*Mdn* =6.5) became **significantly different** from the *EDS Not Depressed* group's scores (*Mdn*=7.0), U=4994.5 $p<.05$, r = -.12; which represents a small effect size. There was no other change in significance.

The parametric analyses were re-run (as in section 3.7.7.1) to include age, marital status and employment as covariates. The significance of the covariates is presented in Appendix 20. There was no change in significance to the support scores presented above in **Table 3.33**.

3.7.7.3 SUPPORT FROM FATHER

Table 3.34 presents the social support from a father (as measured by the SOS) for the *EDS Not Depressed* and *EDS Depressed* groups. These results demonstrated **significant differences** between the *EDS Depressed* and *EDS Not Depressed* groups Actual Emotional, Actual Practical and Ideal Practical Support from a father. There were **no significant differences** between the *EDS Depressed* and *EDS Not Depressed* groups Ideal Emotional Support, Discrepancy in Emotional Support or Discrepancy in Practical Support from a father.

Table 3.34: Parametric analysis showing the difference between support from a father (as measured by the SOS) for the *EDS Depressed* and *EDS Not Depressed* groups

SUPPORT FROM FATHER

Social Support Score	Group	Mean	SD	SE	t-test	r
Actual Emotional**	*EDS Not Depressed*	5.30	1.51	0.11	t(238)=2.83,	.2
	EDS Depressed	4.54	1.91	0.30	p=.005	
Ideal Emotional	*EDS Not Depressed*	6.21	0.89	0.06	t(45.50)=1.94,	
	EDS Depressed	5.72	1.57	0.24	p=.06	
Emotional Discrepancy	*EDS Not Depressed*	0.93	1.21	0.09	t(238)=1.16,	
	EDS Depressed	1.18	1.58	0.25	p=.25	
Actual Practical *	*EDS Not Depressed*	5.07	1.72	0.12	t(238)=2.02,	.13
	EDS Depressed	4.46	1.93	0.30	p=.044	
Ideal Practical *	*EDS Not Depressed*	5.97	1.08	0.08	t(46.60)=2.35,	.33
	EDS Depressed	5.30	1.74	0.27	p=.023	
Practical Discrepancy	*EDS Not Depressed*	0.91	1.26	0.09	t(238)=0.21,	
	EDS Depressed	0.87	1.08	0.17	p=.84	

***Note* * p< .05, ** p < .01, *** p <.001; r=Effect Size**

As two assumptions of parametric tests were broken in the above Ideal Emotional and Ideal Practical Support analysis (homogeneity of variance and equal group size), non-parametric tests were also run. There was no change in significance.

The parametric analyses were re-run to include age, marital status and employment as covariates. Marital status was found to have a significant influence ($p<.05$) on the Ideal Emotional Support (from father) score. When this was adjusted for in the analysis, the difference between the Ideal Emotional Support (from father) between the *EDS Depressed* and *EDS Not Depressed* groups became **significant** $F(1,229) = 6.29$, $p=.013$. Although no covariates were found to have a significant influence on the Actual Practical Support (from father) scores ($p>.05$), the difference between the Actual Practical Support (from father) scores for the *EDS Depressed* and *EDS Not Depressed* groups was **no longer significant** once the adjustment for covariates was made $F(1,229)= 2.48$, $p=.117$.

3.7.7.4 SUPPORT FROM AN 'OTHER'

Table 3.35 presents the social support from an 'other' (as measured by the SOS) for the *EDS Not Depressed* and *EDS Depressed* groups. There was **no significant difference** between the *EDS Depressed* and *EDS Not Depressed* groups Ideal Emotional Support from an 'other.' All other support scores were significantly different between the groups.

Table 3.35: Parametric analysis showing the difference between support from an 'other' (as measured by the SOS) for the *EDS Depressed* and *EDS Not Depressed* groups

SUPPORT FROM 'OTHER'

Social Support Score	Group	Mean	SD	SE	t-test	r
Actual Emotional ***	*EDS Not Depressed*	6.34	0.97	0.06	t(60.80)=4.26,	.48
	EDS Depressed	5.59	1.13	0.16	p<.001	
Ideal Emotional ***	*EDS Not Depressed*	6.65	0.59	0.04	t(273)=3.33,	.20
	EDS Depressed	6.33	0.64	0.09	p<.001	
Emotional Discrepancy**	*EDS Not Depressed*	0.34	0.74	0.05	t(60.31)=2.95,	.36
	EDS Depressed	0.75	0.88	0.13	p=.005	
Actual Practical ***	*EDS Not Depressed*	5.93	1.25	0.08	t(273)=3.89,	.23
	EDS Depressed	5.14	1.33	0.19	p<.001	
Ideal Practical **	*EDS Not Depressed*	6.34	0.86	0.06	t(273)=2.91,	.17
	EDS Depressed	5.92	0.91	0.13	p=.004	
Practical Discrepancy*	*EDS Not Depressed*	0.43	0.81	0.05	t(61.15)=2.60,	.32
	EDS Depressed	0.81	0.93	0.14	p=.012	

***Note* * p< .05, ** p < .01, *** p <.001; r = Effect Size**

As there were two assumptions of parametric tests broken in the above Actual Emotional, Discrepancy in Emotional and Discrepancy in Practical Support

analysis (homogeneity of variance and equal group size), non-parametric tests were also run. The significant differences remained.

The parametric analyses were re-run to include age, marital status and employment as covariates. There was no change in significance to the support scores presented above in **Table 3.35**.

3.7.7.5 TOTAL SUPPORT SCORES

The analysis showing the difference between the *EDS Depressed* and *EDS Not Depressed* Total Emotional and Practical Support scores is included in Appendix 21.

3.7.8 DIFFERENCE IN LEVEL OF SOCIAL SUPPORT BETWEEN *DASS DEPRESSED* & *NOT DEPRESSED* GROUPS, *ANXIOUS* & *NOT ANXIOUS* AND *STRESSED* & *NOT STRESSED* GROUPS

The analyses run in section 3.7.7 were repeated to identify the difference in levels of social support between the *DASS Depressed* and *DASS Not Depressed* groups, the *Anxious* and *Not Anxious* groups and the *Stressed* and *Not Stressed* groups. As above, independent t-tests were used to calculate whether there were significant differences between the groups. Where the assumption of heterogeneity of variance was violated, Welch's t-test was used. Where two assumptions of parametric tests were broken (e.g. homogeneity of variance and equal group size) non-parametric tests were run. The parametric analyses were also re-run to include the covariates which were found to be significantly different between the groups (see section 3.7.6). **Table 3.36** presents a summary of the results. Where there was a change in the significance following Mann-Whitney non-parametric tests or after adjustment for covariates, the adjusted significance is presented. Appendix 22 presents a table showing the initial significance, the significance following Mann-Whitney non-parametric tests and after covariate adjustment. It also includes the covariates which were found to be significant.

Table 3.36: Summary table comparing the significant differences between social support scores for the groups

	EDS Depressed vs *EDS Not Depressed*	*DASS Depressed vs DASS Not Depressed*	*Anxious vs Not Anxious*	*Stressed vs Not Stressed*
PARTNER				
Actual Emotional	***	***	***	***
Ideal Emotional	*	*	*NS*	*
Discrepancy Emotional	***	***	***	***
Actual Practical	***	***	**	***
Ideal Practical	*	***	*NS*	**
Discrepancy Practical	***	***	**	***
MOTHER				
Actual Emotional	***	***	**	**
Ideal Emotional	*	*	*	*
Discrepancy Emotional	***	***	*	**NS**
Actual Practical	**	***	**	*
Ideal Practical	*	***	**	*
Discrepancy Practical	**NS**	***	*NS*	*NS*
FATHER				
Actual Emotional	*	*	*NS*	*NS*
Ideal Emotional	*	*	*NS*	**NS**
Discrepancy Emotional	**NS**	*NS*	*NS*	**NS**
Actual Practical	**NS**	**	*NS*	*NS*
Ideal Practical	**	*	*	*NS*
Discrepancy Practical	**NS**	*NS*	*NS*	*NS*
'OTHER'				
Actual Emotional	***	***	*	*NS*
Ideal Emotional	**	***	*NS*	*NS*
Discrepancy Emotional	***	***	**NS**	*NS*
Actual Practical	***	***	*NS*	*NS*
Ideal Practical	**	***	*NS*	*NS*
Discrepancy Practical	*	***	*NS*	*NS*

Note * p< .05, ** p < .01, *** p <.001

3.7.9 SUMMARY OF SOCIAL SUPPORT DIFFERENCES BETWEEN GROUPS

Sections 3.7.7 and 3.7.8 have explored the differences in levels of social support between women with and without significant levels of symptoms. These results are summarised in **Table 3.36**. The main findings were:

- There were similar results for the EDS and DASS depression groups. The only differences in results were the Discrepancy in Practical Support from a mother and Actual Practical Support from a father.

- Antenatal women with depression, anxiety and stress symptoms had significantly lower emotional and practical support from a partner and mother compared with antenatal women without symptoms.
- Antenatal women with depression symptoms had significantly lower emotional support from a father compared with women without symptoms, but there was no significant difference between women with and without anxiety or stress symptoms.
- Antenatal women with depression symptoms had significantly lower emotional and practical support from an 'other' compared with women without symptoms, but there was no significant difference between women with and without anxiety or stress symptoms.

3.7.10 DIFFERENCE IN LIFE EVENTS BETWEEN *DEPRESSED* AND *NOT DEPRESSED* GROUPS

On average, the *EDS Depressed* group had higher life event scores (M=7.3) than the *EDS Not Depressed* group (M=3.4) (see **Table 3.37**). As the assumption of homogeneity of variance was violated (Levene's test for equality of variances was significant F=26.421, p<.001), Welch's t-test was used. This showed that the difference was **significant** t(59.57)= 4.43, p<.001; which represents a large effect size r = .50 (Cohen, 1992).

Table 3.37: Comparison of mean Life Event scores between the *EDS Depressed* and *EDS Not Depressed* groups

	EDS Depressed (N=52)	*EDS Not Depressed (N=246)*
Mean	7.3	3.4
SD	6.2	3.8
SE	0.9	0.2

There were two assumptions of parametric tests broken in the above analysis (homogeneity of variance and equal group size). For this reason, Mann-Whitney non-parametric tests were also run. The *EDS Depressed* group's Life Event Scores (*Mdn* = 6.5) remained **significantly different** from the *EDS Not Depressed* group's scores (*Mdn*=2.0), U= 3930.50, p<.001, r = -.26.

The parametric analysis was re-run to include age, marital status and employment as covariates since these were the variables found to be significantly different between the groups (see section 3.7.6). Only marital status and employment were found to have a significant (p<.05) influence on the Life Event Scores. The difference between the *EDS Depressed* and *EDS Not Depressed* groups, however, remained **significant** F(1,284)=23.985, p<.001.

The above analysis (3.7.10) was re-run to compare the *DASS Depressed* and *DASS Not Depressed* groups (see Appendix 23). The results revealed the same significant differences between groups.

3.7.11 DIFFERENCE IN LIFE EVENTS BETWEEN *ANXIOUS* AND *NOT ANXIOUS* GROUPS

Similar to the results for the *Depressed/Not Depressed* groups, the *Anxious* group had significantly higher life event scores than the *Not Anxious* group (see **Table 3.38**): t (102.52) = 3.11, p = .002; which represents a small to medium effect size r = .29 (Cohen, 1992). As above, non parametric tests were run, but the significant differences remained.

Table 3.38: Comparison of mean Life Event scores between the *Anxious* and *Not Anxious* groups

	Anxious (N=74)	*Not Anxious (N=225)*
Mean	5.6	3.5
SD	5.4	4.1
SE	0.6	0.3

The parametric analysis was re-run to include marital status, employment, education and parity as covariates. Marital status, employment and parity were found to have a significant ($p<.05$) influence on the Life Event Scores. The difference between the *Anxious* and *Not Anxious* groups, again, remained **significant** $F(1,279)=6.005$, $p=.015$.

3.7.12 DIFFERENCE IN LIFE EVENTS BETWEEN *STRESSED* AND *NOT STRESSED* GROUPS

The *Stressed* group also had significantly higher life event scores than the *Not Stressed* group (see **Table 3.39**): t (101.83) = 4.64, p <.001; which represents a medium to large effect size r = .42 (Cohen, 1992). As above non parametric tests were run, but the significant differences remained.

Table 3.39: Comparison of mean Life Event scores between the *Stressed* and *Not Stressed* groups

	Stressed (N=74)	*Not Stressed (N=225)*
Mean	6.4	3.3
SD	5.3	4.0
SE	0.6	0.3

The parametric analysis was re-run to include employment as a covariate. This was found to have a significant ($p<.05$) influence on the Life Event Scores. The difference between the *Stressed* and *Not Stressed* groups remained, however, **significant** $F(1,292)=24.99$, $p<.001$.

The above analysis (in section 3.7.10 – 3.7.12) was repeated using the *number* of life events. There were no significant differences in the results. This analysis is included in Appendix 24.

3.7.13 SUMMARY OF DIFFERENCES IN LIFE EVENTS BETWEEN GROUPS

Sections 3.7.10 to 3.7.12 have explored the differences in life event scores between women with and without significant levels of symptoms. Women suffering from depression, anxiety and stress symptoms were consistently found to have experienced a significantly higher level of distress from life events *and* a higher number of life events in the past six months.

3.8 FACTORS INFLUENCING ANTENATAL DISTRESS

Section 3.7 presented the differences in demographics, social support and life events between antenatal women with and without significant levels of symptoms. Section 3.8 expands on the analysis to explore the multivariate factors influencing antenatal distress.

Exploration of the factors influencing antenatal distress was completed using the sequential enter method of multiple regression. This method allows the researcher to place the Independent Variables (IVs) into the model in a prearranged order. Typically, IVs which can not be manipulated (such as demographic variables) are entered first followed by known predictors from previous research (Field, 2006). This method allows an explicit model to be tested to see how much variance in the dependent variable (DV) is accounted for by certain independent variables (IVs) when other variables are already in the model (Clark-Carter, 2004). Pearson bivariate correlation was used to initially explore the variables (see Appendix 25). Multicollinearity was checked throughout the multiple regression analysis. Other assumptions were checked as part of the univariate analysis.

3.8.1 FACTORS INFLUENCING ANTENATAL DEPRESSION SYMPTOMS

The EDS measure of depression symptoms was set as the DV. All potential IVs were initially explored using correlation analysis (see Appendix 25). It was clear that certain potential IVs (such as Actual Emotional Support and Discrepancy Emotional Support) were inter-correlated ($r > .8$), which would result in an unstable model due to multicollinearity. The correlation matrix of the initial IVs chosen is presented in **Table 3.40**:

Table 3.40: The Pearson bivariate correlations between the variables

	EDS	Age	Marital	Work	Qftn	P-DES	P-DPS	LE
EDS	1.000							
Age	-.280**	1.000						
Marital	-.273**	.352**	1.000					
Work	.235**	-.195**	-.240**	1.000				
Qftn	-.146*	.295**	.249**	-.208**	1.000			
P- DES	.437**	-.065	-.304**	.148*	-.126*	1.000		
P- DPS	.352**	-.009	-.282**	.095	.005	.656**	1.000	
LE	.448**	-.219**	-.300**	.230**	-.083	.383**	.347**	1.000

Note ***p<.05, ** p<.01; 'Qftn'=Qualifications; 'P- DES'=Partner Discrepancy Emotional Support; 'P-DPS'=Partner Discrepancy Practical Support; 'LE'=Life Events**

The initial multiple regression analysis revealed that with age, partner discrepancy in emotional support and (distress from) life events in the model, a significant proportion of variance in depression scores was accounted for, $R^2 = .284$, $F_{(1, 271)} = 35.865$, $p < .001$. In order to explore the influence of other support figures on the DV, the support scores for mother, father and 'other' were sequentially entered into the model. Non significant variables were removed from the model. With age, partner discrepancy in emotional support, life events, actual emotional support from mother and actual practical support from 'other' in the model a larger proportion of variance in depression scores was accounted for, $R^2 = .392$, $F_{(1, 234)} = 30.112$, $p < .001$. Further details of the regression analysis are presented in **Table 3.41.**

Table 3.41: Multiple regression of depression symptoms (as measured by the EDS)

	Multiple R	Multiple R^2	B	Final Standardised ß	t	p
Variable						
Age	.278	.077	-0.198	-.210	4.021	p<.001
Partner Dis Em	.512	.263	1.551	.260	4.542	p<.001
Life Events	.580	.337	0.273	.249	4.327	p<.001
Mother Act Em	.605	.366	-0.478	-.134	2.368	.019
Other Act Prac	.626	.392	-0.675	-.173	3.143	.002

Note **'Partner Dis Em' = Discrepancy in Emotional Support from a Partner; 'Mother Act Em' = Actual Emotional Support from a Mother, 'Other Act Prac' = Actual Practical Support from an 'Other'**

In order to test the validity of this regression model, it was re-run using the DASS-21 depression scores as the DV. This analysis found that the IV, actual emotional support from mother, was not significant (p=.064). With age, partner discrepancy in emotional support, life events and actual practical support from 'other' in the model, a significant proportion of variance in depression scores (as measured by the DASS-21) was accounted for, $R^2 = .401$, $F_{(1, 250)} = 41.877$, $p < .001$. In order to explore whether there were other significant predictors of depression symptoms (as measured by the DASS-21), the other IVs were also sequentially added to the model. As above, non significant variables were removed from the model. With age, discrepancy in emotional support from partner, discrepancy in practical support from partner, discrepancy in emotional support from mother, actual practical support from 'other' and distress from life events, a larger significant proportion of variance in depression scores (as measured by the DASS-21) was accounted for, $R^2 = .447$, $F_{(1, 233)} = 31.362$, $p < .001$. Further details of the regression analysis are presented in **Table 3.42**:

Table 3.42 Multiple regression of depression symptoms (as measured by the DASS-21)

	Multiple R	Multiple R^2	B	Final Standardised ß	t	p
Variable						
Age	.235	.055	-0.210	-.174	3.468	.001
Partner Dis Em	.554	.307	1.949	.254	3.849	p<.001
Partner Dis Prac	.586	.344	1.190	.148	2.268	.024
Life Events	.627	.393	0.283	.200	3.623	p<.001
Mother Dis Em	.640	.409	0.611	.107	2.035	.043
Other Act Prac	.668	.447	-1.037	-.207	3.973	p<.001

Note **'Partner Dis Em' = Discrepancy in Emotional Support from a Partner; 'Partner Dis Prac' = Discrepancy in Practical Support from a Partner; 'Mother Dis Em' = Discrepancy in Emotional Support from a Mother; 'Other Act Prac' = Actual Practical Support from an 'Other'**

3.8.1.1 FACTORS INFLUENCING ANTENATAL DEPRESSION SYMPTOMS OF WOMEN WITH CHILDREN & PRIMIPAROUS WOMEN

In order to explore whether there were different predictors of antenatal depression symptoms for women with children or primiparous women, the sample was split into two groups: *Women with Children* (N=154) and *Primiparous Women* (N=145). The multiple regression analysis was then repeated using the EDS scores as the DV.

For the *Women with Children*, when age, partner discrepancy in practical support, life events and actual emotional support from mother was entered in the model a significant proportion of variance in depression scores (as measured by the EDS) was accounted for, $R^2 = .416$, $F_{(1, 129)} = 22.971$, $p < .001$. Further details of the regression analysis are presented in **Table 3.43** below:

Table 3.43 Multiple regression for depression symptoms (as measured by the EDS) in a sample of antenatal women with children

	Multiple R	Multiple R^2	B	Final Standardised ß	t	p
Variable						
Age	.249	.062	-0.210	-.207	3.051	.003
Partner Dis Prac	.462	.214	1.175	.201	2.727	.007
Life Events	.607	.368	0.385	.368	4.891	p<.001
Mother Act Em	.645	.416	-0.752	-.231	3.257	.001

Note **'Partner Dis Prac' = Discrepancy in Practical Support from a Partner; 'Mother Act Em' = Actual Emotional Support from a Mother**

To test the validity of this regression model, it was re-run using the DASS-21 scores as the DV. With age, discrepancy practical support from partner, life events and actual emotional support from mother in the model a significant proportion of variance in the depressions scores (as measured by the DASS-21) was accounted for, $R^2 = .393$, $F_{(1, 129)} = 20.912$, $p < .001$. Further details of the regression analysis are presented in **Table 3.44**:

Table 3.44 Multiple regression for depression symptoms (as measured by the DASS-21) in a sample of antenatal women with children

	Multiple R	Multiple R^2	B	Final Standardised ß	t	p
Variable						
Age	.213	.046	-.232	-.170	2.460	.015
Partner Dis Prac	.484	.234	2.097	.267	3.557	.001
Life Events	.594	.353	.451	.322	4.195	p<.001
Mother Act Em	.627	.393	-.925	-.212	2.927	.004

Note **'Partner Dis Prac' = Discrepancy in Practical Support from a Partner; 'Mother Act Em' = Actual Emotional Support from a Mother**

This showed that using the DASS-21 scores, the same model was found to be significant but accounted for a slightly lower amount of the variance (39% vs 42% respectively).

For the *Primiparous Women*, when age, partner discrepancy emotional support, discrepancy practical support from mother and actual emotional support from 'other' were entered in the model, a significant proportion of variance in depression scores (as measured by the EDS) was accounted for, $R^2 = .381$, $F_{(1,109)} = 16.806$, $p < .001$. Further details of the regression analysis are presented in **Table 3.45** :

Table 3.45 Multiple regression for depression symptoms (as measured by the EDS) in a sample of antenatal primiparous women

	Multiple R	Multiple R^2	B	Final Standardised ß	t	p
Variable						
Age	.360	.130	-0.253	-.277	3.558	.001
Partner Dis Em	.552	.305	1.971	.301	3.622	p<.001
Mother Dis Prac	.598	.357	1.070	.202	2.500	.014
Other Act Em	.618	.381	-0.927	-.177	2.071	.041

Note **'Partner Dis Em' = Discrepancy in Emotional Support from a Partner; 'Mother Dis Prac' = Discrepancy in Practical Support from a Mother; 'Other Act Em' = Actual Emotional Support from an 'Other'**

To test the validity of this regression model, it was re-run using the DASS-21 scores as the DV. With age, discrepancy in emotional support from partner and actual emotional support from 'other' entered in the model, a significant proportion of variance in the depressions scores (as measured by the DASS-21) was accounted for, $R^2 = .344$, $F_{(1, 251)} = 43.838$, $p < .001$. Further details of the regression analysis are presented in **Table 3.46**:

Table 3.46 Multiple regression for depression symptoms (as measured by the DASS-21) in a sample of antenatal primiparous women

	Multiple R	Multiple R^2	B	Final Standardised ß	t	p
Variable						
Age	.209	.044	-0.181	-.153	2.974	.003
Partner Dis Em	.534	.286	3.252	.423	7.886	p<.001
Other Act Em	.586	.344	-1.571	-.252	4.716	p<.001

Note **'Partner Dis Em' = Discrepancy in Emotional Support from a Partner; 'Other Act Em' = Actual Emotional Support from an 'Other'**

This showed that using the DASS-21 scores, the independent variable, discrepancy in practical support from mother, was not a significant predictor of depression (p=.087). With the other same variables in the model (e.g. age, discrepancy emotional support from a partner and actual emotional support from an 'other') the model was found to be significant but it accounted for a slightly lower amount of the variance (34% vs 38% respectively).

3.8.2 SUMMARY OF FACTORS INFLUENCING ANTENATAL DEPRESSION SYMPTOMS

Section 3.8.1 explored the factors influencing antenatal depression symptoms. The main findings were:

- Young age, dissatisfaction with support from a partner, distress from life events, emotional support from a mother *and* practical support from an 'other' were significant factors influencing antenatal depression symptoms.
- For women with children, practical support from a partner appeared to be more important than emotional support. Emotional support from a mother, however, remained a significant factor influencing antenatal depression symptoms.
- For primiparous women, emotional support from an 'other' was a significant factor influencing antenatal depression symptoms.

3.8.3 FACTORS INFLUENCING ANTENATAL ANXIETY SYMPTOMATOLOGY

In order to explore whether there were different predictors of antenatal anxiety symptoms, the multiple regression analysis was re-run using the DASS-21 anxiety measure as the DV. The same initial IVs were entered into the model; age, marital status, employment status, qualifications, partner discrepancy in emotional support, partner discrepancy in practical support and (distress from) life events. Following the removal of the non-significant IVs, the other support scores for mother, father and 'other' were sequentially entered into the model. The analysis revealed that with discrepancy in emotional support from partner, life events, discrepancy in practical support from 'other' and ideal emotional support from mother entered in the model, a significant proportion of variance in anxiety scores was accounted for, $R^2 = .275$, $F_{(1, 243)} = 23.100$, $p < .001$. Further details of the regression analysis are presented in **Table 3.47**:

Table 3.47 Multiple regression of anxiety symptoms (as measured by the DASS-21)

	Multiple R	Multiple R^2	B	Final Standardised ß	t	p
Variable						
Partner Dis Em	.448	.201	2.412	.318	5.230	p<.001
Life Events	.493	.243	0.296	.209	3.494	.001
Other Dis Prac	.512	.262	1.020	.132	2.336	.020
Mother Ideal Em	.525	.275	-0.881	-.119	2.143	.033

Note **'Partner Dis Em' = Discrepancy in Emotional Support from a Partner; 'Other Dis Prac' = Discrepancy in Practical Support from an 'Other'; 'Mother Ideal Em' = Ideal Emotional Support from a Mother**

3.8.3.1 FACTORS INFLUENCING ANTENATAL ANXIETY SYMPTOMATOLOGY OF WOMEN WITH CHILDREN & PRIMIPAROUS WOMEN

In order to explore whether there were different predictors of antenatal anxiety symptoms for women with children and primiparous women, the multiple regression analysis was repeated on the two samples: *Women with Children* (N=154) and *Primiparous Women* (N=145).

For the *Women with Children*, when partner discrepancy in emotional support, life events and ideal emotional support from mother were entered in the model, a significant proportion of variance in anxiety scores was accounted for, $R^2 = .299$, $F_{(1, 134)} = 19.072$, $p < .001$. Further details of the regression analysis are presented in **Table 3.48** :

Table 3.48 Multiple regression for anxiety symptoms (as measured by the DASS-21) in a sample of antenatal women with children

	Multiple R	Multiple R^2	B	Final Standardised ß	t	p
Variable						
Partner Dis Em	.452	.204	2.266	.311	3.848	p<.001
Life Events	.511	.262	0.376	.262	3.258	.001
Mother Ideal Em	.547	.299	-1.426	-.196	2.682	.008

Note **'Partner Dis Em' = Discrepancy in Emotional Support from a Partner; 'Mother Ideal Em' = Ideal Emotional Support from a Mother**

For the *Primiparous Women*, when age and partner discrepancy in emotional support were entered in the model, a significant proportion of variance in anxiety scores was accounted for, $R^2 = .262$, $F_{(1,130)} = 23.078$, $p < .001$. Further details of the regression analysis are presented in **Table 3.49:**

Table 3.49 Multiple regression for anxiety symptoms (as measured by the DASS-21) in a sample of antenatal primiparous women

	Multiple R	Multiple R^2	B	Final Standardised ß	t	p
Variable						
Age	.241	.058	-.187	-.176	2.308	.023
Partner Dis Em	.512	.262	3.716	.456	5.991	p<.001

Note **'Partner Dis Em' = Discrepancy in Emotional Support from a Partner**

3.8.4 SUMMARY OF FACTORS INFLUENCING ANTENATAL ANXIETY SYMPTOMS

Section 3.8.3 explored the factors influencing antenatal anxiety symptoms. The main findings were:

- Dissatisfaction with emotional support from a partner was a significant factor influencing antenatal anxiety symptoms.
- For women with children, having a lower ideal level of emotional support from a mother was a significant factor influencing anxiety symptoms.
- Distress from life events was a significant factor influencing anxiety symptoms for antenatal women with children, but not for primiparous women.
- Young age was a significant factor influencing anxiety symptoms for primiparous antenatal women.

3.8.5 FACTORS INFLUENCING ANTENATAL STRESS SYMPTOMATOLOGY

In order to explore whether there were different predictors of antenatal stress symptoms, the multiple regression analysis was re-run using the DASS-21 stress measure as the DV. The same procedure was used as described in section 3.8.3.

The analysis revealed that with discrepancy in emotional support from partner, actual practical support from partner, life events and ideal emotional support from mother entered in the model, a significant proportion of variance in stress scores was accounted for, $R^2 = .254$, $F_{(1, 263)} = 22.397$, $p < .001$. Further details of the regression analysis are presented in **Table 3.50**:

Table 3.50 Multiple regression of stress symptoms (as measured by the DASS-21)

	Multiple R	Multiple R^2	B	Final Standardised ß	t	p
Variable						
Partner Dis Em	.386	.149	1.720	.170	2.453	.015
Partner Act Prac	.433	.187	-1.353	-.164	2.336	.020
Life Events	.484	.235	.469	.244	4.175	p<.001
Mother Ideal Em	.504	.254	-1.446	-.143	2.616	.009

Note **'Partner Dis Em' = Discrepancy in Emotional Support from a Partner; 'Partner Act Prac' = Actual Practical Support from a Partner; 'Mother Ideal Em' = Ideal Emotional Support from a Mother**

3.8.5.1 FACTORS INFLUENCING ANTENATAL STRESS SYMPTOMS OF WOMEN WITH CHILDREN & PRIMIPAROUS WOMEN

In order to explore whether there were different predictors of antenatal stress symptoms for women with children and primiparous women, the multiple regression analysis was repeated on the two samples: *Women with Children* (N=154) and *Primiparous Women* (N=145).

For the *Women with Children*, when partner discrepancy in emotional support, life events and ideal emotional support from mother were entered in the model a significant proportion of variance in stress scores was accounted for, $R^2 = .347$, F

$(_{1, 134}) = 23.770$, $p < .001$. Further details of the regression analysis are presented in **Table 3.51**:

Table 3.51 Multiple regression for stress symptoms (as measured by the DASS-21) in a sample of antenatal women with children

	Multiple R	Multiple R^2	B	Final Standardised ß	t	p
Variable						
Partner Dis Em	.410	.168	2.059	.214	2.736	.007
Life Events	.532	.283	.704	.371	4.777	p<.001
Mother Ideal Em	.589	.347	-2.477	-.257	3.644	p<.001

Note **'Partner Dis Em' = Discrepancy in Emotional Support from a Partner; 'Mother Ideal Em' = Ideal Emotional Support from a Mother**

For the *Primiparous Women*, when employment status and partner discrepancy in emotional support were entered in the model a significant proportion of variance in stress scores was accounted for, $R^2 = .178$, $F_{(1,130)} = 14.090$, $p < .001$. Further details of the regression analysis are presented in **Table 3.52**:

Table 3.52 Multiple regression for stress symptoms (as measured by the DASS-21) in a sample of antenatal primiparous women

	Multiple R	Multiple R^2	B	Final Standardised ß	t	p
Variable						
Employment Status	.340	.116	6.255	.259	3.092	.002
Partner Dis Em	.422	.178	2.822	.263	3.142	.002

Note **'Partner Dis Em' = Discrepancy in Emotional Support from a Partner**

3.8.6 SUMMARY OF FACTORS INFLUENCING ANTENATAL STRESS SYMPTOMS

Section 3.8.5 explored the factors influencing antenatal stress symptoms. The main findings were:

- Emotional and practical support from a partner were significant factors influencing antenatal stress symptoms.

- Similar to the multivariate analysis of anxiety symptoms, having a lower ideal level of emotional support from a mother was a significant factor influencing stress symptoms among antenatal women with children.
- Not working was a significant factor influencing stress symptoms among primiparous women.

3.9 RELIABILITY ANALYSIS OF THE MEASURES

Reliability analysis aims to ensure that the measures used in the questionnaire produce a stable, consistent measurement (Clark-Carter, 2004). A reliability coefficient called Cronbach's alpha is used to conduct a split-half reliability analysis (using all possible split halves). This was used to estimate the reliabilities (internal consistencies) of the EDS and DASS-21. It is widely accepted that alpha should ideally be around .9 and not be below .7 (Clark-Carter, 2004).

3.9.1 EDINBURGH DEPRESSION SCALE (EDS)

The reliability of the Edinburgh Depression Scale (EDS) was good within this sample (Cronbach's alpha = .90). A reliable scale will also show good correlation (greater than .3) between individual items and the total score (Field, 2006). **Table 3.53** presents the correlations between the ten individual EDS items and the total scores from the questionnaire.

Table 3.53: The EDS corrected item-total score correlations

EDS Item	Corrected Item-Total Correlation
1. I have been able to laugh and see the funny side of things	.62
2. I have looked forward with enjoyment to things	.56
3. I have blamed myself unnecessarily when things went wrong	.54
4. I have been anxious or worried for no good reason	.68
5. I have felt scared or panicky for no very good reason	.70
6. Things have been getting on top of me	.67
7. I have been so unhappy that I have had difficulty sleeping	.75
8. I have felt sad or miserable	.77
9. I have been so unhappy that I have been crying	.76
10. The thought of harming myself has occurred to me	.42

The correlations presented in **Table 3.17** demonstrate that all items have good reliability within the scale.

3.9.2 DEPRESSION ANXIETY STRESS SCALES (DASS-21)

The reliability of the DASS-21 depression, anxiety and stress subscales were good within this sample (Cronbach's alpha = .86, .79 and .88 respectively).

Table 3.54 presents the correlations between the individual DASS-21 items and the total scores from the questionnaire. These show that all items have good reliability within the scale.

Table 3.54: The DASS-21 corrected item-total score correlations

Subscale		DASS-21 Item	Corrected Item-Total Correlation
Depression	3	I couldn't seem to experience any positive feeling at all	.70
	5	I found it difficult to work up the initiative to do things	.48
	10	I felt that I had nothing to look forward to	.69
	13	I felt down-hearted and blue	.71
	16	I was unable to become enthusiastic about anything	.74
	17	I felt I wasn't worth much as a person	.70
	21	I felt that life was meaningless	.51
Anxiety	2	I was aware of dryness of my mouth	.42
	4	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	.49
	7	I experienced trembling (e.g. in the hands)	.44
	9	I was worried about situations in which I might panic and make a fool of myself	.65
	15	I felt I was close to panic	.61
	19	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	.61
	20	I felt scared without any good reason	.53
Stress	1	I found it hard to wind down	.66
	6	I tended to over-react to situations	.67
	8	I felt that I was using a lot of nervous energy	.58
	11	I found myself getting agitated	.76
	12	I found it difficult to relax	.79
	14	I was intolerant of anything that kept me from getting on with what I was doing	.56
	18	I felt that I was rather touchy	.69

3.10 VALIDITY OF THE MEASURES

The relationships between the EDS and the DASS-21 subscales (depression, anxiety and stress) were initially explored using scatterplots. These are illustrated below in **Figure 3.15:**

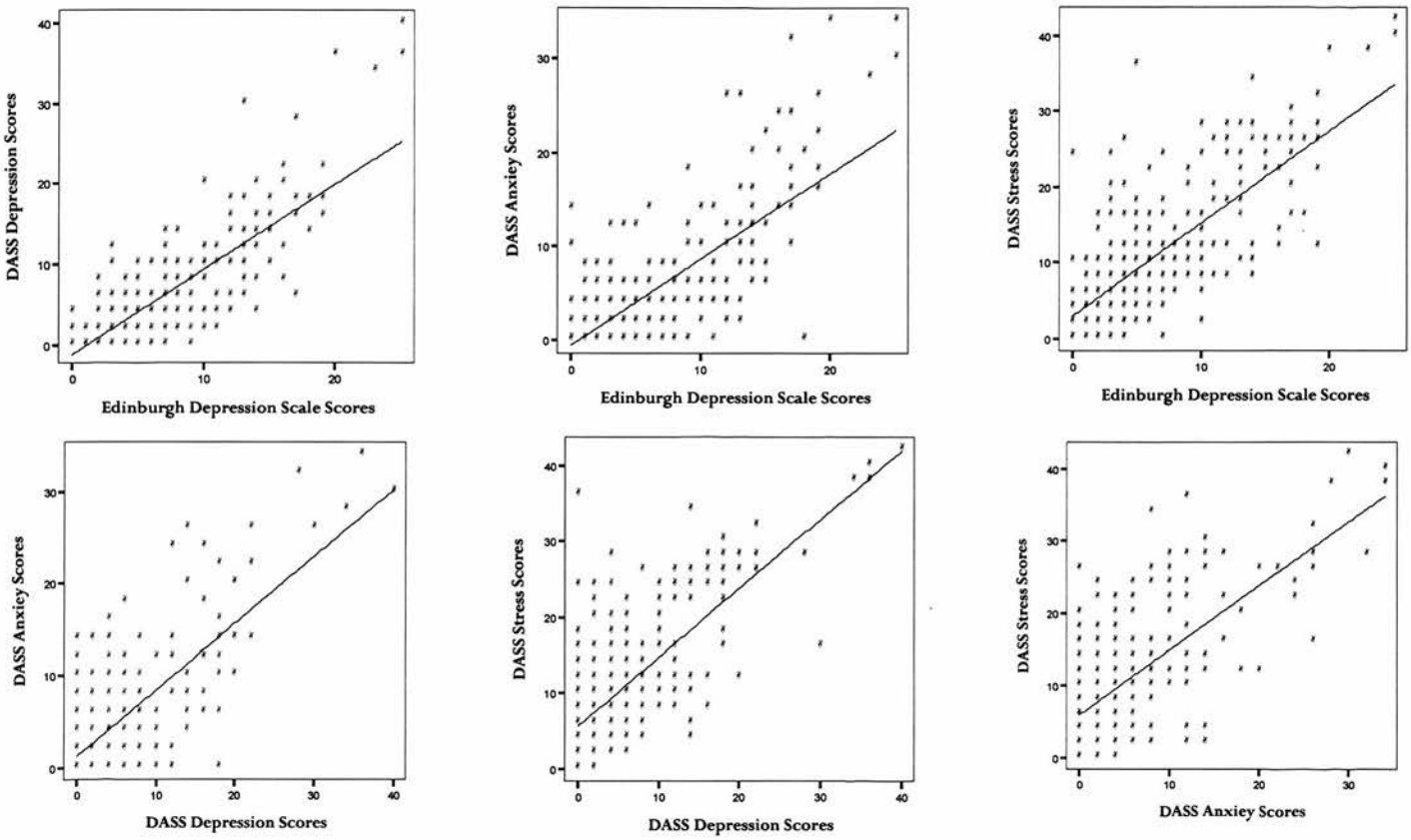

Figure 3.15: Scatterplots showing the relationship between the EDS and DASS-21 subscales

All of the above figures suggest that there is a positive correlation between the EDS and the DASS-21 subscales and between the subscales themselves. Pearson product-moment correlations were used to further examine these relationships. These correlations are presented in **Table 3.55:**

Table 3.55: Correlations between the EDS & DASS-21 subscale scores

r (*N*)	EDS	DASS Depression	DASS Anxiety	DASS Stress
EDS	-	-	-	-
DASS Depression	.82** (301)	-	-	-
DASS Anxiety	.73** (301)	.75** (302)	-	-
DASS Stress	.75** (301)	.71** (302)	.68** (302)	-

Note ** p < .01 level

As described in section 3.4.5 the data were not normally distributed. The correlations were re-run on the transformed data but the significance remained (see Appendix 26). As a consequence, the results presented here show the correlations of the untransformed data.

The EDS correlated highly with the DASS-21 depression scores (r =.82). There was also a high correlation between the DASS-21 subscales: depression and anxiety (r=.75), anxiety and stress (r=.68), depression and stress (r=.71).

The validity of the DASS-21 depression subscale as a measure of antenatal depression can be further explored by examining the classifications of women identified by the DASS-21 with the classifications of the EDS (see **Figure 3.16**). The EDS cut-off of 10 or above (Murray & Carothers, 1990) was used to compare against the five severity (*normal, mild, moderate, severe* and *extremely severe)* classifications of the DASS-21.

Sixty-one women scored in the 'mild or above' classification on the DASS-21 for depression symptoms. Ten of these women were below the EDS cut-off. The DASS-21 classified 241 women as being in the 'normal' range for depression

symptoms. Twenty of these women scored above the EDS cut-off. Within this group of 20 women, however, seven were identified by the DASS-21 as having a 'mild or above' level of anxiety symptoms and nine as having a 'mild or above' level of stress symptoms. Eight women out of the 20 were in the 'normal' range for depression, anxiety and stress symptoms according to the DASS-21. Five of these women, however, scored below the recommended antenatal cut-off of 12 (Murray & Cox, 1990). This information is illustrated in **Figure 3.16**.

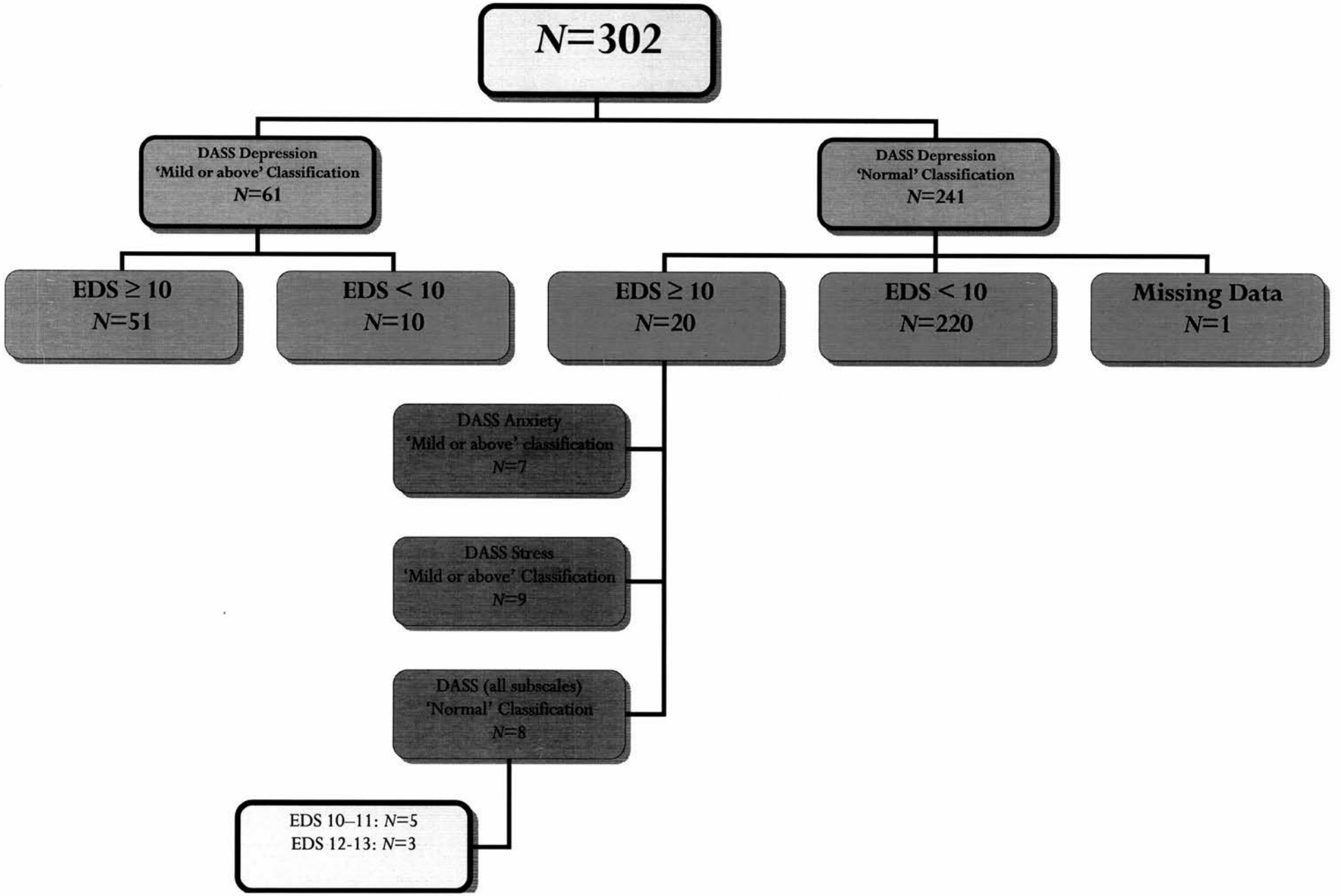

Figure 3.16: Comparison of DASS-21 classifications with the EDS

The validity of the EDS as a measure of perinatal distress, as opposed to a pure depression measure, can also be explored further by examining the classifications of women identified by the EDS, with the classifications of the DASS-21 (see **Figure 3.17**).

Seventy-one women scored 10 or above on the EDS. Twenty of these women were identified as having 'normal' levels of depression symptoms according to the DASS-21. Seven of these women, however, were identified as having a 'mild or above' level of anxiety symptoms and five were identified as having 'mild or above' levels of stress symptoms. According to the DASS-21 classification, eight of the 71 women identified above the EDS cut-off, were in the normal range for symptoms associated with depression, anxiety and stress.

Two hundred and thirty women scored below the EDS cut-off. The DASS-21 classified 10 of these women as having symptoms associated with a 'mild or above' level of depression. The DASS-21 also classified 27 of these women as having symptoms associated with a 'mild or above' level of anxiety. In addition, the DASS-21 classified 15 of the 230 women as having symptoms associated with a 'mild or above' level of stress. This information is illustrated in **Figure 3.17**.

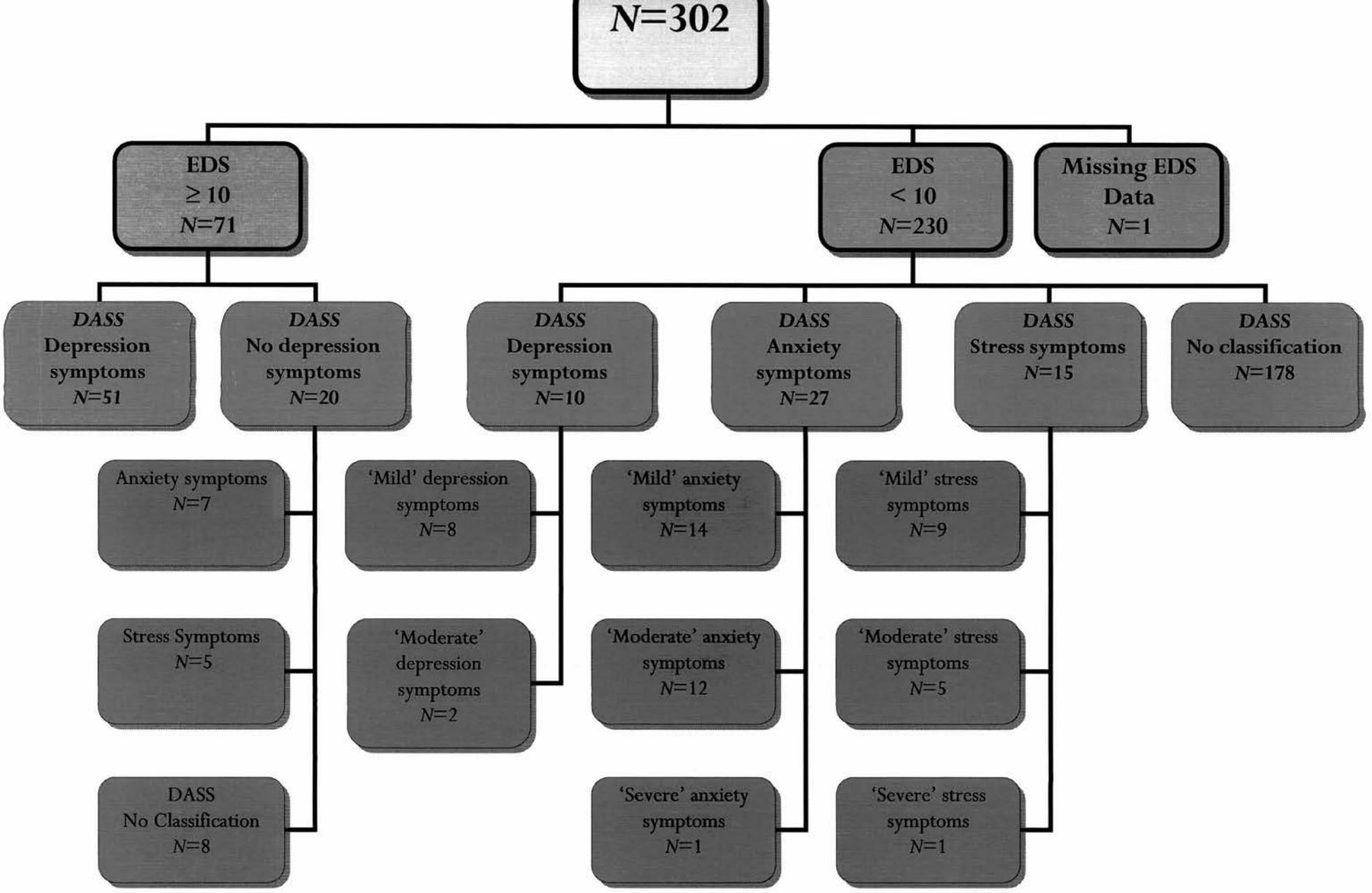

Figure 3.17: DASS-21 classifications of antenatal women identified above the EDS cut-off

3.11 TYPE OF SUPPORT FOR EMOTIONAL ISSUES WANTED BY ANTENATAL WOMEN IN FIFE

The questionnaire included the following question: 'If you wanted support with emotional issues (such as low mood or anxiety) during your pregnancy, which of the following would you consider?' The percentage of positive responses from the women with any symptoms[8], women with depression symptoms[9], anxiety symptoms[10] or stress symptoms[11] are presented in **Table 3.56**. Appendix 27 includes the data from the total sample

Table 3.56: The percentage of antenatal symptomatic women, 'depressed' women, 'anxious' women and 'stressed' women who would use the different support options

	Symptomatic (*N*=117)	'Depressed' (*N*=35)	'Anxious' (*N*=22)	'Stressed' (*N*=19)
Midwife	76.1	68.6	81.8	78.9
GP	58.1	51.4	63.6	52.6
Health Visitor	41.9	42.9	40.9	36.8
Self-help Reading	35	22.9	31.8	42.1
1-1 Therapy	28.2	20	18.2	31.6
Self-help Internet	28.2	22.9	31.8	42.1
Social Support Group	24.8	20	45.5	36.8
Therapy Group	17.9	14.3	27.3	21.1
Telephone Advice	12.8	8.6	4.5	21.1
Self-help CD Rom	9.4	8.6	4.5	10.5
Medication	7.7	20.0	4.5	0.0

[8] EDS ≥12 or DASS Dep ≥10 or Anx ≥8 or Stress ≥15
[9] EDS ≥14
[10] DASS Anx ≥8 (but not 'depressed' or 'stressed')
[11] DASS Stress ≥15 (but not 'anxious' or 'depressed')

3.12 SUMMARY OF THE MAIN FINDINGS

The following bullet points highlight the main findings from section 3 and links them back to the research questions presented in section 1.5.

1. **What is the prevalence of depression, anxiety and stress symptomatology during the antenatal period among pregnant women in Fife?**

   - 17.2% of women scored above the recommended cut-off (Murray & Cox, 1990) on the EDS.
   - 20.2% of women scored in the 'mild or above' range on the DASS-21 depression scale.
   - 24.5% of women scored in the 'mild or above' range on the DASS-21 anxiety scale.
   - 24.5% of women scored in the 'mild or above' range on the DASS-21 stress scale.

2. **Is there a difference in levels of depression, anxiety or stress symptomatology across the trimesters of pregnancy?**

   - There was no significant difference in the levels of symptoms across the trimesters of pregnancy.

3. **What are the psychosocial risk factors influencing antenatal depression, anxiety and stress symptomatology in pregnant women from Fife?**

   Demographic Variables:

   - Younger age was a significant factor influencing depression symptoms, for antenatal women with and without children. It was also a significant factor influencing anxiety symptoms for primiparous women.
   - Not working was a significant factor influencing stress symptoms for primiparous women.

Life Events:

- Distress from life events was a significant factor influencing depression, anxiety and stress symptoms for all women with children, but not for primiparous women.

Social Support:

- Dissatisfaction with emotional support from a partner was a significant factor influencing depression, anxiety and stress symptoms. For women with children, dissatisfaction with *practical* support was a significant factor predicting depression symptoms.
- Actual or ideal emotional support from a mother was a significant factor influencing depression, anxiety and stress symptoms for all women with children, but not for primiparous women. Emotional support from an 'other' was a significant factor influencing depression symptoms for primiparous women.
- Practical support from an 'other,' typically a sibling or friend, was a significant factor influencing depression and anxiety symptoms when looking at the antenatal sample as a whole.

4. What is the reliability and validity of the DASS-21 & EDS as measures of antenatal distress?

- Both the EDS and DASS-21 depression, anxiety and stress subscales demonstrated good reliability (Cronbach's alpha = .90, .86, .79 and .88 respectively).
- There was good convergent validity between the DASS-21 depression scores and the EDS scores (r=.82).
- Comparing the classifications of the DASS-21 and the EDS revealed that of the women who fell below the conservative cut-off of 10 on the EDS, 10 women were classified by the DASS-21 as being in the 'mild or above' range for depression symptoms, 27 as being in the 'mild or above' range for anxiety symptoms and 15 as being in the 'mild or above' range for stress symptoms.

5. What interventions would pregnant women in Fife find acceptable if they needed support with emotional issues?

- Over 76% of symptomatic women would use their Midwife for support.
- Preferences for health service support options were different among antenatal women with depression, anxiety and stress symptoms.

4. DISCUSSION

4.1 OVERVIEW

This section aims to discuss the results (presented in section 3) and to place these in the context of existing findings. The theoretical, service development and future research implications from the present study will also be outlined. Limitations of the study will be highlighted where relevant throughout the discussion.

4.2 DISCUSSION OF MAIN RESULTS

4.2.1 THE PREVALENCE OF ANTENATAL EMOTIONAL DISTRESS

The prevalence of depression symptoms among antenatal women in Fife was found to be 17.2% as measured by the EDS and 20.2% as measured by the DASS-21. Based on a higher EDS cut-off of 14/15, which Murray & Cox (1990) found had a 100% sensitivity for identifying major depression, the present study suggests a prevalence of 11.6% of *major* depression. In combination, these results suggest a higher level of (major and minor) depression symptoms during the antenatal period than the average rate found during the postnatal period (13%; O'Hara & Swain, 1996). This is consistent with other studies using self-report symptom rating scales which reliably find a higher score in pregnancy than postnatally (Green & Murray, 1994). The results also support the findings of Evans *et al.* (2001) who found that depression symptoms were higher in the antenatal period compared with the postnatal period.

In addition to the high prevalence of depression symptoms, 24.5% of the antenatal sample were found to have anxiety symptoms in the 'mild or above'

range (18.2% in the 'moderate or above' range). Other studies have also suggested that perinatal anxiety disorders may be more common than depression (Wenzel *et al.*, 2003). Indeed, Heron *et* al. (2004) found a prevalence of 14.6% at 18 weeks gestation in a large UK community sample (N=1217). Twenty-four percent (24.5%) of the antenatal sample in Fife were also found to have stress symptoms in the 'mild or above' range (16.6% in the 'moderate or above' range). There is limited perinatal research investigating the prevalence of stress symptoms but this was a higher rate than that found in a postnatal sample (N=325; 16.0%) by Miller *et al.* (2006).

As the present study was not longitudinal in design, it was not possible to determine how many of the symptomatic women would continue to have difficulties during the postnatal period. It is known, however, that antenatal symptoms are a significant risk factor for PND and recent studies (Matthey *et al.*, 2003; Heron *et al.*, 2004) have indicated that a history of anxiety may be more predictive of PND than a history of depression. In addition to this, the presence of anxiety and stress in the antenatal period is of concern in its own right. As discussed in section 1.3, there is growing evidence that such symptoms have a significant impact on the foetus, pregnancy outcome and later child development (Van den Bergh *et al.*, 2005). For these reasons, the need for early identification and intervention within the antenatal period is clear. Certainly, the need to widen the focus from 'PND' to 'perinatal distress' has been demonstrated.

The prevalence rates of anxiety and stress also bring into question the recent NICE (2007) guidelines which recommend the use of two screening questions[12] at the initial antenatal appointment. Fifteen percent of the antenatal sample who had 'pure' anxiety or stress symptoms would have been missed using this

[12] 'During the past month, have you often been bothered by feeling down, depressed or hopeless?' and 'During the past month, have you often been bothered by having little interest or pleasure in doing things?'

screening method. In addition, the use of these questions may result in subclinical levels of distress being missed; despite the evidence that such levels are strong predictors of later development of affective disorders (Records & Rice, 2007).

There was also no significant difference found in the levels of symptomatology across the trimesters of pregnancy. This is consistent with the findings from a recent systematic review of prevalence studies of antenatal depression (Bennett *et al.*, 2004). This further questions the current practice in Fife and the recent NICE guidelines which recommend only screening during the first trimester. In contrast, evidence supports the need to monitor emotional distress throughout the course of pregnancy.

A limitation of these results is the reliance on self-report measures rather than diagnostic interviews. A recent systematic review, however, of studies looking at the prevalence of depression during pregnancy (Bennett *et al.*, 2004) found that rates determined by the EDS were not significantly higher than those determined by structured interview. In addition, a large meta-analysis of prevalence studies (N=12,810; O'Hara & Swain, 1996) of PND also found a relatively small difference in the rates based on self-reports and interviews. From a clinical psychology perspective, the most useful validation of these findings would be to determine from a clinical interview whether the women falling above the recommended cut-offs had symptoms causing substantial interference in daily functioning, thus warranting treatment rather than whether they necessarily fell into diagnostic categories. In fact, the inclusion of sub-threshold symptoms in prevalence estimates may actually be clinically important if considering the health service implications.

An additional limitation of the results was the reliance on the DASS-21 anxiety and stress scales which have not been validated with an antenatal sample. These

prevalence rates must therefore be viewed with caution. There is also a possibility that there was a response bias in the present study as women suffering from symptomatology might have been more likely to respond in the hope of obtaining some support or advice. Women with personal experience of perinatal distress may also have been more likely to respond. Equally, however, it could be argued that as a consequence of suffering from symptomatology, women might have been less likely to respond (Bennet *et al.,* 2004) thus leading to an under-representation in the prevalence rates. Unfortunately, the methodology used did not allow for the characteristics of the non-responders to be compared with the responders.

4.2.2 CHARACTERISTICS OF ANTENATAL WOMEN SUFFERING FROM EMOTIONAL DISTRESS

Univariate analysis revealed significant socio-demographic and psychosocial differences between the antenatal women with symptoms and those who fell below the recommended cut-offs. Women suffering from depression and anxiety symptoms were more likely to be single, less likely to be working and less educated. Perhaps not surprisingly, women having children for the first time were significantly more anxious. Women suffering from depression symptoms were also significantly younger. The only significant sociodemographic difference between women with and without stress symptomatology was that symptomatic women were less likely to be working. This finding may be because women who are not working are more likely to have financial worries.

In terms of psychosocial factors, all symptomatic women had experienced a significantly higher number of distressing life events in the previous six months than the non-symptomatic women. There were also significant differences in the level of social support between the antenatal women with and without symptomatology. All symptomatic groups had significantly lower emotional and

practical support from their partner and mother. In addition, the women with depression symptoms had significantly lower emotional support from their father and significantly lower emotional and practical support from an 'other' (typically a sibling or friend).

Together, these findings suggest that antenatal women with depression symptomatology have more widespread difficulties in their social worlds. They have significantly lower emotional *and* practical support and they have inadequate support across all individuals included in this study (partner, mother, father and an 'other'). Women with anxiety and stress symptomatology have similar deficits in social support from their partners and mothers, but there is less difference, compared with non-symptomatic women, in terms of support from their fathers and an 'other'.

The *ideal* support scores also revealed some interesting findings. Women with depression symptomatology had consistently lower ideal levels of emotional and practical support. This may suggest that these women had had experience of receiving inadequate support and had therefore lower ideals. This could be seen as a protective strategy in order to bring their ideal level closer to the actual level of support being provided; thus minimising dissatisfaction. The results suggested, however, that despite lowering their ideal levels for their partners, mothers and an 'other,' the women with depression symptoms remained significantly more dissatisfied than the non-symptomatic women. Women with anxiety and stress also had significantly lower ideal levels of support from their mothers and also still remained dissatisfied with this support. These findings suggest that ideal levels of support can be lowered to an extent, but there are certain key individuals whose support is needed during pregnancy.

These social support results differed from the findings of Power *et al.* (1988) who found that depressed people did not have significantly lower actual emotional and practical support, but had significantly higher ideals and discrepancy scores. They suggested that depressed people tended to have higher expectations of themselves and others. One explanation for this difference may be that antenatal women are a group whose *actual* level of (emotional and practical) social support is more important than in the general population.

The univariate results presented a story consistent with existing perinatal and non-perinatal literature; young, single women with lower levels of education, inadequate social support and a higher number of stressful life events are particularly vulnerable to emotional difficulties (Brown & Harris, 1978; Brown & Moran, 1997; Records & Rice, 2007; Seguin *et al.*, 1995). In order to tease out further detail of the predictive factors of antenatal emotional distress, multivariate regression analysis was conducted. These findings are discussed below.

4.2.3 FACTORS INFLUENCING ANTENATAL EMOTIONAL DISTRESS

The multivariate analysis revealed that 39% of the variance of antenatal depression symptoms (as measured by the EDS) was due to young age, distress from life events, dissatisfaction with emotional support from a partner, low emotional support from a mother *and* low practical support from an 'other.' This final regression model was also validated by the DASS-21 depression measure. With the addition of the variable, dissatisfaction with practical support from a partner, 45% of the variance of antenatal depression symptoms (as measured by the DASS-21), was accounted for.

Age has previously been found to be a predictor of antenatal depression symptomatology in a study by Rich-Edwards *et al.* (2006). They found, however, that adjusting for household income in the regression analysis lessened the

influence of age on depression symptoms. In the present study the employment variable (which could be seen as a measure of financial income) did not have a significant influence. This suggests that further research is needed to clarify whether it is age *per se* that is influencing antenatal depression symptoms or whether it is other demographic variables associated with being young.

A high level of distress from life events has also been found to be a consistently significant factor influencing depression in the general population and in single mothers (e.g. Brown & Harris, 1978) although there is surprisingly little research from the antenatal period. A recent U.S. study found life stress to be correlated with depression symptomatology during pregnancy, but did not find it to be a significant predictive factor (Records & Rice, 2007). This may reflect differences in populations or methodological differences in the measure of life stress. In the present study, it may have proved useful to have considered some pregnancy-related life events. Nine women added 'miscarriage' or 'IVF/conception difficulties' as a significant other event with a mean distress score of 3.1 (out of a maximum of 4). If these events had been listed, a more accurate picture of the importance of such events could have been drawn. All women were experiencing the life event 'being pregnant' but it may also have been useful to enquire about the women's feelings towards this event. Recent studies have also found that life experiences of humiliation or entrapment are particularly prominent before depression onset (Harris, 2001). A measure focusing on such events may have helped build on this work within an antenatal context. Finally, research suggests that people suffering from depression or anxiety symptoms have a tendency to appraise events as more upsetting than controls (Dohrenwend, 2006). It is possible therefore that this inflated the association between symptomatology and distressing events. It seems likely, however, that, based on the considerable non-perinatal depression literature, distress from life events will be a significant

predictor of antenatal depression, but further research is required before firm conclusions can be drawn.

A lack of support from a partner has consistently been found to be predictive of antenatal depression (Rubertsson *et al.,* 2003), but these results also highlighted the importance of emotional support from a mother *and* practical support from an 'other.' Support from a father was no longer significant in the multivariate analysis. The research and clinical implications of these findings are discussed further below.

Twenty-eight percent of the variance of anxiety symptomatology was due to distress from life events, dissatisfaction with emotional support from a partner, dissatisfaction with practical support from an 'other' and lower ideal levels of maternal emotional support. Similar to the predictors of depression symptomatology, support from a mother and an 'other,' in addition to partner support, was significant.

Twenty-five percent of the variance of stress symptomatology was due to distress from life events, dissatisfaction with emotional support from a partner, lower practical support from a partner and lower ideal level of maternal emotional support. These findings suggest that although practical support from an 'other' was not a significant predictor of antenatal stress (as it was with depression and anxiety symptomatology), this *type* of support is still required.

It is not clear why lower *ideal* maternal emotional support was predictive of anxiety and stress symptomatology. One hypothesis is that having lower ideal levels may be a reflection of having had inadequate maternal emotional support in the past. As anxiety and stress are often centred around worrying about the future, this experience of having been let down could lead pregnant women to

feel anxious or stressed about how they will be supported once their baby arrives. To the author's knowledge, there is no previous research to compare with these findings. Further research is therefore required in order to draw any conclusions.

The factors influencing antenatal depression, anxiety and stress symptomatology were investigated further by comparing the results for pregnant women with children and primiparous women.

For pregnant women with children, it was dissatisfaction with *practical* (but not emotional) support from a partner that was revealed as a significant predictor of antenatal depression symptoms (as measured by both the EDS and DASS-21). Emotional support was still required, but from the mother, rather than partner. If these results were replicated, this information could be used to advise partners of pregnant women having additional children, of the importance of prioritising practical support or to encourage women to explore alternatives when partners are unable to give this support. As expected, emotional support from a partner was also found to be a significant predictor of symptoms for all other women (with or without children).

For primiparous women, emotional support from an 'other' (typically a friend or sibling) was found to be a significant predictor of depression symptomatology, whereas low (actual or ideal) maternal emotional support was found to be predictive of all symptomatology for women with children. Prior to giving birth it seems that emotional support from friends or siblings is important but 'when daughters become mothers, mothers and daughters tend to reevaluate each other and become more involved in each others' lives' (Fischer, 1981, p.613). There was also some evidence that more practical support, perhaps such as pregnancy-related advice, was needed from a mother for primiparous women. Interestingly, being young was only a significant influencing factor of anxious symptomatology

for primiparous women. This suggests that women are less likely to be anxious about having their first child if they are older.

Distress from life events was only found to be predictive of symptomatology for antenatal women with children, not with primiparous women. This may suggest that primiparous women are more able to cope with life events without the additional burden of looking after children. It seems more likely, however, that this reflects a methodological issue as one of the life event items enquired about behaviour problems with children[13]. This question is not applicable to primiparous women thus reducing their overall possible scores.

These specific social support findings help create a richer picture of the factors influencing antenatal emotional distress. Although previous studies have frequently found an association between low social support and poorer physical and psychological health during pregnancy, (e.g. Elsenbruch *et al.,* 2007), few studies have pinpointed the key individuals and types of support found to be predictive of antenatal depression symptomatology. More often, studies have focused on the importance of partner support (e.g. Rini *et al.*, 2006). No studies, to the author's knowledge, have explored the factors predictive of antenatal anxiety and stress. It is this type of detail that may be crucial in the development of interventions for 'at risk' women (which will be discussed further below). Replication of these results would enable firmer conclusions to be drawn.

[13] 'Have you had trouble or behaviour problems with your children within the past six months?'

4.2.4 RELIABILITY & VALIDITY OF THE EDS & DASS-21

Both the EDS and DASS-21 depression, anxiety and stress subscales demonstrated good reliability (Cronbach's alpha = .90, .86, .79 and .88 respectively). These internal consistencies were similar to those reported in other postnatal studies (Cox, 1994; Miller *et* al., 2006). The DASS-21 depression scale also showed good convergent validity with the EDS; higher than that reported in other validation studies (e.g. Crawford & Henry, 2003). There was also a high correlation between the DASS-21 subscales similar to the mean interscale correlations found by Lovibond & Lovibond (2004) during the initial full (DASS-42) scale construction from the original non-clinical sample (N=1750). The validation of the DASS-21 was further explored through comparing the classifications with the EDS (a validated antenatal measure). Of the 241 women classified within the 'normal' range for all symptomatology on the DASS-21, only three fell above the recommended antenatal EDS cut-off of 12. The DASS-21 classified 10 women as having 'mild or above' depression symptoms that fell below the conservative EDS cut-off of 10. Further validation is required using clinical interviews to determine the sensitivity and specificity rates of the DASS-21 depression scale and to investigate the validity of the anxiety and stress scale, but these preliminary results suggest that the DASS-21 depression scale is a reliable and valid measure of antenatal depression symptomatology.

The validity of the EDS as a measure of perinatal distress, as opposed to a pure measure of depression, was also explored by comparing the classifications with the DASS-21. Of the 230 women who fell below the conservative EDS cut-off of 10, 27 were identified as having 'mild or above' anxiety symptoms (14 = 'mild', 12 = 'moderate' and 1 = 'severe'). In addition, a further 15 women were identified as having 'mild or above' stress symptoms (9 = 'mild,' 5 = 'moderate' and 1 = 'severe'). The use of the DASS-21 highlighted an additional 14% of the total sample who were suffering from anxiety or stress who would not have been

identified using the EDS as a screening measure. These findings replicate those of Miller *et al.* (2006) who compared the DASS-21 and the EDS in a postnatal sample (N=325) and again stress the importance of assessing perinatal women for broader indicators of distress than that of depression alone.

4.2.5 SUPPORT OPTIONS FOR ANTENATAL EMOTIONAL DISTRESS

The study also investigated the types of health service support preferred by antenatal women suffering from emotional distress. The support options chosen by symptomatic women, women with depression symptomatology, anxiety symptomatology and stress symptomatology were compared. The main findings will now be discussed.

The results showed that the majority of antenatal women would use their Midwife as a source of support with emotional issues. This emphasises the importance of ensuring Midwives feel adequately trained and supported to deal with such issues. It also confirms that the clearest opportunity for identifying the majority of antenatal women struggling with emotional issues exists via the Midwives. Interestingly, the results suggested that women with higher depression symptomatology were less likely to use their Midwife or their GP for support. These findings demonstrate the vulnerability of these women, they may reflect poorer support seeking skills and emphasise the need to enquire about emotional issues as these women may not volunteer this information.

A larger percentage of women with depression symptomatology said they would consider the use of medication (20% compared with 4.5% of anxious women and 0% of stressed women). This may be because many of these women were already taking medication or had done so in the past. In light of the risks associated with this during pregnancy (NICE, 2007) this may suggest a need for psychoeducation

about the effectiveness of psychological treatment. It may also reflect the fact that medication is more readily available.

Other interesting findings included the popularity of self-help reading and internet sites, particularly for women with stress symptoms. This highlights an opportunity for providing support (through recommending effective self-help schemes) which would place very little burden on health services. It was also interesting that a group form of support was most appealing to women with anxiety symptoms. A social support group would also have less resource implications than a therapy group and this appeared to be the preferred choice.

The fact that only 18.2 - 31.6% of symptomatic antenatal women said they would use one-to-one therapy suggests that clinical psychology services would not necessarily be over-burdened with referrals if identification of emotional distress was to increase. This is in accordance with the changes currently occurring within the clinical psychology profession towards spending more time working in consultation with other professionals (such as providing teaching or supervision to Midwives, Health Visitors and GPs), developing stepped-care models of service (such as ensuring appropriate self-help resources exist for antenatal emotional issues) as well as seeing individuals (at the more severe end of the spectrum) for one-to-one therapy.

Together, these findings suggest that there are differences in the support options considered by antenatal women suffering from different psychological difficulties. In order to develop services that best meet the needs of these women, it is important to understand these differences. Further research into this area is recommended and may also prove useful out with the perinatal field.

4.3 THEORETICAL CONSIDERATIONS FROM THE STUDY

One of the theoretical considerations from the present study is in relation to why women with depression symptoms are more likely to have widespread inadequate social support. Does a pregnant woman develop depression as a result of having inadequate support or does this inadequate support reflect interpersonal deficits inherent in the pregnant woman? One possible hypothesis is that low maternal emotional support (found to be associated with antenatal depression) leads to a greater likelihood that the antenatal woman has an insecure attachment, which increases the chances of having poorer interpersonal relationships due to ineffective support seeking (Collins & Feeney, 2000). The combination of these factors, particularly during pregnancy, is likely to increase the antenatal woman's vulnerability to depression. Following the birth, a woman with an insecure attachment pattern combined with depression symptoms is more likely to have difficulty providing responsive and sensitive parenting, thus increasing the likelihood of the infant forming an insecure attachment. This hypothesis illustrates the potential for antenatal emotional distress to lead to an intergenerational cycle of interpersonal difficulties. Indeed, some research has demonstrated a link between antenatal social support and problematic postpartum mother-infant interactions (Goldstein *et al.*, 1996). Further research looking at attachment styles, social support and perinatal distress would be enlightening and could help provide clues for effective preventative interventions.

A further theoretical implication of the study is in relation to the importance of support from a partner or husband. Dissatisfaction with emotional support from a partner was found to be a highly significant predictor of antenatal distress. Being single, rather than married, was not, however, found to be a predictor. This is consistent with other studies (e.g. Seguin *et al.*, 1995) which may suggest that it is better for a pregnant women's mental health to be without a partner than to be with an unsupportive partner. This may be because if a pregnant woman has

no partner, she is more likely to receive support from other sources. Further research in this field is required, however, particularly to determine whether other positive sources of support can counteract the negative effect on a pregnant woman from being in an unsupportive relationship.

This study did not attempt to identify a complete theoretical model of antenatal distress. Future studies using path analysis or structural equation modelling (e.g. Ross *et al.*, 2004) are likely to produce a richer biopsychosocial model of perinatal distress, ideally showing the 'final common pathway' to onset (Harris, 2001).

4.4 SERVICE & FUTURE RESEARCH IMPLICATIONS OF THE STUDY

A possible service implication of the study is the introduction of population-wide antenatal screening for depression, anxiety and stress symptoms. Given the prevalence and the potential impact of these symptoms, does this support the introduction of antenatal screening in Fife? There are three main aspects to consider; the availability of a reliable and validated screening tool, the feasibility of screening within the current antenatal service and the organisational implications of screening. Each of these will now be discussed.

Prior to its widespread introduction, a screening measure needs to be validated. Initial findings from this study suggest that the DASS-21 may be a useful tool as it measures a wider range of symptoms than those only associated with depression. Further validation in an antenatal sample, however, would be required, including the development of antenatal norms. The EDS is a validated tool but the focus on depression may result in other difficulties being missed. The use of the EDS, however, may at least serve to open up discussions about emotional well-being and therefore be preferable to no formal assessment. The recent NICE guidelines

(2007) state that a 'healthcare professional may consider the use of self-report measures' (p.13) and suggest the EDS, the Hospital Anxiety and Depression Scale (HADS) or the Patient Health Questionnaire-9 (PHQ-9). Recent studies have shown, however, that the HADS is *not* a reliable screening tool in pregnancy (Jomeen & Martin, 2004) and the PHQ-9 has not been validated for use in an antenatal setting. In fact, the latter includes several somatic items which are likely to lead to a large number of 'false-positive' cases.

The antenatal care in the UK provides excellent opportunity for screening as women have regular contact with health professionals, particularly their Community Midwives. This has also been found to be feasible and acceptable to women attending GP antenatal clinics (Green & Murray, 1994). Repeated assessments throughout the pregnancy would be recommended based on the findings that there is no difference in levels of symptomatology across the trimesters. More research into the onset of symptomatology may provide further information about optimal screening times.

The major service issue emerges after the screening is completed. There are approximately 3772 deliveries each year in Fife (ISD Scotland, 2005). According to the prevalence rate (17.2%) found in this study, if screening was introduced using the EDS, approximately 649 women with depression symptoms would fall above the recommended cut-off. Based on the positive predictive values found by Murray & Cox (1990), 214 of these women would have major depression and 110 would have minor depression. In addition, 15% of antenatal women would be identified as suffering from 'pure' stress or anxiety. It is therefore unethical to introduce a population-wide screening programme without careful consideration of how services will meet the subsequent demands.

Prior to recommending antenatal screening, the focus should therefore be on the development of stepped care interventions, such as those indicated as preferred forms of support, and the integration of these into specific referral pathways. There have been promising outcomes from interventions tailoring CBT to the postnatal period (Milgrom *et al.*, 2006) which are likely to be adaptable to the antenatal period (L. Negri, personal communication, 19 September, 2006). There have also been encouraging findings from small studies using IPT with symptomatic women in the antenatal period (Zlotnick *et al.*, 2001; Spinelli & Endicott, 2003; Grote *et al.*, 2004). In light of the importance of social support found in this study, a tailored interpersonal program would make theoretical and clinical sense. The inclusion of partners, mothers, siblings or friends in interventions would also seem advisable. Adaptation of structured and validated programmes to the antenatal period would enable rigorous evaluation to be completed, particularly to determine the outcome of interventions for symptomatic antenatal women who do not necessarily meet formal diagnostic criteria. In addition, evaluation of interventions for antenatal anxiety and stress is also greatly needed. In the long-term, this will help to clarify whether such interventions during pregnancy can prevent or minimise the ill-effects of stress and anxiety on children's development and on mother's postnatal health (Heron *et al.*, 2004).

Although the immediate recommendation is not to introduce antenatal screening, it is important that the prevalence of antenatal emotional distress in Fife is recognised, not only by healthcare professionals but also by antenatal women themselves. The notion that women should 'bloom' during pregnancy needs to be countered, allowing women the opportunity to admit to feeling 'less than blooming' – while at the same time not over-pathologising normal anxiety and fears in relation to pregnancy (Oates, 2002). Disseminating the results of the study to the perinatal health professionals in Fife and to the antenatal women

themselves[14] is a future plan. It is likely that there needs to be a cultural shift away from prioritising physical health tasks during the antenatal appointments, and towards mental health being given equal importance. In publicising the results of this study and providing education about the risks of antenatal symptoms in their own right, it is hoped that this shift may begin to happen.

It will also be important to encourage joint working with obstetric staff, particularly the Community Midwives, to provide education and training in relation to mental health issues and to ensure that staff feel comfortable enquiring and hearing about women's emotional issues.

All of the above leads to the long term recommendation of introducing antenatal screening for depression, anxiety and stress symptoms, as well as enquiring about key risk factors. Raised awareness of these issues among antenatal healthcare professionals is a start, but missed diagnoses are common when there is no formal method of assessment (Austin & Priest, 2005). An initial step towards this may be to selectively screen 'at risk' women.

The implementation of population-wide screening would also enable large scale prospective studies to be completed which would increase our understanding of the outcomes for women identified as symptomatic and 'at risk'; particularly 'false-positive' and 'false-negative' cases.

[14] This only includes women who indicated on their questionnaire that they wanted to be sent a summary of the results.

4.5 CONCLUSIONS

In line with recent findings (e.g. Evans *et al.*, 2001) the results of this study suggest that antenatal depression symptoms are higher than the level typically found postnatally and perinatal anxiety may be more common than depression. The need to widen the focus from 'PND' to 'perinatal distress' has been demonstrated. Ignoring antenatal distress will lead to opportunities for preventative interventions being missed. The prevalence of anxiety and stress symptoms, combined with the growing evidence demonstrating its negative impact on the foetus, pregnancy outcome and child development, provides an additional impetus for early intervention. Whether such interventions can alleviate the impact, however, remains to be seen.

The long-term recommendation of this study is to introduce population-wide antenatal screening of depression, anxiety and stress symptoms along with the identification of key risk factors. The DASS-21 may be a promising antenatal screening tool but further investigation of its validity within an antenatal sample is required. Introduction of screening should also only occur after careful consideration of how services will meet the subsequent demand. This is likely to require the development of stepped care models of intervention, ranging from the provision of evidence based self-help schemes to one-to-one therapy. Interventions with an interpersonal focus may prove particularly effective as a lack of social support (from a range of individuals) appears to be a significant predictor of antenatal distress. Interventions should consider the different needs of antenatal women with children and primiparous women and it may be beneficial to involve key individuals in the intervention.

The role of clinical psychology should include joint working with obstetric staff, development of stepped care models of service and provision, including evaluation, of interventions for antenatal distress.

Our one chance to prevent much of the problems of mental ill health begins at birth. Let's take it and run with it.

(Buist, 2002, p.206)

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6. APPENDICES

APPENDIX 1

DSM-IV Criteria for 'Major Depressive Disorder'

The criteria stipulate the presence of either (1) depressed mood most of the day, nearly every day supported by subjective reports *or* (2) markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly everyday *plus* five (or more) of the criteria listed below for at least a two-week period, nearly every day and represent a change from previous functioning:

1. Markedly diminished interest of pleasure in all, or almost all, activities
2. Significant weight loss when not dieting, or weight gain, or decrease or increase in appetite
3. Insomnia or hypersomnia
4. Psychomotor agitation or retardation (observable by others, not merely subjective feelings of restlessness or being slowed down)
5. Fatigue of loss of energy
6. Feelings of worthlessness or excessive or inappropriate guilt
7. Diminished ability to think or concentrate, or indecisiveness
8. Recurrent thoughts of death (not just fear of dying) or recurrent suicidal ideation.

APPENDIX 2

NHS Research Ethics Committee & NHS Fife Research and Development Team Approval Letters

NHS
Fife

Fife & Forth Valley Research Ethics Committee

12 January 2007

Miss Helen M Wright

Dear Miss Wright

Full title of study: **A Cross-sectional Survey of Affectional Difficulties, Social Support & Life Events during the Antenatal Period**

REC reference number: **06/S0501/97**

Thank you for your letter of 12 December 2006, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information was considered and approved under Chairs Actions on 12 January 2007.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised.

Ethical review of research sites

The Committee has not yet been notified of the outcome of any site-specific assessment (SSA) for the research site(s) taking part in this study. The favourable opinion does not therefore apply to any site at present. I will write to you again as soon as one Local Research Ethics Committee has notified the outcome of a SSA. In the meantime no study procedures should be initiated at sites requiring SSA.

Conditions of approval

The favourable opinion is given provided that you comply with the conditions set out in the attached document. You are advised to study the conditions carefully.

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
Application	1	13 November 2006
Investigator CV		13 November 2006
Protocol	1	01 November 2006
Covering Letter		13 November 2006
Letter from Sponsor		13 November 2006
Compensation Arrangements		28 July 2006
Questionnaire: Emotional Difficulties & Related Factors During Pregnancy	2.0	12 December 2006
Questionnaire: Questionnaire	1	13 November 2006
Letter of invitation to participant	1	13 November 2006
Participant Information Sheet: Participant Information Leaflet	1	13 November 2006
Participant Information Sheet: Research Information Sheet for Midwives	1.0	12 December 2006
Response to Request for Further Information		12 December 2006
amendment to application		
Instructions for handing out the questionnaire		
Flowchart B	1	13 November 2006
Flowchart A	1	13 November 2006

Research governance approval

The study should not commence at any NHS site until the local Principal Investigator has obtained final research governance approval from the R&D Department for the relevant NHS care organisation.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

With the Committee's best wishes for the success of this project

Yours sincerely

Chair
Fife & Forth Valley REC

Email: fiona.thow@faht.scot.nhs.uk

Enclosures: *Standard approval conditions, SL-AC2*
Site approval form

Copy to:

Miss Helen Wright

Medical Director, Primary Care
Room 313
Hayfield House
Hayfield Road
KIRKCALDY
Fife KY2 5AH
Tel 01592 643355
www.show.scot.nhs.uk/fpct

Date 15 January 2007
Your Ref
Our Ref
Enquiries to Aileen Yell
Ext 01383 623623 Ext 5110
Email aileen.yell@faht.scot.nhs.uk

Dear Miss Wright

Project Title: "Emotional difficulties and related factors during pregnancy"

Thank you for your application to carry out the above project.

Your project documentation has been reviewed for resource and financial implications for NHS Fife Primary Care Division and I am happy to inform you that Management Approval has been granted, subject to all necessary Ethical approvals being in place.

Details of our participation in this study will be included in quarterly returns to the National Research Register and annual returns we are expected to complete as part of our agreement with the Chief Scientist Office. The enclosed Research Registration Form has been prepared and should be checked, signed and returned together with the attached NRR Form to the R&D Office, Lynebank Hospital, Halbeath Rd, Dunfermline KY11 4UW. If you have any questions or need further information contact Amanda Wood, Research Coordinator on: 01383 623623 ext 5111 or at amanda.wood@faht.scot.nhs.uk

May I take this opportunity to remind you that all research undertaken in NHS Fife is managed strictly in accordance with the Research Governance Framework for Health & Community Care (http://www.sehd.scot.nhs.uk/cso/) and that all research should be carried out according to Good Clinical Practice (GCP). In order to comply with the RGF, the R&D Office are required to hold copies of all study protocols, ethical approvals and amendments for the duration of this study.

You will also be required to provide information in regard to monitoring and study outcomes, including a lay summary on completion of the research. I would like to wish you every success with your study and look forward to receiving a summary of the findings for dissemination once the project is complete.

Yours sincerely

DR STELLA CLARK
Medical Director, Primary Care
NHS Fife

Cc

APPENDIX 3

Participant Information Sheet

NHS Fife

The University of Edinburgh

Emotional Difficulties, Social Support & Life Events during Pregnancy

Information for Prospective Participants

Thank you for reading this.

♦Introduction ♦

You are being invited to take part in a research study about emotional difficulties during pregnancy. This study is being undertaken for educational purposes and is in part contribution towards a doctorate degree in clinical psychology in conjunction with the University of Edinburgh and NHS Fife. Before you decide if you would like to participate it is important that you know a bit more about the study and what participation will involve. Please take time to read the following information carefully and raise any questions you may have with the study researcher (contact details are provided at the end of this sheet). Please ask if there is anything you are unclear about or if you would like more information.

♦What is the study about? ♦

This study is trying to estimate the levels of depression, anxiety and stress among pregnant women in Fife. This information will help inform discussion about how services can be developed to best meet the needs of women with emotional difficulties during pregnancy. This is of particular importance because emotional difficulties during pregnancy can impact on adjustment after the birth. In order to try to understand some of these difficulties, the study is also looking at level of social support and recent life events; both of which have been found to be linked with emotional difficulties.

♦Why have I been chosen? ♦

1000 questionnaires are being distributed to pregnant women across all stages of pregnancy in Fife. You have been invited because you fit into this category.

♦Do I have to take part in the study?♦

Participation in this study is entirely voluntary. This information sheet is for you to keep and will help you decide if you would like to take part. If you decide not to take part, this will not affect any current or future care you may receive.

♦What will participation involve? ♦

If you would like to take part then please complete the enclosed questionnaire which asks a range of questions about symptoms related to low mood, anxiety and stress. There are also questions about the types of support you would like to be offered, your level of social support and recent life events. Your responses to all of these will be entirely confidential, and should take approximately 20 minutes to complete. You will only be asked to complete the questionnaires once.

♦What are the possible benefits of taking part?♦

The benefit of you taking part is that your mood, anxiety and stress levels will be screened. If the study researcher (who is a Trainee Clinical Psychologist) is concerned by your responses then she will contact you to discuss this and provide verbal or written advice. With your consent, she will also pass this information on to your Community Midwife and GP so that suitable support can be arranged. If consent is not given, but the level of concern is high then the researcher will have to act on their duty of care and contact your Community Midwife and GP.

The information you provide will be extremely valuable in helping us to understand and support pregnant women suffering from emotional difficulties in Fife.

♦Will my participation in the study be kept confidential?♦

The information you provide will be kept **strictly confidential**. You will not be personally identified in any of the study results or reports. The only person with direct access to your information will be the study researcher. All of the information held by the researcher will be held on a protected database.

Please note: As mentioned above, if the researcher is concerned about a participant's responses to some questionnaire items (for example, if the answers to some questions suggest the possibility of depression), we would like to be able to contact you to discuss your results with you personally and confidentially, and to offer you some support and advice either directly over the telephone, by sending you some more information, or by recommending that you speak to your Midwife or GP in the first instance. In order for us to do this, please provide us with your name and address when you return the questionnaires. You may also wish to provide your name and address if you wish to receive a written summary of the results of this research. Your contact details will remain strictly confidential and will not be made known to anyone outwith the research team.

♦What will happen to the results of the study?♦

The results will be included in a doctoral thesis submitted to the University of Edinburgh by the study researcher. You will not be identified in this, or in any other report resulting from the study. A brief summary of the results will be made available to all those who participated in the study, if requested. You will not be identified in this summary.

♦Who else knows about the study? ♦

The study has been reviewed by Fife and Forth Valley Research Ethics Committee, and by the University of Edinburgh Doctorate in Clinical Psychology Course Organisation Committee.

♦What should I do now? ♦

If you wish to take part: Please complete the enclosed questionnaire (within one month) and return this in the stamped addressed envelope.

If you do not wish to take part: We would like to thank you for taking the time to read through this information sheet. You need do nothing more. Your decision not to take part is completely respected.

♦Who can I contact? ♦

If you have been affected by anything in the questionnaire then please feel free to contact the Study Researcher on the telephone number given below. Alternatively we would advise you to speak to your Midwife or GP.

If you have any queries about any aspect of the study or require further information, again, please do not hesitate to contact us at the address given below:

Helen Wright
Trainee Clinical Psychologist/Study Researcher
Address
Telephone:

Email:

Name
Research Supervisor
Address
Telephone:

Email:

This information sheet is for you to keep. Thank you for taking the time to read this letter.

APPENDIX 4

Full Questionnaire

(Printed on lilac paper)

NHS
Fife

The University of Edinburgh

QUESTIONNAIRE

Emotional Difficulties & Related Factors during Pregnancy

Please complete the following information and return the completed questionnaire in the enclosed stamped addressed envelope:

Please tick box

I have read and understood the information given to me about this study ☐

I hereby fully and freely consent to participating in this study ☐

Name (please print): _____

Signature: _____ **Date:** _____

Address:

Postcode:

Telephone Number:

Community Midwife's Name:

GP's Name:

GP's Address:

NB – The above information will be stored separately from the rest of the questionnaire so that your responses are anonymous. We will only use these contact details if you would like to be sent a summary of results or if we have any concerns about your wellbeing (as explained in the 'Information for Prospective Participants' sheet).

1. What is your age? ☐☐

2. What is your marital status? Please put an "X" on the line

Single ____ Divorced ____

Married or Co-habiting ____ Widowed ____

Separated ____

3. What is your work status? Please put an "X" on the line

Full-time employment ____ Permanently sick/disabled ____

Part-time employment ____ Volunteer ____

Look after home/family ____ Unemployed ____

Student or further education ____

4. What is your ethnic group? Please put an "X" on the line

White (e.g. Scottish/British/Irish) ____ Caribbean ____

Indian ____ African ____

Pakistani ____ Mixed background ____

Bangladeshi ____ Other ethnic group ____

Chinese ____

5. What qualifications do you have? Please put an "X" on the line

No qualifications ____ Vocational/Further education (e.g. SVQ) ____

Standard grades / "O" grades ____ University degree ____

Highers / A levels ____ Other ____

6. Do you have any children? Please CIRCLE YES / NO

7. If YES: How old are they? (If NO, go to question 8)

8. Approximately how many weeks pregnant are you? ☐☐

9. **Are you receiving support from any of the following professionals (<u>in addition</u> to your routine medical / pregnancy care)?**

<u>Please put an "X" on the line</u>

Specialist Midwife ____ Counsellor ____

Health Visitor ____ Community Psychiatric Nurse ____

GP ____ Nurse ____

Psychologist ____ Other (**please specify**) _____

10. **If you wanted support with emotional issues (such as low mood or anxiety) during your pregnancy, which of the following would you consider?**

<u>Please mark with an "*X*"</u>

	X
Recommended 'self help' reading material	
A recommended 'self help' CD Rom	
A recommended 'self help' internet site	
Speaking to a GP	
Use of medication	
Speaking to a Midwife	
Speaking to a Health Visitor	
Attending a therapy group for women with similar difficulties (e.g. an anxiety management group)	
Attending a social support group (e.g. an informal group for pregnant women)	
Telephone advice from a trained professional	
Seeing a professional (such as a Clinical Psychologist) for one-to-one therapy	

11. **Are there any other types of support that you think should be provided for women suffering from emotional issues (such as low mood or anxiety) during pregnancy?**

12. **Please tick the box if you would like to be sent a summary of the results of this research** ☐

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[15].

The rating scale is as follows:

0 Did not apply to me at all
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 time
3 Applied to me very much, or most of the time

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

[15] Depression Anxiety Stress Scales (Lovibond & Lovibond, 1995)

lease put an "X" on the line next to the answer which comes closest to how you have felt

N THE PAST 7 DAYS, not just how you feel today[16].

I have been able to laugh and see the funny side of things As much as I always could ____ Not quite so much now ____ Definitely not so much now ____ 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 ____
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 ____	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 ____
I have blamed myself unnecessarily when things went wrong Yes, most of the time ____ Yes, some of the time ____ Not very often ____ No, never ____	8	**I have felt sad or miserable** Yes, most of the time ____ Yes, quite often ____ Not very often ____ No, not at all ____
I have been anxious or worried for no good reason No, not at all ____ Hardly ever ____ Yes, sometimes ____ Yes, very often ____	9	**I have been so unhappy that I have been crying** Yes, most of the time ____ Yes, quite often ____ Only occasionally ____ No, never ____
I have felt scared or panicky for no very good reason Yes, quite a lot ____ Yes, sometimes ____ No, not much ____ No, not at all ____	10	**The thought of harming myself has occurred to me** Yes, quite often ____ Sometimes ____ Hardly ever ____ Never ____

[16] Edinburgh Depression Scale (Cox *et al.*, 1987)

Listed below are three sources of personal and social support on which you may be able to draw. For each person please **CIRCLE** a number from 1 to 7 to show how well support is provided.

The second part of each question asks you to rate how you would like things to be if they were exactly as you hoped for. As before, please put a **CIRCLE** around a number between 1 to 7 to show what your rating is.

Please note: If a particular source of support does not exist for you, please leave the section blank[17].

Person 1: Husband or Partner

		Never			Sometimes			Always
1	a) Can you trust, talk to frankly and share your feelings with this person?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7
2	a) Can you lean on and turn to this person in times of difficulty?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7
3	a) Does he give you practical help?	1	2	3	4	5	6	7
	b) What would your ideal be?	1	2	3	4	5	6	7
4	a) Can you spend time with him socially?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7

Person 2: Mother

		Never			Sometimes			Always
1	a) Can you trust, talk to frankly and share your feelings with this person?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7
2	a) Can you lean on and turn to this person in times of difficulty?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7
3	a) Does she give you practical help?	1	2	3	4	5	6	7
	b) What would your ideal be?	1	2	3	4	5	6	7
4	a) Can you spend time with her socially?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7

[17] Significant Others Scale (Power *et al.*, 1988)

Person 3: Father

		Never						Always
1	a) Can you trust, talk to frankly and share your feelings with this person?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7
2	a) Can you lean on and turn to this person in times of difficulty?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7
3	a) Does he give you practical help?	1	2	3	4	5	6	7
	b) What would your ideal be?	1	2	3	4	5	6	7
4	a) Can you spend time with him socially?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7

Please list below one **OTHER** person who may be important in your life. Typical other relationships include child, brother or sister, close friend etc. As before, for this person please **CIRCLE** a number from 1 to 7 to show how well support is provided.

Again, the second part of each question asks you to rate how you would like things to be if they were exactly as you hoped for. As before, please put a **CIRCLE** around a number between 1 to 7 to show what your rating is.

Person 4 (Please STATE THE RELATIONSHIP - e.g. best friend or sister):

.....

		Never						Always
1	a) Can you trust, talk to frankly and share your feelings with this person?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7
2	a) Can you lean on and turn to this person in times of difficulty?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7
3	a) Does he or she give you practical help?	1	2	3	4	5	6	7
	b) What would your ideal be?	1	2	3	4	5	6	7
4	a) Can you spend time with him or her socially?	1	2	3	4	5	6	7
	b) What rating would your ideal be?	1	2	3	4	5	6	7

Please read each of the seventeen statements below and indicate that they apply to you by putting an **"X"** in the box marked **'YES'** or that they do not apply to you by putting an **"X"** in the box marked **'NO'**. You may find that none of these statements apply to you, or you may find that only some of them apply. However, **if you answer 'YES'** to any questions please indicate the degree of distress you experienced as a result of that particular situation[18].

		NO	YES	If "YES" was the situation:			
				Not at all distressing	Somewhat distressing	Moderately distressing	Extremely distressing
1	Have you had a serious illness or injury within the past six months?		→				
2	Has a close relative had a serious illness or injury within the past six months?		→				
3	Has there been a death in your close family within the past six months (mother, father, brother, sister, wife, husband, son or daughter)		→				
4	Has there been a death of a close friend, uncle, aunt or cousin within the past six months?		→				
5	Have you had a separation due to marital difficulties within the past six months?		→				
6	Have you broken off a steady relationship within the past six months?		→				
7	Have you had a serious problem with a close friend, neighbour or relative within the past six months?		→				
8	Within the past six months, has there been any period during which you were unemployed and seeking work for more than one month?		→				
9	Within the past six months have you been sacked from your job?		→				
10	Have you had any major financial crisis within the past six months?		→				
11	Have you had any problems with the police or have you had a court appearance within the past six months?		→				
12	Have you had any valuables lost or stolen within the past six months?		→				
13	Have you had an increase in arguments with your partner within the past six months?		→				
14	Have you had trouble or behaviour problems with your children within the past six months?		→				
15	Have you moved house within the past six months?		→				
16	Has an immediate family member had difficulties with drugs or alcohol over the past six months?		→				
17	Other event (**please specify**)		→				

THANK YOU VERY MUCH for your help with this questionnaire. If you have any comments, or you would like to add anything, please feel free to do so here:_____

_____

_____

[18] Adapted version of the List of Threatening Experiences (Brugha *et al.*, 1985)

APPENDIX 5

The Main Themes Specified as 'Other events' in the Life Events Measure

'Other' Life Events Specified	Frequency	Mean Level of Distress (Maximum score = 4)
Miscarriage	7	2.7
Stress at work	4	2.8
Moved from abroad / Planning to move abroad	3	2.3
Conception difficulties /IVF	2	3.5
Caring for family member with mental health problems	2	3
Stress from partner's family	2	3
Partner working away from home	2	2.5
Building/repairs to house	2	2.5
Death of distant relative	2	2
Ongoing grieving for close family member (> six months ago)	1	2
Fatigue from treatment for cancer	1	4
Victim of domestic abuse	1	4
No contact with family	1	4
Partner in Army	1	4
Dissatisfaction with governmental financial support system	1	4
Wedding	1	2
Other event not specified	1	4

APPENDIX 6

Research Information Sheet

NHS Fife

The University of Edinburgh

Emotional Difficulties, Social Support & Life Events during Pregnancy

Research Information Sheet for Midwives

Thank you for considering assisting me with this research. Below is a brief summary of the proposed study and an outline of how you can help.

♦Background to the study ♦

Research suggests that a preventative approach to Post Natal Depression (PND) would be to target symptoms during pregnancy in the hope that these would be reduced by the post natal period. This study therefore aims to estimate the prevalence of depression, anxiety and/or stress among antenatal women in Fife. This will help to inform a discussion on whether there is a need for psychological support for these women and how the Fife Clinical Psychology Department can provide a service that best meets the needs of these women.

In order to expand the research to look at possible contributory factors of the emotional difficulties during the antenatal period, the research will also look at the level of social support and recent life events during pregnancy. These have been found to correlate with the development of PND and will help inform discussion on the future development of appropriate preventative or early intervention services (e.g. support groups, types of therapy, etc.).

♦Design of Study♦

The study is a cross-sectional survey design which aims to distribute 1000 questionnaires to pregnant women (across all stages of pregnancy) in Fife over a two month period (January – March 2007). The questionnaires will be distributed during routine antenatal appointments but can be completed in the women's own time. A stamped addressed envelope is enclosed.
This has been discussed with and approved by Joyce Leggate, Fife Community Midwife Manager.

♦How can you help?♦

Questionnaires will be delivered to the three Fife Community Midwife bases (Queen Margaret Hospital, Forth Park Maternity Hospital and Memorial Hospital) in January 2007. There is a brief verbal instruction attached to the front of the questionnaire which explains what to say when handing out the questionnaire. It should not take more than 1-2 minutes to do this. The women can complete the questionnaires in their own time – **you do <u>not need</u> to collect the completed questionnaires.**

If all Fife Community Midwives (n=35) distribute the questionnaires (n=1000) then there will be approximately 28 questionnaires per Midwife to distribute over a two month period.

If you would like to help with this study, then please hand out **approximately 10 questionnaires at each** of the following antenatal appointments:

1. The Booking visit
2. The 22 week Clinic Appointment
3. Any of the 3rd Trimester clinic appointments (32 /36 / 38 / 40 week clinic appointments)

In summary, your task will be to distribute the questionnaires during routine antenatal appointments - <u>you will not</u> need to wait for these to be completed nor collect this information.

♦Inclusion Criteria♦

Please distribute the questionnaires to:

* Pregnant women aged 18 or over
* Women receiving routine antenatal care in the Fife region of Scotland.

♦Exclusion Criteria♦

Please **<u>do not</u>** distribute the questionnaire to:

* Women less than 18 years of age
* Women with cognitive impairment
* Women with a learning disability
* Non-English speaking women

♦What if a returned questionnaire raises concern about a participant's wellbeing?♦

The questionnaire will provide an additional screening of mood, anxiety and stress levels amongst pregnant women in Fife. If the study researcher (who is a Trainee Clinical Psychologist supervised by a qualified Clinical Psychologist) is concerned about a response then she will contact the woman by telephone to discuss this and provide verbal or written advice. With their consent, the study researcher will also pass this information on to you and to the relevant GP so that suitable support can be arranged (which may include a referral to the Fife Clinical Psychology service). If consent is not given, but the level of concern is high, then the study researcher will have to act on their duty of care and contact you and the relevant GP.

♦What will happen to the results of the study?♦

The results will be included in a doctoral thesis submitted to the University of Edinburgh by the study researcher. A brief summary of the results will be made available to all those who participate in the study and to the Fife Community Midwife teams. The results will also be presented at a Community Midwife meeting in 2007.

♦Who else knows about the study? ♦

The study has been reviewed by Fife and Forth Valley Research Ethics Committee, and by the University of Edinburgh Doctorate in Clinical Psychology Course Organisation Committee.

♦What should I do now? ♦

If you are happy to help with the study: Questionnaires will be delivered to the Community Midwife teams in Fife in January 2007. Please distribute these as described above.

Please do not hesitate to contact me if you wish to discuss any aspect of it in more detail.

THANK YOU FOR YOUR HELP AND INTEREST

Helen Wright
Trainee Clinical Psychologist / Study Researcher
ADDRESS

Telephone:
Email:

APPENDIX 7

Midwife Instruction Sheet

NHS Fife

The University of Edinburgh

INSTURCTIONS for handing out the questionnaire

Please hand out approximately 10 questionnaires to pregnant women at each of the following antenatal appointments:

1. The Booking visit
2. The 22 week clinic appointment
3. Any of the 3rd trimester clinic appointments (32, 36, 38 or 40 week clinic appointments)

Please read out the following instruction when handing out the questionnaire: -

"*This envelope contains a questionnaire which is being used for a research project looking at what emotional issues are experienced by pregnant women in Fife. It is entirely up to you whether you want to complete it and whether you do or not will have no impact on your care. Further information is included in the envelope and if you have any questions then there is a contact number given on the information sheet.*"

** Do not hand out questionnaire to:

* Women less than 18 years of age
* Women with cognitive impairment or a learning disability
* Non-English speaking women

Any questions, please contact Helen Wright TELEPHONE NO.

Thank you for helping with this research.

APPENDIX 8

Participant Invitation Letter

NHS
Fife

The University of Edinburgh

ADDRESS

Dear Participant,

You are being invited to take part in a research study about emotional difficulties during pregnancy. In order to try to understand some of these difficulties, the study is also looking at social support and life events; both of which have been found to be linked with emotional difficulties.

I have enclosed further information about the research in the sheet entitled "Information for Prospective Participants." I have also enclosed the questionnaire and a stamped addressed envelope for its return. The questionnaire will take approximately 20 minutes to complete.

You are under no obligation to complete the questionnaire and if you decide not to take part, this will not affect any current or future care you may receive.

Thank you for taking the time to read this.

Best wishes.

Yours faithfully,

Helen Wright
Trainee Clinical Psychologist

APPENDIX 9

Example Templates of Letters Sent to Questionnaire Respondents (scoring above the cut-off) and to their GP and Midwife

Private & Confidential

INSERT ADDRESS

Dear INSERT NAME

Thank you for taking the time to complete the questionnaire "Emotional Difficulties & Related Factors during Pregnancy." As we discussed on the telephone it sounds as if you have recently been feeling INSERT.

You explained on the telephone that INSERT INFORMATION.

ADD ADDITIONAL INFORMATION IF APPROPRIATE

I have enclosed a Self-Help leaflet on INSERT. Some of this information may not be relevant to you but perhaps you will find parts of it useful.

As I explained on the telephone I will also write to your GP, INSERT NAME, and your Community Midwife, INSERT NAME, to let them know about the difficulties you indicated on your questionnaire. This will mean that they can ask how you are feeling when they next see you. If you find that these difficulties continue after the birth or if you have any concerns about how you are feeling then I would recommend you mention this to your GP, Midwife or Health Visitor.

If you have any further questions or concerns, then please do not hesitate to contact me on INSERT TEL.

Best wishes and thanks again for taking the time to complete the questionnaire.

Yours sincerely

Private & Confidential

INSERT GP NAME & ADDRESS

Dear INSERT GP NAME

Re: INSERT RESPONDENT'S NAME & ADDRESS

I am writing to let you know that INSERT NAME recently participated in some research looking at 'Emotional Difficulties during Pregnancy.' This involved completing a questionnaire which included the Depression Anxiety Stress Scales (DASS-21) and the Edinburgh Depression Scale (EDS). INSERT NAME scores indicated that she has recently been suffering from some of the symptoms typically associated with a INSERT level of INSERT (INSERT QUESTIONNAIRE SCORES).

Her INSERT-related symptoms included: INSERT

I contacted INSERT NAME to discuss these concerns and she explained that ADD INFORMTION

ADD ADDITIONAL INFORMATION IF APPROPRIATE

For this reason I have agreed to send INSERT some of our department's self-help information about INSERT.

I have encouraged INSERT to discuss how she is feeling with yourself, her Midwife or Health Visitor. She said she was happy for me to write to you to let you know of these concerns so that you can enquire about this when you next see her.

I hope that you will find this information useful. Please do not hesitate to contact me if you have any questions or concerns.

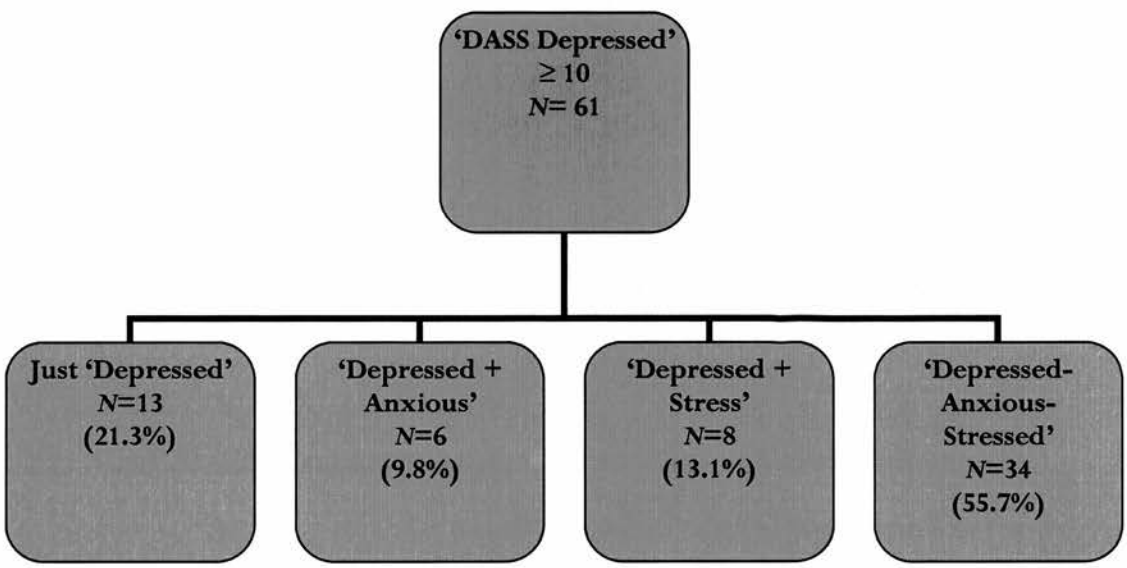
Best Wishes.

Yours sincerely

APPENDIX 10

The Co-morbidity of Depression, Anxiety & Stress using the DASS-21

The figure below shows that of the 61 women who score in the 'mild or above' range (≥10) on the DASS-21 depression subscale, 13 (21.3%) described 'pure' depression symptoms. 6 (9.8%) scored above the cut off on the DASS-21 anxiety subscale and 8 (13.1%) scored above the cut-off on the DASS-21 stress subscale. 34 (55.7%) of the women scored above the cut-offs on the DASS-21 depression, anxiety *and* stress subscales.



APPENDIX II

The Difference in Levels of Depression Symptomatology (as Measured by the DASS-21) Across the Stages of Pregnancy

The mean DASS-21 depression subscale scores were 5.8 for women in the first trimester of pregnancy, 4.6 in the second trimester and 5.8 in the third trimester.

	1st Trimester (N=70)	2nd Trimester (N=99)	3rd Trimester (N=130)
DASS-21 Depression Subscale			
Mean score	5.8	4.6	5.8
SD	6.5	6.4	7.2

One-way independent ANOVA showed that there was **no significant effect** on depression symptoms (as measured by the DASS-21) across the trimesters of pregnancy, $F(2, 296)=1.08$, $p=.359$.

APPENDIX 12

The Difference in the Prevalence of Depression, Anxiety or Stress Symptomatology across the Stages of Pregnancy

The table below presents the prevalence rates of depression, anxious and stress symptomatology (e.g. the percentage of women falling above the recommended cut-offs) across the trimesters of pregnancy.

	1st Trimester	2nd Trimester	3rd Trimester
EDS (≥ 12)	15.7	13.3	21.5
DASS-21 Depression ('mild or above')	21.4	17.2	21.5
DASS-21 Anxiety ('mild or above')	25.7	20.2	27.7
DASS-21 Stress ('mild or above')	24.3	21.2	27.7

3 x 4 X^2 tests were conducted to compare the proportions of women classified as having symptomatology above the recommended cut-offs in the first, second or third trimesters of pregnancy. There were **no significant differences** in the proportions of symptomatology between the trimesters: depression symptomatology (EDS): $X^2(2) = 2.846$, $p = .248$, $N = 298$; depression symptomatology (DASS-21): $X^2(2) = .774$, $p = .696$, $N = 299$; anxiety symptomatology (DASS-21): $X^2(2) = 1.739$, $p = .427$, $N = 299$; stress symptomatology (DASS-21): $X^2(2) = 1.278$, $p = .530$, $N = 299$.

APPENDIX 13

Total Support Scores

The mean actual emotional support, ideal emotional support and discrepancy emotional support scores for the total sample were 5.9, 6.6 and 0.6 respectively.

The mean actual practical support, ideal practical and discrepancy practical support scores for the total sample were 5.6, 6.3 and 0.7 respectively. These results are presented below:

Significant Others Scale (N=302)				
	Mean	**SD**	**Minimum**	**Maximum**
Total Emotional Support:				
Actual	5.9	0.9	2.8	7.0
Ideal	6.6	0.5	3.6	7.0
Discrepancy	0.6	0.7	0.0	3.7
Total Practical Support:				
Actual	5.6	1.1	2.5	7.0
Ideal	6.3	0.7	3.0	7.0
Discrepancy	0.7	0.8	0.0	4.3

APPENDIX 14

Frequency of Life Events Items

The following table presents the frequencies of the responses to the Life Event items included in the measure. Items 14-17 were the additional items added to the original LTE measure.

	Life Event Scale (N=302)	No	Yes	Yes Not at all distressing	Yes Somewhat distressing	Yes Moderately distressing	Yes Extremely distressing	Missing
1	Have you had a serious illness or injury within the past six months?	291	8	0	5	1	2	3
2	Has a close relative had a serious illness or injury within the past six months?	232	65	2	20	20	23	5
3	Has there been a death in your close family within the past six months (mother, father, brother, sister, wife, husband, son or daughter)?	282	16	0	2	6	8	4
4	Has there been a death of a close friend, uncle, aunt or cousin within the past six months?	262	36	2	15	11	8	4
5	Have you had a separation due to marital difficulties within the past six months?	292	7	0	3	1	3	3
6	Have you broken off a steady relationship within the past six months?	281	17	1	8	2	6	4
7	Have you had a serious problem with a close friend, neighbour or relative within the past six months?	264	35	0	13	4	8	3
8	Within the past six months, has there been any period during which you were unemployed and seeking work for more than one month?	281	15	3	5	5	2	6
9	Within the past six months have you been sacked from your job?	293	5	0	2	2	1	4
10	Have you had any major financial crisis within the past six months?	271	27	2	8	10	7	4
11	Have you had any problems with the police or have you had a court appearance within the past six months?	290	9	0	4	3	2	3
12	Have you had any valuables lost or stolen within the past six months?	290	9	0	4	3	2	3
13	Have you had an increase in arguments with your partner within the past six months?	243	53	5	26	17	5	6
14	Have you had trouble or behaviour problems with your children within the past six months?	259	37	6	21	4	6	6
15	Have you moved house within the past six months?	232	61	20	29	9	3	9
16	Has an immediate family member had difficulties with drugs or alcohol over the past six months?	278	20	2	5	8	5	4
17	Other event	271	34	1	12	11	10	4

APPENDIX 15

Formulas Used to Calculate Effect Sizes (Field, 2006)

r =.10 (small effect) / r =.3 (medium effect)/ r = .5(large effect)

Statistical Test	Formula
t-test	$r = \sqrt{(t^2/t^2 + df)}$
Mann-Whitney Test	$r = z/\sqrt{N}$

APPENDIX 16

Full Demographic Characteristics of *EDS Depressed* vs *EDS Not Depressed* Groups

Characteristic	*EDS Depressed* (*N*=52)		*EDS Not Depressed* (*N*=249)	
	N	**Mean (SD)**	***N***	**Mean (SD)**
Age* **	51	26.1 (6.0)	241	29.8 (5.3)
Gestational Weeks	52	27.0 (10.6)	246	24.5 (10.3)
		%		**%**
		(of group)		**(of group)**
Stage of Pregnancy				
1st Trimester	11	21.2	59	24.0
2nd Trimester	13	25.0	85	34.6
3rd Trimester	28	53.8	102	41.5
**Marital Status ** **				
Married of Cohabiting	39	76.5	224	91.1
Single	10	19.6	19	7.7
Separated	1	2.0	3	1.2
Divorced	1	2.0	0	0
Ethnic Origin				
White	52	100	244	99.2
Pakistani	0	0	1	0.4
Other ethnic group	0	0	1	0.4
**Employment Status ** **				
Full time work	19	37.3	123	50.2
Part time work	10	19.6	70	28.6
Look after home or family	7	13.7	32	13.1
Student or further education	4	7.8	10	4.1
Permanently sick or disabled	2	3.9	1	0.4
Unemployed	9	17.6	9	3.7
Education Level				
University degree	10	19.6	87	35.4
Vocational/ further education	24	47.1	87	35.4
Highers or 'A' levels	5	9.8	29	11.8
Standard grades or 'O' levels	11	21.6	33	13.4
Other qualifications	1	0.9	4	1.6
No qualifications	0	0	6	2.4
Unknown				
Children				
Yes	26	50.0	128	52.0
No	26	50.0	118	48.0
Unknown				

Note *** p<.05, **p <.01, *** p <.001**

APPENDIX 17

Summary Table of Demographic Characteristics of *DASS Depressed* vs *DASS Not Depressed* Groups

Characteristic	*DASS Depressed* (*N*=61)		*DASS Not Depressed* (*N*=241)	
	N	**Mean (SD)**	***N***	**Mean (SD)**
Age**	59	27.0 (6.3)	234	29.8 (5.3)
Stage of Pregnancy (Gestational Weeks)	60	25.4 (10.7)	239	24.9 (10.3)
		% (of group)		**% (of group)**
Stage of Pregnancy (Trimester)				
1st Trimester	15	25	55	23
2nd Trimester	17	28.3	82	34.3
3rd Trimester	28	46.7	102	42.7
Marital Status ***				
Married of Cohabiting	44	74.6	220	92.1
Single (incl Separated and Divorced)	15	25.4	19	7.9
Ethnic Origin				
White	59	98.3	238	99.6
Pakistani	1	1.7	0	0
Other ethnic group	0	0	1	0.4
Employment Status ***				
Working (incl student or in full time education)	33	55.9	190	79.8
Not Working (incl looking after home, permanently sick or disabled or unemployed)	26	44.1	48	20.2
Education Level*				
University degree	10	16.9	88	36.8
Vocational/ further education	28	47.5	83	34.7
Highers or 'A' levels	7	11.9	27	11.3
Standard grades or 'O' levels (or less level of education)	12	20.3	38	15.9
Other	2	3.4	3	1.3
Children				
Yes	34	56.7	120	50.2
No	26	43.3	119	49.8

Note *** p<.05, **p <.01, *** p <.001**

APPENDIX 18

Summary Table of Demographic Characteristics of *Anxious* vs *Not Anxious* Groups

Characteristic	*Anxious* (*N*=74)		*Not Anxious* (*N*=228)	
	N	**Mean (SD)**	***N***	**Mean (SD)**
Age	72	28.0 (6.5)	221	29.6 (5.2)
Stage of Pregnancy (Gestational Weeks)	74	26.2 (10.9)	225	24.6 (10.2)
		% (of group)		**% (of group)**
Stage of Pregnancy (Trimester)				
1st Trimester	18	24.3	52	23.1
2nd Trimester	20	27.0	79	35.1
3rd Trimester	36	48.6	94	41.8
Marital Status **				
Married of Cohabiting	58	78.4	206	78.0
Single (incl Separated and Divorced)	16	21.6	18	52.9
Ethnic Origin				
White	74	100	223	99.1
Pakistani	0	0	1	0.4
Other ethnic group	0	0	1	0.4
Employment Status **				
Working (incl student or in full time education)	45	61.6	178	79.5
Not Working (incl looking after home, permanently sick or disabled or unemployed)	28	38.4	46	20.5
Education Level*				
University degree	14	19.2	84	37.3
Vocational/ further education	36	49.3	75	33.3
Highers or 'A' levels	8	11.0	26	11.6
Standard grades or 'O' levels (or less level of education)	14	19.2	36	16.0
Other	1	1.4	4	1.8
Children*				
Yes	30	40.5	124	55.1
No	44	59.5	101	44.9

Note *** p<.05, **p <.01, *** p <.001**

APPENDIX 19

Summary Table of Demographic Characteristics of *Stressed* vs *Not Stressed* Groups

Characteristic	*Stressed* (*N*=74)		*Not Stressed* (*N*=228)	
	N	**Mean (SD)**	***N***	**Mean (SD)**
Age	73	28.2 (6.2)	220	29.5 (5.4)
Stage of Pregnancy (Gestational Weeks)	74	25.5 (10.8)	225	24.8 (10.2)
		% (of group)		**% (of group)**
Stage of Pregnancy (Trimester)				
1st Trimester	17	23.0	53	23.6
2nd Trimester	21	28.4	78	34.7
3rd Trimester	36	48.6	94	41.8
Marital Status				
Married of Cohabiting	61	82.4	203	90.6
Single (incl Separated and Divorced)	13	17.6	21	9.4
Ethnic Origin				
White	74	100.0	223	99.1
Pakistani	0	0	1	0.4
Other ethnic group	0	0	1	0.4
Employment Status **				
Working (incl student or in full time education)	45	61.6	178	79.5
Not Working (incl looking after home, permanently sick or disabled or unemployed)	28	38.4	46	20.5
Education Level				
University degree	19	26.0	79	35.1
Vocational/ further education	32	43.8	79	35.1
Highers or 'A' levels	7	9.6	27	12.0
Standard grades or 'O' levels (or less level of education)	14	19.1	36	16.0
Other	1	1.4	4	1.8
Children				
Yes	40	54.1	114	50.7
No	34	45.9	111	49.3

Note *** p<.05, **p <.01, *** p <.001**

APPENDIX 20

The Significance of the Covariates on the Social Support Scores

The table below presents the significance of the covariates (age, marital status and work status) on the social support scores. It also shows the significance between social support scores for the *EDS Depressed* and *EDS Not Depressed* groups after adjusting for the covariates.

	Covariate Age	Covariate Marital Status	Covariate Work Status	Significance (After covariate adjustment)
PARTNER:				
Actual Emotional	**NS**	*	**NS**	**p<.001**
Ideal Emotional	**NS**	**NS**	**NS**	**NS p=.590**
Discrepancy Emotional	**NS**	*	**NS**	**p<.001**
Actual Practical	*	*	**NS**	**p<.001**
Ideal Practical	**NS**	**NS**	**NS**	**p=.024**
Discrepancy Practical	*	*	**NS**	**p<.001**
MOTHER:				
Actual Emotional	**NS**	**NS**	*	**p<.001**
Ideal Emotional	**NS**	**NS**	**NS**	**NS p=.102**
Discrepancy Emotional	**NS**	**NS**	*	**p<.001**
Actual Practical	*	**NS**	**NS**	**p=.003**
Ideal Practical	**NS**	**NS**	**NS**	**p=.01**
Discrepancy Practical	*	**NS**	**NS**	**NS p=.074**
FATHER:				
Actual Emotional	**NS**	*	*	**p=.029**
Ideal Emotional	**NS**	*	**NS**	**p=.013**
Discrepancy Emotional	**NS**	**NS**	*	**NS p=.531**
Actual Practical	**NS**	**NS**	**NS**	**NS p=.117**
Ideal Practical	**NS**	**NS**	**NS**	**p =.002**
Discrepancy Practical	**NS**	**NS**	**NS**	**NS p=.518**
'OTHER':				
Actual Emotional	**NS**	**NS**	**NS**	**p<.001**
Ideal Emotional	**NS**	**NS**	**NS**	**p=.003**
Discrepancy Emotional	**NS**	**NS**	**NS**	**p=.004**
Actual Practical	**NS**	**NS**	**NS**	**p<.001**
Ideal Practical	**NS**	**NS**	**NS**	**p=.001**
Discrepancy Practical	**NS**	**NS**	**NS**	**p=.009**

Note * **p<.05**

APPENDIX 21

Total Emotional & Practical Support Scores for the EDS Groups

TOTAL SUPPORT SCORES (HUSBAND, MOTHER, FATHER & 'OTHER')						
Social Support Score	**Group**	**Mean**	**SD**	**SE**	**t-test**	**r**
Actual Emotional* **	*EDS Not Depressed*	6.10	0.82	0.05	t(63.64)=5.65,	.6
	EDS Depressed	5.20	1.08	0.15	p<.001	
Ideal Emotional **	*EDS Not Depressed*	6.60	0.47	0.03	t(60.86)=2.95,	.4
	EDS Depressed	6.31	0.70	0.10	p=.004	
Emotional Discrepancy* **	*EDS Not Depressed*	0.54	0.65	0.04	t(64.17)=4.62,	.5
	EDS Depressed	1.11	0.84	0.12	p<.001	
Actual Practical * **	*EDS Not Depressed*	5.75	1.07	0.07	t(299)=4.73,	.3
	EDS Depressed	4.97	1.18	0.16	p<.001	
Ideal Practical * **	*EDS Not Depressed*	6.36	0.67	0.04	t(299)=4.03,	.2
	EDS Depressed	5.92	0.87	0.12	p<.001	
Practical Discrepancy **	*EDS Not Depressed*	0.63	0.75	0.05	t(299)=2.94,	.2
	EDS Depressed	0.97	0.80	0.11	p=.004	

***Note* * p< .05, ** p < .01, *** p <.001; r = Effect size**

As there were two assumptions of parametric tests broken in the above Emotional Support analysis (homogeneity of variance and equal group size), non-parametric Mann-Whitney tests were also run. There was no change in the significance of the results.

The parametric analyses were re-run to include age, marital status and employment as covariates. Again, there was no change in significance.

APPENDIX 22

Significant Differences in Social Support Scores Between Groups Showing Adjustments for Non-Paramteric Tests and Covariates

	EDS Depressed vs EDS Not Depressed	*DASS Depressed vs DASS Not Depressed*	*Anxious vs Not Anxious*	*Stressed vs Not Stressed*
PARTNER				
Actual Emotional	***	***	** (MW***)	** (MW***) (Co*** work)
Ideal Emotional	NS (MW*)	NS (MW*)	NS	NS (MW*)
Discrepancy Emotional	***	***	***	** (MW***) (Co***work)
Actual Practical	***	***	**	***
Ideal Practical	*	** (MW***) (Co***)	NS	**
Discrepancy Practical	***	***	**	***
MOTHER				
Actual Emotional	** (Co*** work)	***	* (MW**) (Co** work)	**
Ideal Emotional	NS (MW*)	NS (MW*) (Co*)	NS (Co*)	*
Discrepancy Emotional	** (Co*** work)	***	NS(MW*)(Co* work)	* (Co – NS, work)
Actual Practical	**	***	* (Co**parity)	*
Ideal Practical	**(MW*)(Co*)	** (Co***)	NS (Co**)	** (MW*)
Discrepancy Practical	NS	** (MW***)(Co*** age)	NS	NS
FATHER				
Actual Emotional	**(Co* marital, work)	**(Co*marital, work)	NS	NS
Ideal Emotional	NS (Co* marital)	*	NS	* (MW – NS)
Discrepancy Emotional	NS	NS	NS	NS
Actual Practical	*(Co NS)	* (MW**)(Co**)	NS	NS
Ideal Practical	*(Co**)	*	NS (Co* parity)	NS
Discrepancy Practical	NS	NS	NS	NS
'OTHER'				
Actual Emotional	***	***	*	NS
Ideal Emotional	***(Co**)	***	NS	NS
Discrepancy Emotional	**(MW***)	**(MW***)	* (Co NS)	NS
Actual Practical	***	***	NS	NS
Ideal Practical	**	***	NS	NS
Discrepancy Practical	*	***	NS	NS
OVERALL				
Actual Emotional	***	***	**	*** (Co** work)
Ideal Emotional	**	**	NS	**
Discrepancy Emotional	***	***	**	** (Co* work)
Actual Practical	***	***	** (MW*) (Co*parity)	**
Ideal Practical	***	***	NS (Co*parity)	**
Discrepancy Practical	**	***	NS	NS (MW*)

Note * p < .05, ** p < .01, ***p <.001, NS = Not significant, (MW) = Mann Whitney Adjustment, (Co) = Covariate adjustment

E.g. (Co* parity) – After adjusting for covariates the social support score became significant (p<.01). The parity covariate was significant.

APPENDIX 23

Difference in Life Event Scores between *DASS Depressed* and *DASS Not Depressed* Groups

The *DASS Depressed* (N=60) group had significantly higher life event scores than the *DASS Not Depressed* group (See table below): t (72.49) = 4.98, p < .001; which represents a large effect size r = .51 (Cohen, 1992). Non-parametric tests were run, but the significant differences remained.

	DASS Depressed (N=60)	*DASS Not Depressed* (N=239)
Mean Life Event Scores	7.17	3.24
SD	5.78	3.83
SE	0.75	0.25

The parametric analysis was re-run to include age, marital status, employment and education as covariates. Only marital status and employment were found to have a significant ($p<.05$) influence on the Life Event Scores. The difference between the *DASS Depressed* and *DASS Not Depressed* groups, again, remained **significant** $F(1,279)=27.669$, $p<.001$.

APPENDIX 24

Difference in the Number of Life Event Scores Between Groups

	EDS Depressed (*N*=52)	*EDS Not Depressed* (*N*=246)
Mean No of Life Events	2.50	1.28
SD	1.96	1.39
SE	0.27	0.09

The *EDS Depressed* group had experienced a higher mean *number* of life events (*M*=2.5) than the *EDS Not Depressed* group (*M*=1.3). The assumption of heterogeneity of variance was violated (Levene's test for equality of variances was significant F=15.66, p<.001), so Welch's t-test was used. This showed that this difference was **significant** t (62.35) = 4.26, p<.001; which represents a medium-large effect size r = .47 (Cohen, 1992).

There were two assumptions of parametric tests broken in the analysis (homogeneity of variance and equal group size). For the reason, Mann-Whitney non-parametric tests were also run: The *EDS Depressed* group's Number of Life Event Scores (*Mdn* = 2.0) remained **significantly different** from the *EDS Not* Depressed group's scores (*Mdn*=1), U= 4014.00, p<.001, r = -0.25.

The parametric analysis was also re-run to include age, marital status and employment as covariates. Only marital status and employment were found to have a significant (p<.05) influence on the Number of Life Event Scores. The difference between the *EDS Depressed* and *EDS Not Depressed* groups, however, remained **significant** F(1,284)=16.721, p<.001.

	DASS Depressed (N=60)	*DASS Not Depressed (N=239)*
Mean No of Life Events	2.47	1.25
SD	1.81	1.40
SE	0.23	0.09

Similar to the results for the *EDS* groups, the *DASS Depressed* group experienced a significantly higher mean *number* of life events than the *DASS Not Depressed* group: t (77.76) = 4.85, $p<.001$; which represents a medium to large effect size r = .48 (Cohen, 1992). As above non parametric tests were run, but the significant differences remained.

The parametric analysis was also re-run to include age, marital status, employment and education as covariates. Again, only marital status and employment were found to have a significant ($p<.05$) influence on the Number of Life Event Scores. The difference between the *DASS Depressed* and *DASS Not Depressed* groups, remained **significant** $F(1,279)=19.460$, $p<.001$.

	Anxious **(N=74)**	*Not Anxious* **(N=225)**
Mean No of Life Events	2.07	1.31
SD	1.78	1.45
SE	0.21	0.21

The *Anxious* group also experienced a significantly higher mean *number* of life events than the *Not Anxious* group: t (106.70) = 3.34, $p<.001$; which represents a medium effect size r = .31 (Cohen, 1992). As above non parametric tests were run, but the significant differences remained.

The parametric analysis was also re-run to include age, marital status, employment, education and parity as covariates. Age, marital status and

employment were found to have a significant ($p<.05$) influence on the Number of Life Event Scores. The difference between the *Anxious* and *Not Anxious* groups, again, remained **significant** $F(1,279)=6.504$, $p=.011$.

	Stressed (*N*=74)	*Not Stressed* (*N*=225)
Mean No of Life Events	2.20	1.26
SD	1.67	1.46
SE	0.19	0.10

The *Stressed* group also experienced a significantly higher mean *number* of life events than the *Not Stressed* group: $t\ (112.11) = 4.33$, $p < .001$; which represents a medium effect size $r = .38$ (Cohen, 1992). As above non parametric tests were run, but the significant differences remained.

The parametric analysis was also re-run to include employment as a covariate. This was found to have a significant ($p<.05$) influence on the Number of Life Event Scores, but the difference between the *Stressed* and *Not Stressed* groups remained **significant** $F(1,292)=24.99$, $p<.001$.

APPENDIX 25 - **Correlation Matrix of Variables**

Pearson Correlations												
	EDS	**DASSDep**	**Anxiety**	**Stress**	**Age**	**Marital**	**Qualification**	**Work**	**LE**	**EMP**	**IEMP**	**ESSP**
EDS	1.000											
DASSDep	0.818	1.000										
Anxiety	0.730	0.750	1.000									
Stress	0.745	0.714	0.679	1.000								
Age	-0.280	-0.242	-0.185	-0.166	1.000							
Marital	-0.273	-0.268	-0.217	-0.125	0.352	1.000						
Qual	-0.146	-0.130	-0.110	-0.051	0.295	0.249	1.000					
Work	0.235	0.247	0.204	0.136	-0.195	-0.240	-0.208	1.000				
LE	0.448	0.429	0.328	0.377	-0.219	-0.300	-0.083	0.230	1.000			
EMP	-0.431	-0.498	-0.388	-0.348	0.109	0.308	0.120	-0.161	-0.390	1.000		
IEMP	-0.144	-0.168	-0.119	-0.103	0.170	0.144	0.071	-0.137	-0.184	0.484	1.000	
ESSP	0.437	0.513	0.396	0.357	-0.065	-0.304	-0.126	0.148	0.383	-0.966	-0.284	1.000
PRP	-0.373	-0.456	-0.309	-0.376	0.011	0.216	0.011	-0.101	-0.362	0.652	0.340	-0.630
IPRP	-0.190	-0.236	-0.141	-0.219	-0.003	-0.001	0.043	-0.087	-0.195	0.314	0.472	-0.250
PSSP	0.352	0.441	0.311	0.335	-0.009	-0.282	0.005	0.095	0.347	-0.646	-0.216	0.656
EMM	-0.325	-0.333	-0.244	-0.252	-0.012	-0.027	0.088	-0.169	-0.247	0.326	0.210	-0.306
IEMM	-0.186	-0.191	-0.190	-0.226	0.012	-0.068	0.012	-0.078	-0.060	0.171	0.127	-0.152
ESSM	0.268	0.272	0.162	0.144	0.022	-0.020	-0.106	0.155	0.252	-0.273	-0.187	0.261
PRM	-0.227	-0.267	-0.212	-0.198	-0.103	-0.087	0.012	-0.104	-0.180	0.272	0.171	-0.267
IPRM	-0.148	-0.197	-0.172	-0.198	-0.048	-0.106	-0.042	-0.052	-0.023	0.210	0.195	-0.196
PSSM	0.175	0.190	0.130	0.096	0.088	0.021	-0.054	0.097	0.211	-0.181	-0.077	0.183
EMF	-0.269	-0.187	-0.138	-0.152	0.052	-0.080	0.014	-0.169	-0.128	0.247	0.160	-0.235
IEMF	-0.231	-0.214	-0.168	-0.180	0.009	-0.109	-0.033	-0.054	-0.006	0.155	0.157	-0.127
ESSF	0.144	0.055	0.031	0.035	-0.057	0.005	-0.048	0.169	0.143	-0.176	-0.093	0.182
PRF	-0.223	-0.173	-0.114	-0.103	0.017	-0.050	0.019	-0.142	-0.104	0.159	0.126	-0.149
IPRF	-0.227	-0.192	-0.163	-0.153	-0.006	-0.090	-0.034	-0.060	0.012	0.161	0.189	-0.136
PSSF	0.096	0.058	0.001	-0.004	-0.025	-0.020	-0.063	0.142	0.159	-0.073	-0.010	0.082
EMO	-0.345	-0.369	-0.289	-0.199	0.061	0.072	-0.038	-0.124	-0.253	0.313	0.189	-0.280
IEMO	-0.239	-0.266	-0.197	-0.104	-0.004	-0.014	-0.086	-0.107	-0.180	0.209	0.366	-0.141
ESSO	0.259	0.271	0.224	0.166	-0.092	-0.113	-0.031	0.101	0.185	-0.240	-0.059	0.246
PRO	-0.305	-0.348	-0.226	-0.215	-0.045	-0.057	-0.110	-0.109	-0.193	0.218	0.130	-0.200
IPRO	-0.212	-0.260	-0.110	-0.135	-0.096	-0.068	-0.114	-0.067	-0.116	0.120	0.205	-0.088
PSSO	0.246	0.262	0.232	0.181	-0.030	0.011	0.048	0.118	0.175	-0.215	-0.064	0.218

	PRP	IPRP	PSSP	EMM	IEMM	ESSM	PRM	IPRM	PSSM	EMF	IEMF	ESSF	PRF
EDS													
DASSDep													
Anxiety													
Stress													
Age													
Marital													
Qual													
Work													
LE													
EMP													
IEMP													
ESSP													
PRP	1.000												
IPRP	0.627	1.000											
PSSP	-0.916	-0.289	1.000										
EMM	0.333	0.176	-0.319	1.000									
IEMM	0.225	0.261	-0.134	0.576	1.000								
ESSM	-0.244	-0.042	0.289	-0.819	-0.009	1.000							
PRM	0.392	0.266	-0.360	0.742	0.430	-0.606	1.000						
IPRM	0.380	0.475	-0.240	0.483	0.724	-0.083	0.652	1.000					
PSSM	-0.211	0.015	0.277	-0.588	0.014	0.734	-0.785	-0.052	1.000				
EMF	0.247	0.200	-0.179	0.421	0.348	-0.268	0.418	0.317	-0.280	1.000			
IEMF	0.257	0.328	-0.115	0.329	0.636	0.033	0.384	0.566	-0.051	0.591	1.000		
ESSF	-0.096	-0.002	0.121	-0.252	0.072	0.356	-0.208	0.060	0.308	-0.761	0.066	1.000	
PRF	0.282	0.237	-0.230	0.374	0.269	-0.272	0.620	0.467	-0.434	0.787	0.519	-0.556	1.000
IPRF	0.323	0.427	-0.179	0.275	0.475	-0.011	0.476	0.710	-0.057	0.511	0.739	-0.039	0.711
PSSF	-0.087	0.065	0.150	-0.262	0.085	0.383	-0.408	0.034	0.561	-0.607	-0.007	0.751	-0.714
EMO	0.358	0.173	-0.346	0.382	0.220	-0.311	0.388	0.207	-0.344	0.369	0.267	-0.242	0.319
IEMO	0.268	0.361	-0.158	0.289	0.367	-0.102	0.326	0.355	-0.146	0.372	0.472	-0.090	0.341
ESSO	-0.256	-0.004	0.316	-0.273	-0.004	0.336	-0.261	-0.016	0.334	-0.152	0.049	0.232	-0.127
PRO	0.401	0.369	-0.291	0.332	0.249	-0.227	0.480	0.410	-0.301	0.406	0.373	-0.197	0.481
IPRO	0.335	0.481	-0.170	0.239	0.275	-0.101	0.382	0.510	-0.095	0.305	0.471	0.010	0.400
PSSO	-0.266	-0.113	0.265	-0.270	-0.097	0.263	-0.346	-0.119	0.360	-0.283	-0.065	0.308	-0.295

	IPRF	PSSF	EMO	IEMO	ESSO	PRO	IPRO	PSSO
EDS								
DASSDep								
Anxiety								
Stress								
Age								
Marital								
Qual								
Work								
LE								
EMP								
IEMP								
ESSP								
PRP								
IPRP								
PSSP								
EMM								
IEMM								
ESSM								
PRM								
IPRM								
PSSM								
EMF								
IEMF								
ESSF								
PRF								
IPRF	1.000							
PSSF	-0.020	1.000						
EMO	0.187	-0.271	1.000					
IEMO	0.395	-0.099	0.623	1.000				
ESSO	0.072	0.259	-0.815	-0.082	1.000			
PRO	0.419	-0.264	0.693	0.474	-0.527	1.000		
IPRO	0.547	-0.023	0.409	0.627	-0.069	0.745	1.000	
PSSO	-0.061	0.368	-0.626	-0.110	0.729	-0.741	-0.123	1.000

Key	
Variable	**Full Name**
EDS	Edinburgh Depression Scale Scores
DASSDep	DASS-21 Depression Scale Scores
Anxiety	DASS-21 Anxiety Scale Scores
Stress	DASS-21 Stress Scale Scores
Age	Age
Marital	Marital Status
Qual	Qualifications
Work	Employment Status
LE	Life Events Scores
EMP	Actual Emotional Support from a Partner (or Husband)
IEMP	Ideal Emotional Support from a Partner (or Husband)
ESSP	Discrepancy Emotional Support from a Partner (or Husband)
PRP	Actual Practical Support from a Partner (or Husband)
IPRP	Ideal Practical Support from a Partner (or Husband)
PSSP	Discrepancy Practical Support from a Partner (or Husband)
EMM	Actual Emotional Support from a Mother
IEMM	Ideal Emotional Support from a Mother
ESSM	Discrepancy Emotional Support from a Mother
PRM	Actual Practical Support from a Mother
IPRM	Ideal Practical Support from a Mother
PSSM	Discrepancy Practical Support from a Mother
EMF	Actual Emotional Support from a Father
IEMF	Ideal Emotional Support from a Father
ESSF	Discrepancy Emotional Support from a Father
PRF	Practical Support from a Father
IPRF	Ideal Practical Support from a Father
PSSF	Discrepancy Practical Support from a Father
EMO	Actual Emotional Support from an 'Other'
IEMO	Ideal Emotional Support from an 'Other'
ESSO	Discrepancy Emotional Support from an 'Other'
PRO	Actual Practical Support from an 'Other'
IPRO	Ideal Practical Support from an 'Other'
PSSO	Discrepancy Practical Support from an 'Other'

APPENDIX 26

Correlations between Measures using Transformed Data

Pearson product moment correlation between the EDS, DASS depression, DASS anxiety and DASS stress scales using transformed data. The data were transformed using Naperian logs plus one: $\ln(x) + 1$.

r(*N*)		EDS	DASS Depression	DASS Anxiety	DASS Stress
EDS	r	-	-	-	-
DASS Depression	r	.702** (301)	-	-	-
DASS Anxiety	r	.572** (301)	.542** (302)	-	-
DASS Stress	r	.693** (301)	.617** (302)	.535** (302)	-

Note ** p<.01; N for each correlation in parentheses

APPENDIX 27

Desired Support Options for the Total Sample

'If you wanted support with emotional issues (such as low mood or anxiety) during your pregnancy, which of the following would you consider?'

	% of Total Sample (*N*=301)
Midwife	81.1
GP	53.5
Health Visitor	39.2
Self-help Reading	33.6
1-1 Therapy	25.3
Self-help Internet	24.9
Social Support Group	21.6
Therapy Group	14.0
Telephone Advice	13.3
Self-help CD Rom	9.0
Medication	5