

**PREDICTING MATERNAL MENTAL HEALTH  
AND  
PRE-SCHOOL CHILD DEVELOPMENT  
IN A  
HIGH RISK FIRST PREGNANCY COHORT  
THAT INCLUDES A  
NESTED PREVENTATIVE RCT**

**A thesis submitted in partial fulfilment of  
the requirements for the degree of  
Doctor of Philosophy**

**by**

**Lisa Marie Kerr BSc (Leicester), PGCE (Cardiff)**



**School of Psychology**

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## ABSTRACT

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### **Predicting maternal mental health and pre-school child development in a high risk first pregnancy cohort that includes a nested preventative RCT**

*Lisa M Kerr, University of Leicester, 2005*

This thesis is concerned with a 3½ year follow-up of mothers (n = 114) and their first born children (n = 116, including 2 sets of twins). When pregnant with these children, the mothers participated in a randomised controlled trial (RCT) of a psychosocial intervention known as Preparing for Parenthood (PFP), which was designed to prevent maternal depression. This follow-up is the latest of seven main stages of the PFP research programme: (1) women were screened for sub-clinical depression (n = 1300), those who screened positive were thereby, identified as at high risk of maternal depression (n = 400) and; (2) underwent baseline assessments (n = 292); (3) the women were randomised (n = 209) to continue standard antenatal care or, in addition, receive the intervention; (4) the PFP intervention was held; (5) to evaluate the effectiveness of the intervention, randomised women were followed-up at 3 months after childbirth (n = 190); (6) also, at 12 months after childbirth (n = 180), at which point, their first born children were followed-up (n = 182, including 2 sets of twins). In this seventh stage of the research programme, using in-depth maternal health-related and child development assessments used at baseline and/or the previous follow-ups, the aims were to: (1) evaluate the long-term effectiveness of the intervention, testing the hypotheses that the intervention will determine maternal mental health and child development, as well as positively influence maternal social support and personal problem solving; (2) test the hypothesis that antenatal depression will be a substantial predictor of maternal depression. The results refuted the hypotheses. It was concluded that the intervention did not determine maternal mental health and child development, or positively influence maternal social support and personal problem solving, which are consistent with conclusions drawn at the 3 and/or 12 month follow-ups. It was also concluded that antenatal depression was not a substantial predictor of maternal depression at 3½ years after childbirth.

## **LENGTH OF THESIS**

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This thesis is approximately 30000 words. In accordance with the regulations of the University of Leicester, for the degree of Doctor of Philosophy, in the Faculty of Medicine and Biological Sciences, the word count excludes the following:

1. All pages preceding chapter I, except the Abstract.
2. Tabulated and graphical data in chapter III.
3. Appendix sections.
4. Reference section.

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## DEDICATION

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*I dedicate this doctoral thesis to  
someone very special to me,  
Professor M Kerr,  
in recognition, and in honour,  
of his strength, perseverance and courage  
with which he has fought tirelessly to be here today.*

## QUOTATION I

---

In that day I will make a covenant for them  
with the beasts of the field and the birds of the air  
and the creatures that move along the ground.  
Bow and sword and battle I will abolish from the land,  
so that all may lie down in safety.

Hosea 2:18

## QUOTATION II

---

Two roads diverged in a wood,  
And I took the one less travelled by,  
And that has made all the difference.

Robert Frost

## ACKNOWLEDGEMENTS

---

*I would like to convey much thanks to those who have made this thesis possible. Firstly, my supervisor, Professor Andrew M Colman, who has provided unswerving support every step of the way and in doing so, has helped me to fulfil a life ambition – to gain a PhD. Secondly, the 230 women and children who gave their time and help to participate in this research.*

*I would also like to convey much thanks to my family, in particular, my husband, Dr Andrew C Kerr, a geochemist who is certainly the great rock in my life; Professor M Kerr, and Alan and Sandra Kerr, who are in my thoughts everyday; my parents for years of support; and my family of animals who have given me many years of happiness in their own unique and special ways.*

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# CHAPTER I

---

## INTRODUCTION

### 1.1 OVERVIEW

This thesis is concerned with a 3½ year follow-up of mothers and their first born children. When pregnant with these children, the mothers participated in a randomised controlled trial (RCT) of a psychosocial intervention known as Preparing for Parenthood (PFP), which was designed to prevent maternal depression (Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley, 2000; Wheatley et al., 2000; 2003). This is the third follow-up of the mothers and the second of the children to evaluate the effectiveness of the intervention. The mothers were first followed-up at 3 months postnatally (Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley, 2000; Wheatley et al., 2000; 2003), then at 12 months postnatally, at which point the children were followed-up (Brugha et al., 1999c).

This chapter begins with a discussion of postpartum psychiatric disorders. It then focuses on maternal depression in relation to child development and behaviour, and psychosocial factors. It continues with a discussion of treating and preventing maternal depression. Detailed information follows on the history of the PFP programme of research. The rationale for this thesis is then provided, followed by the aims of the thesis and finally, the hypotheses tested.

### 1.2 POSTPARTUM PSYCHIATRIC DISORDERS

It is generally accepted that there are three disorders covering the spectrum of postpartum psychiatric disorders (Hamilton, 1989; Glover et al., 1994). These disorders are, in order of ascending severity, the blues, maternal depression (also known as postnatal depression or postpartum depression) and puerperal psychosis (Cutrona, 1982; Snaith, 1983; Hopkins et al., 1984; Kendell, 1985; Murray & Gallahue, 1987; Gitlin & Pasnau, 1989). Each of these disorders is described below.

### **1.2.1 The blues**

The symptoms of this disorder include changes of mood, dysphoria, anxiety, tension, crying, impaired concentration, forgetfulness, confusion, insomnia, irritability and loss of appetite (O'Hara et al., 1991b). The symptoms are mild, usually present within 10 days of giving birth and are transient, lasting only a few hours or days (Yalom et al., 1968; Pitt, 1973; Dalton, 1980; Knight & Thirkettle, 1986; O'Hara, 1987; O'Hara et al., 1991b).

The blues seem to be specific to giving birth, rather than simply a non-specific reaction to a large stressor (Kendell et al., 1984; Iles et al., 1989). Huge hormonal changes occur after giving birth, and the blues has been explained as representing an adjustment of hormones (Stein, 1982).

The criteria for the blues ranges from one symptom, namely crying, for five minutes or more, to a number of the aforementioned symptoms (O'Hara et al., 1991b). The blues does not necessarily require medical attention, but rather, understanding (Ketai & Brandwin, 1979).

Estimates of the prevalence of the blues have varied considerably depending on the particular diagnostic criteria applied. The estimates have ranged from 26-85% (Robin, 1962; Yalom et al., 1968; Pitt, 1973; Handley et al., 1980; Harris, 1980; Stein et al., 1981; O'Hara et al., 1990; Robertson et al., 2004).

Distinctions between the blues and maternal depression can be made on the basis of the frequency and severity of symptoms, in addition to the course of the disorder. An indication of susceptibility to maternal depression is protracted or severe blues (Paykel et al., 1980; Kendell et al., 1981; Morsbach & Gordon, 1984; Hapgood et al., 1988).

### **1.2.2 Maternal depression**

The symptoms of maternal depression include depressed mood, self-depreciation, feeling a failure, ineffectual and ashamed of the depression, as well as feeling guilty and worthless over not fulfilling self-expectations (Chalmers & Chalmers, 1986;

Raphael-Leff, 1991). Symptoms also include anxiety over the welfare of the child, fears of causing physical or psychological harm to, or being harmed by, the child; in addition to fears of being judged and criticised by other people (Raphael-Leff, 1991). Other symptoms that are usually related to maternal depression include appetite and weight loss, sleep problems, premature waking, physical exhaustion and irritability (Caltabiano & Slomka, 1995; Caltabiano & Caltabiano, 1996). Overall though, epidemiological and clinical work has consistently shown that maternal depression does not differ significantly from affective conditions experienced by women at other, non-postpartum periods (Kumar & Robson, 1984; O'Hara et al., 1991a; Cox et al., 1993).

It is generally accepted that the onset of maternal depression is any point from a week after childbirth. It lasts for a minimum of 14 days (McIntosh, 1993), but usually lasts for much longer than this period and in many cases, is chronic. Examples of how long maternal depression can last for after childbirth are 5 months (Oakley & Chamberlain, 1981), a year (Pitt, 1968), longer than a year (Nott, 1987), 2 years (Campbell et al., 1992) and 6 years (Kumar & Robson, 1984; Coleman et al., 1986).

It has been argued that maternal depression is a reproductive syndrome. However, the validity of this argument has been questioned, because it has been consistently shown that the disorder is not caused by birth-specific factors (Ussher, 1992). It has also been argued that maternal depression can be caused by psychological and social factors (Cox et al., 1993; Cooper & Murray, 1995). Arguments of this nature are very pertinent to this thesis, and will be discussed later.

If maternal depression goes untreated for a prolonged period, there is an increased chance that it will become chronic. It is recommended that early treatment be encouraged, which not only requires maternal depression to be identified early, but also pregnant women and all their health care professionals to be fully informed of the symptoms of the disorder (England et al., 1994).

Maternal depression can have serious consequences for the mother and her family. Examples are that it can give rise to marital discord, which, if unresolved, can lead to divorce. The disorder can also have a fundamental, long-lasting, detrimental affect on

the mother's self-esteem, principally, her confidence in herself to be a good mother. Also, maternal depression, experienced over a long period, can cause permanent regret, as the mother feels it resulted in her missing out on her child's life for the duration of the disorder. Additionally, maternal depression can adversely affect child development and behaviour (Elliott, 1989), which is particularly relevant to this thesis, and will be discussed later.

The prevalence rate of maternal depression is 10-15% (O'Hara & Swain, 1996; Beck & Gamble, 2001; Robertson et al., 2004). It has been reported to be most prevalent during the autumn as opposed to any other season (Ballard et al., 1993).

### ***1.2.3 Puerperal psychosis***

The symptoms experienced by approximately half of mothers with this disorder are severe depression, morbid anxiety, delusional guilt, hopelessness and impulsive thoughts of infanticide or suicide that are seldom put into action. Puerperal psychosis, for the remaining half of mothers, is manic, schizophrenic or schizoaffective in form (Stewart, 1989).

In all cases, puerperal psychosis is acute, and involves a preoccupation with the child. The symptoms of the disorder usually revolve around the relationship the mother has with her child. Her interactions can range from over stimulation in an agitated form, to depressive void of emotion, or inattentiveness towards her child. She might automatically keep providing childcare, or neglect it, or compulsive rituals may affect it. She may see her child symbolically. An example is that she may be convinced her child is either damaged or dead, and refuse to provide care (Hurt & Ray, 1985).

The symptoms of puerperal psychosis are severe and typically present within 2 weeks of giving birth (Brockington et al., 1981; 1982; McNeil, 1986; Harding, 1989). The cause of this disorder is thought to be the hormonal changes after birth (Brockington et al., 1988).

Recovery from puerperal psychosis can be complete, provided treatment is prompt. The mother and child are typically admitted to hospital, which provides her with the

opportunity to care, under supervision, for her child throughout treatment; as well as restore and retain a healthy bond with her child. Her treatment can comprise antidepressants, neuroleptic medication, electro convulsive therapy, counselling, one-to-one psychotherapy and/or family therapy. When the psychosis has subsided, psychotherapy can help the mother to make sense of her disorder. Also, in the aftermath of the disorder, psychotherapy can support the mother as she adapts to home life with her child (Brockington et al., 1982; Dean et al., 1989).

Puerperal psychosis has a relapse rate of 30-50%. The mother is therefore, advised that there should be a minimum of a 2 year interval before a subsequent pregnancy. It is recommended, for the same reason, that the mother be closely monitored during future pregnancies. If she does give birth again, prophylactic treatment, combined with lithium carbonate, can be given straight after birth, provided she does not breast feed (Stewart et al., 1991).

With regard to the number of mothers who experience puerperal psychosis, there are only 1 or 2 in every 1000 (Normand, 1972; Herzog & Detre, 1976; Kendell et al., 1987; Brockington, 1992; Robertson et al., 2004).

#### ***1.2.4 Choice of maternal depression as a research target***

It is clear from the above descriptions of the blues, maternal depression and puerperal psychosis, that maternal depression is a serious disorder, more so than the blues, but less so than puerperal psychosis. Maternal depression was decided upon as a target for research on the basis of its relative high prevalence, the length of time it can last for, and the serious consequences it can have for the mother and her family. Although puerperal psychosis is a more serious disorder than maternal depression, it was excluded from the PFP programme of research due to its relative infrequency, and chiefly, its severity and the attendant ethical problems of investigation (Brugha et al., 1998b; 2000; Wheatley et al., 2000).

### **1.3 MATERNAL DEPRESSION, & CHILD DEVELOPMENT & BEHAVIOUR**

Maternal health problems have been examined in relation to child development and behaviour problems. Also, interventions designed to reduce or prevent these child problems have been implemented and evaluated. A literature review now follows.

A relationship between maternal depression, and deficits in child behaviour and development has been consistently documented (Hagen, 1999). For example, in one study, maternal depression was found to be related to child behavioural problems and poor social development. Also, sons of mothers who were the most depressed tended to have more behavioural problems and poorer social development than daughters of these mothers. It was suggested that the behaviour of the sons could have been aversive for these depressed mothers, and it thus, increased the probability of the mothers responding to, and reinforcing, behavioural problems (Gross et al., 1995).

Also, in an investigation of maternal depression in relation to child development, children of depressed and non-depressed mothers were assessed on their developmental skills. The children of the depressed mothers were found to have poorer development than the children of the non-depressed mothers, particularly when they were 2 and 3 years of age. Two possible accounts for these findings were offered. Firstly, depressed mothers tend to provide less stimulation and opportunities for their children to explore than non-depressed mothers, which can be to the detriment of child development. Secondly, maternal depression may have had a negative effect on the degree of responsiveness expressed by the children, to the person assessing their development (Lyons-Ruth et al., 1984).

Furthermore, it has been consistently documented that maternal depression can have deep-rooted, long-term effects on child development (Chen et al., 2000). For example, such effects can take the form of delayed attachment to, and responsive interaction with, mothers, as well as enduring cognitive and behavioural problems (Elliott, 1989).

Additionally, in a longitudinal study, maternal depression was found to have detrimental effects on child behaviour and development during the first 4 years of life. Children of mothers who experienced maternal depression were found to have deficits in their early social and cognitive development. These children also had behavioural

problems and deficits in their cognitive development at 4 years of age. Longitudinal analyses have shown that maternal depression can impair early mother-child interaction, which can have the aforementioned detrimental, long lasting effects on children. There is also evidence that cognitive development, in particular, has a critical developmental stage, but the exact parameters are unknown (Murray & Cooper, 1996).

Research has shown that interventions can have positive effects on child development and behaviour in the long-term. For example, 2 year old children who were failing to thrive in their home environment due to maternal negative affect and/or economic deprivation, were randomised to receive an intervention designed to reduce or prevent adverse child development and behaviour outcomes. The long-term effectiveness of the intervention was evaluated over a year after it had finished, when the children were 4 years of age.

The intervention was found to have positive effects on the motor development of all the children, and on the cognitive development and behaviour of children whose mothers were experiencing low levels of maternal negative affect. However, the intervention was evaluated immediately after it had finished, and no positive effects were found. It was pointed out that these findings emphasise the importance of evaluating the long-term effectiveness of interventions (Hutcheson et al., 1997).

Finally, it is apparent from the above that maternal depression can result in child development and behaviour problems, which can be long-lasting. Therefore, it is possible that the well-being of mothers is embodied in the development and behaviour of their children. This possibility gives rise to the argument that if interventions are effective in preventing maternal depression, they may also prevent child problems. Indeed, this is an argument that has been repeatedly put forward over the past few years (e.g. Ranjso-Arvidson et al., 1998; Cooper et al., 2002; Heh & Fu, 2003). It is important then, that child outcome forms part of evaluations of the effectiveness of these interventions. This importance has been repeatedly stressed (e.g. Ranjso-Arvidson et al., 1998; Cooper et al., 2002). Also, as pointed out by Hutcheston et al. (1997), it is important to evaluate the long-term effectiveness of interventions on child outcomes, even if it is found that the interventions are not effective on first evaluation,

because it does not necessarily follow that no positive effects found initially, means that no positive effects will be found in the long-term.

#### **1.4 MATERNAL DEPRESSION & PSYCHOSOCIAL FACTORS**

Examples of psychosocial factors (i.e. psychological and social factors) are social support (Holden, 1994; Brugha et al., 1998a), adversity (Brugha, 1995a) and personal problem solving (Wilson et al., 1996).

Psychosocial factors are generally considered to have important implications for maternal depression. Some of these factors, such as poor social support (Brugha et al., 1998a) and adversity (Brugha, 1995a) can cause and/or exacerbate this disorder. However, other psychosocial factors, such as good social support (Holden, 1994) and good personal problem solving approach (Wilson et al., 1996) can protect against or reduce the disorder.

There are three psychosocial factors pertinent to this thesis. These factors are depression preceding maternal depression, social support and personal problem solving. Each of these factors is discussed below.

##### ***1.4.1 Depression preceding maternal depression***

A major risk of maternal depression is preceding depression, either during pregnancy or soon afterwards (Brugha et al., 1998b; 1999c). Indeed, it has been consistently shown that maternal depression can be predicted by depression antenatally or in early postpartum. A review of the literature is provided below.

In order to indicate who is at greater risk than others of maternal depression, a screening instrument was introduced, known as the Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987). This instrument was not designed to identify maternal depression, but since its introduction, there have been reports that maternal depression has been increasingly identified (Affonso et al., 2000), which has been thought to be due to the possibility that it has the capacity to measure the disorder more accurately

than a health visitor can (Leverton & Elliott, 2000). The EPDS (Cox et al., 1987) has been validated for use during and after pregnancy (Pajulo et al., 2001).

In a study to predict maternal depression, Leverton & Elliott (2000) used the EPDS (Cox et al., 1987) and a health visitors' report at 6 weeks postpartum. Depression experienced at this period was found to be a predictor of maternal depression experienced within 2 months postpartum. However, the health visitors' report was found to be a more accurate method of prediction than the EPDS (Cox et al., 1987).

Yamashita et al. (2000) also used the EPDS (Cox et al., 1987) to predict maternal depression, but much earlier than Leverton & Elliott (2000) did, at 5 days postpartum. They found that the EPDS (Cox et al., 1987) predicted the onset of early maternal depression and thus, concluded that it can be a useful screening tool for early onset of this disorder. However, whilst it is acknowledged that this is a fair conclusion, it should be pointed out that, according to the aforementioned results of Leverton & Elliott (2000), the performance of this tool in predicting maternal depression is limited when compared with a health visitor.

According to Appleby et al. (1994), antenatal depression, in particular, is a key risk of maternal depression. They found that women who experienced antenatal depression at 36 weeks gestation, compared to those who did not, were three times more likely to develop maternal depression at 8 weeks postpartum.

Also, Saisto et al. (2001) investigated possible antenatal predictors of maternal depression. The predictors investigated were depression, relationship with spouse or partner, personality and socioeconomic issues. They found that antenatal depression, both before 30 weeks gestation and just before childbirth, was not only a predictor of maternal depression at 2-3 months postpartum, but it was also the strongest predictor.

In summary, it is apparent from the above review that a key risk of maternal depression is previous depression, experienced either in the antenatal or early postpartum period. Therefore, preventing depression during these periods may be one way of antenatal interventions achieving an aim to prevent maternal depression. It is logical then, that evaluations of the effectiveness of such interventions investigate

whether or not depression preceding maternal depression is a predictor of maternal depression in the study samples.

#### ***1.4.2 Social support***

It has been consistently acknowledged that poor social support is a risk of maternal depression and good social support is a protector of it (Paykel et al., 1980; O'Hara, 1986; Wilson et al., 1996; Webster et al., 2000). A literature review now follows.

As many as 1 in 3 women who receive poor social support when pregnant are at risk of depression after childbirth (Forman et al., 2000). Women who are particularly at risk, are those who receive poor social support during pregnancy from their spouse or partner, mother and friends, which should be kept in mind when developing antenatal interventions designed to prevent maternal depression (Pajulo et al., 2001).

Of particular importance to this thesis (the importance will be explained later in the chapter), is a prospective study, known as the Leicester 500 Project (Brugha et al., 1998a), which was undertaken to investigate possible causes of maternal depression. As this study is particularly important, detailed information will be provided.

In the Leicester 500 Project (Brugha et al., 1998a), nulliparous pregnant women of a wide range of cultures and backgrounds were recruited from their first antenatal class at the Leicester General Hospital (LGH), and assessed both antenatally and postnatally. The assessments took place during the first trimester, soon before the birth and 3 months after the birth.

With regard to the antenatal assessments, a series of psychosocial measures were administered to 507 women at the LGH or their home. These measures concerned sociodemographic matters, health, social relationships, personality and life events. The measures included the Interview Measure of Social Relationships (IMSR; Brugha et al., 1987), the Eysenck Personality Questionnaire Neuroticism Subscale (EPQ-N; Eysenck & Eysenck, 1975) and the 30 item version of the General Health Questionnaire (GHQ-30; Goldberg, 1972).

427 of the women assessed antenatally agreed to be assessed postnatally at their home. The GHQ-30 (Goldberg, 1972) was also used for this stage of assessment, as was another health measure, the Schedules of Clinical Assessment in Neuropsychiatry (SCAN; Wing et al., 1990).

The findings of the Leicester 500 Project (Brugha et al., 1998a) were that maternal depression could be predicted antenatally. The antenatal predictors were that the women perceived their friends and close family, particularly their mother and/or spouse/partner, to neither provide enough support when they announced they were pregnant, or subsequently in their pregnancy.

It has also been shown that reductions in levels of maternal depression can be predicted by being part of, and gaining companionship from, a group of people who are similar (Cutrona, 1989). Also, good outcome can be predicted by pregnant women being able to confide in someone who has been through, and understands, their experiences. It can also be predicted by offers of social support that have not had to be sought (Brugha, 1995b).

It is apparent that support group sessions can have positive effects, over time, on social support and depression after childbirth. Women who were depressed after giving birth, and attended a series of support group sessions on effective communication, stress management, life planning and the transition to parenthood, received increased levels of social support, over the course of the sessions, which was accompanied by decreased levels of depression (Chen et al., 2000).

Theoretical explanations have been put forward for social support and its implications for depression, which could also apply to maternal depression. These explanations have been provided by the direct effect theory (Champion & Goodall, 1994), buffering theory (Cohen & Wills, 1985) and interpersonal theory (Sullivan, 1953; Kiesler, 1996).

According to the direct effect and buffering theories, social support provides protection from depression. The direct effect theory suggests that support makes any given situation easier to deal with and thus, protects against depression arising from

the situation (Champion & Goodall, 1994). The buffering theory suggests that support buffers stress and thus, protects against depression during stressful periods (Cohen & Wills, 1985).

With regard to interpersonal theory, it suggests that inadequate social support can result in depression. This theory explains that individuals continually influence, and are influenced by, others through their interactions. Thus, if people communicate their feelings and needs inadequately, they will receive inadequate support at least some, if not most, of the time. Depression can result from the inadequate support being a repeated occurrence and/or repeatedly having to cope more or less by oneself (Sullivan, 1953; Kiesler, 1996).

In summary, it is clear from this literature review that poor social support, particularly during pregnancy from friends, the spouse/partner and mother, puts women at risk of maternal depression. It is also apparent that good social support offers protection from maternal depression. Therefore, it can be argued that antenatal interventions to prevent maternal depression should direct attention to trying to increase social support, particularly from friends and close relatives. It would seem from the above review that group, rather than one-to-one, interventions would be preferable, as Cutrona (1989) pointed out, being in, and mixing with, a group of similar people can reduce maternal depression. Group interventions would provide the opportunity for pregnant women to mix with other pregnant women, who would probably have at least some, if not a number of, experiences in common; and as Brugha (1995b) stressed, openly sharing experiences can be beneficial. In view of the work of Chen et al. (2000) showing that a succession of support group sessions on effective communication, stress management, life planning and the transition to parenthood, resulted in increased social support and decreased maternal depression, it would make sense that such sessions form part of interventions. The logic of including the topic of effective communication in intervention sessions also comes from interpersonal theory stressing that failure to convey feelings and needs sufficiently will result in insufficient social support (Sullivan, 1953; Kiesler, 1996). If attempting to increase social support is used in interventions as a means of trying to prevent maternal depression, then during evaluations of the effectiveness of these interventions, it makes sense to establish if the interventions positively influenced social support; and

if poor social support was a risk, and good social support a protector, of maternal depression.

### ***1.4.3 Personal problem solving***

Considerably less attention has been devoted to personal problem solving in relation to maternal depression than the other two psychosocial factors discussed above, namely prior depression and social support. However, a poor approach to personal problem solving has been identified as a risk of maternal depression and a good personal problem solving approach a protector of it (Brugha et al., 1998b; 1999c; 2000; Wheatley et al., 2000). A literature review is provided below.

According to social problem solving theory, an overall good personal problem solving approach constitutes self-confidence in problem solving ability, addressing rather than avoiding the problem and self-control to, for example, be calm, rational and objective about the problem; as well as invest a considerable degree of effort into generating solutions, thinking the solutions through before selecting one and evaluating if the entire approach was effective in solving the problem. Conversely, an overall poor personal problem solving approach constitutes lack of self-confidence in problem solving ability, avoiding rather than addressing the problem and lack of self-control (Nezu & D’Zurilla, 1989; Nezu et al., 1989; D’Zurilla & Nezu, 1990; D’Zurilla et al., 2004).

Social problem solving theory explains that self-confidence, in particular, plays an important role in personal problem solving. One’s self-confidence will help them to try to address the problem and exert self-control, thereby, increasing the chances of solving it. The reverse applies to those who are not self-confident, that is, their lack of confidence will get in the way of them trying to address the problem and exert self-control, thereby, reducing the chances of solving it (Heppner & Krauskopf, 1987; Nezu et al., 1989; D’Zurilla et al., 2004).

It has been shown that women who adopt a poor approach to personal problem solving during pregnancy are at risk of maternal depression onset 6 months after

childbirth, whilst women who adopt a good personal problem solving approach are not (Demyttenaere et al., 1995).

A possible explanation has been put forward for personal problem solving approach during pregnancy being either a risk or protector of maternal depression. It has been explained that a poor approach throughout pregnancy decreases positive affect and increases negative affect antenatally, which in turn, increases the risk of both antenatal and maternal depression. However, the reverse applies to a good approach throughout pregnancy, that is, it increases positive affect and decreases negative affect antenatally, which in turn, decreases the risk of both antenatal and maternal depression (Elliott et al., 1996).

Additionally, social problem solving theory has explained how personal problem solving approach can be either a risk or protector of depression, which can also apply to maternal depression (Elliott et al., 1996). It explains that one can become depressed as a result of firstly, their failure to resolve problems and due to this failure, secondly, having to live with these problems. Since it is probable that a poor approach to problem solving will result in failure to resolve and thus remove the problems, this can increase the risk of depression. In comparison, as a good approach to problem solving is more likely to result in successful problem resolution, thereby removing the problems, this approach can be a protector of depression (Nezu & D’Zurilla, 1989; Chang et al., 2004). Indeed, it has also been explained that successful problem resolution is likely to boost satisfaction with life and thus psychological well-being (McFall, 1982; Heppner et al., 2004).

In view of the health implications of personal problem solving approach, such as those described above, it has been advocated that it should be a key focus of interventions designed to promote psychological well-being (Cohen, 2002), and can be easily incorporated into antenatal programmes (Elliott et al., 1996). Also, it has been pointed out that developing a good problem solving approach is imperative in the prevention of depressive disorders (Heppner et al., 1984; Nezu, 1987).

In summary, it is apparent from the above literature that personal problem solving approach, in particular, during the antenatal period, has implications for maternal

depression; with a poor approach being a risk, and a good approach a protector, of this disorder. It is also apparent that personal problem solving should form an integral part of health promoting interventions. In view of these points, it makes sense that considerable attention should be devoted to trying to develop a good personal problem solving approach during antenatal interventions to prevent maternal depression. If problem solving is used in these interventions as a way of attempting to prevent maternal depression, then arguably, during evaluations of the effectiveness of the interventions, it should be ascertained if problem solving was positively influenced; and if a poor approach was a risk of maternal depression and a good approach a protector of it.

#### ***1.4.4 Antenatal depression as a substantial predictor of maternal depression***

Antenatal depression, compared to other psychosocial factors, such as those discussed in this thesis, has been consistently identified as the strongest predictor of maternal depression (O'Hara et al., 1984; 1991a; Whiffen, 1988; Gotlib et al., 1989; 1991; Brugha et al., 1998b; 1999c; Robertson et al., 2004). Therefore, if antenatal depression as a predictor of maternal depression was to be investigated, it would be reasonable to expect that it would be a substantial predictor, even when other psychosocial factors are taken into account.

### **1.5 TREATMENT FOR MATERNAL DEPRESSION**

Maternal depression often remains untreated due to either not being diagnosed, or being mistaken by both health professionals and mothers as the norm to, for example, feel low in spirits and tired (Brugha et al., 1998b; 1999c). When treatment is prescribed, successful outcome not only requires individuals to participate in their treatment, but also motivated and very skilled health professionals to provide the treatment (Brugha, 1995b).

Maternal depression can be treated effectively with drugs, such as antidepressants and tranquillisers, as well as psychosocial methods (Brugha et al., 1998b; 1999c). Psychosocial methods of treatment are of far more relevance to this thesis than drug

treatment and will therefore, be discussed further, although reference will be made to drug treatment.

There are four main *psychosocial* treatment methods. These methods are known as cognitive-behavioural therapy (CBT), interpersonal psychotherapy (IPT), problem solving therapy (PST) and the eclectic approach. The methods are used for maternal depression, but not exclusively (Brugha et al., 1998b). Each of the methods is discussed below.

### ***1.5.1 Cognitive-behavioural therapy***

A basic tenet of CBT is that how one thinks about a situation, partly dictates how they react to that situation, both with regard to behaviour and affect (Beck, 1991). Distorted thought processes and dysfunctional beliefs are considered central to a lot of mental illnesses. During CBT, the client learns to recognise and correct these thought processes and beliefs in order to decrease distress and increase coping (Hollon, 1998).

CBT can be either a one-to-one or group treatment (Hall & Marzillier, 1992). It is provided by mental health specialists, mostly in secondary health care (Marzillier, 1992a). It is generally brief, usually lasting for a few weeks or a maximum of a few months (Marzillier, 1992b).

There are a number of variations to CBT, but the fundamental characteristic is the same (Hollon & Beck, 1994). Clients are essentially encouraged to recognise, and empirically test, their thought processes and beliefs. The testing is rather like hypotheses testing, in that scientific research has had to depend on empirical observations and controlled experiments to challenge preconceptions and prejudices; and in CBT, clients make structured observations, and behave in a manner that is incompatible with their usual thought processes and beliefs to challenge the distortions and dysfunctions central to their mental illness (Hollon, 1998).

CBT is closely connected to experimental cognitive science, which argues that clients frequently suffer as a result of their erroneous perceptions without any reasons for doing so or for preserving the perceptions, except a fear that the perceptions are true

(Hollon & Garber, 1990). For example, although poor personal problem solving approach can result in depression, this approach, and for that matter, good personal problem solving approach, often deteriorates as a result of depression. Generally, when confronted with problems, depressed clients exaggerate them, and perceive themselves as either incapable of solving them, or not worthy of the benefits should they solve them. Consequently, they do not set themselves goal directed strategies, and when they fail, they perceive the failure to be due to their inadequacies. Essentially then, they become victims of the self-fulfilling prophecy. In CBT, these clients are given encouragement to break their problems into particular parts in order to avoid feeling overwhelmed. They are then encouraged to put their negative perceptions to the test by behaving in the required manner, paying close attention to the outcome of every stage and the effect it has on their overall mood (Hollon, 1998).

In general, CBT, compared to drugs, has been reported to be at least as an efficacious treatment for depressive disorders and usually lasts longer (Hollon et al., 1991). Also, CBT has consistently been found to either be equal or superior to drug treatment with regard to removing severe distress in depressive disorders (Rush et al., 1977; Blackburn et al., 1981; Murphy et al., 1984; Hollon et al., 1992). Additionally, it has repeatedly been found that the probability of a relapse in depressive symptoms after treatment with CBT to remission is approximately half that of drug treatment (Kovacs et al., 1981; Blackburn et al., 1986; Simons et al., 1986; Evans et al., 1992).

### ***1.5.2 Interpersonal psychotherapy***

Depressed individuals frequently withdraw from their network of family and friends, and begin to feel helpless (Kiesler, 1996; Joiner et al., 1999; McCullough, 2000), which can result in perpetual social passiveness and isolation. In IPT, clients are helped to stop this cycle to enable interpersonal engagement in a manner that strengthens their connections in, and sense of belonging to, their social network. They are helped to be effective in conveying their feelings and needs to their social network (Klerman et al., 1984; Weissman et al., 2000; Ravitz, 2004).

The purposes of IPT are to relieve depression and current interpersonal problems, and help clients to gain social support (Klerman et al., 1984; Segal et al., 2001; Stuart &

Robertson, 2003). IPT can be either an individual or group treatment (Bolton et al., 2003). The therapy is delivered by mental health specialists, usually in secondary health care. It is structured and time restricted, generally comprising a one hourly session, once a week, for 12-16 weeks (Ravitz, 2004).

IPT is divided into three phases, a beginning, middle and end. In the beginning phase, to ascertain if IPT is right for the client, as well as to determine the focus of treatment, assessments are administered concerning the relationships the client has with the people in their social network. Also, an assessment is made as to whether or not IPT should be combined with drug treatment, and in some cases it is, for example, if the depression is chronic. Finally, in this phase of IPT, the purposes of the therapy are explained to the client (Klerman et al., 1984; Thase et al., 1997; Weissman et al., 2000).

With regard to the middle phase of IPT, expectations and communications in interpersonal relationships are explored, in order to foster social support, as well as improve verbal and non-verbal communication, in which displays of empathy are encouraged, as are conveying feelings and needs clearly. Depressive symptoms are connected with interpersonal experiences, which are framed into four principal domains, namely interpersonal disputes, role transitions, bereavement and interpersonal deficits (Klerman et al., 1984; Weissman et al., 2000).

Interpersonal disputes are unmet role expectations of a significant person, for instance, marital arguments, and usually accompany inadequate communication or unrealistic expectations. In IPT it often becomes apparent that the client unintentionally interacts in a manner that exacerbates these disputes, a particular example being significant omissions from conversation. In order to improve interpersonal relations, a range of methods of communicating and understanding are examined in therapy. Some clients make a decision to finish relationships, which turns the attention of therapy to role transitions (Klerman et al., 1984; Weissman et al., 2000).

Role transitions concern significant changes in the interpersonal role, which arise from life events, such as finishing a relationship, starting a new job or becoming a

parent for the first time. During IPT, both the current role and previous role are addressed. The advantages and disadvantages of the previous role are explored, as are the opportunities and challenges that come with the current role (Klerman et al., 1984; Weissman et al., 2000).

The third principal domain, bereavement, is selected in IPT if the death of a significant person, or an event associated with the death, concurs with the onset of depression. The client sometimes idealises the person they have lost. In order to gain a balanced perspective of the deceased, the positive and negative sides of the relationship the client had with that person are explored. Also, the client is encouraged to find substitutes for part of what was lost with the death, and start to move on (Klerman et al., 1984; Weissman et al., 2000).

The final principal domain, interpersonal deficits, is particularly for clients who find it hard to develop or maintain relationships (Klerman et al., 1984; Weissman et al., 2000). In general, these clients are, interpersonally, extremely sensitive (Stuart & Robertson, 2003). They do not have many interpersonal relationships, so in IPT role plays are used to help them develop social skills (Klerman et al., 1984; Weissman et al., 2000).

As discussed above, IPT is divided into a beginning, middle and end phase. In the end phase, there is a review and consolidation of what has been accomplished in IPT. Also, plans are formulated to prepare for the eventuality of depression recurring (Klerman et al., 1984; Weissman et al., 2000), which can involve monthly maintenance of IPT (Frank et al., 1990; Weissman et al., 2000; Stuart & Robertson, 2003). There is also an honest discussion concerning feelings about the therapy reaching a conclusion, as well as an open exchange of feedback. However, should IPT not have been successful in treating depression to remission, it may be either combined with another method of treatment or extended (Klerman et al., 1984; Thase et al., 1997; Weissman et al., 2000).

Empirical research has increasingly shown that IPT is an effective treatment (Weissman et al., 2000; Stuart & Robertson, 2003). Indeed, the National Institute of Mental Health Treatment of Depression Collaborative Research Programme, which is

recognised as the gold standard for research in the efficacy of psychotherapy (Ravitz, 2004), found that in the treatment of mild to moderate depression, IPT is better than a placebo, and the same as CBT and drug treatment (Elkin et al., 1989).

### ***1.5.3 Problem solving therapy***

In comparison with CBT and IPT, not as much attention has been devoted to PST, although the three treatment methods overlap.

As previously mentioned, one can become depressed as a result of firstly, their failure to resolve personal problems and owing to this failure, secondly, having to live with these problems (Nezu & D’Zurilla, 1989; Chang et al., 2004). Also, the depression can exacerbate the failure to resolve problems. PST is designed to improve problem solving, relieve existing depression and prevent any future depression. One is helped to utilise and advance their resources and skills in order to deal with, and resolve, their current problems and any future problems (Nezu et al., 1989; 2004).

PST is usually a one-to-one treatment, but it can also be a group treatment. It is brief, generally comprising approximately four to six sessions of 30 or 60 minutes each. It is also a structured treatment, in that it is divided into stages, with tangible activities or tasks in each (Marx, 1988; Nezu et al., 1989; 2004; Hegel et al., 2004).

Generally, PST begins with identifying particular personal problems, which are described objectively, explored, made clear and reduced to manageable components. It proceeds with establishing pertinent, objective and achievable goals for solving the problems. It then focuses on generating numerous, alternative solutions to the problems with brainstorming. PST continues by looking at applying guidelines in decision making, which entails a consideration of the advantages and disadvantages of decisions for all concerned, as well as a comparison of solutions. PST then focuses on selecting solutions on the basis of maximising the chances of achieving goals and minimising negative effects. The selected solutions are then addressed in terms of application, which involves identifying and undertaking the steps required to implement the solutions. Finally, the outcome of treatment is evaluated, all tasks or

activities are reviewed, progress and failure is explored and PST is reinforced (Marx, 1988; Nezu et al., 1989; 2004; Hegel et al., 2004).

Training in the provision of PST can be brief, and is not restricted to mental health professionals, it can be also be given to health professionals who have not specialised in mental health, such as physicians and nurses in general practice (Hegel et al., 2004). Indeed, PST has been reported to be an efficacious treatment for depressive disorders (Nezu et al., 1989; 2004; Mynors-Wallis et al., 1995; 2000; Barrett et al., 2001; Unutzer et al., 2002), with no difference in efficacy being found between delivery by mental health professionals and other health professionals (Mynors-Wallis et al., 1997; 2000; Unutzer et al., 2002).

It is increasingly acknowledged that PST is both acceptable to, and feasible in, primary health care (Catalan et al., 1991; Jarrett & Rush, 1994; Mynors-Wallis et al., 1995). Also, it has been argued that the provision of psychosocial treatments, such as PST, in primary health care is of particular benefit to depressed patients in this sector who do not wish to try, or fail to respond to, drug treatment, and/or do not wish to be referred for secondary health care (Kendrick, 1996; Williams et al., 1999; Hegel et al., 2004). It has also been argued that PST should not only be used as a method of treatment, but also as a method of prevention (Marx, 1988).

#### ***1.5.4 Eclectic approach***

This approach means that methods of treatment, for example, those described above, are combined in order to tailor treatment to meet individual requirements. Indeed, combining such treatments has been shown to be efficacious for maternal depression (Wisner et al., 2002). The eclectic approach has increasingly become the preferred choice amongst health care professionals (Marzillier, 1992b).

### **1.6 PREVENTION OF MATERNAL DEPRESSION**

Interventions have been designed to prevent maternal depression. Some have been successful, while others have not. This section begins with a focus on successful interventions. It then looks at similar, unsuccessful interventions. It proceeds by

looking at an intervention that was unsuccessful in the short-term, but successful in the long-term. It continues with a discussion of the PFP intervention in terms of successful interventions available to use as guidance, how it fitted these interventions and supporting literature for decisions made. The section closes with a prospective study that was also used to guide the PFP intervention. It is explained how the intervention was guided by this study. There is also reference to literature that supports decisions taken.

Interventions that have been successful in preventing maternal depression have been designed by Gordon & Gordon (1960) and Elliott et al. (1988; 2000). These interventions:

1. Were for pregnant women in a first or subsequent pregnancy, with the exception of the intervention by Elliott et al. (2000), which was only for women in their first pregnancy.
2. Were selective, in that they were available to women who were identified as at high risk of maternal depression. The only exception being Gordon & Gordon's (1960) intervention, which was available to all pregnant women, irrespective of whether or not they were at risk of maternal depression. Regarding Elliott et al's (1988; 2000) interventions, risk was identified by the women screening positive for sub-clinical depression for Elliott et al's (2000), and in addition, having unsupportive husbands or partners for Elliott et al's (1988).
3. Were randomised and controlled, except Gordon & Gordon's (1960), which was controlled, but not randomised. In all trials, women received either the intervention and standard antenatal care, or the standard antenatal care only.
4. Were psychosocial and delivered by mental health professionals, using talks, handouts, videos, open discussions, exercises and in the interventions by Elliott et al. (1988; 2000), an eclectic therapeutic approach, combining parts of the previously discussed CBT, IPT and PST.
5. Comprised structured, group sessions. Gordon & Gordon (1960) added 2 sessions to standard antenatal care. Elliott et al. (1988) had 10 sessions, 5 antenatally and 5 postnatally. Elliott et al. (2000) had 11 sessions, 5 antenatally and 6 postnatally.
6. Focused on deficiencies in, and enhancing, social support from close family and friends. Easing into life-changing transitions was also focused on, as was motherhood in terms of women's thoughts and feelings, the realities and

encouraging them to mix with other mothers to gain additional insight. Also covered were preparing for possible difficulties in the first few weeks of adapting to life with the new baby, and for the possibility of maternal depression. In the interventions by Elliott et al. (1988; 2000), an entire session was also devoted to maternal depression, which the women's husbands or partners were invited to attend, or in their absence, another close family member or friend. Also, these two interventions focused on negative and erroneous thinking, as well as coping with personal problems and developing a good approach to solving them. These interventions also encouraged the women to form and sustain supportive friendships with each other.

Elliott et al. (2000) also designed an intervention to prevent maternal depression for women in their second pregnancy. It was the same as their intervention described above for women in their first pregnancy (Elliott et al., 2000); except that an emphasis was placed on being a parent to more than one child, in particular, coping and dealing with the demands of this role, and sibling rivalry. However, this intervention was found to be unsuccessful in preventing maternal depression. Therefore, it would seem that the equivalent of what has been found to be effective for first-time mothers, will not necessarily be effective for second-time mothers.

Furthermore, Hayes et al. (2001) demonstrated that it does not necessarily follow that an intervention will be successful if it is similar to other, successful interventions. Their intervention, like those by Gordon & Gordon (1960) and Elliott et al. (1988; 2000), was designed to prevent maternal depression and was psychosocial. Also, it was available to women in their first pregnancy, who were identified as at high risk of maternal depression by screening positive for sub-clinical depression, as well as having deficiencies in social support from close family and friends. It was also randomised and controlled, and women received either the intervention and standard antenatal care, or the standard antenatal care only. Furthermore, it was delivered by mental health professionals, using talks, handouts, videos, open discussions and exercises. Additionally, it comprised a total of 8 antenatal sessions, and covered everything covered in the intervention by Gordon & Gordon (1960); but like the interventions by Elliott et al. (1988; 2000), women were also encouraged to form and sustain supportive friendships with each other. However, Hayes et al. (2001) found

that their intervention did not prevent maternal depression, nor did it have any positive effects on social support.

Nevertheless, it is important to be mindful that even if interventions do not initially appear effective, they can actually be effective in the long-term. This point has been illustrated by an intervention designed by Kirkham et al. (1988) to reduce stress in mothers of mentally retarded children. In accordance with the above five interventions, it was a group intervention, psychosocial, structured, delivered by mental health professionals; using talks, handouts, videos, open discussions, exercises and like most of these interventions, an eclectic therapeutic approach, combining parts of CBT, IPT and PST. Also, in accordance with the majority of the above five interventions, it was randomised and controlled. In this intervention, the mothers were trained in life skills to promote health and self-esteem, improve coping strategies, personal problem solving and effective communication, as well as establish social support systems. Kirkham (1993) evaluated the long-term effectiveness of this intervention, and found that over a 2 year period, the intervention reduced depressive symptoms and had additional health benefits. These type of effects were not evident shortly after the intervention had reached its conclusion.

At the time of planning the PFP intervention, the aforementioned interventions by Gordon & Gordon (1960), Elliott et al. (1988) and Kirkham et al. (1988) were the only effective interventions available to use as guidance. Therefore, the PFP intervention drew from all three of these interventions (Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley et al., 2000).

The PFP intervention was the same as the interventions by Gordon & Gordon (1960) and Elliott et al. (1988); except that firstly, unlike these interventions, it was for nulliparous pregnant women, who were not responsible for step-children on a full-time basis, which was because Elliott et al. encountered difficulties engaging women who had childcare commitments. Secondly, also unlike these interventions, it was available to women who were identified as at high risk of maternal depression by screening positive for sub-clinical depression only. Thirdly, unlike Gordon & Gordon's intervention, it was randomised and controlled. Fourthly, also unlike Gordon & Gordon's intervention, the eclectic therapeutic approach used in Elliott et

al's intervention was used. Fifthly, it was considerably longer than the intervention by Gordon & Gordon, but due to resource constraints, it was shorter than the intervention by Elliott et al., and there was only 1 postnatal session, compared to Elliott et al's 5 postnatal sessions. Lastly, unlike Gordon & Gordon's intervention, it covered the same as Elliott et al's intervention; except that there was a session open to the women's husbands or partners, or in their absence, another close relative or friend, which, unlike Elliott et al's, did not focus solely on maternal depression. Instead, it also focused on potential difficulties in the first few weeks of life with a new baby, as well as developing a good personal problem solving approach; which was because it was felt that it would be helpful if the relatives or friends were also encouraged to give thought to these topics. Also, unlike Elliott et al's intervention, the PFP intervention covered the additional topics covered in Kirkham et al's (1988) intervention, namely self-esteem and effective communication.

With regard to the intervention by Kirkham et al. (1988), the PFP intervention was the same in that it was a group intervention, randomised and controlled, psychosocial, structured, delivered by mental health professionals, using the same methods, and included the same topics. However, as mentioned earlier, the PFP intervention was designed to prevent maternal depression, and was available to nulliparous pregnant women, free from full-time childcare responsibilities; whereas Kirkham et al's was designed to reduce stress in women who were already a mother, with the responsibilities of a special needs child. Also, as indicated by its name, the emphasis of the PFP intervention was preparing women for becoming a parent, and not necessarily to a child with special needs; whereas the emphasis of Kirkham et al's was on equipping the women to cope with being a parent to a special needs child.

The decision that, for the PFP intervention, the women would be identified as at high risk of maternal depression by screening positive for sub-clinical depression is supported by the intervention for women in their first pregnancy of Elliott et al's (2000), who as shown above, also took the same decision.

There is also support for the decision that the PFP intervention would be a group, rather than one-to-one intervention. In addition to being supported by the interventions the PFP intervention drew from, as well as the group intervention for

women in their first pregnancy by Elliott et al. (2000), it was mentioned previously (in summary of section 1.4.2), that group, as opposed to one-to-one interventions seem to be the preferable option for two reasons. Firstly, Cutrona (1989) emphasised that being in, and mixing with, a group of similar people can reduce maternal depression. Secondly, group interventions enable pregnant women to mix with other pregnant women, who would probably have at least some, if not a number of, experiences in common; and Brugha (1995b) pointed out, openly sharing experiences can be beneficial.

Furthermore, the decision that the PFP intervention would cover topics covered in the interventions it drew from is supported by Elliott et al's (2000) intervention for women in their first pregnancy, which, as indicated above, also covered most of the same topics. The decision is also supported by others; because as mentioned earlier (in section 1.4.2), a succession of support group sessions on effective communication, stress management, life planning and the transition to parenthood, resulted in increased social support and decreased maternal depression (Chen et al., 2000). Also, in the same section, it was mentioned that interpersonal theory provides the logic for the inclusion of the topic of effective communication, in terms of stressing that failure to convey feelings and needs sufficiently will result in insufficient social support (Sullivan, 1953; Kiesler, 1996). Furthermore, support for focusing on developing a good personal problem solving approach can be found earlier in this chapter (in section 1.4.3), where it was shown that personal problem solving approach in the antenatal period has implications for maternal depression; with a poor approach being a risk, and a good approach a protector, of this disorder (Demyttenaere et al., 1995; Elliott et al., 1996). Additionally, in the same section, it was mentioned that given such health implications of personal problem solving approach, it should form an integral part of interventions to promote psychological well-being (Cohen, 2002); and it was emphasised that developing a good approach is imperative in the prevention of depressive disorders (Heppner et al., 1984; Nezu, 1987).

In addition to drawing from the interventions by Gordon & Gordon (1960), Elliott et al. (1988) and Kirkham et al. (1988), the PFP intervention also drew from Brugha et al's (1998a) aforementioned Leicester 500 Project (Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley et al., 2000). As previously mentioned (in

section 1.4.2), this prospective study found that deficiencies in social support from friends and close family, particularly spouses or partners and/or mothers, were antenatal predictors of maternal depression. Therefore, it was decided to integrate the topic of social support into every session of the PFP intervention, with a view to trying to increase support to the women from their friends and close relatives, particularly their husband or partner and mother, and thereby, trying to prevent maternal depression (Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley et al., 2000). This method of prevention accords with the argument made earlier (in summary of section 1.4.2), that is, antenatal interventions to prevent maternal depression should, as a means of trying to prevent this disorder, try to increase social support, particularly from friends and close relatives.

Detailed information about the PFP intervention is provided below, in the next section of this chapter.

## **1.7 HISTORY OF THE PFP RESEARCH PROGRAMME**

As previously mentioned in this chapter, this thesis is concerned with a 3½ year follow-up of the mothers who participated in the RCT of the PFP intervention, and their first born children. This follow-up is the latest of seven main stages of the PFP programme of research. The preceding six main stages (Brugha et al., 1998b; 1999c; 2000; Wheatley & Brugha, 1999; Wheatley, 2000; Wheatley et al., 2000; 2003) were, in order of occurrence, as follows:

1. Screening for antenatal sub-clinical depression.
2. Baseline assessments of antenatal psychosocial and physical health matters.
3. Randomisation antenatally to either the intervention or control group.
4. PFP antenatal intervention.
5. Follow-up of the women at 3 months postnatally.
6. Follow-up of the women and their first born children at 12 months postnatally.

Each of these six stages is discussed in a series of sections below. In order to avoid repetition of references, whenever possible, the references are cited either towards the end, or at the end, of each section.

### **1.7.1 Screening**

Selection for the PFP intervention involved screening 1300 consenting women for sub-clinical depression at the LGH, when they were beginning standard antenatal care at between 12 and 20 weeks gestation.

In order to be eligible for screening, each woman was required to meet the following criteria:

1. Be at least 16 years old.
2. In a first pregnancy that she planned to continue with to full term.
3. Not responsible for step-children on a full-time basis.
4. Living within a reasonable travelling distance of the LGH, with no plans to move away from the area for at least 3 months after childbirth.
5. Capable of understanding and completing questionnaires in English, without assistance.

A measure was used for screening, which addressed the women's health. This measure was the 30 item version of the General Health Questionnaire (GHQ-30; Goldberg, 1972), which is described in the next chapter.

In total, 400 of the 1300 women screened positive for sub-clinical depression, and were thereby, identified as at high risk of maternal depression.

(Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley et al., 2000; 2003).

### **1.7.2 Baseline assessments**

Of the 400 women who were identified as at high risk of maternal depression, 292 agreed to a home visit at between 20 and 24 weeks gestation to undergo a series of baseline assessments.

The measures used concerned psychosocial and physical health matters, and comprised the following, which are described in the next chapter:

1. Pre-consent (Wheatley, 1998).
2. 30 item version of the General Health Questionnaire (GHQ-30; Goldberg, 1972).

3. Leicester Housing Schedule (Wheatley, 1998).
4. Service Contact (devised from work undertaken by the Office of National Statistics; ONS; Meltzer et al., 1995).
5. Interview Measure of Social Relationships (IMSR; Brugha et al., 1987).
6. Obstetric and General Life Events (based on life event scales; Barnett et al., 1983; and threatening life events; Brugha et al., 1985).
7. Fetal Health Locus of Control Scale (Labs & Wurtele, 1986).
8. General Difficulties (devised from work undertaken by the ONS; Meltzer et al., 1995).
9. Problem Solving Inventory (Heppner & Petersen, 1982).
10. Antenatal Social Support (based on a screening tool designed by Brugha et al., 1998a).
11. Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987).

During the assessments, it became apparent that 11 of the women who were thought to have met the aforementioned eligibility criteria for screening, actually failed to meet this criteria. Of these 11 women, 2 already had one child, 1 was responsible for step-children on a full-time basis and 8 had a very poor command of English. Therefore, all 11 women were excluded from the PFP programme of research.

(Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley et al., 2000; 2003).

### **1.7.3 Randomisation**

Following the baseline assessments, the women who wished to have the opportunity to receive the PFP intervention were allocated to either an intervention or control group. Allocation was by computerised, stratified randomisation, using a computer programme (Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley et al., 2000; 2003), known as Minimisation (MINIM), which is specifically designed to randomise participants to treatment groups in clinical trials (Evans et al., 1990).

A total of 209 women wished to be randomised, of whom 103 were allocated to the intervention group, and 106 to the control group. The intervention group received standard antenatal care, in addition to the intervention. The control group received

standard antenatal care only (Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley et al., 2000; 2003).

#### **1.7.4 PFP intervention**

The intervention was held at the LGH. It was delivered by one male and two female course leaders, who were experienced mental health professionals, trained in psychiatric nursing and occupational therapy. The male and one of the female course leaders were parents. The course leaders delivered the intervention using talks, handouts, videos, open discussions, exercises and an eclectic therapeutic approach, combining parts of CBT, IPT and PST. They were supervised by an experienced clinical psychologist and two experienced occupational therapists. Regular weekly meetings were held between the supervisors and course leaders to ensure correct delivery of the intervention, as well as to discuss any actual and anticipated problems.

The intervention began with an introductory session, of 30 minutes duration, when the women were approximately 28 weeks pregnant. It continued with the following six, structured, antenatal sessions, each of two hours duration, which were held on a weekly basis:

Session I: Becoming a mother - what does it mean for me?

Session II: Ways of coping.

Session III: Life with a new baby.

Session IV: Social support.

Session V: Putting changes into action.

Session VI: Coming to an end & facing a new beginning.

The intervention concluded with a reunion session, of 60 minutes duration, at approximately 8 weeks after childbirth. All sessions were delivered by the two female course leaders, with the exception of session III, which was delivered by the male and female course leaders. The intervention sessions were run every 2-3 months, over the course of 18 months, to enable the women to attend in small groups of 10-15.

(Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley, 2000; Wheatley et al., 2000; 2003).

Detailed information about each session now follows.

#### ***1.7.4.1 Introductory session***

The purposes of the session were to enable the course leaders to:

1. Introduce themselves, welcome the women and introduce the content of the intervention.
2. Emphasise positive aspects of childbirth and motherhood.
3. Provide advice on possible risks of depression and obtaining early, effective treatment.
4. Emphasise that support and understanding from friends and close family, particularly husbands/partners and mothers is very important.
5. Gather information on any social support deficits in relation to the women's friends and close family, particularly their husband/partner and mother.

Should a woman fail to attend this session, she was telephoned the following day to establish if she was alright and had any transportation problems getting to the LGH. The woman was also reassured that she would be welcome to attend another introductory session.

(Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley et al., 2000; 2003).

#### ***1.7.4.2 Session I: Becoming a mother - what does it mean for me?***

The session began with seeking the women's views on their images of motherhood and how these images may have affected them. The women were encouraged to protect themselves from unhelpful aspects of such images by exploring more about the realities of motherhood through spending time with, and talking to, other mothers.

The session continued with an exercise in which the women noted down what being a mother meant to them. The women were asked to draw up a list of all the positive and

negative aspects of being a mother. They were also encouraged to think how some of the negative aspects that they had listed might be positive aspects for other women and vice versa. It was emphasised that being a mother held different meanings for different people, with the balance of positive to negative aspects differing considerably. Women who only saw predominantly either positive or negative aspects were then asked to write down some points that would help balance their profile. It was stressed that these positive and negative aspects were only predictions about what might happen, not certainties.

The women were then introduced to the concept of life-changing transitions. It was briefly stressed that they were going through major changes in their lives that could be exciting and interesting, in addition to unsettling and unnerving. Handouts were given on life-changing transitions during pregnancy, which reviewed ways of easing transitions, focussing on:

1. Keeping the number of changes to a minimum.
2. Being prepared for changes.
3. Approaching change positively.
4. Allowing time to adjust.
5. Getting social support from friends and close family, particularly husbands/partners and mothers.
6. Taking care of physical and emotional wellbeing.

The session continued with a focus on cognitions (i.e. ways of thinking). It was explained that negative ways of thinking about ourselves and the world can adversely affect our feelings and thereby, our emotional wellbeing. The concept of erroneous ways of thinking (i.e. distortions or errors in the way we think) was explained. Common erroneous ways of thinking were covered, such as catastrophising, over-generalisation, jumping to conclusions, selective thinking and all or nothing thinking.

The women were then presented with possible methods of altering ways of thinking. These methods included identifying and challenging automatic thoughts, focusing on the positive as well as the negative and re-framing (i.e. thinking of difficulties as possible opportunities, not as problems).

The concept of self-talk was then introduced. It was emphasised that helpful, encouraging self-talk is a simple, yet effective, way of taking care of oneself emotionally. An exercise was given to encourage the women to address some of the unhelpful ways in which they might have been thinking about their pregnancies.

Finally, the session was summarised and the women were given a self-help exercise to complete in their own time. The purpose of this exercise was to enable the women to build on what they had learned during the session. The exercise required the women to note down examples of erroneous ways of thinking in their everyday lives, and encouraged them to try to change this thinking using methods covered in the session.

(Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley et al., 2000; 2003).

#### ***1.7.4.3 Session II: Ways of coping***

This session commenced with a review of the self-help exercise on erroneous ways of thinking given at the close of session I.

The session continued by addressing coping styles (i.e. ways of coping with particular personal problems). It was stressed that there are no right or wrong ways of coping with problems, but rather that we need to be aware of our own styles, and their strengths and weaknesses. It was also pointed out that if we are aware of other coping styles, then we can learn from them. An exercise followed in which the women were asked to try to identify their own, usual coping styles.

The session proceeded by asking the women to think about the advantages and disadvantages of different coping styles. It was then stressed that there are two coping styles that are particularly passive, and do little for one's self-esteem and confidence, namely avoidance (i.e. avoiding the problem) and wishful thinking (i.e. convincing oneself that the problem does not exist). It was also stressed that it is useful to be able to call on a wide range of coping styles, such as seeking support from friends and close family, particularly husbands/partners and mothers, for both the problem and one's own feelings.

In the next part of the session, personal problem solving was addressed. The point was made that developing a good problem solving approach is very helpful to coping with, and resolving, everyday problems. In order to help the women develop this approach, the following five principles of personal problem solving were presented and illustrated with several examples, some of which, were supplied by the women themselves:

1. Formulate a clear statement of what the problem is, in a way that does not imply a solution.
2. Generate creative solution options, without criticising possible options.
3. Decide on the best option by assessing the probable short and long term effects on all concerned, as well as the amount of effort that is required.
4. Enact the steps required to implement the chosen option.
5. Give self-praise for applying these problem solving principles. Evaluate the principles in terms of effectiveness in solving the problem. If a successful outcome was achieved, give self-praise. Note and adjust any principles that did not work in preparation for future problems.

The session concluded with a summary of the session and a self-help exercise for the women to complete in their own time. This exercise required the women to:

1. Explain the five principles of personal problem solving to their husband/partner or in their absence, another close relative or friend.
2. Apply these principles to a current problem.

(Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley et al., 2000; 2003).

#### ***1.7.4.4 Session III: Life with a new baby***

The husbands/partners of the women were invited to attend this session. If the husbands/partners were unavailable, another close relative or friend was invited in their place.

As mentioned previously, this session was delivered by the male course leader, in addition to the two female course leaders. The role of the male course leader was to:

1. Identify with the women's husbands/partners.
2. Encourage them to take an active role in the session.
3. Enable them to express any concerns they might be having about, for example, how to help during and after the pregnancy.
4. Show, by example, how he (i.e. the male course leader) and the female course leaders work together in a way that enables them to help each other out, add their own perspectives, experiences and skills, and be respectful of each other's contributions.

The session began by introducing the male course leader and welcoming the women's husbands/partners/other relatives/friends. It was briefly explained that these people had been invited to this session, because pregnancy affects the mother-to-be as well as her relatives and friends, and being prepared for potential problems can result in less strain and stress. It was also explained that this session is an opportunity to stop and reflect, share common concerns and prepare for what lies ahead.

A video was then shown about bringing the baby home, which covered the following themes:

1. Anxiety on arriving home.
2. Emotional sensitivity/vulnerability/misinterpretation.
3. Feeling inadequate/unconfident.
4. Feeling left out/unimportant/undervalued.
5. Feelings of responsibility/restriction.
6. Establishing routines.
7. Dealing with physical discomfort/pain.

After the video, the class was divided into the following three groups:

1. One of the female course leaders and the pregnant women.
2. The male course leader and the husbands/partners.
3. The other female course leader and the relatives/friends.

Each of the groups discussed the potential sources of strain/conflict/worry in the early weeks, after the baby has come home. These groups then reconvened to identify common areas and complementary concerns.

A video on maternal depression was then shown. Following this video, the women's relatives/friends were asked to discuss how they would recognise maternal depression, and how would they go about getting help. It was then stressed to the women, their relatives/friends that it is possible to try to reduce the risks of developing maternal depression by:

1. Being realistic about what lies ahead.
2. Spending time with people who have babies and talking about their experiences.
3. Trying to keep life changes to a minimum.
4. Being aware of problems and taking steps to deal with them.
5. Getting practical and emotional support from friends and close family, particularly husbands/partners and mothers.
6. Ensuring physical and emotional well-being.

The session continued by stressing that it is important to seek help quickly in the event of suspected maternal depression. Examples of the reasons given were that prompt help can reduce the amount of distress for everyone concerned, including the baby, and prevent extra problems developing within the family. The group was then asked to identify possible reasons that may stop someone with suspected maternal depression from seeking help quickly. Common reasons identified correctly were loss of self-esteem, and feeling afraid of not only the stigma, but also being sectioned and losing the child. If appropriate, or requested, the course leaders provided information on the nature of treatment for maternal depression.

Personal problem solving was then focused on. The five principles of personal problem solving, introduced in session II, were summarised for the benefit of the women's relatives/friends present. The self-help exercise on these principles, given at the end of that session, was also reviewed. A self-help exercise for the current session was then given, which required the women and their relatives/friends present to jointly address a current problem, in their own time, using the five principles of personal problem solving.

The session drew to a close by summarising the session, and thanking the women's relatives/friends for attending.

(Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley et al., 2000; 2003).

#### ***1.7.4.5 Session IV: Social support***

Following a review of the self-help exercise on personal problem solving from the previous session, the current session commenced with an introduction to the importance of social support. It was explained that throughout life, we all need different types of support, such as practical and emotional support, from friends and family, particularly husbands/partners and mothers.

The women were then asked to complete an exercise to help them assess if there are any gaps in their social support networks, and if they are too reliant on one person. The exercise required them to consider their own support networks in terms of companionship and emotional support, as well as practical, information and advice issues.

The session continued by asking the women to identify areas in their social support networks that they wished to change. One of the areas that someone wished to change was then selected as an example of how one might go about making the change, applying the aforementioned five principles of personal problem solving. Following this example, the women were asked to try to complete the same exercise for an area in their own support networks that they wished to change.

Possible obstacles to asking for, and receiving, social support from friends and close family, particularly husbands/partners and mothers, were then discussed, which included:

1. Risk of being rejected, criticised, humiliated or misunderstood.
2. Fear of being controlled, ignored or walked over.
3. Threat to self-esteem.
4. Feeling unworthy of help.

The session proceeded by exploring general beliefs about asking for help from friends and close family, particularly husbands/partners and mothers, which included:

1. The only type of help worth having is spontaneously offered.
2. Only total, unconditional help, on one's own terms, is of any real value.

It was stressed that a part of receiving social support involved being able to cope when someone misjudges our needs or lets us down. It was also stressed that our beliefs about help can result in us missing out on help. An example was given that if we believe help is only worth having when it is offered without us asking, then we are likely to miss out, as others may not be aware we need it. In order to reinforce these points, the women completed an exercise on beliefs about help.

In the next part of the session, issues relating to support defeating and support enhancing patterns were addressed, which required the woman to ask themselves what makes them want, and not want, to help someone. The women were then encouraged to consider whether or not their answers could be applied to them by their friends and close family, particularly their husband/partner and mother.

Following a summary of this session, a self-help exercise was given for the women to complete in their own time, which was to:

1. Practise asking their friends and close family, particularly their husband/partner and mother, for help at least once a day, starting with requests that are easy to make, and gradually building up to requests that are more difficult to make.
2. Note any declines to offers of help.

(Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley et al., 2000; 2003).

#### ***1.7.4.6 Session V: Putting changes into action***

The session opened with a review of the self-help exercise from the previous session on asking for, and declining, help. The review was followed with the subject of improving social support networks. The women were asked if one of them would like to share with the group an area in their support network that they would like to

improve. The group were then asked to generate options for this example, and discuss how to decide which option to try.

It was emphasised that communication skills are needed to improve social support networks. It was explained that people often do without help, rather than working out ways of asking for it clearly. The women were then asked to identify any types of communication skills that they felt they either lacked, or were uncomfortable about using. Following this exercise, the women were asked to discuss how they might address the identified problems.

The session continued by focusing on self-praise. It was stressed that people are often quite poor at self-praise, and frequently engage in behaviours that they would rather not engage in, but do so just to get praise and approval. The point was made that it is much better to be able to give ourselves praise rather than rely on others.

It was then emphasised that self-praise is important when struggling to keep going with repetitive tasks, particularly when efforts are not appreciated by others. It was pointed out that many of the daily tasks of being a mother are repetitive, and learning to give self-praise for effort is vital to self-esteem. An exercise followed, which required the women to think of the type of statements they could use for self-praise and self-affirmation.

It was then stressed that after praising efforts, it is necessary to evaluate whether everything was completed successfully, and if success was not always achieved, to deal with the setback. It was explained that it is quite unusual to get everything exactly right the first time and therefore, it is usually necessary to make alterations and try again. Finally, it was pointed out that it is often useful to seek someone else's opinion concerning how something went, as disappointment may make it difficult to be objective.

A summary of this session followed. The women were then reminded that the next session will be the final session, and were asked if there is anything they would like covered.

A self-help exercise was given for the women to complete in their own time, which required them to:

1. Practise a skill that they find difficult, and evaluate their success using a worksheet provided.
2. Write down and practise self-praise statements.

(Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley et al., 2000; 2003).

#### ***1.7.4.7 Session VI: Coming to an end & facing a new beginning***

The session commenced with a review of the self-help exercise from the previous session on practising a skill and self-praise. The session then focused on dealing with deficiencies in social support from friends and close family, particularly husbands/partners and mothers.

Firstly, the women were asked to discuss how they felt when these people let them down, and who elicited the strongest feelings. This discussion generally revealed that the strongest feelings were elicited by someone who, in the women's opinion, ought not to have let them down. It was then stressed to the women that some people do not have the capacity or skills to provide all types of social support. Also, it was emphasised that it is helpful to accept that nobody is infallible, and to acknowledge people's strengths and weaknesses.

Secondly, the women were asked to think of practical methods of coping with deficiencies in social support. A discussion of these methods followed, which included:

1. Empowering self-talk. For example reminding ourselves of times when we have struggled, but coped. It was stressed that such internalised support can help to keep us going through difficult times.
2. Finding alternative people to provide support. It was suggested that it would be a good idea to have a list of people who could be called on for different types of support.

A brief review of all the sessions followed. It was emphasised that the sessions were intended to prevent maternal depression. The women were given the opportunity to re-visit topics, as well as have anything new covered. They were then asked to:

1. Write down three aspects of the sessions that wanted to remember.
2. Share other aspects of the sessions that they found particularly helpful and/or enjoyable.
3. Look ahead and think of a simple, achievable short-term goal to aim for.

The women were then reminded of the date of the reunion session, and were asked how they would like to spend the time during that session. In order to sustain or develop their relationships, the women were encouraged to exchange phone numbers. Finally, the women were thanked for coming to the sessions so far, and were wished well for the future.

(Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley et al., 2000; 2003).

#### ***1.7.4.8 Reunion session***

This session began by welcoming the women back, and encouraging them to sustain or develop the relationships they had formed previously. It was then explained that the session provided an opportunity to consolidate everything they had learned during the previous sessions.

Recaps followed on anything the women asked for. Also, anything new was covered at the women's request.

The session continued by inviting each woman to share something that they felt good about. They were then each invited to share something that they had found difficult since childbirth, either of an emotional or practical nature.

The session progressed by asking the women:

1. Are you taking good care of yourselves?
2. If you are, how?
3. If you are not, why?

The women were asked to discuss their answers to the above questions as a group. Positive thoughts and actions were then reinforced to the women, and the importance of social support, positive self-talk and self-praise was reiterated.

A summary of the session followed. The women were then given an opportunity to exchange contact details and arrange keeping in touch. They were thanked for their attendance, reminded that the first follow-up assessments were due to take place in approximately a month and wished well for the future.

(Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley et al., 2000; 2003).

### ***1.7.5 Postnatal follow-ups***

As previously mentioned in this chapter, in order to evaluate the effectiveness of the PFP intervention, the women in the intervention and control groups were followed-up at 3 months postnatally (Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley, 2000; Wheatley et al., 2000; 2003), then at 12 months postnatally, at which point the children they were pregnant with at the time of the intervention were also followed-up (Brugha et al., 1999c).

The follow-up assessments, and the results and conclusions of these assessments are summarised below.

#### ***1.7.5.1 Follow-up outcome assessments at 3 & 12 months postnatally***

Of the 103 women in the intervention group, 94 agreed to being followed-up at 3 months postnatally (Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley et al., 2000; 2003), and 93 agreed to themselves and their children being followed-up at 12 months postnatally (Brugha et al., 1999c). Of the 106 women in the control group, 96 agreed to being followed-up at 3 months postnatally (Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley et al., 2000; 2003), and 87 agreed to themselves and their children being followed-up at 12 months postnatally (Brugha et al., 1999c).

The women and children were followed-up in their homes. The women were assessed using the same aforementioned measures used at baseline, except that the Schedules of Clinical Assessment in Neuropsychiatry (SCAN; Wing et al., 1990) was also used to assess mental and physical health at both of the postnatal stages (Brugha et al., 1998b; 1999c; 2000; Wheatley & Brugha, 1999; Wheatley et al., 2000; 2003). The children were assessed using a child development measure (Brugha et al., 1999c), known as the Denver II Scale (Frankenberg et al., 1992). Both the SCAN (Wing et al., 1990) and Denver II Scale (Frankenberg et al., 1992) are described in the next chapter.

Additionally, any visits made by the women and children to their General Practitioner (GP) surgery, and Accident and Emergency (A&E) unit at the Leicester Royal Infirmary (LRI), in the first postnatal year, were recorded in terms of the number of visits made, the reasons for these visits and the outcome of the visits. What was particularly pertinent, was any visits the women made to their GP surgery for depression (Brugha et al., 1999c).

#### ***1.7.5.2 Results of the follow-up outcome assessments at 3 months postnatally***

The results of the 3 month follow-up showed that there were no significant differences between the intervention and control groups in maternal depression, as measured using the:

1. Primary measure of depression, the GHQ-30 (Goldberg, 1972)  
(odds ratio = 1.22, 95% confidence interval = 0.63–2.39, *P* value = 0.55).
2. Secondary measure of depression, the EPDS (Cox et al., 1987)  
(odds ratio = 0.82, 95% confidence interval = 0.48–1.75, *P* value = 0.26).
3. Tertiary measure of depression, the SCAN (Wing et al., 1990)  
(odds ratio = 2.11, 95% confidence interval = 0.51–8.71, *P* value = 0.30).

Thus, it was concluded that the PFP intervention did not prevent maternal depression at 3 months postnatally.

Also, there were no significant differences between the intervention and control groups in social support, as measured using the IMSR (Brugha et al., 1987):

1. Poor versus good social support from good friends  
(odds ratio = 999.0, 95% confidence interval = 0–infinity,  $P$  value = 0.96).
2. Poor versus good social support from close relatives  
(odds ratio = 0.84, 95% confidence interval = 0.25–2.86,  $P$  value = 0.78).

Thus, it was concluded that the intervention did not positively influence maternal social support at 3 months postnatally.

Furthermore, with the exception of avoidant approach to personal problem solving, there were no significant differences between the intervention and control groups in personal problem solving, as measured using the Problem Solving Inventory (Heppner & Petersen, 1982):

1. Confidence versus lack of confidence in problem solving ability  
(odds ratio = 0.69, 95% confidence interval = 0.25–1.90,  $P$  value = 0.48).
2. Avoidant versus non-avoidant approach to problem solving  
(odds ratio = 2.23, 95% confidence interval = 1.23–4.06,  $P$  value = 0.009,  $P < 0.05$ ).
3. Personal control versus lack of personal control in problem solving  
(odds ratio = 1.13, 95% confidence interval = 0.64–2.00,  $P$  value = 0.67).

With regard to avoidant approach to personal problem solving, the above results show that the intervention group was approximately twice as likely to take this approach than the control group (odds ratio = 2.23, 95% confidence interval = 1.23–4.06,  $P$  value = 0.009,  $P < 0.05$ ). Since avoiding problems constitutes a poor approach, and in view of the other results for personal problem solving, it was concluded that the intervention did not positively influence maternal personal problem solving at 3 months postnatally.

Finally, the follow-up showed that there were no significant differences between the intervention and control groups in each of the following, which are reported in less detail than the above, because they were not of prime importance:

1. Presence of pregnancy specific, non-pregnancy specific and support threatening life events, using the Obstetric and General Life Events measure (based on life event scales; Barnett et al., 1983; and threatening life events; Brugha et al., 1985).
2. Impairments in social performance, using the General Difficulties measure (devised from work undertaken by the ONS; Meltzer et al., 1995).
3. Primary and secondary health service usage, using the Service Contact measure (devised from work undertaken by the ONS; Meltzer et al., 1995).
4. Internal and external locus of control, using the Fetal Health Locus of Control Scale (Labs & Wurtele, 1986).
5. Dissatisfaction with living accommodation, using the Leicester Housing Schedule (Wheatley, 1998).

(Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley, 2000; Wheatley et al., 2000; 2003).

### ***1.7.5.3 Results of the follow-up outcome assessments at 12 months postnatally***

The results of the 12 month follow-up showed that there were no significant differences between the intervention and control groups in maternal depression, as measured using the:

1. Primary measure of depression, the GHQ-30 (Goldberg, 1972)  
(odds ratio = 1.64, 95% confidence interval = 0.74–3.64, *P* value = 0.22).
2. Secondary measure of depression, the EPDS (Cox et al., 1987)  
(odds ratio = 1.31, 95% confidence interval = 0.58–2.99, *P* value = 0.50).
3. Tertiary measure of depression, the SCAN (Wing et al., 1990)  
(odds ratio = 1.17, 95% confidence interval = 0.38–3.61, *P* value = 0.78).
4. Survival analysis of the SCAN International Classification of Diseases, Tenth Revision (ICD-10) depression diagnosis (Wing et al., 1990). Survival pertained to surviving the development of a new episode of ICD-10 depression. The results showed that there was very little difference in survival between the intervention

and control groups. A log-rank test showed that this difference was not significant (chi-square = 0.39, degrees of freedom = 1,  $P$  value = 0.534).

Thus, consistent with the 3 month follow-up, it was concluded that the PFP intervention did not prevent maternal depression at 12 months postnatally.

Also, there was no significant difference between the intervention and control groups in social support\*, as measured using the IMSR (Brugha et al., 1987):

- Poor versus good social support from close relatives

(odds ratio = 0.55, 95% confidence interval = 0.15–1.93,  $P$  value = 0.35).

Thus, consistent with the 3 month follow-up, it was concluded that the intervention did not positively influence maternal social support at 12 months postnatally.

*\*NB The intervention and control groups did not receive poor social support from good friends at 12 months postnatally, so unlike at 3 months postnatally, there was no analysis regarding poor versus good social support from good friends.*

Furthermore, there were no significant differences between the intervention and control groups in personal problem solving, as measured using the Problem Solving Inventory (Heppner & Petersen, 1982):

1. Confidence versus lack of confidence in problem solving ability  
(odds ratio = 1.24, 95% confidence interval = 0.48–3.14,  $P$  value = 0.66).
2. Avoidant versus non-avoidant approach to problem solving  
(odds ratio = 1.31, 95% confidence interval = 0.71–2.39,  $P$  value = 0.39).
3. Personal control versus lack of personal control in problem solving  
(odds ratio = 1.12, 95% confidence interval = 0.63–1.98,  $P$  value = 0.71).

Thus, consistent with the 3 month follow-up, it was concluded that the intervention did not positively influence maternal personal problem solving at 12 months postnatally.

Also consistent with the 3 month follow-up, the 12 month follow-up showed that there were no significant differences between the intervention and control groups in each of the following, which are reported in less detail than the above, because they were not of prime importance:

1. Presence of pregnancy specific, non-pregnancy specific and support threatening life events, using the Obstetric and General Life Events measure (based on life event scales; Barnett et al., 1983; and threatening life events; Brugha et al., 1985).
2. Impairments in social performance, using the General Difficulties measure (devised from work undertaken by the ONS; Meltzer et al., 1995).
3. Primary and secondary health service usage, using the Service Contact measure (devised from work undertaken by the ONS; Meltzer et al., 1995).
4. Internal and external locus of control, using the Fetal Health Locus of Control Scale (Labs & Wurtele, 1986).
5. Dissatisfaction with living accommodation, using the Leicester Housing Schedule (Wheatley, 1998).

It was found that in the first postnatal year, there were no significant differences between the women in the intervention and control groups in terms of visits to their:

1. GP surgery for depression  
(Mann-Whitney: 95% confidence interval = -0.0001-0.0002, *P* value = 0.98).
2. GP surgery for anything, including depression  
(Mann-Whitney: 95% confidence interval = -1.00-1.00, *P* value = 0.76).
3. A&E unit  
(odds ratio = 0.81, 95% confidence interval = 0.21–3.12, *P* value = 0.76).

Additionally, in the first postnatal year, there were no significant differences between the children of the women in the intervention group, and the children of the women in the control group, in terms of visits to their:

1. GP surgery  
(Mann-Whitney: 95% confidence interval = -0.00-1.99, *P* value = 0.23).
2. A&E unit  
(odds ratio = 0.49, 95% confidence interval = 0.12–2.02, *P* value = 0.32).

Thus, it was concluded that the intervention did not have any effect on the women and children's visits to their GP surgery and A&E unit during the first postnatal year.

The results of the 12 month follow-up also showed that there were no significant differences between the children of the women in the intervention group, and the children of the women in the control group, in terms of child development, as measured using the Denver II Scale (Frankenberg et al., 1992):

1. Personal-social skills

(odds ratio = 1.17, 95% confidence interval = 0.57–2.37, *P* value = 0.670).

2. Fine-motor adaptive skills

(odds ratio = 1.76, 95% confidence interval = 0.93–3.30, *P* value = 0.080).

3. Language skills

(odds ratio = 1.23, 95% confidence interval = 0.68–2.20, *P* value = 0.489).

4. Gross motor skills

(odds ratio = 1.39, 95% confidence interval = 0.76–2.53, *P* value = 0.277).

Thus, it was concluded that the intervention did not have positive effects on child development at 12 months postnatally.

(Brugha et al., 1999c).

## 1.8 RATIONALE FOR THESIS

As mentioned earlier in this chapter, this thesis is concerned with the third follow-up, at 3½ years after childbirth, of the women who participated in the RCT of the PFP intervention, and the second follow-up of their first born children they were pregnant with at the time of the intervention. During this follow-up, the long-term effectiveness of the intervention was evaluated in terms of whether or not it determined maternal mental health and child development, as well as positively influenced maternal social support and personal problem solving. It was also investigated if antenatal depression is a substantial predictor of maternal depression. A discussion of the rationale for this thesis now follows.

With regard to maternal outcome, mental health was addressed in terms of maternal depression. There were two reasons for this decision. Firstly, since the intervention

was designed to prevent maternal depression, it makes sense to focus on this disorder. Secondly, as maternal mental health was focused on in terms of maternal depression during the evaluations at 3 months after childbirth (Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley, 2000; Wheatley et al., 2000; 2003), and 12 months after childbirth (Brugha et al., 1999c), the same focus at 3½ years after childbirth would enable an ease of comparison between results.

It was decided to include maternal social support and personal problem solving in the 3½ year evaluation. The reason for this decision was, as previously argued (in sections 1.4.2 and 1.4.3), if attempts to both increase social support and develop a good personal problem solving approach are used in interventions as means of trying to prevent maternal depression, which as shown above, was the case with the PFP intervention; then during evaluations of the effectiveness of these interventions, it is logical to ascertain if the interventions positively influenced social support and personal problem solving, which again as shown above, the evaluations did at 3 months after childbirth (Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley, 2000; Wheatley et al., 2000; 2003) and 12 months after childbirth (Brugha et al., 1999c).

Although the PFP intervention did not prevent maternal depression, nor positively influence maternal social support and personal problem solving at 3 months after childbirth (Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley, 2000; Wheatley et al., 2000; 2003), and 12 months after childbirth (Brugha et al., 1999c), it is possible the intervention had positive, delayed effects on these maternal outcomes at 3½ years after childbirth that, by virtue of being delayed, were previously undetectable. Indeed, as emphasised earlier (in section 1.6), one of the interventions the PFP intervention drew from, namely Kirkham et al's (1988), did not initially appear effective, but was actually effective in the long-term.

It was decided to investigate if antenatal depression is a substantial predictor of maternal depression in the study sample, because as previously shown (in sections 1.4.1 and 1.4.4), antenatal depression is not only a key risk of maternal depression, but it is also the strongest of psychosocial predictors. If antenatal depression was found to be a substantial predictor of maternal depression, then this finding could be used to

inform future antenatal interventions to prevent maternal depression, as it would suggest that one way of trying to prevent maternal depression would be to direct considerable attention to trying to prevent antenatal depression.

During the investigation of whether or not antenatal depression is a substantial predictor of maternal depression, it was decided to take into account antenatal social support and personal problem solving. This decision was made, because as shown earlier (in sections 1.4.2 and 1.4.3), poor antenatal social support and personal problem solving approach are risks of maternal depression, and good antenatal social support and personal problem solving approach are protectors of it. Also, since efforts were made during the PFP intervention to both increase social support and develop a good personal problem solving approach in order to try to prevent maternal depression, then, as previously argued (in sections 1.4.2 and 1.4.3), it makes sense to establish if poor social support and personal problem solving approach were risks of maternal depression, and good social support and personal problem solving approach protectors. In view of antenatal depression being shown to be the strongest of psychosocial predictors of maternal depression, it was thought that even when social support and problem solving are taken into account, it would be a substantial predictor.

With respect to child outcome, child development formed part of the evaluation of the effectiveness of the intervention at 3½ years after childbirth for two reasons. Firstly, as previously illustrated (in section 1.3), maternal depression can result in long-lasting child development problems, giving rise to the possibility that the well-being of mothers is embodied in the development of their children. Secondly, as previously stressed in the same section, this possibility enables the argument that if interventions are successful in preventing maternal depression, they could also prevent child problems. Indeed, it was for these two reasons that child development was included in the evaluation of the PFP intervention at 12 months after childbirth (Brugha et al., 1999c).

Although the intervention did not prevent maternal depression at 3 months after childbirth (Brugha et al., 1998b; 2000; Wheatley & Brugha, 1999; Wheatley, 2000; Wheatley et al., 2000; 2003), and 12 months after childbirth, or have positive effects

on child development at this latter stage (Brugha et al., 1999c), if it had positive, delayed effects on maternal depression at 3½ years after childbirth, it could well have had the same type of effects on child development this time point that could not have been detected during the previous evaluation, when the children were approximately 12 months of age. Also, as emphasised earlier (in section 1.3), it is imperative that the long-term effectiveness of interventions on child outcomes be evaluated, even if, on first evaluation, they are found not to be effective; because it does not necessarily follow that no positive effects found initially, will mean that no positive effects will be found in the long-term.

Finally, if the PFP intervention is found to have had positive, delayed effects on maternal and/or child outcome at 3½ years after childbirth, the findings could be used to develop and evaluate preventative interventions with long-term effectiveness.

## 1.9 AIMS OF THESIS

The aims of this thesis were to:

1. Evaluate the long-term effectiveness of the PFP intervention, at 3½ years after childbirth, focusing on maternal mental health, social support and personal problem solving, as well as child development.
2. Investigate antenatal depression as a substantial predictor of maternal depression at 3½ years after childbirth.

## 1.10 HYPOTHESES OF THESIS

Three hypotheses were tested, which were as follows:

**Hypothesis I:** The PFP intervention will determine maternal mental health and child development at 3½ year outcome.

**Hypothesis II:** The PFP intervention will positively influence maternal social support and personal problem solving at 3½ year outcome.

**Hypothesis III:** Antenatal depression level will be a substantial predictor of maternal depression at 3½ years after the birth of a first child, even when antenatal social support and personal problem solving are taken into account in risk factor modelling.

## **CHAPTER II**

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### **METHODOLOGY**

#### **2.1 OVERVIEW**

There are two main components to this chapter, the first of which is the study methods, and the second is the plan of analysis.

The study methods component is divided into the following four main sections:

1. Study Sample.
2. Design.
3. Study Power.
4. Procedures.

The plan of analysis component concerns the reasoning behind decisions made when planning the analyses, and is divided into the following four main sections:

1. Participation and attrition.
2. Demography.
3. Primary analyses.
4. Secondary analyses.

A discussion now follows of the study methods.

#### **2.2 STUDY SAMPLE**

As mentioned in chapter I, this thesis is concerned with a 3½ year follow-up of the mothers who participated in the RCT of the PFP intervention, and their first born children they were pregnant with at the time of the intervention.

A total of 230 women and children participated in the 3½ year follow-up. There were 114 women (intervention:  $n = 55$ , control:  $n = 59$ ) and 116 children (including two sets of identical twins). The women were 22-42 years of age (mean = 31, SD = 4.93) and the children were all approximately 3½ years of age. 84 of the women fell into an

ethnic classification of 'white', and 30 of the women fell into the remaining ethnic classification of 'other'. All of the women were capable of understanding and completing questionnaires in English, without assistance, which, as mentioned in chapter I, was a requirement for participation in the PFP programme of research.

In order to provide further details of the involvement of the current sample in the PFP programme of research, as mentioned in chapter I:

1. Selection for the PFP intervention involved screening 1300 consenting women for sub-clinical depression at the Leicester General Hospital (LGH), when they were beginning standard antenatal care at between 12 and 20 weeks gestation.
2. 400 women screened positive for sub-clinical depression, and were thereby, identified as at high risk of maternal depression, of whom 292 agreed to undergo baseline assessments at between 20 and 24 weeks gestation.
3. 209 women wished to have the opportunity to receive the intervention and were randomised, of whom 103 were allocated to the intervention group, and 106 to the control group.
4. The intervention group received standard antenatal care, in addition to the intervention. The control group received standard antenatal care only.
5. The intervention was held at the LGH. It commenced when the women were approximately 28 weeks pregnant, continued with six antenatal, weekly sessions and concluded with a session at approximately 8 weeks after childbirth.
6. Of the 103 women in the intervention group, 94 agreed to being followed-up at 3 months postnatally, and 93 agreed to themselves and their first born children being followed-up at 12 months postnatally.
7. Of the 106 women in the control group, 96 agreed to being followed-up at 3 months postnatally, and 87 agreed to themselves and their first born children being followed-up at 12 months postnatally.

Finally, the LGH is one of two major hospitals in Leicester, which serves Leicester City, its suburbs, and the surrounding towns and countryside. The cultures and backgrounds of the people who reside in these areas are very wide ranging.

## **2.3 DESIGN**

The design of the study was a cohort survey of women who screened positive for sub-clinical depression when they were in their first pregnancy that they had elected to take to full-term, and were thereby, identified as at high risk of maternal depression. Within the cohort was nested a randomised trial testing the PFP intervention.

The measure used for screening was the 30 item version of the General Health Questionnaire (GHQ-30; Goldberg, 1972). A standardised depression sub-scale within the GHQ-30 has been identified by Surtees & Miller (1990). This sub-scale comprises 6 items concerning: (1) feeling unhappy and depressed; (2) loosing confidence in oneself; (3) thinking of oneself as a worthless person; (4) feeling that life is entirely hopeless; (5) feeling that life is not worth living; (6) finding oneself unable to do anything at times because of nerves being too bad. A symptom count can be derived for this sub-scale. One symptom can be counted for each of the above 6 items that is experienced more than usual during the month prior to administering the GHQ-30. This symptom count was employed in the PFP programme of research. During the screening stage, women who experienced at least one of the above 6 items more than usual during the month prior to the screening date, screened positive for sub-clinical depression. The GHQ-30 is described in further detail later in this chapter.

As mentioned previously, the women who screened positive were randomised to either continue to receive standard antenatal care (control group) or in addition, receive the PFP intervention (intervention group). The long-term effectiveness of the intervention was evaluated by following-up the women in the intervention and control groups and their first born children, repeating measures used previously.

## **2.4 STUDY POWER**

Prior to originally recruiting the women from the antenatal clinics, it was planned to recruit approximately 60 women in the intervention group and 60 women in the control group. It was anticipated that two groups of approximately this size would be sufficient to undertake study power calculations to conventional standards (power = 0.8,  $\alpha = 0.05$ ; Cohen, 1988; 1992). These calculations were based on estimates derived from a prospective study the PFP intervention drew from, the Leicester 500

Project (Brugha et al., 1998a), and showed that with 60 women in each group, it was possible to detect a relative reduction of 66% in the proportion of depression cases after childbirth from 0.35-0.12 at  $\alpha = 0.05$  and power = 0.8, using the GHQ-30 (Goldberg, 1972), in particular, the symptom count (Surtees & Miller, 1990) mentioned in the previous section. The number of women recruited from the antenatal clinics was approximately 100 per group, and almost 60 women per group participated in the 3½ year follow-up. Thus, a similar study power to the Leicester 500 Project (Brugha et al., 1998a) can be calculated for the 3½ year follow-up.

## 2.5 PROCEDURES

The procedures taken for selecting, preparing and using the measures are discussed below.

### 2.5.1 Maternal measures

In the PFP programme of research, it is of crucial importance that the results from all stages are comparable with each other. Consequently, whenever possible, the same measures were administered at each stage, enabling comparisons of like with like. Thus, all of the measures administered during the screening, baseline, and 3 and 12 month follow-up stages were also administered during the 3½ year follow-up stage. In total, 14 measures were administered during the 3½ year follow-up, 13 were maternal measures and 1 was a child measure. The measures used repeatedly in the programme are described below. All measures can be found in appendices III and IV.

Furthermore, in the stages of the PFP programme of research that precede the 3½ year follow-up stage, binary data produced from cut-points were used in preference to continuous data. Again, in order to enable the results from all stages to be comparable with each other, whenever possible, the same cut-points were used at each stage. It was decided, for this reason, to use binary data produced from the same cut-points in the 3½ year follow-up stage. However, in making this decision, it was acknowledged that certain problems can be incurred with the use of cut-points, such as loss of variance and important quantities of statistical power.

The cut-points used were those suggested by the authors of the measures. The overall cut-points used are provided below, which were deduced from individual cut-points that are too detailed to be included in this chapter, but the details are provided in full, in an annex to appendix I.

A description of the maternal measures repeated in the 3½ year follow-up now follows. The measures used for statistical analysis will appear first, beginning with the measures of main interest, the depression measures, each of which will appear in order of importance to the follow-up. These descriptions will be followed by the remaining measures used for analysis concerning social support and personal problem solving respectively (the ordering was decided on the basis of social support appearing before personal problem solving in the pertinent hypothesis). Descriptions of the measures that were not used for analysis will then follow in the order that they were administered (after discounting the measures used for analysis). Psychometric properties of each measure are included where applicable.

#### ***2.5.1.1 The 30 item version of the General Health Questionnaire (GHQ-30)***

Goldberg, D.P. (1972). *The detection of psychiatric illness by questionnaire*. Oxford: Oxford University Press.

The GHQ-30 is a non-specific measure of psychosocial distress. It is succinct and clearly phrased. In the PFP programme of research, the GHQ-30 was first used during the screening stage. It is a well established screening instrument for psychiatric disorder in both patient and community samples. It was chosen because it measures psychosocial symptoms instead of relying on somatic symptoms often experienced during pregnancy. It has also been found to be a reliable screening instrument for postpartum psychiatric disorder. For example, Nott & Cutts (1982) have reported a sensitivity of 87%, a specificity of 83%, a misclassification rate of 16% and a positive predictive value of 53% in comparison to clinical diagnosis using a standardised psychiatric interview, the Clinical Interview Schedule (Goldberg et al., 1970).

As indicated by its name, the GHQ-30 is a questionnaire comprising 30 questions. It is also a self-report questionnaire that requires the respondent to answer each question by indicating which one of four responses available best signifies how they have felt

during the month prior to the date the GHQ-30 was administered. Of the responses available, the first signifies positive wellbeing; the second, unchanged wellbeing; the third, average psychological and/or social dysfunction and the fourth, considerable psychological and/or social dysfunction. Endorsement of the first or second responses can be interpreted as the symptom being absent. Endorsement of the third or fourth responses can be interpreted as the symptom being present. Estimates of the sensitivity and specificity of the GHQ-30 as a descriptive rather than screening measure are 81% and 80% respectively (Goldberg & Williams, 1988).

As described previously (in section 2.3), a 6 item standardised depression sub-scale within the GHQ-30 has been identified by Surtees & Miller (1990). The authors selected the items for the depression sub-scale, because they are similar to questions that commonly form part of diagnostic criteria for depression disorders. The symptom count for this sub-scale (range 0-6) described above (in section 2.3) was used throughout the PFP programme of research, not just the screening stage, in order to retain comparability between the results from each stage.

The GHQ-30 has been the most important measure in the stages of PFP programme of research that precede the 3½ year follow-up stage. In addition to being chosen as the screening measure, it was also chosen as the primary measure of depression for the subsequent stages, using the aforementioned depression symptom count (Surtees & Miller, 1990). In order to retain comparability with the results from the previous stages, the GHQ-30 was also chosen as the primary measure of depression for the 3½ year follow-up, again using the depression symptom count (Surtees & Miller, 1990). The overall cut-points used were depressed (GHQ-30 total  $\geq 2$ ) = 1, and not depressed (GHQ-30 total  $\leq 1$ ) = 0.

#### **2.5.1.2 Edinburgh Postnatal Depression Scale (EPDS)**

Cox, J.L., Holden, J.M. & Sagovsky, R. (1987). Detection of postnatal depression. Development of the 10 item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry*, 150, 782-786.

The EPDS is a self-report questionnaire developed as a screening instrument to indicate increased risk of maternal depression. It comprises 10 statements concerning depressive symptoms. There are four responses available for each statement. Women are required to select the response that most closely reflects how they have felt during the week prior to the date of completing the EPDS. The responses available are scored on a four point scale of 0, 1, 2 and 3 (range 0-3), according to increased intensity of symptoms.

Originally, the EPDS was intended to be used by primary health care professionals, in particular, health visitors, during standard postnatal care. Following its development, the EPDS has also been validated in a random community sample of over 700 mothers at 6 weeks postnatally by Murray & Carothers (1990). They reported estimates of a sensitivity of 68%, a specificity of 96% and a positive predictive value of 67% in relation to Research Diagnostic Criteria for depression (Spitzer et al., 1978). During this validation, Murray & Carothers (1990) used postal administration of the EPDS and reported a rate of return of 97%. This very high return rate was taken as evidence of the acceptability of the EPDS to mothers, which is why it was chosen for use in the PFP programme of research.

During the stages of the PFP programme of research that have gone before the 3½ year follow-up stage, the EPDS has been used as the secondary measure of depression. In order to retain comparability with the results from the previous stages, the EPDS was also used as the secondary measure of depression during the 3½ year follow-up stage. The overall cut-points used were depressed (EPDS total  $\geq 11$ ) = 1, and not depressed (EPDS total  $\leq 10$ ) = 0.

#### ***2.5.1.3 Schedules of Clinical Assessment in Neuropsychiatry (SCAN)***

Wing, J.K., Babor, T., Brugha, T., Burke, J., Cooper, J.E., Giel, R., Jablenski, A., Regier, D. & Sartorius, N. (1990). SCAN. Schedules for Clinical Assessment in Neuropsychiatry. *Archives of General Psychiatry*, 47, 589-593.

SCAN is designed to assess, measure and classify the psychopathology and behaviour connected with major psychiatric disorders in adulthood. It is divided into four parts: (1) Present State Examination, Tenth Edition (PSE-10), which is a semi-structured interview; (2) Glossary of differential definitions of SCAN items and commentary on SCAN text; (3) Item Group Checklist (IGC), which is used to rate information from informers besides the respondent and/or case records to either supplement information from the PSE-10, or be a substitute for the PSE-10 when it cannot be completed; (4) Clinical History Schedule (CHS), which is used to rate information from the respondent, informers and/or records to supplement information from the PSE-10 and IGC.

The PSE-10 interview and the glossary were the only parts of SCAN required throughout the PFP programme of research. The PSE-10 is divided into two parts. The first part includes somatoform, dissociative, anxiety, depressive and bipolar disorders, in addition to appetite, alcohol and other substance use related problems. It also includes a screen for disorders covered in the second part of the PSE-10. This second part includes psychotic and cognitive disorders, in addition to observed behaviour, affect and speech abnormalities.

The interviewer is trained in the use of SCAN at a World Health Organisation (WHO) accredited training centre (in the case of the PFP programme of research, Leicester). The interviewer encourages and assists the respondent to use their own words to describe, in order of importance to them, their mental and/or physical health problems. The interviewer compares the respondent's behaviour and descriptions with the glossary definitions, and rates symptoms as either absent or present and if present, at a particular severity level, according to the glossary criterion. In the 3½ year follow-up stage of the PFP programme of research, the time period covered in the interview was approximately 3½ years, that is, from childbirth, up to, and inclusive of, the month prior to the date of the interview.

SCAN was chosen for use in the PFP programme of research, because it provides a clinical and research diagnostic assessment of psychiatric disorder, as required by the International Classification of Diseases, Tenth Revision (ICD-10; WHO, 1992), and

the Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised (DSM-III-R; American Psychiatric Association, 1987).

The PSE has been used in population surveys of psychiatric disorder (Brown et al., 1973; Wing et al., 1977). Its reliability and validity for obtaining data retrospectively, particularly data concerning depression, is well established (Brown et al., 1985).

In the stages of the PFP programme of research prior to the 3½ year follow-up stage, SCAN, when administered in addition to the GHQ-30 and EPDS, was always used as the tertiary measure of depression. In the interest of retaining comparability with the results from the previous stages, SCAN was used as the tertiary measure of depression in the 3½ year follow-up. However, in making this choice, it was acknowledged that arguably, SCAN has merits over and above the GHQ-30 and EPDS, particularly, in terms of decisions concerning the presence, absence and the severity of symptoms being made in accordance with strict criterion, rather than by means of self-report. Indeed, it is these type of qualities that enable SCAN, as an assessment tool, to be closer to the gold standard than self-report measures (Brugha et al., 1999a).

#### **2.5.1.4 Interview Measure of Social Relationships (IMSR)**

Brugha, T.S., Sturt, E., MacCarthy, B., Potter, J., Wykes, T. & Bebbington, P.E. (1987). The Interview Measure of Social Relationships: the description and evaluation of a survey instrument for assessing personal social resources. *Social Psychiatry*, 22, 123-128.

This is a structured interview of approximately 30 minutes duration. It assesses the size and quality of the respondent's social network during the week preceding the interview date. It includes an in-depth assessment of primary group members (i.e. good friends and close relatives), in addition to acquaintances.

The IMSR assesses self-reported emotional closeness to the social network. The interviewer rates reports of negative interaction between the respondent and their primary group members, and the degree of social support these members and acquaintances have given to the respondent.

Negative interaction is rated on the following seven point scale (range 0-6):

0. Either no difference of opinion, or agreed to disagree.
1. Cooperation (quickly and amicably resolving the problem).
2. Avoidance (being aware of the problem, but avoiding it).
3. Competitiveness (challenging exchanges and difficulty resolving the problem).
4. Hostility (antagonistic exchanges and making the problem worse).
5. Unsure (respondent does not grasp the question).
6. Inappropriate (respondent or other party were not able to interact).

The degree of social support provided is rated on the following three point scale (range 1-3):

1. Not needed last week.
2. If needed, insufficient support.
3. Sufficient support.

It has been reported that the IMSR has very good reliability. In a reliability study undertaken on 18 IMSR interviews, there was a 96% agreement for negative interaction and 100% agreement for the degree of social support provided (Brugha et al., 1998a).

The combination of self-reporting and interviewer rating in the IMSR was the reason it was chosen for use in the PFP programme of research. Of particular relevance to the programme was the provision of poor or good social support from good friends and close relatives. During the programme, when a rating of 'sufficient support' was given, clarification was sought in terms of whether or not the support was sufficient enough to constitute good support. If the support was sufficient enough, it was noted as such and included in the data analyses as good social support. If it was not sufficient enough, it noted as such and excluded from the data analyses. It was necessary to follow this procedure due to a rating not being available of 'good support' and obviously, a rating of 'sufficient support' does not necessarily mean that the support was good. The overall cut-points used were poor social support (poor support total  $\geq 1$ ) = 1, and good social support (poor support total = 0) = 0. These cut-points were used separately for good friends and close relatives.

### 2.5.1.5 Problem Solving Inventory

Heppner, P.P. & Petersen, C.H. (1982). The development and implications of a personal problem-solving inventory. *Journal of Counselling Psychology*, 29, 66-75.

This is a questionnaire that measures self-appraised personal problem solving. In particular, it measures three factors: (1) confidence in problem solving ability; (2) avoidant approach to problem solving; (3) personal control in problem solving.

The Problem Solving Inventory comprises 32 statements. The respondent is required to indicate the extent to which they agree or disagree with each statement by selecting a response on a six point scale, which ranges from 1 = 'strongly agree' to 6 = 'strongly disagree'. The respondent is required to base their responses upon general problems that have been resolved recently, as opposed to large and/or unresolved problems.

Alpha coefficients suggest that each of the three factors the Problem Solving Inventory measures has reasonable internal consistency. The alpha coefficients are: (1) confidence in problem solving ability = 0.85; (2) avoidant approach to problem solving = 0.84; (3) personal control in problem solving = 0.72. The responses to the statements in the Problem Solving Inventory have been found to be relatively stable over a period of two weeks, with test re-test correlations from 0.83-0.89. Estimates of validity suggest that the responses to the statements are significantly related in predicted directions with a range of self-report and observation measures (Heppner, 1988).

The Problem Solving Inventory was chosen for use in the PFP programme of research, because the factors it measures are particularly pertinent to the programme. The following overall cut-points were used:

1. Confidence in problem solving ability (confidence total  $\leq 38$ ) = 0, and lack of confidence in problem solving ability (confidence total  $\geq 39$ ) = 1.
2. Avoidant approach to problem solving (avoidant total  $\geq 57$ ) = 1, and non-avoidant approach to problem solving (avoidant total  $\leq 56$ ) = 0.
3. Personal control in problem solving (control total  $\leq 17$ ) = 0, and lack of personal control in problem solving (control total  $\geq 18$ ) = 1.

### **2.5.1.6 Pre-consent**

Wheatley, S.L. (1998). *Pre-consent: background and questionnaire format*. Leicester: University of Leicester.

This is a self-report questionnaire. It was written by a member of the PFP programme of research, specifically for the programme. It was designed purely to obtain background information about the participants. Such information includes contact details, living arrangements, childcare, having more children, employment status and hospital treatment.

The questionnaire is brief and simple. It comprises 7 main questions, which mostly lead to sub-questions. The women were generally required to answer the questions by simply selecting a response from two or more available, mainly either 0 = 'no' or 1 = 'yes'. Of the questions that are not accompanied by responses to select from, the women were required to answer by providing names, addresses and phone numbers. Also, they were required to use their own words to provide information concerning: (1) whether or not they themselves look after any children during the day who live in their household; (2) reasoning for either intending or not intending to have more children; (3) any hospital visits or stays.

### **2.5.1.7 Leicester Housing Schedule**

Wheatley, S.L. (1998). *The Leicester Housing Schedule: background and questionnaire format*. Leicester: University of Leicester.

This is a self-report questionnaire that was written by the same member of PFP programme of research who wrote the Pre-consent questionnaire described above. The LHS, like the Pre-consent questionnaire, was written specially for the programme. It was designed to obtain factual information on the women's housing and finances in general, and dissatisfaction with their housing in particular.

The LHS comprises 22 main questions, some of which lead to sub-questions. Approximately half of the questions were used to obtain the general information on housing and finances. These questions concern how long the women have lived in Leicestershire, as well as how long they have actually lived, and expect to live, at

their current address. The questions also concern the type of housing they live in (e.g. owner occupation, rented, supported or temporary accommodation); the household appliances they are equipped with; reasons for moving home; income; the type of housing they require at present and in the future; and living arrangements. The majority of the questions required the women to answer by selecting one response from at least two available, many are simply either 0 = 'no' or 1 = 'yes'. Some of the questions required the women to answer in their own words.

The remaining questions in the LHS were used to obtain the information on dissatisfaction with housing. The questions concern whether or not the women: (1) prefer to share the rooms in their home; (2) have had problems with their landlord and were affected by the problems; (3) have had problems paying for their home and were affected by the problems; (4) have problems in their neighbourhood, such as crime, dogs and noise; (5) get on with their neighbours; (6) have felt cut off from friends or work due to living too far away; (7) are on a Council waiting list to move home; (8) like living in their home; (9) are in any housing need. The questions required the women to provide answers by selecting one response from a minimum of two available, mostly either 0 = 'no' or 1 = 'yes'. Endorsement of negative responses, of which there are a minimum of 1 and a maximum of 17 available, constitutes dissatisfaction with housing.

The LHS was piloted extensively for, and used repeatedly in, the PFP programme of research. It was consistently found to be well received by women and successful in obtaining the information it was designed to obtain. Since this information is simply of a factual nature, the LHS was never subject to formal reliability/validity tests.

#### **2.5.1.8 Service Contact**

This is a questionnaire devised by members of the PFP programme of research from:

Meltzer, H., Gill, B., Petticrew, M. & Hinds, K. (1995). OPCS Surveys of Psychiatric Morbidity in Great Britain. In Office of Population Censuses and Surveys Social Survey Division (Ed.). *Report 2: Physical complaints, service use and treatment of adults with psychiatric disorder*. London: HMSO.

The questionnaire was devised specifically for the PFP programme of research to obtain factual information regarding usage and non-usage of services provided by the National Health Service (NHS). Some of the questions cover a time period of either 2 weeks or 1 year prior to the date of the questionnaire being administered, one question covers the date of the questionnaire being administered and other questions do not specify a time period.

The Service Contact is a brief, straightforward, self-report questionnaire, comprising 5 main questions, which lead to sub-questions. The main questions concern whether or not the women have: (1) talked to their general practitioner (GP); (2) been in hospital as an in-patient; (3) been in hospital, a clinic or elsewhere as an out-patient; (4) received home visits from health and/or non-health professionals; (5) decided against seeing a health professional when they should have seen this person. All of these questions required the women to simply select an initial response of either 0 = 'no' or 1 = 'yes'. The sub-questions expand on the main questions. For example, in the case of the first main question, if the women had talked to their GP, they were asked how often, what was the nature of the health problem talked about, if they were satisfied or dissatisfied with this consultation and if dissatisfied, the reason why. Generally, the sub-questions required the women to select one response from a minimum of two available. Some of the questions required the women to answer using their own words.

The questionnaire was repeatedly piloted for, and used throughout, the PFP programme of research. It was always found to not only be acceptable to women, but also to obtain the information it was devised to obtain. In view of this information being simply factual, the questionnaire was not formally tested for its reliability/validity.

### **2.5.1.9 Obstetric and General Life Events**

This is a questionnaire designed by members of the PFP programme of research based on:

1. Barnett, B.E.W., Hanna, B. & Parker, G. (1983). Life event scales for obstetric groups. *Journal of Psychosomatic Research*, 27, 313-320.
2. Brugha, T.S., Bebbington, P.E., Tennant, C. & Hurry, J. (1985). The List of Threatening Experiences: a subset of 12 life event categories with considerable long-term contextual threat. *Psychological Medicine*, 15, 189-194.

The questionnaire was designed specifically for the PFP programme of research to assess the presence of three types of life events in the 12 month period prior to the assessment date. The three types of life events are: (1) pregnancy specific; (2) non-pregnancy specific; and (3) support threatening.

It is a self-report questionnaire that assesses a maximum of 35 life events. Examples of each of the three types of life events are: (1) for pregnancy specific life events, termination; unwanted pregnancy; miscarriage; and serious illness during pregnancy; (2) for non-pregnancy specific life events, financial crisis; serious illness or injury; and husband/partner becoming unemployed; (3) for support threatening life events, separation from family and/or a close friend; serious arguments with family; and somebody close becoming seriously ill and/or dying.

The women were required to indicate whether or not they had experienced each life event with either a 'no' or 'yes' answer. If they gave a 'no' answer, there was no further questioning on the life event concerned. If they gave a 'yes' answer, there was further questioning, initially 10 questions. The first of these questions concerns the number of times the life event has occurred. The remaining 9 questions, which are repeated as many times as the life event has occurred, concern when it occurred; details about its nature; when it stopped being a problem; and practical and emotional support sought as well as offered. The women were required to answer half of the questions by selecting a response from a minimum of three available. They were required to answer the remaining half by using their own words, which, with one exception, simply entails giving numbers and a date. The one exception being the

question concerning the details about the nature of the life event, which entails giving as much information as possible.

In cases where the women had given birth during the time period covered in the assessment and/or were pregnant again, they were asked about pregnancy-specific life events. Again, a 'no' answer ends questioning on the life event concerned, and a 'yes' answer leads to the same further questioning described in the previous paragraph. In all cases, endorsement of a 'yes' answer constitutes the life event being present. Since a maximum of 35 life events are assessed, the range of the total possible number of life events present is 1-35.

The members of the PFP programme of research who designed the Obstetric and General Life Events questionnaire found it to have good reliability and validity (the actual figures have not been reported to date).

#### ***2.5.1.10 Fetal Health Locus of Control Scale***

Labs, S.M. & Wurtele, S.K. (1986). Fetal Health LOC Scale: Development and Validation. *Journal of Consulting and Clinical Psychology*, 54, 814-819.

This is a self-report questionnaire that measures locus of control (LC) in relation to fetal health. It is succinct, comprising 16 statements concerning women's beliefs about their unborn baby's health. Women are required to indicate the degree to which they agree or disagree with each of the statements by selecting a response on a nine point scale, which ranges from 1 = 'strongly disagree' to 9 = 'strongly agree'.

There are three sub-scales in the questionnaire known as: (1) Fetal Health LC - Internal (FHLC-I), which reflects a woman's belief that her own behaviours will influence her baby's health; (2) Fetal Health LC - Chance (FHLC-C), which reflects a woman's belief that fate will influence her baby's health; (3) Fetal Health LC - Powerful Others (FHLC-P), which reflects a woman's belief that the behaviours of health care professionals will influence her baby's health.

It has been reported that each of the three sub-scales in the questionnaire has reasonable internal reliability, with estimates of: (1) FHLC-I = 0.88; (2) FHLC-C = 0.83; (3) FHLC-P = 0.76. It has also been reported that each of the sub-scales is reasonably stable over a period of two weeks, with test re-rest reliabilities of: (1) FHLC-I = 0.80; (2) FHLC-C = 0.86; (3) FHLC-P = 0.67 (Labs & Wurtele, 1986).

The questionnaire was chosen for use in the PFP programme of research, because of the opportunity it provides to measure, in a succinct form, LC purely in relation to fetal health.

#### **2.5.1.11 General Difficulties**

This is a questionnaire devised by members of the PFP programme of research from:

Meltzer, H., Gill, B., Petticrew, M. & Hinds, K. (1995). OPCS Surveys of Psychiatric Morbidity in Great Britain. In Office of Population Censuses and Surveys Social Survey Division (Ed.). *Report 2: Physical complaints, service use and treatment of adults with psychiatric disorder*. London: HMSO.

The questionnaire was devised specifically for the PFP programme of research to gain factual information on the presence of general difficulties, in terms of impairments in social performance. It is a self-report questionnaire, consisting of 7 main questions. The first 6 of these questions concern whether or not difficulties have arisen in the month prior to the questionnaire being administered with: (1) getting out and about or using transport; (2) medical care; (3) household activities; (4) practical activities; (5) paperwork; and (6) managing money.

The women were required to answer each question by selecting a response of either 0 = 'no' or 1 = 'yes'. If they selected 'no', there was no further questioning. If they selected 'yes', they were asked if they needed assistance with the difficulty concerned, which they were required to answer by again, selecting a response of either 0 = 'no' or 1 = 'yes'. Both of these responses result in a question concerning whether or not the difficulty has emerged recently, which required them to answer in their own words. The 'yes' response also results in a question concerning who has provided assistance, which again, required them to answer in their own words.

Endorsement of a 'yes' response to any of the first 6 main questions constitutes a general difficulty being present. Thus, the range of the total possible number of general difficulties present is 1-6.

With regard to the seventh main question, it concerns whether or not the women have worked over the 3 years prior to the questionnaire being administered. They were required to answer by selecting a response of either 0 = 'no' or 1 = 'yes'. A response of 'no' ends questioning. A response of 'yes' leads to further questioning concerning whether or not their health or how they have felt has resulted in time off work over the previous 3 years. The women were required to answer by selecting a response of either 0 = 'no' or 1 = 'yes'. A response of 'no' ends questioning. A response of 'yes' leads to questioning concerning the number of days off they have had, which they were required to answer in their own words.

The General Difficulties questionnaire was piloted extensively and used throughout the PFP programme of research. It was repeatedly found to be well received by women and successful in gaining the information it was devised to gain. As this information is simply factual, formal reliability/validity tests were never undertaken on the questionnaire.

#### ***2.5.1.12 Antenatal Social Support***

This is a questionnaire designed by members of the PFP programme of research, which was based on a screening tool used in the following research by:

Brugha, T.S., Sharp, H.M., Cooper, S.A., Weisender, C., Britto, D., Shinkwin, R., Sherrif, T. & Kirwan, P.H. (1998a). The Leicester 500 Project. Social support and the development of postnatal depressive symptoms, a prospective cohort survey. *Psychological Medicine*, 28, 63-79.

The questionnaire was designed specially for the PFP programme of research to collect background information about the women. It is a self-report questionnaire, consisting of 5 main questions concerning: (1) if the father of their child is aware he is the father; (2) if they are in contact with the father; (3) if the relationship with the father has been stable since it began; (4) what the present situation is regarding the

requirement for, and accessibility of, practical support; as well as (5) emotional support.

The women were required to answer the first two questions by selecting a response of either 0 = 'no' or 1 = 'yes'. They were required to answer the remaining three questions by selecting a response from a minimum of four and a maximum of six available, which for the third question, the range is from 1 = 'stable' to 4 = 'permanently broken up'; for the fourth question, the range is from 1 = 'I have no need for practical support' to 6 = 'I have obtained practical support successfully without actively seeking it from anyone'; and for the fifth question, the range is from 1 = 'there is nobody I can talk freely to' to 4 = 'I have sought emotional support and have obtained it successfully'.

In general, the responses lead to further questioning to expand on the answers given. For example, in the case of the first question (i.e. concerning if the father of the child is aware he is the father), if the women selected a response of 'no', they were asked: (A) why they had not told him, which required them to answer in their own words; (B) if they intend on telling him, which required them to select a response of either 0 = 'no' or 1 = 'yes'; (C) how they think he will react, which required them to answer in their own words. The combination of questions requiring answers by selecting from responses available and using one's own words, is a feature of the questionnaire throughout.

The questionnaire was piloted extensively for, and used repeatedly in, the PFP programme of research. It was consistently found to be acceptable to women and successful in collecting the information it was designed to collect. In view of this information being only background information, the questionnaire was never subject to formal reliability/validity tests.

### 2.5.2 Child measure

The following child development measure was introduced for the 12 month follow-up stage of the PFP programme of research, and used again for the 3½ year follow-up stage:

Frankenberg, W.K., Dodds, J., Archer, P., Bresnick, B., Maschka, P., Edelman, N. & Shapiro, H. (1992). *Denver II Scale*. Colorado: University of Colorado.

The Denver II Scale was designed for children below the age of 6 years. It comprises four, rather wide ranging levels of assessment: (1) personal-social skills; (2) fine-motor adaptive skills; (3) language skills; and (4) gross motor skills. It is because these levels are so wide ranging that the Denver II Scale was chosen for use in the PFP programme of research.

In each of four levels of assessment, there is a series of exercises, the first of which is the easiest and the last is the most difficult. The total number of exercises in the four levels combined is 36. In most cases, the assessor asks the child to complete the exercises. In the remaining cases, the assessor asks the mother of the child if he or she is cable of completing the exercises. The assessor scores each exercise on a four point scale, ranging from 1 = 'pass' to 4 = 'refusal'. The criteria to award a 'pass' for each level of assessment requires the total number of pass scores to be divided by the total number of exercises in the level to obtain a percentage pass score, which must be 65% or more. This criteria was employed in the PFP programme of research.

The authors of the Denver II Scale have undertaken two types of tests on it: (1) concurrent assessor-observer reliability, in which the assessor administered the measure while the observer watched, and both the assessor and observer scored the exercises independently of each other; (2) 10 day test re-test stability, in which the entire procedure for the concurrent assessor-observer reliability test was repeated 10 days later. The results of these tests were for: (1) the concurrent assessor-observer reliability test, the mean = 0.99, range = 0.95-1.00 and standard deviation (SD) = 0.016; and (2) the 10 day test re-test stability, the mean = 0.90, range = 0.50-1.00 and SD = 0.12 (Frankenberg et al., 1992).

The Denver II Scale appears in full in appendix III. Summaries of the four levels of assessment are provided below. The range of difficulty within each level is indicated in the summaries by including the first and last exercise of each of the levels.

#### ***2.5.2.1 Personal-social skills***

This level of assessment concerns the child's personal and social capabilities, in terms of, for example, dressing themselves, brushing their teeth and interactive play with others.

The exercises commence with the mother being asked if her child is capable of washing his or her hands without assistance, other than with taps that are beyond reach. The exercises end with the mother being asked if her child is capable of preparing a bowl of cereal by getting the required items, and pouring the cereal and milk into a bowl without much spillage. The milk can be poured from any type of container. The child must be capable of doing this preparation without assistance, other than with items that are difficult to reach.

#### ***2.5.2.2 Fine-motor adaptive skills***

This level is about eye-hand co-ordination, manipulation of objects and solving problems. Examples include building towers with cubes and copying shapes by drawing.

The exercises start by showing the child how to build a tower with 6 cubes. The child is then asked to build a tower with these cubes, and is given a total of three attempts. The exercises finish by showing the child two parallel, vertical lines on paper and asking him or her to decide which is the longer of the two lines. The paper is turned upside down and the child is asked to make the same decision again. The paper is then turned back to the original position and the child is asked to make the decision for a third time. Should the child fail to give the correct answer to one of the questions, the exercise is repeated and the child must answer all of the questions correctly.

### **2.5.2.3 Language skills**

This level is concerned with hearing, comprehending and vocabulary. For example, the child is required to speak in an understandable manner, name colours and define words.

The exercises begin by gauging the lucidity of the child's speech in terms of whether or not at least half of it can be understood. The exercises end by establishing whether or not the child knows 3 adjectives. For example, the child is asked what they do when they are cold and tired.

### **2.5.2.4 Gross motor skills**

This level of assessment is about usage of large muscles in terms of, for example, jumping and hopping.

The exercises commence by the child being asked to throw a ball overhand to the assessor, who is standing at least 3 feet in front of the child. The ball must come within arms reach of the assessor, and at a height between the assessor's knees and head. It is permissible for the ball to bounce off the floor before the assessor can reach it, provided it got to a height between the assessor's knees and head prior to falling towards the floor. The child is given a total of three attempts to throw the ball correctly. The exercises finish by getting the child to stand in an open space and showing him or her how to balance on one foot. The child is asked to balance on one foot and is given a total of three attempts, except if he or she balances for at least 6 seconds on the first attempt. The child is then asked to do the same with the other foot. Overall, the child must balance on each foot for at least 4 seconds on one occasion.

### **2.5.2.5 Questions accompanying the Denver II Scale**

There are a series of questions before and after the Denver II Scale. These questions are included in appendix III. A summary of the questions now follows.

Regarding the questions preceding the Denver II Scale, these questions concern background information, such as whether or not the mother has given consent for her child to be assessed; the child's name; date of birth; and the date of assessment. Some of the questions are answered by the assessor, on the basis of research records, and other questions are answered by the mother.

With respect to the questions succeeding the Denver II Scale, these questions focus on the mother and child. With regard to the child, particular focal points include whether or not the behaviour displayed during assessment was representative of his or her behaviour in general; the degree of general alertness; and whether he or she was fearful in the company of an unfamiliar person. Some of the questions are answered by the assessor, on the basis of observation, and other questions are answered by the mother.

The questions close by focusing on the mother. Particular focal points include the mother being asked about employment; child care arrangements; and plans to have more children. One of the closing questions covers a time period of approximately 3½ years prior to the assessment date, another question covers the 12 month period after the assessment date, other questions cover the present period, and some of the questions do not specify a time period.

### ***2.5.3 Additions to the measures and procedures***

A maternal measure was introduced for the 3½ year follow-up stage of the PFP programme of research. This measure is known as the Alcohol Use Disorders Identification Test (AUDIT; Babor & Grant, 1989) and can be found in appendix III. It was introduced because it provides the opportunity to identify, in a concise form, any of the women who have a drinking problem.

A new assessment procedure was also introduced at the 3½ year follow-up stage for use during the administration of SCAN (Wing et al., 1990). This procedure involved referring to written comments, made during the 12 month follow-up SCAN (Wing et al., 1990) assessments, by the interviewer, about the women. These comments pertain

to mental and physical health problems experienced during approximately the first 12 months after childbirth.

The purpose of introducing the new assessment procedure was to enhance the opportunity to track the course of the health problems during the approximate 2½ year interval between the 12 month and 3½ year follow-up SCAN (Wing et al., 1990) assessments. It was intended that referring to the comments would bring the problems to the fore, and thus, help the women to recall any further information in terms of, for example, whether or not the symptoms changed, went away and recurred.

This new assessment procedure was planned prior to piloting. It was apparent after piloting that additional assessment procedures could also be introduced for the 3½ year follow-up stage. These procedures are discussed later in this chapter, in a section concerning the results of piloting (section 2.5.5.1).

#### ***2.5.4 Ethical approval***

Ethical approval to prepare for, pilot and undertake the 3½ year follow-up, under the auspices of the Leicestershire and Rutland Healthcare NHS Trust, was granted by the Leicestershire Research Ethics Committee in October 1999.

During the follow-up, it became apparent that telephone assessments would be required to be undertaken to recover data lost as a result of a computer error (full details are provided later in this chapter, in section 2.5.10). Further ethical approval for the telephone assessments was granted by the Ethics Committee in February 2001.

#### ***2.5.5 Piloting***

Piloting was undertaken from November 1999 until May 2000. The pilot sample comprised women and their first born children, and was representative of the 3½ year follow-up sample of women and children. The results of the pilot work are provided below.

### **2.5.5.1 Assessment structure and procedures**

Piloting showed that the most productive order to administer the 14 measures was as follows:

1. Pre-consent (Wheatley, 1998).
2. GHQ-30 (Goldberg, 1972).
3. Leicester Housing Schedule (Wheatley, 1998).
4. Service Contact (devised from work undertaken by the ONS; Meltzer et al., 1995).
5. IMSR (Brugha et al., 1987).
6. Obstetric and General Life Events (based on life event scales; Barnett et al., 1983; and threatening life events; Brugha et al., 1985).
7. Fetal Health Locus of Control Scale (Labs & Wurtele, 1986).
8. General Difficulties (devised from work undertaken by the ONS; Meltzer et al., 1995).
9. Problem Solving Inventory (Heppner & Petersen, 1982).
10. Antenatal Social Support (based on a screening tool designed by Brugha et al., 1998a).
11. EPDS (Cox et al., 1987).
12. Denver II Scale (Frankenberg et al., 1992).
13. SCAN (Wing et al., 1990).
14. AUDIT (Babor & Grant, 1989).

One main reason why this order of assessment was found to be more productive than others was that it improved the accuracy of symptom reporting during SCAN (Wing et al., 1990). This improvement was made as a result of the responses to the first 11 measures listed above enabling the interviewer to be aware of any mental and/or physical health problems experienced; and thus, being able to remind the women of these health problems during SCAN, enabling them to elaborate on the problems. Without these reminders, the volume of different measures preceding SCAN, generally resulted in the women forgetting to mention during SCAN, at least some of the problems they had mentioned during the preceding measures, which inevitably reduced the accuracy of symptom reporting.

Other benefits of following the order of assessment listed above were that by administering the Denver II Scale (Frankenberg et al., 1992) after the first 11 measures, the women were able to have a period of respite between their measures, so by the time SCAN (Wing et al., 1990) was administered, they were able to approach the questions with a refreshed frame of mind. Furthermore, time was saved by leaving the AUDIT (Babor & Grant, 1989) until last, because the women were asked to complete it whilst the assessment equipment was being packed away, and thus, the assessment time did not exceed 2 hours, which was ideal for the women. In view of the overall success of the aforementioned assessment structure and procedures, it was decided to introduce the same structure and procedures for the 3½ year follow-up.

#### ***2.5.6 Tracing***

Tracing of the women and children for the 3½ year follow-up took place from May 2000 until January 2001. Tracing involved referring to records of addresses and telephone numbers made during the previous stages of the PFP programme of research. In these records, there were details for contacting the women directly (i.e. primary contacts) and in the event that these contacts had become obsolete, there were also details for contacting the women through their place of work, family and friends (i.e. secondary contacts).

#### ***2.5.7 Arranging appointments for assessment***

Most of the women were initially contacted by telephone, at which point, they were briefly reminded of their participation in the previous stages of the PFP programme of research; familiarised with the 3½ year follow-up stage; asked if they were willing to both participate themselves and allow their children to participate; and if they were, an appointment for assessment was arranged. A letter was then posted to the women which confirmed the appointment and expanded on the information given over the telephone.

Some of the women could not be contacted by telephone. These women were given the same information as the women who could be contacted by telephone. This information was posted to the women in a letter, with a suggested appointment date

and time. The women were asked to contact the researcher if the appointment was inconvenient, otherwise it was assumed that it was convenient.

In order to minimise the chances of the women forgetting the appointments, no appointments were made, either by telephone or post, for more than 2 weeks in advance.

Assessments were arranged to take place in the women's homes. Should a woman not be at home to honour the appointment, the researcher would wait 10 minutes for her to arrive. If she had not arrived by this time, a sheet entitled *Sorry I Missed You* was put through her letter box, asking her to contact the researcher to arrange another appointment. Should she fail to make contact, the researcher would contact her. Once the appointment had been rescheduled, a letter confirming the appointment was posted to the her. If she was not at home to honour the rescheduled appointment, the researcher would again, wait 10 minutes for her to arrive. If she had not arrived by this time, a letter was put through her letter box politely advising her that the opportunity to meet has passed. It was necessary to apply this cut off point in order to assess all the women and children within a finite time scale.

(NB All of the above mentioned telephone and written information that was given to the women can be found in appendix II).

### **2.5.8 Consent and withdrawal**

When the women were visited for assessment, they were asked to sign a consent sheet to firstly, confirm that they know and fully understand what participation in the 3½ year follow-up entails; and to secondly, give consent for their own and their children's participation in the follow-up. Should, at any point, the women request to withdraw their consent for their own and/or their children's participation, their request would be respected. Their request would also be acknowledged in writing, which would be posted to them. The consent and acknowledgement sheets are provided in appendix II.

### 2.5.9 Assessments

The 3½ year follow-up assessments commenced in May 2000. In order to prevent the possibility that knowledge of treatment assignment could influence the results, 'single-blind' conditions were maintained during the assessments. These conditions were maintained by asking the women not to tell the researcher which group they had been assigned to. This request was made on two occasions, firstly, in the information letter posted to the women prior to the assessment date and secondly, when the women and children were visited for assessment. The request was always respected, thus, blinding was never breached.

All of the measures, with the exception of the AUDIT (Babor & Grant, 1989), were administered using the computer programme, Blaise. This particular programme was selected for two reasons. Firstly, it was used successfully during previous stages of the PFP programme of research and secondly, it uses very little computer memory. The purpose of using a computer programme during assessment was to facilitate data analysis, which was undertaken by computer. Using a computer programme to administer the measures enabled the data obtained to be entered straight into the computer and thus, avoided what would have been a time consuming process of entering all of the data into the computer at a later date.

During assessment, the questions were read out to the women and children. A laptop computer was positioned so that the screen was in full view of the women to enable them to see what was being inputted.

With regard to the one measure that was not administered by computer, the AUDIT (Babor & Grant, 1989), it was decided that as this measure deals with the sensitive subject of alcohol consumption, the women may feel more comfortable giving candid answers to the measure if they could answer with, rather than without, anonymity. Therefore, three steps were taken to maximise anonymity. Firstly, the AUDIT (Babor & Grant, 1989) was given to the women in paper form for them to complete by hand. Secondly, an envelope was provided with this measure, which the women were asked to seal their answers in. Thirdly, the women were provided with a participant number to use instead of their names.

### **2.5.10 Telephone assessments**

Unfortunately, a computer error resulted in a loss of approximately 5% of the data obtained during the 3½ year follow-up maternal assessments. However, this error did not result in any breaches of confidentiality. In fact, the only way the lost data could be obtained was by partly assessing the women concerned again. This method of obtaining the lost data would require particular components of 7 of the measures to be administered again, which would take approximately 10-20 minutes per woman.

A decision was made to assess the women by telephone so as to accelerate data recovery. In order to prevent the overall results of the 3½ year follow-up being influenced by differences between the assessments undertaken by telephone, and the assessments undertaken in person, it was decided to undertake the telephone assessments in exactly the same way as the assessments undertaken in person; except that as the women would not be able to see what was being entered into the computer, this information would be read to them as it was entered. Also, 'single-blind' conditions would once again be maintained by asking the women not to disclose whether or not they were assigned to the intervention group.

When the women were telephoned, they were briefly reminded of their participation in the follow-up, and the situation concerning the lost data was explained to them, as was what was entailed in recovering the data. They were asked if they would mind providing the lost data during the telephone call. All of the women were happy to oblige. The components of the 7 measures were then read to them. As with the assessments undertaken in person, 'single-blind' conditions were maintained successfully. The measures were as follows:

1. Pre-consent (Wheatley, 1998).
2. Leicester Housing Schedule (Wheatley, 1998).
3. Service Contact (devised from work undertaken by the ONS; Meltzer et al., 1995).
4. IMSR (Brugha et al., 1987).
5. Fetal Health Locus of Control Scale (Labs & Wurtele, 1986).
6. General Difficulties (devised from work undertaken by the ONS; Meltzer et al., 1995).
7. Problem Solving Inventory (Heppner & Petersen, 1982).

The components of the measures that were read out to the women are denoted in bold type in appendix III. The information given to the women prior to reading out the measures is provided in appendix II. The assessments were undertaken in March 2001.

## **2.6 PLAN OF ANALYSIS**

As mentioned in the overview of the chapter, this section is concerned with the rationale for decisions made when planning the analyses. The analyses planned are also provided (in an abbreviated form) for the purpose of clarity. The full plan of analysis is provided in appendix I, and was divided into the following four main sections:

1. Participation and attrition.
2. Demography.
3. Primary analyses (to test hypothesis I).
4. Secondary analyses (to test hypotheses II and III).

As emphasised previously, it is of crucial importance that the results from all stages of the PFP programme of research are comparable with each other. Consequently, whenever possible, the methods of analysis were repeated at each stage, enabling comparisons of like with like. Therefore, these methods were proposed to be repeated at the 3½ year follow-up stage.

The types and definitions of the statistical methods proposed were:

1. Logistic regressions (i.e. investigations of the relationship between binary response variables and independent variables).
2. Survival analysis (i.e. estimated survival functions for survival times in the lives of the people the analysis is concerned with).
3. Log-rank test (i.e. an examination to establish if a difference exists in survival functions between two groups of people).
4. Frequency analyses (i.e. the number of times the object of analysis has occurred).
5. Medians (i.e. averages).
6. Quartiles (i.e. quarters).

Finally, it was proposed that statistical significance would be assessed at the conventional 5% level. It was also proposed that the plan of analysis would be executed using the computer package, Statistical Analysis Software (SAS) Version 8.

## **2.7 PARTICIPATION AND ATTRITION**

This section of the plan of analysis focused on the flow of participation and attrition in the PFP programme of research, from randomisation, to the outcome of randomisation, through to the follow-up at 3½ years after childbirth. The data were presented in the form of a consort diagram, so that the impact of attrition on the balance between the arms and the derivation of the sample followed-up at 3½ years after childbirth could be easily deduced.

## **2.8 DEMOGRAPHY**

This section of the analysis plan addressed age and ethnicity (with base numbers) at both the outcome of randomisation and the follow-up at 3½ years after childbirth by group (intervention and control). Age was planned to be shown in terms of the minimum, lower quartile, median, upper quartile and maximum age. Ethnicity was planned to be shown in terms of 'white' and 'other', with 'other' being any ethnic origin other than 'white'. The demographic data were planned to be presented in the form of one table to enable an easy comparison between the outcome of randomisation and the 3½ year follow-up, as well as a clear presentation of how many women were followed up at this stage from the number randomised.

## **2.9 PRIMARY ANALYSES**

**Hypothesis I:** The PFP intervention will determine maternal mental health and child development at 3½ year outcome.

### **2.9.1 Analyses to address hypothesis I**

The following four measures were proposed for analysis of this hypothesis:

1. Primary measure of depression, the GHQ-30 (Goldberg, 1972).
2. Secondary measure of depression, the EPDS (Cox et al., 1987).
3. Tertiary measure of depression, the SCAN ICD-10 depression diagnosis (Wing et al., 1990).
4. Measure of child development, the Denver II Scale (Frankenberg et al., 1992); specifically, the four levels of assessment, personal-social skills, fine-motor adaptive skills, language skills and gross motor skills.

The hypothesis was proposed to be tested using:

1. A logistic regression analysis of each of the above measures of depression.
2. A logistic regression analysis of each of the above Denver II Scale levels of assessment (Frankenberg et al., 1992).
3. A survival analysis of the SCAN ICD-10 depression diagnosis (Wing et al., 1990).
4. A log-rank test of survival curves produced from the survival analysis.

With regard to the survival analysis of the SCAN ICD-10 depression diagnosis (Wing et al., 1990), this analysis was introduced at the 12 month outcome to establish whether or not there were any differences between the intervention and control groups in terms of surviving the development of a new episode of ICD-10 depression; looking specifically, at any point succeeding childbirth, right up to, and inclusive of, the month immediately prior to the SCAN assessment date (i.e. approximately 12 months after childbirth). It was proposed, for the same reason, to undertake a survival analysis at the 3½ year outcome.

When planning the survival analysis and logistic regression of the SCAN ICD-10 depression diagnosis data, many issues were raised concerning the use of the data. These issues are discussed below.

### ***2.9.1.1 Time periods***

In view of the fact that the time period covered in the SCAN assessments ranged from any point following childbirth, up to, and inclusive of, the month immediately preceding the date of assessment (i.e. an approximate 3½ year span), it was necessary to decide whether to use all, or part, of this period in the analyses.

As mentioned above, a logistic regression and survival analysis of the SCAN ICD-10 depression diagnosis (Wing et al., 1990) were proposed to form part of the hypothesis testing. The results of the logistic regression were proposed to be presented with the results produced from the logistic regressions of the EPDS (Cox et al., 1987) and GHQ-30 (Goldberg, 1972). Since the EPDS (Cox et al., 1987) and GHQ-30 (Goldberg, 1972) do not cover a time period beyond the month immediately prior to the assessment date, it was decided to include the SCAN data pertaining to this period only in the logistic regression of the SCAN ICD-10 depression diagnosis (Wing et al., 1990); otherwise, there would have been an imbalance in the presentation of the results.

However, as regards the survival analysis, there were not any factors to prevent the opportunity to use the entire time period covered in the SCAN assessments, and therefore, it was proposed that this opportunity be taken.

### ***2.9.1.2 SCAN ICD-10 depression diagnosis data***

In addition to being available at the 3½ year outcome, the SCAN ICD-10 depression diagnosis data were available at the 3 and 12 month outcomes. When planning the survival analysis, the 3½ year outcome data were considered for use with, and without, the 3 and 12 month outcome data. The factors considered are discussed below.

### ***2.9.1.3 Arguments for using the 3½ year outcome data only***

In view of the fact that the ICD-10 depression diagnosis data pertaining to the period from childbirth to approximately 3½ years after childbirth were proposed for use in

the survival analysis, and that these data were produced from the SCAN assessments at the 3½ year outcome, it could be argued that it would be unnecessary to use the ICD-10 depression diagnosis data produced from the SCAN assessments at the 3 and 12 month outcomes.

Furthermore, the use of the 3½ year outcome data with the 3 and 12 month outcome data could be problematic. For example, there could be conflicts between the 3 month, 12 month and 3½ year outcome data in terms of depressive episode onsets; because during assessment at each of these three stages, some of the women may well have given different time periods for the onset of the same depressive episode, perhaps as a result of fatigue, child distractions and memory failure.

Additionally, as new procedures for the administration of SCAN (Wing et al., 1990) were introduced for the 3½ year follow-up to improve the accuracy of symptom reporting, the data from this follow-up may, in particular, conflict with the data from the 3 and 12 month follow-ups. In fact, there is an increased probability of this conflict, because the follow-ups involved two SCAN interviewers, one of whom undertook the 3 and 12 month assessments, and the other undertook the 3½ year assessments. There would inevitably have been individual differences between the interviewers, hence, the increased probability of the data at the 3½ year outcome conflicting with the data at the 3 and 12 month outcomes.

Other arguments in favour of using the 3½ year outcome data only are that the inclusion of the 3 and 12 month outcome data would necessitate a modification to the procedure required for undertaking the survival analysis, namely the LIFE procedure (Keller et al., 1987). There were two reasons why this procedure could not be undertaken without modification. Firstly, some of the women did not undergo a 3 month outcome SCAN assessment. Secondly, of the women who did undergo this assessment, none were reminded of the information they provided regarding depressive episode onsets.

#### **2.9.1.4 Arguments for using the 3 month, 12 month and 3½ year outcome data**

If the data at the 3½ year outcome were to be used with the data at the 3 and 12 month outcomes, the accuracy of the results of the survival analysis may be enhanced. For example, the 3 and 12 month outcome data concerning depressive episode onsets might be more accurate than the 3½ year outcome data of the same; because the former were collected while the episodes were occurring, or much sooner after the occurrences than the latter. Therefore, in the event of conflicts between the data at the 3½ year outcome, and the data at 3 and 12 month outcomes, the conflicts could be dealt with by treating the data at the 3 and 12 month outcomes as the more accurate and as such, discounting the data at the 3½ year outcome. These principles could also apply, for the same reasons, in any instances of conflict between the 3 and 12 month outcome data.

In view of the merits of using the 3 month, 12 month and 3½ year outcome data, it was decided to propose to use the data from all three of these stages in the survival analysis. Any conflict between the data was proposed to be dealt with as detailed above, for the same reasons given. Also, as previously discussed, a modified version of the LIFE procedure (Keller et al., 1987) was necessary, and was therefore, proposed for use.

## **2.10 SECONDARY ANALYSES**

**Hypothesis II:** The PFP intervention will positively influence maternal social support and personal problem solving at 3½ year outcome.

**Hypothesis III:** Antenatal depression level will be a substantial predictor of maternal depression at 3½ years after the birth of a first child, even when antenatal social support and personal problem solving are taken into account in risk factor modelling.

### **2.10.1 Analyses to address hypothesis II**

The following two measures were proposed for analysis of this hypothesis:

1. IMSR (Brugha et al., 1987) for social support.
2. Problem Solving Inventory (Heppner & Petersen, 1982) for personal problem solving.

The hypothesis was proposed to be tested using a logistic regressions analysis of each of the following:

1. Poor versus good social support from good friends.
2. Poor versus good social support from close relatives.
3. Confidence versus lack of confidence in problem solving ability.
4. Avoidant versus non-avoidant approach to problem solving.
5. Personal control versus lack of personal control in problem solving.

The above proposed analyses for social support, as measured using the IMSR (Brugha et al., 1987), depart from a suggestion put forward by the authors. This departure was made each time data from the IMSR (Brugha et al., 1987) were used for analysis in the previous stages of the PFP programme of research. The reason for the departure being made in the first place was that without it, the volume of analyses would have been overly large for the purposes of the PFP research programme. The departure was proposed to made again at the 3½ year outcome due to the aforementioned importance of retaining comparability between the results from each stage of the PFP research programme.

In comparison with other measures administered, the IMSR (Brugha et al., 1987) is very cumbersome (please see appendix III). However, only a small proportion of it was pertinent to, and therefore, proposed for use in, the analyses. The proportion proposed for use was data produced from the following rating scale, for the following questions, which were asked for each person named as either a good friend or close relative:

A. EITHER

If it was apparent from prior questioning that the participant has been in recent contact with, and has recently needed support from, the person in question, the following was asked:

Did you get sufficient support from him or her?

B. OR

If it was apparent from prior questioning that the participant has not been in recent contact with, but has recently needed support from, the person in question, the following was asked:

Would you say that you have had insufficient support from this person then?

RATING SCALE

1. Not needed last week.
2. If needed, insufficient support.
3. Sufficient support.

During the analyses, poor social support was proposed to be defined as a rating of insufficient support from either good friends or close relatives. Good social support was proposed to be defined as a rating of good support from either good friends or close relatives, which, as detailed previously (in section 2.5.1.4), involved using the rating of 'sufficient support'.

***2.10.2 Analyses to address hypothesis III***

The following four measures were planned for analysis of this hypothesis:

1. Primary measure of depression, the GHQ-30 (Goldberg, 1972).
2. Secondary measure of depression, the EPDS (Cox et al., 1987).
3. IMSR (Brugha et al., 1987) for social support.
4. Problem Solving Inventory (Heppner & Petersen, 1982) for personal problem solving.

It was planned that the antenatal depression, social support and personal problem solving components of the hypothesis would be analysed using data collected at baseline, which was because this was the only antenatal time point when all the measures required for the hypothesis were administered.

The hypothesis was planned to be tested using 2 x 2 frequency tables, which were intended to build up to logistic regression analyses to address the hypothesis in full.

Firstly, baseline depression and maternal depression at 3½ years after the birth of a first child were decided to be analysed in terms of each of the following 2 x 2 frequency tables:

1. Depressed or not depressed at baseline by 3½ years after childbirth, as measured using the GHQ-30 (Goldberg, 1972).
2. Depressed or not depressed at baseline by 3½ years after childbirth, as measured using the EPDS (Cox et al., 1987).

Secondly, baseline social support and personal problem solving, and maternal depression at 3½ years after the birth of a first child were decided to be analysed in terms of 2 x 2 frequency tables. Maternal depression was planned to be analysed using the GHQ-30 (Goldberg, 1972), rather than the EPDS (Cox et al., 1987), due to the former being chosen as the primary measure. It was decided that there would be 2 x 2 frequency tables of each of the following:

1. Poor or good social support from good friends by depressed or not depressed.
2. Poor or good social support from close relatives by depressed or not depressed.
3. Confidence or lack of confidence in problem solving ability by depressed or not depressed.
4. Avoidant or non-avoidant approach to problem solving by depressed or not depressed.
5. Personal control or lack of personal control in problem solving by depressed or not depressed.

Finally, logistic regression analyses were planned of depression at both baseline and 3½ years after the birth of a first child, and social support and personal problem solving at baseline. It was decided that depression would be analysed using the GHQ-

30 (Goldberg, 1972) due to it being chosen as the primary measure. Each logistic regression was planned to be of the GHQ-30 (Goldberg, 1972) and each of the following:

1. Poor versus good social support from good friends.
2. Poor versus good social support from close relatives.
3. Confidence versus lack of confidence in problem solving ability.
4. Avoidant versus non-avoidant approach to problem solving.
5. Personal control versus lack of personal control in problem solving.

The above planned analyses for social support, as measured using the IMSR (Brugha et al., 1987), depart from a suggestion put forward by the authors, for the reasons given previously (in section 2.10.1). Also, the same proportion of the IMSR (Brugha et al., 1987) planned to be used for hypothesis II, was planned to be used for hypothesis III, for the reason mentioned before (in section 2.10.1). Additionally, it was planned that poor social support would be defined as a rating of insufficient support from either good friends or close relatives; and good social support as a rating of good support from either good friends or close relatives in the manner indicated above (in section 2.10.1).

When planning the analyses to address hypothesis III, much consideration was given to whether or not to undertake a panel-based analysis. This analysis would involve the use of data collected during earlier stages of this research, that is, at baseline, and 3 and 12 months after childbirth. The data from these stages would be used in conjunction with the data collected at 3½ years after childbirth. It is apparent from the above details of the analyses planned to address the hypothesis that a panel-based analysis was not included. A discussion now follows of the considerations given to undertaking a panel-based analysis.

The measures concerned with the hypothesis were administered to the women at baseline, and 3 months, 12 months and 3½ years after childbirth. It could be argued therefore, that the opportunity should be taken to use the data from each of these stages. One way of taking this opportunity would be by undertaking a panel-based analysis.

Before and after analyses are often used to study hypotheses about the effects of independent variables (IVs) on dependent variables (DVs) over time. In some cases, a panel-based analysis, that includes repeated testing, is preferred. In particular, it is preferred if it is crucial to determining the precise timing of effects or the functional characteristics of time curves; answering questions, such as does change occur steeply at first and then level off? or does it occur steadily over the entire period?

These type of questions about precise timing and the change functions are not of particular concern to hypothesis III. What is of particular concern, is whether or not the IVs have the predicted effects over a long period; not precisely when and precisely in what functional change form. Should the effects be found to be significant, the more specific questions about the nature of the changes could always be asked during any further follow-up stages in the PFP programme of research. Therefore, it can be argued that undertaking a panel-based analysis would be premature for establishing whether or not there were any significant effects.

Furthermore, in some cases, a panel-based analysis is not preferred, because the problem of confounding the observed effects with experimenter effects can occur as a result of repeated testing. When members of a panel are repeatedly tested, they sometimes behave differently from how they would if they were tested only before and after. For example, the chances are increased of what is known as a Hawthorne effect (i.e. a change in performance, resulting from the introduction of new working methods or conditions, irrespective of the nature of the change). Thus, a panel-based analysis is sometimes specifically avoided to prevent experimenter and Hawthorne effects contaminating the effects of the IV manipulations on the DVs.

Finally, the decision not to undertake a panel-based analysis was made on the basis of the drawbacks outlined of this analysis. However, this decision will not prevent the use of data collected at 3 and 12 months after childbirth, because, as mentioned above, the data from these stages were planned for use to address hypothesis I.

## **CHAPTER III**

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### **RESULTS**

#### **3.1 OVERVIEW**

This chapter is divided into the following four main sections:

1. Participation and attrition.
2. Demography.
3. Primary analyses.
4. Secondary analyses.

The analyses pertaining to each of these four sections were produced using the computer package, Statistical Analysis Software (SAS) Version 8, and are presented and reported below.

#### **3.2 PARTICIPATION AND ATTRITION**

Figure 3.2.1 is a consort diagram showing the flow of participation and attrition in the PFP programme of research, from randomisation, to the outcome of randomisation, through to the follow-up at 3½ years after childbirth.

The consort diagram shows that a total of 209 women consented to be randomised, with the outcome being that almost equal numbers of women were allocated to the intervention and control groups. 103 women (49%) were allocated to the intervention group and 106 women (51%) were allocated to the control group.

With regard to the follow-up at 3 months after childbirth, of the 103 women allocated to the intervention group, 94 (91%) consented to be followed-up and 9 (9%) did not. Of the 106 women allocated to the control group, 96 (91%) consented to be followed-up and 10 (9%) did not. Of the 209 women randomised, a total of 190 (91%) consented to be followed-up at this stage and 19 (9%) did not.

In view of the participation and attrition in the 3 month follow-up, it is apparent that participation at this stage was high and thus, attrition was low. It is also apparent that the intervention and control groups did not differ in terms of participation and attrition.

Regarding the follow-up at 12 months after childbirth, out of the 94 women in the intervention group who consented to the 3 month follow-up, 93 (99%) also consented to the 12 month follow-up; leaving only 1 (1%) who consented to the 3 month follow-up, but not the 12 month follow-up. All 9 women in the intervention group who did not consent to the 3 month follow-up, also did not consent to the 12 month follow-up. Out of the 96 women in the control group who consented to the 3 month follow-up, 87 (91%) also consented to the 12 month follow-up; leaving 9 (9%) who consented to the 3 month follow-up, but not the 12 month follow-up. All 10 women in the control group who did not consent to the 3 month follow-up, also did not consent to the 12 month follow-up. Out of the 209 women randomised, a total of 180 (86%) consented to the 12 month follow-up and 29 (14%) did not.

It is apparent from the participation and attrition in the 12 month follow-up that participation continued to remain high, and therefore, attrition continued to remain low. It is also apparent that there were quite small differences between the intervention and control groups in participation and attrition.

With respect to the follow-up at 3½ years after childbirth, of the 93 women in the intervention group who consented to *both* the 3 and 12 month follow-ups, 55 (59%) consented to the 3½ year follow-up; leaving 38 (41%) who did not. All 10 women in the intervention who did not consent to the 12 month follow-up, which includes the 9 who also did not consent to the 3 month follow-up, did not consent to the 3½ year follow-up either. Of the 87 women in the control group who consented to *both* the 3 and 12 month follow-ups, 59 (68%) consented to the 3½ year follow-up; leaving 28 (32%) who did not. All 19 of the women in the control group who did not consent to the 12 month follow-up, which includes the 10 who also did not consent to the 3 month follow-up, did not consent to the 3½ year follow-up either. Of the 209 women randomised, a total of 114 (55%) consented to the 3½ year follow-up and 95 (45%) did not.

Given the participation and attrition in the 3½ year follow-up, it is apparent that participation was higher than attrition, but the greatest loss of participants occurred during this follow-up than during the previous follow-ups. It is also apparent that there was not much difference between the intervention and control groups in terms of participation and attrition.

During the 3 month, 12 month and 3½ year follow-ups, attrition occurred because the women:

**1. Declined participation**

The women declined either personally or through a third party, typically their husband/partner or mother. The reasons given for declining were mostly time pressures of family and/or work. 10 women declined all the follow-ups. 6 women declined the 12 month and 3½ year follow-ups. 25 women declined the 3½ year follow-up.

**2. Were repeatedly not at home to honour appointments**

The number of women who failed to honour their appointments was 1 woman at the 3 month follow-up, 1 woman at the 12 month follow-up and 3 women at the 3½ year follow-up.

**3. Were not traceable after exhausting primary and secondary contacts**

7 women were untraceable during all the follow-ups. 2 women were untraceable during the 12 month and 3½ year follow-ups. 19 women were untraceable during the 3½ year follow-up.

**4. Had emigrated or relocated beyond reasonable commuting distance**

1 woman did not participate in any of the follow-ups due to relocating before the 3 month follow-up. 1 woman did not participate in the 12 month and 3½ year follow-ups due to emigrating before the 12 month follow-up. 19 women did not participate in the 3½ year follow-up due to emigrating or relocating before this follow-up.

Finally, a fundamental principle of an RCT was observed during the 3 month, 12 month and 3½ year follow-ups, that is, a concerted effort was made to provide all the women randomised with the opportunity to participate in each of the follow-ups.

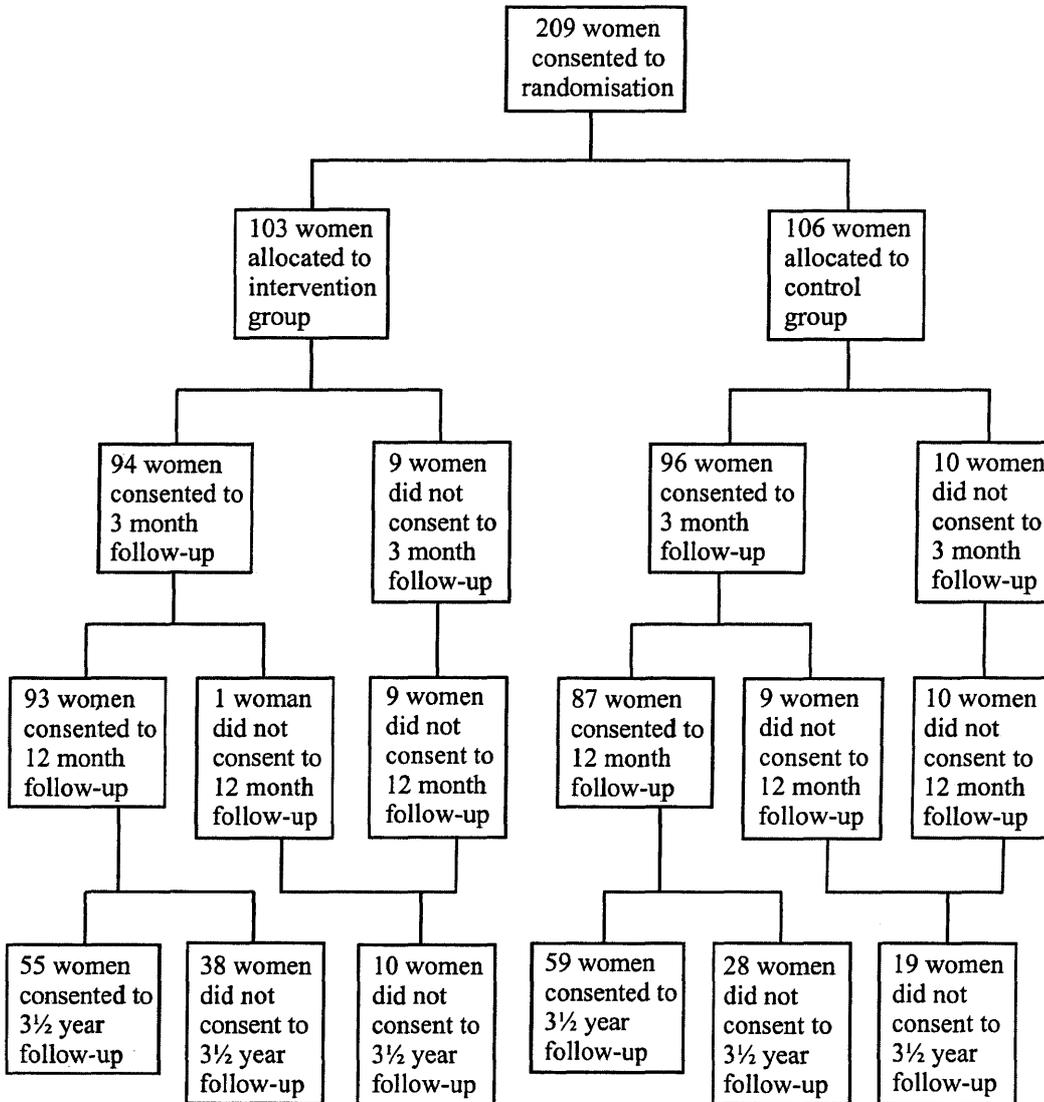


Figure 3.2.1 Participation and attrition from randomisation to 3½ year follow-up

### 3.3 DEMOGRAPHY

Table 3.3.1 shows the demographic data in terms of age and ethnicity at both the outcome of randomisation and the follow-up at 3½ years after childbirth by group (intervention and control).

It is apparent from the base figures in the table that, as mentioned above (in section 3.2), 103 women were randomised to the intervention group and 106 women were randomised to the control group; and 55 women in the intervention group and 59 women in the control group were followed-up at 3½ years after childbirth. Thus, also as mentioned above (in section 3.2), in total, 209 women were randomised, 114 of whom, were followed-up at 3½ years after childbirth.

With regard to age, the table shows that there was a good age range of at least 19 years between the minimum and maximum ages in both the intervention and control groups at the outcome of randomisation and the 3½ year follow-up. At the outcome of randomisation, in the intervention group, there was an age range of 22 years, with the ages ranging from 16-38 years; and in the control group, there was an age range of 21 years, with the ages ranging from 17-38 years. At the 3½ year follow-up, in both the intervention and control groups, there was an age range of 19 years, with the ages ranging from 22-41 years in the intervention group and 23-42 years in the control group.

There was also a good overall balance in terms of age between the intervention and control groups at the outcome of randomisation and the 3½ year follow-up. For example, at the outcome of randomisation, in the intervention and control groups, the median age was 25 years. At the 3½ year follow-up, in the intervention group, the median age was 29 years and in the control group, the median age was 31 years, so more of the younger women did not participate.

With regard to ethnicity, there was almost an equal number of women classed as 'white' in the intervention and control groups at the outcome of randomisation and the 3½ year follow-up. At the outcome of randomisation, 75 out of the 103 women (73%) in the intervention group, and 77 out of the 106 women (73%) in the control group, were classed as 'white'. At the 3½ year follow-up, 40 out of the 55 women (73%) in the intervention group, and 44 out of the 59 women (75%) in the control group, were classed as 'white'.

It is apparent from the table that the ethnic classification of 'white' is one of two ethnic classifications, with the second of which being known as 'other'. This classification constitutes any ethnic origin other than 'white'. Since there were almost equal numbers of women classed as 'white' in the intervention and control groups at the outcome of randomisation and the 3½ year follow-up, then as would be expected, in the remaining classification, there were almost equal numbers of women classed as 'other' in the intervention and control groups at the outcome of randomisation; and there were equal numbers of women (and almost equal percentages) classed as 'other' in the intervention and control groups at the 3½ year follow-up. At the outcome of randomisation, 28 out of the 103 women (27%) in the intervention group, and 29 out of the 106 women (27%) in the control group, were classed as 'other'. At the 3½ year follow-up, 15 out of the 55 women (27%) in the intervention group, and 15 out of the 59 women (25%) in the control group, were classed as 'other'.

Finally, the table shows that overall, there were over 2½ times as many women classed as 'white' than 'other'. This imbalance occurred at randomisation and was due to the women in the 'other' classification, much more so than the women in the 'white' classification, not giving consent to be randomised.

Age	Randomly allocated to	Randomly allocated to	Intervention group at	Control group at
Ethnicity	intervention group	control group	3½ year follow-up	3½ year follow-up
<b>Age:</b>				
Minimum	16	17	22	23
Lower quartile	23	24	27	28
Median	25	25	29	31
Upper quartile	29	29	34	35
Maximum	38	38	41	42
<b>Ethnicity:</b>				
White	75	77	40	44
Other	28	29	15	15
<b>Base</b>	103	106	55	59

**Table 3.3.1 Age and ethnicity at the outcome of randomisation  
and at the 3½ year follow-up by group (intervention and control)**

### 3.4 PRIMARY ANALYSES

**Hypothesis I:** The PFP intervention will determine maternal mental health and child development at 3½ year outcome.

#### *3.4.1 Analyses to address the maternal mental health component of hypothesis I*

Maternal mental health was measured using the:

1. Primary measure of depression, the 30 item version of the General Health Questionnaire (GHQ-30; Goldberg, 1972).
2. Secondary measure of depression, the Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987).
3. Tertiary measure of depression, the Schedules of Clinical Assessment in Neuropsychiatry (SCAN; Wing et al., 1990).

The maternal component of hypothesis I was tested using:

1. Logistic regressions.
2. Survival analysis.
3. Log-rank test.

The overall cut-points applied are detailed under the following heading. These cut-points were deduced from individual cut-points that are too detailed to be included in this chapter, but the details are provided in full, in the annex to appendix I.

#### *3.4.2 GHQ-30, EPDS and SCAN*

Table 3.4.2.1 shows the results of three logistic regression analyses. Each logistic regression was of one measure at 3½ year outcome by group (intervention and control). In order to provide protection against Type I errors arising from multiple significance tests, a Bonferroni-correction was made.

The measures were the:

1. GHQ-30 (Goldberg, 1972).
2. EPDS (Cox et al., 1987).

3. SCAN International Classification of Diseases, Tenth Revision (ICD-10) depression diagnosis (Wing et al., 1990) of the month immediately preceding the SCAN assessment date.

The overall cut-points applied were:

1. Depressed (GHQ-30 total  $\geq 2$ ) = 1.
2. Not depressed (GHQ-30 total  $\leq 1$ ) = 0.
3. Depressed (EPDS total  $\geq 11$ ) = 1.
4. Not depressed (EPDS total  $\leq 10$ ) = 0.

The table shows that the intervention did not determine maternal mental health at 3½ year outcome. There were no significant differences between the intervention and control groups in maternal depression, as measured using the GHQ-30 (Goldberg, 1972), EPDS (Cox et al., 1987) and SCAN (Wing et al., 1990).

Measure	Odds ratio	95% Confidence interval	P value
GHQ-30	0.510	0.121–2.146	0.358
EPDS	1.077	0.208–5.575	0.930
SCAN	2.189	0.193–24.840	0.527

**Table 3.4.2.1 Logistic regressions of GHQ-30, EPDS and SCAN at 3½ year outcome by group (intervention and control). Bonferroni-corrected alpha level is  $P < 0.017$ .**

### 3.4.3 SCAN

Figure 3.4.3.1 shows the results of a survival analysis of the SCAN ICD-10 depression diagnosis (Wing et al., 1990) at 3½ year outcome by group (intervention and control). Survival pertains to surviving the development of a new episode of ICD-10 depression. The time period covered in the analysis was from any point succeeding childbirth, right up to, and inclusive of, the month immediately prior to the SCAN assessment date.

The figure shows that the intervention did not determine maternal mental health at 3½ year outcome. There was very little difference in the survival curves between the intervention and control groups. A log-rank test of the survival curves showed that the difference was not significant (chi-square = 0.084, degrees of freedom; df = 1, *P* value = 0.772).

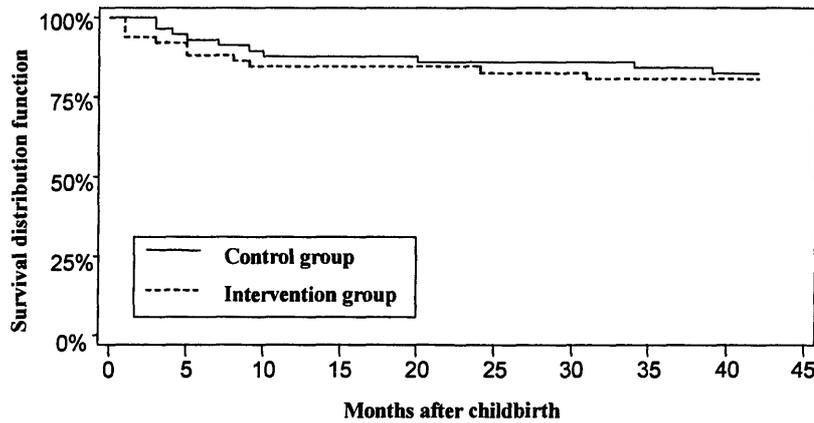


Figure 3.4.3.1 Estimated survival functions of mothers at 3½ year outcome by group (intervention and control)

### 3.4.4 Hypothesis I

The PFP intervention will determine maternal mental health and child development at 3½ year outcome.

#### 3.4.4.1 Analyses to address the child development component of hypothesis I

Child development was measured using the Denver II Scale (Frankenberg et al., 1992).

The child component of hypothesis I was tested using logistic regressions.

The overall cut-points adopted are detailed under the heading below. As before, these cut-points were deduced from individual cut-points that are too detailed to be included in this chapter, but full details are provided in the annex to appendix I.

### 3.4.5 Denver II Scale

Table 3.4.5.1 shows the results of four logistic regression analyses. Each logistic regression was of one of the Denver II Scale levels of assessment (Frankenberg et al., 1992) at 3½ year outcome by group (intervention and control). In order to provide protection against Type I errors arising from multiple significance tests, a Bonferroni-correction was made.

The levels of assessment were:

1. Personal-social skills.
2. Fine-motor adaptive skills.
3. Language skills.
4. Gross motor skills.

The overall cut-points adopted were:

1. Pass (percentage  $\geq 65$ ) = 1.
2. Fail (percentage  $< 65$ ) = 0.

The table shows that the intervention did not determine child development at 3½ year outcome. There were no significant differences between the children of the women in the intervention group, and the children of the women in the control group, in terms of child development, specifically personal-social skills, fine-motor adaptive skills, language skills and gross motor skills, as measured using the Denver II Scale (Frankenberg et al., 1992).

However, the validity of the results of one of the logistic regressions is questionable, namely language skills (odds ratio =  $>999.999$ , 95% confidence interval =  $<0.001$ - $>999.999$ ,  $P$  value = 0.960). The validity of the results was brought into question, because problems emerged when fitting the logistic regression model, which were caused by 113 children passing language skills and only 1 child failing.

Denver II Scale level of assessment	Odds ratio	95% Confidence interval	P value
Personal-social skills	0.608	0.098–3.785	0.594
Fine-motor adaptive skills	1.130	0.458–2.789	0.790
Language skills	>999.999	<0.001->999.999	0.960
Gross motor skills	1.450	0.618–3.402	0.393

**Table 3.4.5.1 Logistic regressions of Denver II Scale levels of assessment at 3½ year outcome by group (intervention and control). Bonferroni-corrected alpha level is  $P<0.012$ .**

### 3.4.6 Primary analyses: hypothesis, summary and conclusion

#### 1. Hypothesis I

The PFP intervention will determine maternal mental health and child development at 3½ year outcome.

#### 2. Summary of the results of the analyses used to test hypothesis I

Logistic regressions of the GHQ-30 (Goldberg, 1972), EPDS (Cox et al., 1987) and SCAN (Wing et al., 1990) showed that there were no significant differences between the intervention and control groups in terms of maternal depression at 3½ year outcome.

Furthermore, a survival analysis of the SCAN ICD-10 depression diagnosis (Wing et al., 1990) showed that there was very little difference in the survival curves between the intervention and control groups at 3½ year outcome, and a log-rank test of the curves showed that this difference was not significant.

Additionally, logistic regressions of the Denver II Scale levels of assessment (Frankenberg et al., 1992) showed that there were no significant differences between the children of the women in the intervention group, and the children of the women in the control group, in terms of child development, specifically personal-social skills, fine-motor adaptive skills, language skills and gross motor skills, at 3½ year outcome.

Finally, it is apparent from the non-significant results of the primary analyses that hypothesis I was refuted.

### **3. Conclusion from the primary analyses**

In view of hypothesis I being refuted, it was concluded that the PFP intervention did not determine maternal mental health and child development at 3½ year outcome.

## **3.5 SECONDARY ANALYSES**

**Hypothesis II:** The PFP intervention will positively influence maternal social support and personal problem solving at 3½ year outcome.

**Hypothesis III:** Antenatal depression level will be a substantial predictor of maternal depression at 3½ years after the birth of a first child, even when antenatal social support and personal problem solving are taken into account in risk factor modelling.

### ***3.5.1 Hypothesis II***

The PFP intervention will positively influence maternal social support and personal problem solving at 3½ year outcome.

#### ***3.5.1.1 Analyses to address hypothesis II***

Social support was measured using the Interview Measure of Social Relationships (IMSR; Brugha et al., 1987).

Personal problem solving was measured using the Problem Solving Inventory (Heppner & Petersen, 1982).

The hypothesis was tested using logistic regressions.

Details of each of the overall cut-points employed are provided under the following heading. Again, these cut-points were deduced from individual cut-points that are too detailed to be included in this chapter, but details are provided in full, in the annex to appendix I.

### ***3.5.2 Social support and personal problem solving***

Table 3.5.2.1 shows the results of four logistic regression analyses. Each logistic regression was of either social support or personal problem solving at 3½ year outcome by group (intervention and control). In order to provide protection against Type I errors arising from multiple significance tests, a Bonferroni-correction was made.

Social support was analysed as poor versus good social support from close relatives. Poor social support was defined as a rating of insufficient support from close relatives. Good social support was defined as a rating of good support from close relatives. It was intended that social support would also be analysed as poor versus good social support from good friends, but none of the women received poor social support from their good friends at 3½ year outcome.

Personal problem solving was analysed as:

1. Confidence versus lack of confidence in problem solving ability.
2. Avoidant versus non-avoidant approach to problem solving.
3. Personal control versus lack of personal control in problem solving.

The overall cut-points employed for social support were:

1. Poor social support (poor support total  $\geq 1$ ) = 1.
2. Good social support (poor support total = 0) = 0.

The overall cut-points employed for personal problem solving were:

1. Confidence in problem solving ability (confidence total  $\leq 38$ ) = 0.
2. Lack of confidence in problem solving ability (confidence total  $\geq 39$ ) = 1.

3. Avoidant approach to problem solving (avoidant total  $\geq 57$ ) = 1.
4. Non-avoidant approach to problem solving (avoidant total  $\leq 56$ ) = 0.
5. Personal control in problem solving (control total  $\leq 17$ ) = 0.
6. Lack of personal control in problem solving (control total  $\geq 18$ ) = 1.

The table shows that with the exception of avoidant approach to personal problem solving, there were no significant differences between the intervention and control groups in maternal social support, as measured using the IMSR (Brugha et al., 1987); and in maternal personal problem solving, as measured using the Problem Solving Inventory (Heppner & Petersen, 1982).

With regard to avoidant approach to problem solving, the results show that the intervention group was approximately 3½ times as likely to take this approach than the control group (odds ratio = 3.585, 95% confidence interval = 1.313-9.787, *P* value = 0.013). Since, as shown in chapter I, avoiding problems constitutes a poor approach, and in view of the other results for personal problem solving and social support, it is apparent that the intervention did not positively influence maternal social support and personal problem solving at 3½ year outcome.

Social support and personal problem solving	Odds ratio	95% Confidence interval	P value
Poor social support from close relatives versus good social support from close relatives	0.487	0.127-1.865	0.294
Confidence in problem solving ability versus lack of confidence in problem solving ability	0.378	0.089-1.610	0.188
Avoidant approach to problem solving versus non-avoidant approach to problem solving	3.585	1.313-9.787	0.013
Personal control in problem solving versus lack of personal control in problem solving	0.991	0.416-2.363	0.983

**Table 3.5.2.1 Logistic regressions of social support and personal problem solving at 3½ year outcome by group (intervention and control). Bonferroni-corrected alpha level is  $P < 0.012$ .**

### 3.5.3 Hypothesis III

Antenatal depression level will be a substantial predictor of maternal depression at 3½ years after the birth of a first child, even when antenatal social support and personal problem solving are taken into account in risk factor modelling.

#### 3.5.3.1 Analyses to address hypothesis III

Antenatal depression level (i.e. baseline depression level) and maternal depression at 3½ years after the birth of a first child were measured using the:

1. Primary measure of depression, the GHQ-30 (Goldberg, 1972).
2. Secondary measure of depression, the EPDS (Cox et al., 1987).

Antenatal social support (i.e. baseline social support) was measured using the IMSR (Brugha et al., 1987).

Antenatal personal problem solving (i.e. baseline personal problem solving) was measured using the Problem Solving Inventory (Heppner & Petersen, 1982).

The hypothesis was tested using:

1. 2 x 2 frequency tables.
2. Logistic regressions.

Baseline depression level and maternal depression at 3½ years after childbirth were analysed using:

1. Firstly, the GHQ-30 (Goldberg, 1972).
2. Secondly, the EPDS (Cox et al., 1987).

Baseline social support and personal problem solving were analysed with:

1. Firstly, the GHQ-30 (Goldberg, 1972) at 3½ years after childbirth only.
2. Secondly, the GHQ-30 (Goldberg, 1972) at both baseline and 3½ years after childbirth.

Throughout the analyses, the baseline sample of women was the same sample who participated in the follow-up at 3½ years after childbirth.

Details of each of the overall cut-points applied are provided under the relevant headings below. As before, these cut-points were deduced from individual cut-points that are too detailed to be included in this chapter, but full details are provided in the annex to appendix I.

#### **3.5.4 GHQ-30**

Table 3.5.4.1 shows the frequency, with percentage and chi-square ( $\chi^2$ ) figures, of women who were either depressed or not depressed at baseline and 3½ years after childbirth, as measured using the GHQ-30 (Goldberg, 1972).

The overall cut-points applied were:

1. Depressed (GHQ-30 total  $\geq 2$ ) = 1.
2. Not depressed (GHQ-30 total  $\leq 1$ ) = 0.

With regard to depression, the table shows that baseline depression level was not a *substantial* predictor of maternal depression at 3½ years after the birth of a first child. Only 44% or 4 out of 9 women who were depressed at 3½ years after childbirth were depressed at baseline.

However, the table shows that if depression was not experienced at baseline, it was probable that it would not be experienced at 3½ years after the birth of a first child either. As many as 73% or 77 out of 105 women who were not depressed at 3½ years after childbirth were not depressed at baseline.

The  $\chi^2$  value in the table shows that the proportion of women who were depressed at baseline and 3½ years after childbirth, did not differ significantly from the proportion of women who were not depressed at baseline, but were depressed at 3½ years after childbirth ( $\chi^2 = 0.56$ ,  $P$  value = 0.45).

GHQ-30 at baseline	GHQ-30 at 3½ years after childbirth		Total
	Depressed	Not depressed	
Frequency			
Depressed	4 (3.5%)	28 (24.6%)	32 (28.1%)
Not depressed	5 (4.4%)	77 (67.5%)	82 (71.9%)
Total	9 (7.9%)	105 (92.1%)	114
$\chi^2$	0.56	$P$ value = 0.45	

**Table 3.5.4.1 Frequency of depressed or not depressed: baseline by 3½ years after childbirth.  $P < 0.05$ .**

### 3.5.5 EPDS

Table 3.5.5.1 shows the frequency, with percentage and  $\chi^2$  figures, of women who were either depressed or not depressed at baseline and 3½ years after childbirth, as measured using the EPDS (Cox et al., 1987).

The overall cut-points applied were:

1. Depressed (EPDS total  $\geq 11$ ) = 1.
2. Not depressed (EPDS total  $\leq 10$ ) = 0.

Consistent with table 3.5.4.1, table 3.5.5.1 shows that baseline depression level was not a *substantial* predictor of maternal depression at 3½ years after the birth of a first child. Only 33% or 2 out of 6 women who were depressed at 3½ years after childbirth were depressed at baseline.

Also consistent with table 3.5.4.1, table 3.5.5.1 shows that if depression was not present at baseline, it was probable that it would not be present at 3½ years after the birth of a first child either. As many as 80% or 86 out of 108 women who were not depressed at 3½ years after childbirth were not depressed at baseline.

Again, consistent with table 3.5.4.1, the  $\chi^2$  value in table 3.5.5.1 shows that the proportion of women who were depressed at baseline and 3½ years after childbirth, did not differ significantly from the proportion of women who were not depressed at baseline, but were depressed at 3½ years after childbirth ( $\chi^2 = 0.06$ ,  $P$  value = 0.81).

EPDS at baseline	EPDS at 3½ years after childbirth		Total
	Depressed	Not depressed	
Frequency			
Depressed	2 (1.8%)	22 (19.3%)	24 (21.1%)
Not depressed	4 (3.5%)	86 (75.4%)	90 (78.9%)
Total	6 (5.3%)	108 (94.7%)	114
$\chi^2$	0.06	$P$ value = 0.81	

**Table 3.5.5.1 Frequency of depressed or not depressed: baseline by 3½ years after childbirth.  $P < 0.05$ .**

### 3.5.6 IMSR and GHQ-30

Tables 3.5.6.1 and 3.5.6.2 show the frequency, with percentage and  $\chi^2$  figures, of women who received either poor or good social support from good friends and close relatives at baseline, as measured using the IMSR (Brugha et al., 1987); and who were either depressed or not depressed at 3½ years after childbirth, as measured using the GHQ-30 (Goldberg, 1972).

Poor social support was defined as a rating of insufficient support from either good friends or close relatives. Good social support was defined as a rating of good support from either good friends or close relatives.

The overall cut-points applied for social support were:

1. Poor social support (poor support total  $\geq 1$ ) = 1.
2. Good social support (poor support total = 0) = 0.

The overall cut-points applied for the presence and absence of depression were:

1. Depressed (GHQ-30 total  $\geq 2$ ) = 1.
2. Not depressed (GHQ-30 total  $\leq 1$ ) = 0.

The two tables show that in the majority of cases (75-90%), women who received poor social support at baseline were not depressed at 3½ years after the birth of a first child. Of 10 women who received poor support from good friends at baseline, 9 were not depressed at 3½ years after childbirth, leaving only 1 who was depressed (table 3.5.6.1). Of 4 women who received poor support from close relatives at baseline, 3 were not depressed at 3½ years after childbirth, leaving only 1 who was depressed (table 3.5.6.2).

The two tables show that in the majority of cases (92-93%), women who received good social support at baseline were not depressed at 3½ years after the birth of a first child. Of 104 women who received good support from good friends at baseline, 96 were not depressed at 3½ years after childbirth, leaving only 8 who were depressed (table 3.5.6.1). Of 110 women who received good support from close relatives at baseline, 102 were not depressed at 3½ years after childbirth, leaving only 8 who were depressed (table 3.5.6.2).

The  $\chi^2$  value in table 3.5.6.1 shows that the proportion of women who received poor social support from good friends at baseline, and who were depressed at 3½ years after childbirth, did not differ significantly from the proportion of women who received good social support from good friends at baseline, and who were depressed at 3½ years after childbirth ( $\chi^2 = 0.13$ ,  $P$  value = 0.72).

IMSR at baseline Frequency	GHQ-30 at 3½ years after childbirth		
	Depressed	Not depressed	Total
Poor social support from good friends	1 (0.9%)	9 (7.9%)	10 (8.8%)
Good social support from good friends	8 (7.0%)	96 (84.2%)	104 (91.2%)
Total	9 (7.9%)	105 (92.1%)	114
$\chi^2$	0.13	$P$ value = 0.72	

**Table 3.5.6.1 Frequency of poor or good social support from good friends at baseline by depressed or not depressed at 3½ years after childbirth.  $P < 0.05$ .**

The  $\chi^2$  value in table 3.5.6.2 shows that the proportion of women who received poor social support from close relatives at baseline, and who were depressed at 3½ years after childbirth, did not differ significantly from the proportion of women who received good social support from close relatives at baseline, and who were depressed at 3½ years after childbirth ( $\chi^2 = 0.12$ ,  $P$  value = 0.73).

IMSR at baseline Frequency	GHQ-30 at 3½ years after childbirth		
	Depressed	Not depressed	Total
Poor social support from close relatives	1 (0.9%)	3 (2.6%)	4 (3.5%)
Good social support from close relatives	8 (7.0%)	102 (89.5%)	110 (96.5%)
Total	9 (7.9%)	105 (92.1%)	114
$\chi^2$	0.12	$P$ value = 0.73	

**Table 3.5.6.2 Frequency of poor or good social support from close relatives at baseline by depressed or not depressed at 3½ years after childbirth.  $P < 0.05$ .**

### ***3.5.7 Problem Solving Inventory and GHQ-30***

Tables 3.5.7.1, 3.5.7.2 and 3.5.7.3 show the frequency, with percentage and  $\chi^2$  figures, of women who displayed confidence or lack of confidence in problem solving ability, avoidant or non-avoidant approach to problem solving, and personal control or lack of personal control in problem solving, at baseline, as measured using the Problem Solving Inventory (Heppner & Petersen, 1982); and who were either depressed or not depressed at 3½ years after childbirth, as measured using the GHQ-30 (Goldberg, 1972).

The overall cut-points applied for problem solving were:

1. Confidence in problem solving ability (confidence total  $\leq 38$ ) = 0.
2. Lack of confidence in problem solving ability (confidence total  $\geq 39$ ) = 1.
3. Avoidant approach to problem solving (avoidant total  $\geq 57$ ) = 1.
4. Non-avoidant approach to problem solving (avoidant total  $\leq 56$ ) = 0.
5. Personal control in problem solving (control total  $\leq 17$ ) = 0.
6. Lack of personal control in problem solving (control total  $\geq 18$ ) = 1.

The overall cut-points applied for the presence and absence of depression were:

1. Depressed (GHQ-30 total  $\geq 2$ ) = 1.
2. Not depressed (GHQ-30 total  $\leq 1$ ) = 0.

The three tables show that in the majority of cases (94-100%), women who displayed a lack of confidence in problem solving ability, an avoidant approach to, and a lack of personal control in, problem solving, at baseline were not depressed at 3½ years after the birth of a first child. Of 15 women who displayed a lack of confidence at baseline, all 15 were not depressed at 3½ years after childbirth (table 3.5.7.1). Of 44 women who displayed an avoidant approach at baseline, 42 were not depressed at 3½ years after childbirth, leaving only 2 who were depressed (table 3.5.7.2). Of 62 women who displayed a lack of personal control at baseline, 58 were not depressed at 3½ years after childbirth, leaving only 4 who were depressed (table 3.5.7.3).

The three tables show that in the majority of cases (90-91%), women who displayed confidence in problem solving ability, a non-avoidant approach to, and personal control in, problem solving, at baseline were not depressed at 3½ years after the birth of a first child. Of 99 women who displayed confidence at baseline, 90 were not depressed at 3½ years after childbirth, leaving only 9 who were depressed (table 3.5.7.1). Of 70 women who displayed a non-avoidant approach at baseline, 63 were not depressed at 3½ years after childbirth, leaving only 7 who were depressed (table 3.5.7.2). Of 52 women who displayed personal control at baseline, 47 were not depressed at 3½ years after childbirth, leaving only 5 who were depressed (table 3.5.7.3).

The  $\chi^2$  value in table 3.5.7.1 shows that the proportion of women who displayed confidence in problem solving ability at baseline, and who were depressed at 3½ years after childbirth, did not differ significantly from the proportion of women who displayed a lack of confidence in problem solving ability at baseline, and who were depressed at 3½ years after childbirth ( $\chi^2 = 0.49$ ,  $P$  value = 0.48).

Problem Solving Inventory at baseline Frequency	GHQ-30 at 3½ years after childbirth		
	Depressed	Not depressed	Total
Confidence in problem solving ability	9 (7.9%)	90 (79.0%)	99 (86.9%)
Lack of confidence in problem solving ability	0 (0.0%)	15 (13.1%)	15 (13.1%)
Total	9 (7.9%)	105 (92.1%)	114
$\chi^2$	0.49	$P$ value = 0.48	

**Table 3.5.7.1 Frequency of confidence or lack of confidence in problem solving ability at baseline by depressed or not depressed at 3½ years after childbirth.  $P < 0.05$ .**

The  $\chi^2$  value in table 3.5.7.2 shows that the proportion of women who displayed an avoidant approach to problem solving at baseline, and who were depressed at 3½ years after childbirth, did not differ significantly from the proportion of women who displayed a non-avoidant approach to problem solving at baseline, and who were depressed at 3½ years after childbirth ( $\chi^2 = 0.48$ ,  $P$  value = 0.49).

Problem Solving Inventory at baseline Frequency	GHQ-30 at 3½ years after childbirth		
	Depressed	Not depressed	Total
Avoidant approach to problem solving	2 (1.8%)	42 (36.8%)	44 (38.6%)
Non-avoidant approach to problem solving	7 (6.1%)	63 (55.3%)	70 (61.4%)
Total	9 (7.9%)	105 (92.1%)	114
$\chi^2$	0.48	$P$ value = 0.49	

**Table 3.5.7.2 Frequency of avoidant or non-avoidant approach to problem solving at baseline by depressed or not depressed at 3½ years after childbirth.  $P < 0.05$ .**

The  $\chi^2$  value in table 3.5.7.3 shows that the proportion of women who displayed personal control in problem solving at baseline, and who were depressed at 3½ years after childbirth, did not differ significantly from the proportion of women who displayed a lack of personal control in problem solving at baseline, and who were depressed at 3½ years after childbirth ( $\chi^2 = 0.08$ ,  $P$  value = 0.78).

Problem Solving Inventory at baseline Frequency	GHQ-30 at 3½ years after childbirth		
	Depressed	Not depressed	Total
Personal control in problem solving	5 (4.4%)	47 (41.2%)	52 (45.6%)
Lack of personal control in problem solving	4 (3.5%)	58 (50.9%)	62 (54.4%)
Total	9 (7.9%)	105 (92.1%)	114
$\chi^2$	0.08	<i>P</i> value = 0.78	

**Table 3.5.7.3** Frequency of personal control or lack of personal control in problem solving at baseline by depressed or not depressed at 3½ years after childbirth. *P*<0.05.

### 3.5.8 GHQ-30, and social support and personal problem solving

Table 3.5.8.1 shows the results of five logistic regression analyses. Each logistic regression was of the GHQ-30 (Goldberg, 1972) at both baseline and 3½ years after childbirth; and either social support, as measured using the IMSR (Brugha et al., 1987), or personal problem solving, as measured using the Problem Solving Inventory (Heppner & Petersen, 1982), at baseline. In order to provide protection against Type I errors arising from multiple significance tests, a Bonferroni-correction was made.

Social support was analysed as:

1. Poor versus good social support from good friends.
2. Poor versus good social support from close relatives.

Poor social support was defined as a rating of insufficient support from either good friends or close relatives. Good social support was defined as a rating of good support from either good friends or close relatives.

Personal problem solving was analysed as:

1. Confidence versus lack of confidence in problem solving ability.
2. Avoidant versus non-avoidant approach to problem solving.
3. Personal control versus lack of personal control in problem solving.

The overall cut-points applied for the presence and absence of depression were:

1. Depressed (GHQ-30 total  $\geq 2$ ) = 1.
2. Not depressed (GHQ-30 total  $\leq 1$ ) = 0.

The overall cut-points applied for social support were:

1. Poor social support (poor support total  $\geq 1$ ) = 1.
2. Good social support (poor support total = 0) = 0.

The overall cut-points applied for personal problem solving were:

1. Confidence in problem solving ability (confidence total  $\leq 38$ ) = 0.
2. Lack of confidence in problem solving ability (confidence total  $\geq 39$ ) = 1.
3. Avoidant approach to problem solving (avoidant total  $\geq 57$ ) = 1.
4. Non-avoidant approach to problem solving (avoidant total  $\leq 56$ ) = 0.
5. Personal control in problem solving (control total  $\leq 17$ ) = 0.
6. Lack of personal control in problem solving (control total  $\geq 18$ ) = 1.

The table shows that antenatal (i.e. baseline) depression level was not a substantial predictor of maternal depression at 3½ years after the birth of a first child, even when antenatal (i.e. baseline) social support and personal problem solving are taken into account in risk factor modelling. None of the results of the logistic regressions were significant.

However, the validity of the results of one of the logistic regressions is questionable. This logistic regression is the GHQ-30 (odds ratio = 2.330, 95% confidence interval = 0.576-9.427,  $P$  value = 0.235), and confidence versus lack of confidence in problem solving ability (odds ratio =  $<0.001$ , 95% confidence interval =  $<0.001$ - $>999.999$ ,  $P$  value = 0.959). The validity of the results was brought into question, because problems were encountered when fitting the logistic regression model, which were caused by relatively few of the women who displayed confidence or lack of confidence in problem solving ability being depressed.

Further logistic regression models were attempted on the GHQ-30 (Goldberg, 1972) at both baseline and 3½ years after childbirth; and either social support, as measured using the IMSR (Brugha et al., 1987), or personal problem solving, as measured using the Problem Solving Inventory (Heppner & Petersen, 1982), at baseline. The purpose of these additional analyses was to select the best prediction model using the variable selection methods of forward selection and backward deletion. However, as none of the independent variables (IVs) examined were significant predictors of the GHQ-30

at 3½ years after childbirth, a prediction model could not be defined by either of the selection methods.

The forward selection involves beginning the analysis without any variables in the model, then adding only the variables that are significant linear predictors of the dependent variable (DV), with the additions being made in order of the most significant.

The backward deletion is the opposite method to the forward selection, that is, all the IVs are included in the model to begin with, then each variable that is not a significant linear predictor of the DV is deleted, the deletions taking place in order of the most non-significant.

GHQ-30 at baseline and 3½ years after childbirth and social support and personal problem solving at baseline	Odds ratio	95% Confidence interval	<i>P</i> value
GHQ-30	2.179	0.543-8.745	0.272
Poor social support from good friends versus good social support from good friends	1.198	0.131-10.940	0.873
GHQ-30	1.931	0.458-8.149	0.370
Poor social support from close relatives versus good social support from close relatives	3.141	0.266-37.059	0.363
GHQ-30	2.330	0.576-9.427	0.235
Confidence in problem solving ability versus lack of confidence in problem solving ability	<0.001	<0.001->999.999	0.959
GHQ-30	2.125	0.528-8.548	0.289
Avoidant approach to problem solving versus non-avoidant approach to problem solving	0.444	0.087-2.257	0.328
GHQ-30	2.153	0.537-8.626	0.279
Personal control in problem solving versus lack of personal control in problem solving	0.673	0.170-2.674	0.574

**Table 3.5.8.1 Logistic regressions of GHQ-30 at baseline and 3½ years after childbirth, and social support and personal problem solving at baseline. Bonferroni-corrected alpha level is  $P < 0.01$ .**

### 3.5.9 Secondary analyses: hypotheses, summaries and conclusions

#### 1. Hypothesis II

The PFP intervention will positively influence maternal social support and personal problem solving at 3½ year outcome.

#### 2. Hypothesis III

Antenatal depression level will be a substantial predictor of maternal depression at 3½ years after the birth of a first child, even when antenatal social support and personal problem solving are taken into account in risk factor modelling.

**3. Summary of the results of the analyses used to test hypothesis II**

Logistic regressions of social support, as measured using the IMSR (Brugha et al., 1987) and personal problem solving, as measured using the Problem Solving Inventory (Heppner & Petersen, 1982) showed that with the exception of avoidant approach to personal problem solving, there were no significant differences between the intervention and control groups in maternal social support and maternal personal problem solving at 3½ year outcome. Regarding avoidant approach to problem solving, the intervention group was approximately 3½ times as likely to take this *poor* approach than the control group. Thus, the results of the analyses refute hypothesis II.

**4. Summary of the results of the analyses used to test hypothesis III**

Frequency analyses of women who were either depressed or not depressed, as measured using the GHQ-30 (Goldberg, 1972) and EPDS (Cox et al., 1987) showed that baseline (i.e. antenatal) depression level was not a *substantial* predictor of maternal depression at 3½ years after the birth of a first child. However, these analyses showed that if depression was not experienced at baseline (i.e. antenatally), it was probable that it would not be experienced at 3½ years after the birth of a first child either.

The  $\chi^2$  values presented with these frequency analyses showed that the proportion of women who were depressed at baseline (i.e. antenatally) and 3½ years after childbirth, did not differ significantly from the proportion of women who were not depressed at baseline (i.e. antenatally), but were depressed at 3½ years after childbirth.

Frequency analyses of women who received either poor or good social support from good friends and close relatives, as measured using the IMSR (Brugha et al., 1987); and who were either depressed or not depressed, as measured using the GHQ-30 (Goldberg, 1972) showed that in the majority of cases, women who received:

- A. Poor social support at baseline (i.e. antenatally) were not depressed at 3½ years after the birth of a first child.

- B. Good social support at baseline (i.e. antenatally) were not depressed at 3½ years after the birth of a first child.

The  $\chi^2$  values presented with these frequency analyses showed that the proportion of women who received:

- A. Poor social support from good friends at baseline (i.e. antenatally), and who were depressed at 3½ years after childbirth, did not differ significantly from the proportion of women who received good social support from good friends at baseline (i.e. antenatally), and who were depressed at 3½ years after childbirth.
- B. Poor social support from close relatives at baseline (i.e. antenatally), and who were depressed at 3½ years after childbirth, did not differ significantly from the proportion of women who received good social support from close relatives at baseline (i.e. antenatally), and who were depressed at 3½ years after childbirth.

Frequency analyses of women who displayed confidence or lack of confidence in problem solving ability, avoidant or non-avoidant approach to problem solving, and personal control or lack of personal control in problem solving, as measured using the Problem Solving Inventory (Heppner & Petersen, 1982); and who were either depressed or not depressed, as measured using the GHQ-30 (Goldberg, 1972) showed that in the majority of cases, women who displayed:

- A. Lack of confidence in problem solving ability, an avoidant approach to, and a lack of personal control in, problem solving, at baseline (i.e. antenatally) were not depressed at 3½ years after the birth of a first child.
- B. Confidence in problem solving ability, a non-avoidant approach to, and personal control in, problem solving, at baseline (i.e. antenatally) were not depressed at 3½ years after the birth of a first child.

The  $\chi^2$  values presented with these frequency analyses showed that the proportion of women who displayed:

- A. Confidence in problem solving ability at baseline (i.e. antenatally), and who were depressed at 3½ years after childbirth, did not differ significantly from the proportion of women who displayed a lack of confidence in problem

solving ability at baseline (i.e. antenatally), and who were depressed at 3½ years after childbirth.

- B. Avoidant approach to problem solving at baseline (i.e. antenatally), and who were depressed at 3½ years after childbirth, did not differ significantly from the proportion of women who displayed a non-avoidant approach to problem solving at baseline (i.e. antenatally), and who were depressed at 3½ years after childbirth.
- C. Personal control in problem solving at baseline (i.e. antenatally), and who were depressed at 3½ years after childbirth, did not differ significantly from the proportion of women who displayed a lack of personal control in problem solving at baseline (i.e. antenatally), and who were depressed at 3½ years after childbirth.

All of the frequency analyses for hypothesis III built up to logistic regression analyses to address the hypothesis in full, which were of the GHQ-30 (Goldberg, 1972), and social support, as measured using the IMSR (Brugha et al., 1987) and personal problem solving, as measured using the Problem Solving Inventory (Héppner & Petersen, 1982). These logistic regressions showed that baseline (i.e. antenatal) depression level was not a substantial predictor of maternal depression at 3½ years after the birth of a first child, even when baseline (i.e. antenatal) social support and personal problem solving are taken into account. None of the results of the logistic regressions were significant.

Finally, it is apparent from the results of the analyses that hypothesis III was refuted.

## **5. Conclusions from the secondary analyses**

In view of hypotheses II and III being refuted, it was concluded that:

- A. The PFP intervention did not positively influence maternal social support and personal problem solving at 3½ year outcome.
- B. Antenatal depression level was not a substantial predictor of maternal depression at 3½ years after the birth of a first child, even when antenatal social support and personal problem solving are taken into account in risk factor modelling.

## **CHAPTER IV**

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### **DISCUSSION**

#### **4.1 OVERVIEW**

This chapter begins by comparing the findings in the PFP programme of research. It continues with a discussion of these findings in the context of other, comparable research. It then focuses on the merits and limitations of the programme. A discussion follows of the implications of the programme for future research and practitioners. The chapter closes by concluding the programme.

#### **4.2 COMPARISON OF FINDINGS IN PFP PROGRAMME**

As mentioned in chapter III, it was concluded from the results of the present follow-up, at 3½ years after childbirth, that the PFP intervention did not determine maternal mental health and child development, nor did it positively influence maternal social support and personal problem solving. In fact, the only significant result found was that the intervention group was approximately 3½ times as likely than the control group to take an avoidant approach to problem solving, which has been identified in chapter I as a poor approach.

During the previous two follow-ups, at 3 and 12 months after childbirth, the effectiveness of the PFP intervention was also evaluated in terms of whether or not it determined maternal mental health and child development, as well as positively influenced maternal social support and personal problem solving. The conclusions drawn from the results were consistent with the conclusions drawn from the results of the present follow-up. In fact, the first follow-up, like the present follow-up, showed that the intervention group was significantly more likely, approximately twice as likely in this case, than the control group to take the same poor, avoidant approach to problem solving.

The second follow-up was the only time when no significant difference was found between the intervention and control groups in terms of avoidant approach to problem

solving. It is unclear why the intervention group, in comparison to the control group, went from being approximately twice as likely to take this approach, to being no more likely, and then to being approximately 3½ times as likely.

One possible explanation as to why the women were found to be more inclined to avoid problems at the first and third follow-ups than at the second follow-up is time constraints. During the measure used to assess problem solving, many women justified poor problem solving approaches, although they did so informally, because they were not asked to provide this information and thus, it did not form part of the data collection. Nevertheless, what struck the researchers was that there was one justification, in particular, that was repeatedly put forward by the women for avoiding problems, which was that they simply did not have the time to address them. The women were probably under more time constraints at the first and third follow-ups than at the second follow-up, because: (1) at the first follow-up, they were inexperienced at motherhood, so it may well have taken them longer to deal with the demands of this role than experienced mothers; (2) at the second follow-up, they had had 12 months experience of motherhood, which would have probably enabled them to deal with the demands quicker than they did during the first few months; and (3) at the third follow-up, unlike at the second follow-up, many of the women had gone on to have at least one more child, which would have obviously placed additional constraints on their time.

It is not possible to know if more of the women in the intervention group than in the control group gave time constraints as their justification for avoiding their problems, because at the time of administering the measures, the researchers had no knowledge of which group the women had been assigned to. What is known though, is that at the time of the third follow-up, the maximum number of children any of the women had was three, and more of the women in the intervention group than in the control group had this number of children. Also, overall, the intervention group had more children than the control group, which inevitably added to the demands on their time. Thus, it is certainly possible that the intervention group felt more pressurised by time constraints than the control group.

However, there could, of course, be no connection between the first and third follow-up findings in terms of the intervention group being more likely than the control group to take an avoidant approach to problem solving. These findings could quite well be coincidental.

In summary, the PFP intervention has never been found to be effective, despite its effectiveness being evaluated at three time points, in the relative: (1) short-term; (2) short- to medium-term; and (3) long-term.

#### **4.3 FINDINGS OF PFP PROGRAMME IN LIGHT OF OTHER RESEARCH**

One possible explanation as to why the PFP intervention failed to prevent maternal depression is its failure to positively influence social support. As shown in chapter I, poor social support, in particular, from friends, the spouse or partner and mother (Brugha et al., 1998a; Pajulo et al., 2001), places women at risk of maternal depression; and good social support provides protection from maternal depression (e.g. Paykel et al., 1980; O'Hara, 1986; Wilson et al., 1996; Webster et al., 2000).

Although the PFP intervention failed to positively influence social support, it did, as a means of attempting to prevent maternal depression, devote considerable attention to attempting to increase social support, in particular, from friends and close relatives, using techniques that others have found to be successful or would recommend. For example, as shown in chapter I, the type of sessions that formed part of the PFP intervention were found by Chen et al. (2000) to result in increased social support and decreased maternal depression. Another example is that the PFP intervention focused a lot on the topic of effective communication, with the aim of increasing social support, which, as shown in chapter I, is what interpersonal theory would recommend (Sullivan, 1953; Kiesler, 1996), yet it clearly did not achieve this aim.

Another possible explanation for the PFP intervention not being effective in preventing maternal depression is that it did not positively influence personal problem solving. It is apparent from chapter I, that a poor personal problem solving approach puts women at risk of maternal depression, and a good personal problem solving

approach offers protection from this disorder (Demyttenaere et al., 1995; Elliott et al., 1996; Brugha et al., 1998b; 1999c; 2000; Wheatley et al., 2000).

While the PFP intervention did not positively influence personal problem solving, in order to try to prevent maternal depression, it put considerable effort into developing a good personal problem solving approach, using methods that accord with both social problem solving theory (Nezu & D’Zurilla, 1989; Nezu et al., 1989; D’Zurilla & Nezu, 1990; D’Zurilla et al., 2004), and are employed in problem solving therapy (PST) to successfully treat depressive disorders (Nezu et al., 1989; 2004; Mynors-Wallis et al., 1995; 2000; Barrett et al., 2001; Unutzer et al., 2002). Examples of these methods, which are discussed in chapter I, include encouraging self-confidence in problem solving ability, in addition to self-control in, and a non-avoidant approach to, problem solving. However, despite using these methods, the intervention was clearly unsuccessful in positively influencing problem solving.

It is perhaps more likely than not that the intervention’s failure to prevent maternal depression at the 3½ year follow-up stage is not connected with its failure to positively influence social support and personal problem solving. One conclusion drawn from this stage that has not yet been mentioned in this chapter is that antenatal depression level was not a substantial predictor of maternal depression at 3½ years after the birth of a first child, even when antenatal social support and personal problem solving are taken into account in risk factor modelling. It is apparent from the results that led to this conclusion that social support and personal problem solving were neither risks nor protectors of maternal depression in the study sample. Thus, even if the intervention had positively influenced social support and personal problem solving, it is unlikely that, as a result, it would have prevented maternal depression at 3½ years after childbirth.

It was not until the 3½ year follow-up stage that it was thought to look at whether or not social support and personal problem solving were risks or protectors of maternal depression in the study sample. Thus, prior to this stage, it is not possible to know if it is more likely than not that there is a connection between the intervention’s failure to prevent maternal depression, and its failure to positively influence both social support and personal problem solving.

In chapter I, it was discussed that there are four main *psychosocial* treatment methods used, although not exclusively, for maternal depression, these methods are: (1) cognitive-behavioural therapy (CBT); (2) interpersonal psychotherapy (IPT); (3) problem solving therapy (PST); and (4) the eclectic approach (Brugha et al., 1998b). Also, it was discussed in the same chapter that in order to prevent maternal depression, the PFP intervention used an eclectic approach of CBT, IPT and PST. Whilst this approach has been shown to be efficacious in treating maternal depression (Wisner et al., 2002), it does not necessarily follow that what works in treatment will work in prevention.

However, as shown in chapter I, one of the interventions the PFP intervention drew from that was successful in preventing maternal depression did use an eclectic approach of CBT, IPT and PST. This was the intervention designed by Elliott et al. (1988). However, there are a number of differences between their intervention and the PFP intervention that could account for why theirs was successful and the PFP intervention was not. In particular, their intervention was longer and had 5 postnatal sessions, which covered the period of maximum risk for maternal depression, that is, the first 3 months after childbirth (Cooper et al., 1988; Cox et al., 1993) compared to the PFP intervention's 1 postnatal session, at approximately 2 months after childbirth.

Nevertheless, another intervention the PFP intervention drew from that was also successful in preventing maternal depression was considerably shorter than the PFP intervention, comprising just two sessions, none of which were in the postnatal period. This intervention was designed by Gordon & Gordon (1960) and is described in chapter I. One particular difference between their intervention and the PFP intervention that could account for the difference in outcome is that their intervention took place approximately four decades before the PFP intervention. Although published in 1960, their intervention was held in the late 1950s, before the significant changes in the role of mothers in society in the 1960s and 1970s. Thus, at the time of their intervention, mothers generally took a domestic role. However, since the 1960s and 1970s, the opposite has increasingly occurred, with mothers generally balancing motherhood and employment instead. Consequently, women's experiences of motherhood at the time of Gordon & Gordon's intervention would inevitably have

been somewhat different from women's experiences of motherhood at the time of the PFP intervention.

One example of the differing experiences of motherhood is that when Gordon & Gordon's intervention took place, giving up a job to become a full-time mother would have been in keeping with convention and thus, very unlikely to have met with criticism. However, women in the PFP programme of research who decided to give up their job to become a full-time mother often mentioned that they were criticised for not making the most of their opportunities and as a result, felt that their role as a mother was not valued. Another example is that at the time of Gordon & Gordon's intervention, because the women would generally have been looking after the children themselves, they would not have experienced what women in the PFP programme often mentioned they felt, that is, guilt over leaving their children with someone else while they went out to work.

Whilst the PFP intervention clearly did cater for the modern day role of mother, it drew substantially from Gordon & Gordon's intervention and obviously, it does not necessarily follow that because theirs was successful, after decades of societal change, the PFP intervention will also be successful.

It was shown in chapter I, that the interventions designed by Gordon & Gordon (1960) and Elliott et al. (1988) were two of three interventions the PFP intervention drew from, with the remaining intervention being designed by Kirkham et al. (1988) to reduce stress in mothers of mentally retarded children. Initially, Kirkham et al's intervention, like the PFP intervention, was not found to be effective, but unlike the PFP intervention, it was found to be effective in the long-term. However, while the PFP intervention drew from Kirkham et al's intervention, it obviously does not follow that what works for reducing stress in mothers of mentally retarded children, will work for preventing maternal depression in, at the time, nulliparous pregnant women, without full-time childcare responsibilities.

It was mentioned earlier in this thesis that child development formed part of the evaluations of the effectiveness of the PFP intervention for the first time at the 12 month follow-up, and for the second time at the 3½ year follow-up. It was also

mentioned that at both of these time points, it was found that the intervention did not have positive effects on child development.

A possible explanation for these findings concerns the intervention not being successful in preventing maternal depression. As shown in chapter I, maternal depression can result in enduring, child development problems (e.g. Elliott, 1989; Murray & Cooper, 1996; Chen et al., 2000). It is possible then, that the well-being of mothers is embodied in the development of their children. This possibility has led to an argument that has been consistently made over the years, that if interventions are successful in preventing maternal depression, they also may well prevent child problems (e.g. Ranjso-Arvidson et al., 1998; Cooper et al., 2002; Heh & Fu, 2003). Therefore, it is probable that it is because the PFP intervention was not successful in preventing maternal depression, that it did not have positive effects on child development, at both the first evaluation and the second, long-term evaluation.

In chapter I, it was shown that an intervention to reduce or prevent adverse development and behaviour outcomes of children, stemming from maternal negative affect and/or economic deprivation, was found to be effective when evaluated in the long-term, but not when evaluated initially. This intervention was designed by Hutcheson et al. (1997), and their work highlights the importance of evaluating the long-term effectiveness of interventions on child outcomes, even if, on first evaluation, they were not found to be effective. In the PFP programme of research though, when the effectiveness of the intervention was evaluated on child outcome, positive effects were neither found the first time, nor in the long-term, the second time.

There are, however, a number of differences between the intervention designed by Hutcheson et al. (1997) and the PFP intervention, which could explain why their intervention was effective and the PFP intervention was not. In particular, their intervention was specifically for, and directly received by, the children, rather than the mothers as in the PFP intervention. Also, in their intervention, the children were 2 years old, whereas in the PFP intervention, the children had not even been born. Finally, their intervention was designed to reduce existing, or prevent future, child

problems that had been, or might be, brought about by maternal negative affect and/or economic deprivation; whereas the PFP intervention was designed to prevent maternal depression, with a view, in the process, to preventing child problems that might be brought about by maternal depression.

#### **4.4 STRENGTHS AND WEAKNESSES OF PFP PROGRAMME**

One weakness of the PFP programme of research is that the loss of participants was rather high at some of the stages. In particular, it was high from: (1) the women screening positively for sub-clinical depression to the baseline assessments; (2) the baseline assessments to randomisation; and (3) the 12 month follow-up to the 3½ year follow-up. The participant loss was 108, 83 and 66 respectively. Since this loss considerably reduced the size of the study sample, it would have had a negative impact on the generalisability of the results of the programme. Obviously though, the longer a research programme continues, the greater the loss of participants will be, since as time goes on, they will inevitably, for example, drop-out, become untraceable or relocate.

A strength of the PFP programme is that all of the researchers who undertook the follow-up assessments never, at any point, knew whether the women had been assigned to the intervention or control group. Thus, there was never any possibility of knowledge of treatment assignment influencing the results.

However, it was obviously necessary for the women who participated in the programme to know whether they were in the intervention or control group. This knowledge may have produced differences in the experiences between the two groups, which in turn may have influenced the results (Brugha et al., 1999c).

Possible different experiences between the women in intervention group and those of the women in the control group may have arisen from the fact that all of these women clearly wanted the extra care the intervention provided, as shown by their willingness to be randomised. Therefore, the women in the intervention group most probably experienced positive feelings about their group allocation, such as being relieved,

happy and excited to be getting the care they wanted. In contrast, the women in the control group most probably experienced negative feelings over being denied this care, such as powerlessness to do anything about it, as well as feeling excluded, upset and resentful. These unpleasant feelings could well have been reinforced, as during the routine antenatal classes, the women would have undoubtedly come into contact with some of the women in the intervention group, and may well have heard what they were missing out on. The feelings could have been further reinforced if the women in the control group experienced maternal depression, as they would not have known that the intervention had no preventative effects on maternal depression; so it would have been quite natural to engage in counterfactual thinking in terms of, for example, thinking if only they had been chosen for the intervention, they would not have become depressed.

Although the intervention did not prevent maternal depression, it may have developed the women's existing skills and/or provided them with new skills, which could well have equipped them to deal with situations/circumstances better than before the intervention. Particular components of the intervention that are detailed in chapter I and may have served this purpose are: (1) erroneous ways of thinking; (2) empowering self-talk; (3) coping styles; and (4) clear communication. Since the women would be using skills developed/learned in the intervention, they would obviously be aware that if they had not been in the intervention group, they would not have been able to deal as well with particular matters, which in turn could have added to the aforementioned, positive feelings about their group allocation. They might, for example, have felt fortunate and privileged to have been allocated to this group, which undoubtedly would contrast with the feelings the women in the control group had about their group allocation.

Furthermore, the women in the intervention group benefited from the intervention in other ways, which most probably would have added to any feelings they may have had of being fortunate and privileged to have been allocated to the intervention group. Unlike the women in the control group, women in the intervention group had, and indeed took, the opportunity to strike and sustain supportive friendships with other members of their group. Thus, they knew that as a direct result of being in the intervention group, they had more opportunities than they would have otherwise had

to, for example, share their thoughts, feelings, expectations and experiences with friends who were all preparing, and went on, to become mothers for the first time.

It is apparent from the above examples that the possible effects of the women knowing which group they were in were likely to be positive for the intervention group and in contrast, negative for the control group. Thus, the possible effects could have influenced the results of the programme. Consequently, while the reliability and validity of the results may have been improved by the researchers who assessed the women being blind to their group allocation, the improvement could have been counteracted by the women not being blind to this allocation. However, it has been reported by, for example, Brewin & Bradley (1989) that in randomised controlled trials (RCTs), participant preference, as an influential factor on the results, is a very difficult problem to resolve.

Another weakness of the PFP programme of research is that the intervention as a group, rather than one-to-one, intervention could not address the needs of all of the women who received it. Indeed, failure to address individual needs has been consistently reported as a large problem with group interventions designed to prevent maternal depression (e.g. Van Son et al., 1999; Small et al., 2000; Verkerk et al., 2004). While it was shown in chapter I that group interventions have been effective in preventing maternal depression (e.g. Gordon & Gordon, 1960; Elliott et al., 1988; 2000); and they have the advantages of providing participants with the opportunity to be in, and mix with, a group of similar people (Cutrona, 1989), as well as openly share experiences (Brugha, 1995b), they cannot meet individual needs.

One way the PFP intervention may have failed to meet individual needs is that it did not specifically address cultural differences. The intervention was mostly received by British women, quite a few of whom were Asians, and of the non-British women, Asians formed the majority. Regardless of whether the Asian women had been brought up in Britain or not, they retained at least some of their culture. For example, the majority of the Asian women who participated in the 3½ year follow-up lived with their husband and child(ren) in either their parent's home or in most cases, their parents-in-law's home. Typically, these women took chief responsibility for looking after their child(ren), and shared looking after the home and the remainder of the

family with their mother-in-law, while their husband and father-in-law supported the family financially. These arrangements contrast with what the intervention catered for, that is, those that form part of Western culture, in which the domestic and financial responsibilities are often less clear-cut, such as the nuclear family and one-parent family.

Another way the intervention could have failed to address individual needs is that it did not cater for women who may not have been able to participate fully due to social inhibitions. For example, it would have been very difficult for women who were shy, reserved and/or private to talk freely about very personal matters in a group, particularly at the beginning of the intervention, when they were still getting to know each other. Even women who were outgoing, forthcoming and/or open could have taken a couple of sessions to feel completely comfortable talking about these matters, which would have been a significant proportion of the intervention, given that it comprised 6 antenatal sessions and 1 postnatal session.

If the intervention had been a one-to-one rather than group intervention, it could have been specifically tailored to meet individual needs, but it would have cost substantially more in terms of research time and money than resources would have allowed. However, the intervention did not maximise the opportunity to cater for different needs within the existing resources. For example, as the intervention was received by women living in Leicester City, its suburbs, and the surrounding towns and countryside, which as a whole, has a large Asian population, it should have specifically addressed cultural differences. Indeed, it has been consistently stressed that in order to assist with meeting individual needs, interventions held in culturally diverse areas should directly address cultural issues (e.g. Littlewood, 1990; Douki et al., 1997). Another example is that in the introductory session, particular emphasis could have been placed on the women getting to know each other, which could have been facilitated by the session being longer than only 30 minutes duration. The more opportunity the women had to get to know each other before the actual intervention sessions, the easier they would have probably found it to talk about personal matters during these sessions.

Another weakness of the programme is that the 6 antenatal, intervention sessions were accompanied by only 1 introductory session and 1 postnatal session. Additional introductory and postnatal sessions might well have been beneficial. Extra introductory sessions would have helped the women to get to know each other before the actual intervention sessions and thus, would have probably helped them with the aforementioned, possible problems concerning talking freely about very personal matters during these sessions. With regard to extra postnatal sessions, as mentioned previously in this chapter, in one of the interventions the PFP intervention drew from that was successful in preventing maternal depression, Elliott et al's (1988) intervention, the sessions continued over the first 3 months after childbirth, the period of maximum risk for maternal depression (Cooper et al., 1988; Cox et al., 1993). Thus, the women who received the PFP intervention may have benefited from additional sessions over the course of the first 3 months after childbirth, instead of only 1 session, at approximately 2 months after childbirth.

However, due to resource constraints, the number of sessions the intervention could comprise was very limited. It would have been possible though, to resolve the problem of having only 1 introductory session and 1 postnatal session within the existing resources by having less antenatal intervention sessions, and more introductory and postnatal sessions. The content of the antenatal intervention sessions was somewhat repetitive, more than was necessary to reinforce points, so by reducing the repetition, it would have been possible to cover the content in fewer sessions than were used.

Another weakness of the programme is that it did not place much direct emphasis on the women's self-esteem. It has been consistently documented that low self-esteem can be a key risk of maternal depression (e.g. Priel & Besser, 1999; Matthey et al., 2000). Thus, it would have been prudent if: (1) the PFP intervention had directed considerable attention to trying to raise self-esteem as one of the methods it used to try to prevent maternal depression; and thus, (2) the evaluations of the effectiveness of the intervention had established if the intervention raised self-esteem.

However, the PFP programme of research is not the only programme that has largely overlooked self-esteem. Matthey et al. (2004) have pointed out that this omission is

common in most research programmes to prevent maternal depression. Indeed, in response to self-esteem being repeatedly overlooked, Matthey et al. (2004) designed an antenatal intervention to prevent maternal depression, and placed much emphasis on self-esteem, both in the intervention and during its evaluation. They found that women who had low self-esteem and received the intervention, were better adjusted in terms of sense of competence and postpartum mood, than women who had low self-esteem and not received the intervention.

Finally, another weakness of the PFP programme of research is that the course leaders who delivered the intervention reported that many of the women were depressed at the time of the introductory session, and continued to be depressed during the actual intervention sessions; so they may well have found it difficult to make full use of the intervention. However, it is apparent that this problem is not exclusive to the PFP intervention, as Clarke et al. (1995) have pointed out that it is common in antenatal interventions designed to prevent maternal depression.

#### **4.5 IMPLICATIONS OF PFP PROGRAMME**

The PFP programme of research has implications for both future research and practitioners. With regard to the implications for future research, as the intervention has been evaluated in the relative short-term, short- to medium-term and long-term, and has never been found to be effective, if it were to be evaluated at any point in the future, it is highly unlikely that it would be found to be effective. Thus, it makes sense that the last evaluation should be the final, end point of the programme.

However, the PFP programme could be used as a basis to develop similar research programmes in the future. If it were to be used in this manner, it would be prudent to address the weaknesses identified in the previous section of this chapter.

The weakness concerning the high loss of participants at some of the stages leading to randomisation could be addressed by undertaking some preliminary research on the characteristics of those who would like, and those who would not like, to have the chance of being randomised to receive a health promoting intervention, and then targeting the former. It has been reported that individuals who are most likely to take

potential health promoting measures are information-seekers, and individuals who are least likely to take these measures are information-avoiders (Miller & Mangan, 1983; Steptoe & O'Sullivan, 1986).

With regard to addressing the problem of participant loss from the 12 month follow-up to the 3½ year follow-up, the chances of this loss could be reduced by reducing the time interval between the follow-ups. The shorter the time interval, the less chance there is likely to be of, for example, participants becoming untraceable or relocating.

The weakness that the results of the programme may have been influenced by the possible effects of the women knowing whether they were in the intervention or control group could be addressed by giving participants the opportunity to decide for themselves which group they would form part of. Alternatively, in a Health Technology Assessment programme, Britton et al. (1998) suggested that during considerations of the results of randomised controlled trials (RCTs), a simple additive model could be used to account for the impact of participant preference on the results.

If research resources permitted, the problem of the PFP intervention failing to meet the needs of the individual due to being a group intervention could be overcome if a one-to-one intervention, specifically tailored to meet individual needs, were to be used instead. If a group intervention were to be used, it should endeavour to address individual needs as much as possible. For example, during the intervention sessions, sub-dividing the group into small groups most of the time, rather than some of the time, as in the PFP intervention, would most probably help with, what could well be a common problem, that is, social inhibitions. Another example is that differences in family experiences and expectations due to culture could be specifically addressed; and participants would probably be better able to relate to those delivering the intervention if some of them shared the same or similar culture to their own, rather than the predominating culture.

Furthermore, if resources permitted, it would be prudent to add to the existing introductory and postnatal sessions. An additional 2 introductory sessions, focusing on the women getting to know each other, would most probably help with social inhibitions. An additional 4 postnatal sessions, over the first 3 months after childbirth,

would mean that like the aforementioned intervention that was successful in preventing maternal depression by Elliott et al. (1988), support would be given to women over 5 sessions, during the period identified as the maximum period of risk for maternal depression (Cooper et al., 1988; Cox et al., 1993). If resources would not permit additional introductory and postnatal sessions, the total number of sessions could be proportioned so that a quarter are allocated to introductory sessions, and the remainder are equally divided, as Elliott et al. did, between the antenatal and postnatal periods.

In the previous section of this chapter, it was mentioned that the PFP intervention, like many others, largely neglected to address women's self-esteem, yet it has been repeatedly reported that low self-esteem can be a key risk of maternal depression (e.g. Priel & Besser, 1999; Matthey et al., 2000). It would be prudent then, if future interventions placed much emphasis on attempting to raise self-esteem as a means of attempting to prevent maternal depression.

It was also mentioned in the previous section of this chapter that due to being depressed at the time of receiving the PFP intervention, many of the women might well have found it difficult to fully utilise it. Clarke et al. (1995) have recommended a way of trying to avoid this potential problem during interventions. They have advised that the content focuses specifically on effective ways of coping with depressive symptoms first, before other issues.

If the PFP programme were to be used as a basis for development of similar research programmes, it would be worth considering undertaking the evaluations of the intervention by telephone. It was very costly in terms of time and travel expenses to undertake these evaluations in person, but it would have been considerably more economical if they had been undertaken by telephone instead. Indeed, it is apparent that evaluations of interventions, and even the interventions themselves, have been successfully carried out by telephone. For example, Thome & Alder (1999) designed a telephone intervention to reduce maternal fatigue and the side effects of fatigue, such as depressive symptoms and stress. They evaluated the intervention by telephone, and found it to be efficacious.

As mentioned previously, in addition to having implications for future research, the PFP programme also has implications for practitioners. One implication concerns balancing *pleasant* and *effective* health promotion. The course leaders who delivered the PFP intervention reported that the women who received it viewed it positively. In general, they felt it was an enjoyable, beneficial and worthwhile experience, and one that they would recommend to others and would want to repeat if they became pregnant again (Brugha et al., 1998b; 1999c). However, in view of the lack of effectiveness of the intervention, it is imperative that future interventions strike and sustain an equilibrium between *pleasant* and *effective* health promotion, but Wheatley & Brugha (1999) have pointed out that this equilibrium is difficult to achieve.

Finally, an implication of the PFP programme for practitioners is that treatment for maternal depression is, in relation to this programme, better than prevention. As shown in chapter I, maternal depression can be treated successfully with drugs and psychosocial methods. Whilst these treatments are not always successful, they are obviously a lot more successful than the PFP intervention. Indeed, during the evaluations of the intervention, it became apparent that many of the women had been treated successfully for maternal depression with antidepressants and tranquillisers. It also became apparent that a number of women had been treated successfully with the psychosocial methods used in the intervention.

#### **4.6 CONCLUSIONS OF PFP PROGRAMME**

The PFP programme of research has demonstrated that a psychosocial antenatal intervention, designed to prevent maternal depression, can be implemented in a National Health Service (NHS) setting; and its effectiveness evaluated in the community, on three separate occasions, in the relative short-term, short- to medium-term and long-term.

Each of the three evaluations showed that the intervention was neither effective in preventing maternal depression, nor in positively influencing maternal social support and personal problem solving. Also, the second and third evaluations showed that the intervention was not effective in positively influencing child development. Furthermore, the third evaluation showed that antenatal depression level was not a

substantial predictor of maternal depression at 3½ years after the birth of a first child, even when antenatal social support and personal problem solving are taken into account in risk factor modelling.

Since all three of the evaluations have shown that the intervention has not been effective, the third evaluation should mark the final, end point of an approximate 4 year programme that began when the women were between 12 and 20 weeks pregnant, and ended 3½ years after they gave birth. Also, due to the lack of effectiveness of the intervention, it should not be commissioned as an NHS service. Furthermore, for the same reason, treatment for maternal depression is, in relation to the intervention, better than prevention. However, as previously indicated, the PFP programme could contribute to the development of similar programmes designed to prevent maternal depression.

## APPENDIX I

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### PLAN OF ANALYSIS

*Statistical significance proposed: assessed at the 5% level*

*Statistical package proposed: Statistical Analysis Software (SAS) Version 8*

#### HYPOTHESES

**Hypothesis I:** The PFP intervention will determine maternal mental health and child development at 3½ year outcome.

**Hypothesis II:** The PFP intervention will positively influence maternal social support and personal problem solving at 3½ year outcome.

**Hypothesis III:** Antenatal depression level will be a substantial predictor of maternal depression at 3½ years after the birth of a first child, even when antenatal social support and personal problem solving are taken into account in risk factor modelling.

#### PARTICIPATION AND ATTRITION

Participation and attrition will be presented in the form of a consort diagram. This diagram will show the flow of participation and attrition in the PFP programme of research, from randomisation, to the outcome of randomisation, through to the follow-up at 3½ years after childbirth.

#### DEMOGRAPHY

Demographic data will be presented in the form of a table. This table will show age and ethnicity at both the outcome of randomisation and the follow-up at 3½ years after childbirth by group (intervention and control). Age will be shown in terms of the minimum, lower quartile, median, upper quartile and maximum age. Ethnicity will be shown in terms of 'white' and 'other', with 'other' being any ethnic origin other than 'white'.

## **PRIMARY ANALYSES**

**Hypothesis I:** The PFP intervention will determine maternal mental health and child development at 3½ year outcome.

### *Analyses to address the maternal mental health component of hypothesis I*

Maternal mental health was measured using the:

1. Primary measure of depression, the 30 item version of the General Health Questionnaire (GHQ-30; Goldberg, 1972).
2. Secondary measure of depression, the Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987).
3. Tertiary measure of depression, the Schedules of Clinical Assessment in Neuropsychiatry (SCAN; Wing et al., 1990).

The maternal component of hypothesis I will be tested using:

1. Logistic regressions.
2. Survival analysis.
3. Log-rank test.

The overall cut-points to be applied are detailed under the following heading. These cut-points will be deduced from individual cut-points that are too detailed to be included in this part of the plan of analysis, but the details are provided in full, in an annex to the plan.

### ***GHQ-30, EPDS and SCAN***

Three logistic regression analyses will be undertaken. Each logistic regression will be of one measure at 3½ year outcome by group (intervention and control).

The measures will be the:

1. GHQ-30 (Goldberg, 1972).
2. EPDS (Cox et al., 1987).

3. SCAN International Classification of Diseases, Tenth Revision (ICD-10) depression diagnosis (Wing et al., 1990) of the month immediately preceding the SCAN assessment date.

The overall cut-points to be applied will be:

1. Depressed (GHQ-30 total  $\geq 2$ ) = 1.
2. Not depressed (GHQ-30 total  $\leq 1$ ) = 0.
3. Depressed (EPDS total  $\geq 11$ ) = 1.
4. Not depressed (EPDS total  $\leq 10$ ) = 0.

The results of the logistic regressions will be presented in the form of a table.

### ***SCAN***

A survival analysis will be undertaken. This analysis will be of the SCAN ICD-10 depression diagnosis (Wing et al., 1990) at 3½ year outcome by group (intervention and control). Survival will pertain to surviving the development of a new episode of ICD-10 depression. A log-rank test will also be undertaken. This test will be of survival curves produced from the survival analysis.

The survival analysis will concern the following:

1. The sample of women who participated in the 3½ year follow-up and who, according to the SCAN ICD-10 outputs, were not depressed at the time of childbirth. In view of the fact that it is the survival pattern of this sample that is pertinent, the sample of women who did not participate in the 3½ year follow-up, but who participated in one or more of the preceding follow-ups, will not, as with all the other analyses detailed, form part of the survival analysis.
2. Of relevance will be whether or not the sample of women who participated in the 3½ year follow-up have experienced depressive episode onsets at any point succeeding childbirth, right up to, and inclusive of, the month immediately prior to the SCAN assessment date (i.e. approximately 3½ years after childbirth).
3. The women who have been identified by the ICD-10 code as having experienced depression during this period will be examined.

## *Appendix I*

4. SCAN ICD-10 Depression Diagnosis data were collected during the 3 and 12 month follow-ups. These data will be used with the data collected during the 3½ year follow-up.
5. In any instances of conflict between the 3 month, 12 month and 3½ year follow-up data, the data from the earliest of these three stages will be used in preference to the data from the remaining stages.
6. A modified form of the LIFE procedure (Keller et al., 1987) will be followed.

The results of the survival analysis will be presented in the form of a graph.

### ***Hypothesis I***

The PFP intervention will determine maternal mental health and child development at 3½ year outcome.

### ***Analyses to address the child development component of hypothesis I***

Child development was measured using the Denver II Scale (Frankenberg et al., 1992).

The child component of hypothesis I will be tested using logistic regressions.

The overall cut-points to be adopted are detailed under the heading below. As before, these cut-points will be deduced from individual cut-points that are too detailed to be included in this part of the plan of analysis, but full details are provided in the annex to the plan.

### ***Denver II Scale***

Four logistic regression analyses will be undertaken. Each logistic regression will be of one of the Denver II Scale levels of assessment (Frankenberg et al., 1992) at 3½ year outcome by group (intervention and control).

The levels of assessment will be:

1. Personal-social skills.
2. Fine-motor adaptive skills.
3. Language skills.
4. Gross motor skills

The overall cut-points to be adopted will be:

Pass (percentage  $\geq 65$ ) = 1.

Fail (percentage  $< 65$ ) = 0.

The results of the logistic regressions will be presented in the form of a table.

## **SECONDARY ANALYSES**

**Hypothesis II:** The PFP intervention will positively influence maternal social support and personal problem solving at 3½ year outcome.

**Hypothesis III:** Antenatal depression level will be a substantial predictor of maternal depression at 3½ years after the birth of a first child, even when antenatal social support and personal problem solving are taken into account in risk factor modelling.

### ***Hypothesis II***

The PFP intervention will positively influence maternal social support and personal problem solving at 3½ year outcome.

### ***Analyses to address hypothesis II***

Social support was measured using the Interview Measure of Social Relationships (IMSR; Brugha et al., 1987).

Personal problem solving was measured using the Problem Solving Inventory (Heppner & Petersen, 1982).

The hypothesis will be tested using logistic regressions.

Details of each of the overall cut-points to be employed are provided under the following heading. Again, these cut-points will be deduced from individual cut-points that are too detailed to be included in this part of the plan of analysis, but details are provided in full, in the annex to the plan.

***Social support and personal problem solving***

Five logistic regression analyses will be undertaken. Each logistic regression will be of either social support or personal problem solving at 3½ year outcome by group (intervention and control).

Social support will be analysed as:

1. Poor versus good social support from good friends.
2. Poor versus good social support from close relatives.

Poor social support will be defined as a rating of insufficient support from either good friends or close relatives. Good social support will be defined as a rating of good support from either good friends or close relatives.

Personal problem solving will be analysed as:

1. Confidence versus lack of confidence in problem solving ability.
2. Avoidant versus non-avoidant approach to problem solving.
3. Personal control versus lack of personal control in problem solving.

The overall cut-points to be employed for social support will be:

1. Poor social support (poor support total  $\geq 1$ ) = 1.
2. Good social support (poor support total = 0) = 0.

The overall cut-points to be employed for personal problem solving will be:

1. Confidence in problem solving ability (confidence total  $\leq 38$ ) = 0.

2. Lack of confidence in problem solving ability (confidence total  $\geq 39$ ) = 1.
3. Avoidant approach to problem solving (avoidant total  $\geq 57$ ) = 1.
4. Non-avoidant approach to problem solving (avoidant total  $\leq 56$ ) = 0.
5. Personal control in problem solving (control total  $\leq 17$ ) = 0.
6. Lack of personal control in problem solving (control total  $\geq 18$ ) = 1.

The results of the logistic regressions will be presented in the form of a table.

### ***Hypothesis III***

Antenatal depression level will be a substantial predictor of maternal depression at 3½ years after the birth of a first child, even when antenatal social support and personal problem solving are taken into account in risk factor modelling.

### ***Analyses to address hypothesis III***

Antenatal depression level (i.e. baseline depression level) and maternal depression at 3½ years after the birth of a first child were measured using the:

1. Primary measure of depression, the GHQ-30 (Goldberg, 1972).
2. Secondary measure of depression, the EPDS (Cox et al., 1987).

Antenatal social support (i.e. baseline social support) was measured using the IMSR (Brugha et al., 1987).

Antenatal personal problem solving (i.e. baseline personal problem solving) was measured using the Problem Solving Inventory (Heppner & Petersen, 1982).

The hypothesis will be tested using:

1. 2 x 2 frequency tables.
2. Logistic regressions.

Baseline depression level and maternal depression at 3½ years after childbirth will be analysed using:

1. Firstly, the GHQ-30 (Goldberg, 1972).
2. Secondly, the EPDS (Cox et al., 1987).

Baseline social support and personal problem solving will be analysed with:

1. Firstly, the GHQ-30 (Goldberg, 1972) at 3½ years after childbirth only.
2. Secondly, the GHQ-30 (Goldberg, 1972) at both baseline and 3½ years after childbirth.

Throughout the analyses, the baseline sample of women will be the same sample who participated in the follow-up at 3½ years after childbirth.

Details of each of the overall cut-points to be applied are provided under the relevant headings below. As before, these cut-points will be deduced from individual cut-points that are too detailed to be included in this part of the plan of analysis, but full details are provided in the annex to the plan.

### ***GHQ-30***

A 2 x 2 frequency analysis will be undertaken, with percentage and chi-square ( $\chi^2$ ) figures. The frequency analysis will be of women who were either depressed or not depressed at baseline and 3½ years after childbirth, as measured using the GHQ-30 (Goldberg, 1972).

The overall cut-points to be applied will be:

1. Depressed (GHQ-30 total  $\geq 2$ ) = 1.
2. Not depressed (GHQ-30 total  $\leq 1$ ) = 0.

The results of the frequency analysis will be presented in the form of a 2 x 2 table.

### ***EPDS***

A 2 x 2 frequency analysis will be undertaken, with percentage and  $\chi^2$  figures. The frequency analysis will be of women who were either depressed or not depressed at baseline and 3½ years after childbirth, as measured using the EPDS (Cox et al., 1987).

The overall cut-points to be applied will be:

1. Depressed (EPDS total  $\geq 11$ ) = 1.
2. Not depressed (EPDS total  $\leq 10$ ) = 0.

The results of the frequency analysis will be presented in the form of a 2 x 2 table.

### ***IMSR and GHQ-30***

Two 2 x 2 frequency analyses will be undertaken, with percentage and  $\chi^2$  figures. The frequency analyses will be of:

1. Women who received either poor or good social support from good friends at baseline, as measured using the IMSR (Brugha et al., 1987); and who were either depressed or not depressed at 3½ years after childbirth, as measured using the GHQ-30 (Goldberg, 1972).
2. Women who received either poor or good social support from close relatives at baseline, as measured using the IMSR (Brugha et al., 1987); and who were either depressed or not depressed at 3½ years after childbirth, as measured using the GHQ-30 (Goldberg, 1972).

Poor social support will be defined as a rating of insufficient support from either good friends or close relatives. Good social support will be defined as a rating of good support from either good friends or close relatives.

The overall cut-points to be applied for social support will be:

1. Poor social support (poor support total  $\geq 1$ ) = 1.
2. Good social support (poor support total = 0) = 0.

The overall cut-points to be applied for the presence and absence of depression will be:

1. Depressed (GHQ-30 total  $\geq 2$ ) = 1.
2. Not depressed (GHQ-30 total  $\leq 1$ ) = 0.

The results of the frequency analyses will be presented in the form of 2 x 2 tables.

### ***Problem Solving Inventory and GHQ-30***

Three 2 x 2 frequency analyses will be undertaken, with percentage and  $\chi^2$  figures.

The frequency analyses will be of:

1. Women who displayed confidence or lack of confidence in problem solving ability at baseline, as measured using the Problem Solving Inventory (Heppner & Petersen, 1982); and who were either depressed or not depressed at 3½ years after childbirth, as measured using the GHQ-30 (Goldberg, 1972).
2. Women who displayed avoidant or non-avoidant approach to problem solving at baseline, as measured using the Problem Solving Inventory (Heppner & Petersen, 1982); and who were either depressed or not depressed at 3½ years after childbirth, as measured using the GHQ-30 (Goldberg, 1972).
3. Women who displayed personal control or lack of personal control in problem solving at baseline, as measured using the Problem Solving Inventory (Heppner & Petersen, 1982); and who were either depressed or not depressed at 3½ years after childbirth, as measured using the GHQ-30 (Goldberg, 1972).

The overall cut-points to be applied for problem solving will be:

1. Confidence in problem solving ability (confidence total  $\leq 38$ ) = 0.
2. Lack of confidence in problem solving ability (confidence total  $\geq 39$ ) = 1.
3. Avoidant approach to problem solving (avoidant total  $\geq 57$ ) = 1.
4. Non-avoidant approach to problem solving (avoidant total  $\leq 56$ ) = 0.
5. Personal control in problem solving (control total  $\leq 17$ ) = 0.
6. Lack of personal control in problem solving (control total  $\geq 18$ ) = 1.

The overall cut-points to be applied for the presence and absence of depression will be:

1. Depressed (GHQ-30 total  $\geq 2$ ) = 1.
2. Not depressed (GHQ-30 total  $\leq 1$ ) = 0.

The results of the frequency analyses will be presented in the form of 2 x 2 tables.

### ***GHQ-30, and social support and personal problem solving***

The analyses detailed so far to address hypothesis III, build up to analyses to address this hypothesis in full, which will be five logistic regression analyses. Each logistic regression will be of the GHQ-30 (Goldberg, 1972) at both baseline and 3½ years after childbirth; and either social support, as measured using the IMSR (Brugha et al., 1987), or personal problem solving, as measured using the Problem Solving Inventory (Heppner & Petersen, 1982), at baseline.

Social support will be analysed as:

1. Poor versus good social support from good friends.
2. Poor versus good social support from close relatives.

Poor social support will be defined as a rating of insufficient support from either good friends or close relatives. Good social support will be defined as a rating of good support from either good friends or close relatives.

Personal problem solving will be analysed as:

1. Confidence versus lack of confidence in problem solving ability.
2. Avoidant versus non-avoidant approach to problem solving.
3. Personal control versus lack of personal control in problem solving.

The overall cut-points to be applied for the presence and absence of depression will be:

1. Depressed (GHQ-30 total  $\geq 2$ ) = 1.
2. Not depressed (GHQ-30 total  $\leq 1$ ) = 0.

### *Appendix I*

The overall cut-points to be applied for social support will be:

1. Poor social support (poor support total  $\geq 1$ ) = 1.
2. Good social support (poor support total = 0) = 0.

The overall cut-points to be applied for personal problem solving will be:

1. Confidence in problem solving ability (confidence total  $\leq 38$ ) = 0.
2. Lack of confidence in problem solving ability (confidence total  $\geq 39$ ) = 1.
3. Avoidant approach to problem solving (avoidant total  $\geq 57$ ) = 1.
4. Non-avoidant approach to problem solving (avoidant total  $\leq 56$ ) = 0.
5. Personal control in problem solving (control total  $\leq 17$ ) = 0.
6. Lack of personal control in problem solving (control total  $\geq 18$ ) = 1.

The results of the logistic regressions will be presented in the form of a table.

### **CONCLUDING REMARKS**

Additional maternal and child analyses to the above may be undertaken if the results of which, indicate an appropriateness to do so.

## **ANNEX TO PLAN OF ANALYSIS**

In order to enable ease of reference, particularly from the main body of this thesis, full details of the cut-points are set out separately in this annex to the plan of analysis.

### ***GHQ-30***

Q22 HAVE YOU RECENTLY: Been feeling unhappy and depressed?

Q23 HAVE YOU RECENTLY: Been loosing confidence in yourself?

Q24 HAVE YOU RECENTLY: Been thinking of yourself as a worthless person?

Q25 HAVE YOU RECENTLY: Felt that life is entirely hopeless?

Q29 HAVE YOU RECENTLY: Felt that life is not worth living?

Q30 HAVE YOU RECENTLY: Found at times you could not do anything because your nerves were too bad?

Responses available:

1. Not at all.
2. No more than usual.
3. Rather more than usual.
4. Much more than usual.

### ***GHQ-30 individual cut-points***

If (GHQ-30 Q22  $\leq$  2) then GHQ-30 Q22 = 0.

If (GHQ-30 Q22  $\geq$  3) then GHQ-30 Q22 = 1.

If (GHQ-30 Q23  $\leq$  2) then GHQ-30 Q23 = 0.

If (GHQ-30 Q23  $\geq$  3) then GHQ-30 Q23 = 1.

*Appendix I*

If (GHQ-30 Q24  $\leq$  2) then GHQ-30 Q24 = 0.

If (GHQ-30 Q24  $\geq$  3) then GHQ-30 Q24 = 1.

If (GHQ-30 Q25  $\leq$  2) then GHQ-30 Q25 = 0.

If (GHQ-30 Q25  $\geq$  3) then GHQ-30 Q25 = 1.

If (GHQ-30 Q29  $\leq$  2) then GHQ-30 Q29 = 0.

If (GHQ-30 Q29  $\geq$  3) then GHQ-30 Q29 = 1.

If (GHQ-30 Q30  $\leq$  2) then GHQ-30 Q30 = 0.

If (GHQ-30 Q30  $\geq$  3) then GHQ-30 Q30 = 1.

***GHQ-30 total and overall cut-points***

- GHQ-30 total: GHQ-30 Q22 + GHQ-30 Q23 + GHQ-30 Q24 + GHQ-30 Q25 + GHQ-30 Q29 + GHQ-30 Q30.
- Overall cut-points: depressed (GHQ-30 total  $\geq$  2) = 1, and not depressed (GHQ-30 total  $\leq$  1) = 0.

***EPDS***

Q1 (LAUGH): I have been able to laugh and see the funny side of things.

0. As much as I always could.
1. Not quite as much now.
2. Definitely not so much now.
3. Not at all.

Q2 (LFORW): I have looked forward with enjoyment to things.

0. As much as I ever did.
1. Rather less than I used to.
2. Definitely less than I used to.
3. Hardly at all.

Q3 (BLAME): I have blamed myself unnecessarily when things went wrong.

0. Yes, most of the time.
1. Yes, some of the time.
2. Not very often.
3. No never.

Q4 (WORRY): I have been anxious or worried for no good reason.

0. No, not at all.
1. Hardly ever.
2. Yes, sometimes.
3. Yes, very often.

Q5 (SCARED): I have felt scared or panicky for no good reason.

0. Yes, quite a lot.
1. Yes, sometimes.
2. No, not much.
3. No, not at all.

Q6 (ONTOP): Things have been getting on top of me.

0. Yes, most of the time I have not been able to cope at all.
1. Yes, sometimes I have not been coping as well as usual.
2. No, most of the time I have coped quite well.
3. No, I have been coping as well as ever.

Q7 (SLEEP): I have been so unhappy that I have had difficulty sleeping.

0. Yes, most of the time.
1. Yes, sometimes.
2. Not very often.
3. No, not at all.

Q8 (SAD): I have felt sad or miserable.

0. Yes, most of the time.
1. Yes, quite often.
2. Not very often.

3. No, not at all.

Q9 (CRY): I have been so unhappy that I have been crying.

- 0. Yes, most of the time.
- 1. Yes, quite often.
- 2. Only occasionally.
- 3. No, never.

Q10 (SELFHRM): The thought of harming myself has occurred to me.

- 0. Yes, quite often.
- 1. Sometimes.
- 2. Hardly ever.
- 3. Never.

***EPDS individual cut-points***

EPDS Q1 = LAUGH.

EPDS Q2 = LFORW.

If (BLAME = 0) then EPDS Q3 = 3.

If (BLAME = 1) then EPDS Q3 = 2.

If (BLAME = 2) then EPDS Q3 = 1.

If (BLAME = 3) then EPDS Q3 = 0.

EPDS Q4 = WORRY.

If (SCARED = 0) then EPDS Q5 = 3.

If (SCARED = 1) then EPDS Q5 = 2.

If (SCARED = 2) then EPDS Q5 = 1.

If (SCARED = 3) then EPDS Q5 = 0.

If (ONTOP = 0) then EPDS Q6 = 3.

If (ONTOP = 1) then EPDS Q6 = 2.

If (ONTOP = 2) then EPDS Q6 = 1.

If (ONTOP = 3) then EPDS Q6 = 0.

If (SLEEP = 0) then EPDS Q7 = 3.

If (SLEEP = 1) then EPDS Q7 = 2.

If (SLEEP = 2) then EPDS Q7 = 1.

If (SLEEP = 3) then EPDS Q7 = 0.

If (SAD = 0) then EPDS Q8 = 3.

If (SAD = 1) then EPDS Q8 = 2.

If (SAD = 2) then EPDS Q8 = 1.

If (SAD = 3) then EPDS Q8 = 0.

If (CRY = 0) then EPDS Q9 = 3.

If (CRY = 1) then EPDS Q9 = 2.

If (CRY = 2) then EPDS Q9 = 1.

If (CRY = 3) then EPDS Q9 = 0.

If (SELFHRM = 0) then EPDS Q10 = 3.

If (SELFHRM = 1) then EPDS Q10 = 2.

If (SELFHRM = 2) then EPDS Q10 = 1.

If (SELFHRM = 3) then EPDS Q10 = 0.

***EPDS total and overall cut-points***

EPDS total: EPDS Q1 + EPDS Q2 + EPDS Q3 + EPDS Q4 + EPDS Q5 + EPDS Q6 + EPDS Q7 + EPDS Q8 + EPDS Q9 + EPDS Q10.

Overall cut-points: depressed (EPDS total  $\geq 11$ ) = 1, and not depressed (EPDS total  $\leq 10$ ) = 0.

***IMSR***

The questions below were asked for each person named as either a good friend or close relative:

EITHER

If it was apparent from prior questioning that the participant has been in recent contact with, and has recently needed support from, the person in question, the following was asked:

Did you get sufficient support from him or her?

RATING SCALE

1. Not needed last week.
2. If needed, insufficient support.
3. Sufficient support.

OR

If it was apparent from prior questioning that the participant has not been in recent contact with, but has recently needed support from, the person in question, the following was asked:

Would you say that you have had insufficient support from this person then?

RATING SCALE:

1. Not needed last week.
2. If needed, insufficient support.
3. Sufficient support.

***IMSR overall cut-points***

- Overall cut-points: poor social support from good friends (poor support total  $\geq 1$ ) = 1, and good social support from good friends (poor support total = 0) = 0.
- Overall cut-points: poor social support from close relatives (poor support total  $\geq 1$ ) = 1, and good social support from close relatives (poor support total = 0) = 0.

***Problem Solving Inventory***

PSI\_1: When a solution to a problem was unsuccessful, I do not examine why it did not work.

PSI\_2: When I am confronted with a complex problem, I do not bother to develop a strategy to collect information so I can define exactly what the problem is.

PSI\_3: When my first efforts to solve a problem fail, I become uneasy about my ability to handle the situation.

PSI\_4: After I have solved a problem, I do not analyse what went right or what went wrong.

PSI\_5: I am usually able to think up creative and effective alternatives to solve a problem.

PSI\_6: After I have tried to solve a problem with a certain course of action, I take time and compare the actual outcome to what I thought should have happened.

PSI\_7: When I have a problem, I think up as many possible ways as I can to handle it until I cannot come up with any more ideas.

PSI\_8: When confronted with a problem, I consistently examine my feelings to find out what is going on in the problem situation.

PSI\_9: I have the ability to solve most problems, even though initially, no solution immediately apparent.

PSI\_10: Many problems I face are too complex for me to solve.

PSI\_11: I make decisions and am happy with them later.

PSI\_12: When confronted with a problem, I tend to do the first thing that I can think of to solve it.

PSI\_13: Sometimes I do not stop and take time to deal with my problems, but just kind of muddle ahead.

PSI\_14: When deciding on an idea or possible solution to a problem, I do not take time to consider the chances of each alternative being successful.

PSI\_15: When confronted with a problem, I stop and talk about it before deciding on a next step.

PSI\_16: I generally go with the first good idea that comes to my mind.

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PSI\_17: When making a decision, I weigh the consequences of each alternative and compare them against each other.

PSI\_18: When I make plans to solve a problem, I am almost certain that I can make them work.

PSI\_19: I try to predict the overall result of carrying out a particular course of action.

PSI\_20: When I try to think up possible solutions to a problem, I do not come up with very many alternatives.

PSI\_21: Given enough time and effort, I believe can solve most problems that confront me.

PSI\_22: When faced with a novel situation, I have confidence that I can handle problems that may arise.

PSI\_23: Even though I work on a problem, sometimes I feel like I am groping or wandering, and am not getting down to the real issue.

PSI\_24: I make snap judgements and later regret them.

PSI\_25: I trust my ability to solve new and difficult problems.

PSI\_26: I have a systematic method for comparing alternatives and making decisions.

PSI\_27: When I am confronted with a problem, I do not usually examine what external things in my environment may be contributing to my problem.

PSI\_28: When I am confronted with a problem, one of the first things I do is survey the situation, and consider all the relative bits of information.

PSI\_29: Sometimes I get so charged up emotionally that I am unable to consider many ways of dealing with my problem.

PSI\_30: After making a decision, the outcome I expected usually matches the actual outcome.

PSI\_31: When confronted with a problem, I am unsure of whether I can handle the situation.

PSI\_32: When I become aware of a problem, one of the first things I do is to try to find out exactly what the problem is.

Responses available:

1. Strongly agree.
2. Moderately agree.
3. Slightly agree.
4. Slightly disagree.
5. Moderately disagree.
6. Strongly disagree.

***Problem Solving Inventory individual cut-points***

- Reversed: r.

PSI\_9r = PSI\_9.

PSI\_15r = PSI\_15.

PSI\_17r = PSI\_17.

PSI\_18r = PSI\_18.

PSI\_19r = PSI\_19.

PSI\_21r = PSI\_21.

PSI\_22r = PSI\_22.

PSI\_25r = PSI\_25.

PSI\_26r = PSI\_26.

PSI\_28r = PSI\_28.

PSI\_30r = PSI\_30.

PSI\_32r = PSI\_32.

If (PSI\_1 eq 1) then PSI\_1r = 6.

If (PSI\_1 eq 2) then PSI\_1r = 5.

If (PSI\_1 eq 3) then PSI\_1r = 4.

If (PSI\_1 eq 4) then PSI\_1r = 3.

If (PSI\_1 eq 5) then PSI\_1r = 2.

If (PSI\_1 eq 6) then PSI\_1r = 1.

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If (PSI\_2 eq 1) then PSI\_2r = 6.

If (PSI\_2 eq 3) then PSI\_2r = 4.

If (PSI\_2 eq 5) then PSI\_2r = 2.

If (PSI\_3 eq 1) then PSI\_3r = 6.

If (PSI\_3 eq 3) then PSI\_3r = 4.

If (PSI\_3 eq 5) then PSI\_3r = 2.

If (PSI\_4 eq 1) then PSI\_4r = 6.

If (PSI\_4 eq 3) then PSI\_4r = 4.

If (PSI\_4 eq 5) then PSI\_4r = 2.

If (PSI\_5 eq 1) then PSI\_5r = 6.

If (PSI\_5 eq 3) then PSI\_5r = 4.

If (PSI\_5 eq 5) then PSI\_5r = 2.

If (PSI\_6 eq 1) then PSI\_6r = 6.

If (PSI\_6 eq 3) then PSI\_6r = 4.

If (PSI\_6 eq 5) then PSI\_6r = 2.

If (PSI\_7 eq 1) then PSI\_7r = 6.

If (PSI\_7 eq 3) then PSI\_7r = 4.

If (PSI\_7 eq 5) then PSI\_7r = 2.

If (PSI\_8 eq 1) then PSI\_8r = 6.

If (PSI\_8 eq 3) then PSI\_8r = 4.

If (PSI\_8 eq 5) then PSI\_8r = 2.

If (PSI\_10 eq 1) then PSI\_10r = 6.

If (PSI\_10 eq 3) then PSI\_10r = 4.

If (PSI\_10 eq 5) then PSI\_10r = 2.

If (PSI\_11 eq 1) then PSI\_11r = 6.

If (PSI\_11 eq 3) then PSI\_11r = 4.

If (PSI\_2 eq 2) then PSI\_2r = 5.

If (PSI\_2 eq 4) then PSI\_2r = 3.

If (PSI\_2 eq 6) then PSI\_2r = 1.

If (PSI\_3 eq 2) then PSI\_3r = 5.

If (PSI\_3 eq 4) then PSI\_3r = 3.

If (PSI\_3 eq 6) then PSI\_3r = 1.

If (PSI\_4 eq 2) then PSI\_4r = 5.

If (PSI\_4 eq 4) then PSI\_4r = 3.

If (PSI\_4 eq 6) then PSI\_4r = 1.

If (PSI\_5 eq 2) then PSI\_5r = 5.

If (PSI\_5 eq 4) then PSI\_5r = 3.

If (PSI\_5 eq 6) then PSI\_5r = 1.

If (PSI\_6 eq 2) then PSI\_6r = 5.

If (PSI\_6 eq 4) then PSI\_6r = 3.

If (PSI\_6 eq 6) then PSI\_6r = 1.

If (PSI\_7 eq 2) then PSI\_7r = 5.

If (PSI\_7 eq 4) then PSI\_7r = 3.

If (PSI\_7 eq 6) then PSI\_7r = 1.

If (PSI\_8 eq 2) then PSI\_8r = 5.

If (PSI\_8 eq 4) then PSI\_8r = 3.

If (PSI\_8 eq 6) then PSI\_8r = 1.

If (PSI\_10 eq 2) then PSI\_10r = 5.

If (PSI\_10 eq 4) then PSI\_10r = 3.

If (PSI\_10 eq 6) then PSI\_10r = 1.

If (PSI\_11 eq 2) then PSI\_11r = 5.

If (PSI\_11 eq 4) then PSI\_11r = 3.

If (PSI\_11 eq 5) then PSI\_11r = 2.

If (PSI\_11 eq 6) then PSI\_11r = 1.

If (PSI\_12 eq 1) then PSI\_12r = 6.

If (PSI\_12 eq 2) then PSI\_12r = 5.

If (PSI\_12 eq 3) then PSI\_12r = 4.

If (PSI\_12 eq 4) then PSI\_12r = 3.

If (PSI\_12 eq 5) then PSI\_12r = 2.

If (PSI\_12 eq 6) then PSI\_12r = 1.

If (PSI\_13 eq 1) then PSI\_13r = 6.

If (PSI\_13 eq 2) then PSI\_13r = 5.

If (PSI\_13 eq 3) then PSI\_13r = 4.

If (PSI\_13 eq 4) then PSI\_13r = 3.

If (PSI\_13 eq 5) then PSI\_13r = 2.

If (PSI\_13 eq 6) then PSI\_13r = 1.

If (PSI\_14 eq 1) then PSI\_14r = 6.

If (PSI\_14 eq 2) then PSI\_14r = 5.

If (PSI\_14 eq 3) then PSI\_14r = 4.

If (PSI\_14 eq 4) then PSI\_14r = 3.

If (PSI\_14 eq 5) then PSI\_14r = 2.

If (PSI\_14 eq 6) then PSI\_14r = 1.

If (PSI\_16 eq 1) then PSI\_16r = 6.

If (PSI\_16 eq 2) then PSI\_16r = 5.

If (PSI\_16 eq 3) then PSI\_16r = 4.

If (PSI\_16 eq 4) then PSI\_16r = 3.

If (PSI\_16 eq 5) then PSI\_16r = 2.

If (PSI\_16 eq 6) then PSI\_16r = 1.

If (PSI\_20 eq 1) then PSI\_20r = 6.

If (PSI\_20 eq 2) then PSI\_20r = 5.

If (PSI\_20 eq 3) then PSI\_20r = 4.

If (PSI\_20 eq 4) then PSI\_20r = 3.

If (PSI\_20 eq 5) then PSI\_20r = 2.

If (PSI\_20 eq 6) then PSI\_20r = 1.

If (PSI\_23 eq 1) then PSI\_23r = 6.

If (PSI\_23 eq 2) then PSI\_23r = 5.

If (PSI\_23 eq 3) then PSI\_23r = 4.

If (PSI\_23 eq 4) then PSI\_23r = 3.

If (PSI\_23 eq 5) then PSI\_23r = 2.

If (PSI\_23 eq 6) then PSI\_23r = 1.

If (PSI\_24 eq 1) then PSI\_24r = 6.

If (PSI\_24 eq 2) then PSI\_24r = 5.

If (PSI\_24 eq 3) then PSI\_24r = 4.

If (PSI\_24 eq 4) then PSI\_24r = 3.

If (PSI\_24 eq 5) then PSI\_24r = 2.

If (PSI\_24 eq 6) then PSI\_24r = 1.

If (PSI\_27 eq 1) then PSI\_27r = 6.

If (PSI\_27 eq 2) then PSI\_27r = 5.

If (PSI\_27 eq 3) then PSI\_27r = 4.

If (PSI\_27 eq 4) then PSI\_27r = 3.

If (PSI\_27 eq 5) then PSI\_27r = 2.

If (PSI\_27 eq 6) then PSI\_27r = 1.

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If (PSI\_29 eq 1) then PSI\_29r = 6.

If (PSI\_29 eq 2) then PSI\_29r = 5

If (PSI\_29 eq 3) then PSI\_29r = 4.

If (PSI\_29 eq 4) then PSI\_29r = 3.

If (PSI\_29 eq 5) then PSI\_29r = 2.

If (PSI\_29 eq 6) then PSI\_29r = 1.

If (PSI\_31 eq 1) then PSI\_31r = 6.

If (PSI\_31 eq 2) then PSI\_31r = 5.

If (PSI\_31 eq 3) then PSI\_31r = 4.

If (PSI\_31 eq 4) then PSI\_31r = 3.

If (PSI\_31 eq 5) then PSI\_31r = 2.

If (PSI\_31 eq 6) then PSI\_31r = 1.

***Problem Solving Inventory totals and overall cut-points***

Confidence total: PSI\_5r + PSI\_9r + PSI\_10r + PSI\_11r + PSI\_18r + PSI\_21r +  
PSI\_22r + PSI\_25r + PSI\_30r + PSI\_31r + PSI\_32r.

Overall cut-points: confidence in problem solving ability (confidence total  $\leq 38$ ) = 0,  
and lack of confidence in problem solving ability (confidence total  $\geq 39$ ) = 1.

Avoidant total: PSI\_1r + PSI\_2r + PSI\_4r + PSI\_6r + PSI\_7r + PSI\_8r + PSI\_12r +  
PSI\_14r + PSI\_15r + PSI\_16r + PSI\_17r + PSI\_19r + PSI\_20r + PSI\_26r +  
PSI\_27r + PSI\_28r.

Overall cut-points: avoidant approach to problem solving (avoidant total  $\geq 57$ ) = 1, and  
non-avoidant approach to problem solving (avoidant total  $\leq 56$ ) = 0.

Control total: PSI\_3r + PSI\_13r + PSI\_23r + PSI\_24r + PSI\_29r.

Overall cut-points: personal control in problem solving (control total  $\leq 17$ ) = 0, and  
lack of personal control in problem solving (control total  $\geq 18$ ) = 1.

***Denver II Scale***

Scores available:

1. Pass.
2. Fail.
3. No opportunity.
4. Refusal.

***Personal-social skills***

Wash and dry hands (WASHDRY1): Ask the parent if the child can wash his or her own hands without help, except for turning on faucets that are out of reach.

Name friend (NAMEFR1): Ask the child to name some of his or her friends or playmates (not living with the child).

Put on t-shirt (PUTONTS1): Ask the parent if the child can get his or her t-shirt or pullover on without help.

Dress, no help (DRESSNH1): Ask the parent if the child can dress without any help.

Play board or card games (PLAYBCG1): Ask the parent if the child plays simple board or card games. Specify that the child must really play and understand the game.

Brush teeth, no help (BRTEETH1): Ask the parent if the child brushes his or her teeth without help or supervision some of the time, including putting toothpaste on the brush and brushing all teeth with back and forth strokes at the gum line.

Prepare cereal (PREPCER1): Ask the parent if the child can prepare a bowl of cereal without help (other than being given items that are hard to reach), including getting the bowl, spoon, cereal and milk, and pouring the cereal and milk into the bowl without spilling much. If the parent says the child cannot do this because the container of milk is too large, ask if the child can pour it from a nearly empty container, small pitcher or glass.

***Fine-motor adaptive skills***

Tower of 6 cubes (TOWER6\_1): With the child sitting high enough at the table so that elbows are level with table top and hands are on the table, place the cubes in front of the child on the table. Show the child how to build a tower with the cubes, and ask him or her to build one using the same cubes. It may be helpful to hand the cubes to the child, one at a time. Three trials may be given.

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Imitate vertical line (IMVERT1): The child should be seated at the table at a comfortable writing level. Place a pencil and piece of plain paper in front of the child and ask him or her to draw lines like yours. On the paper, demonstrate how to draw vertical lines, drawing toward the child. Do not guide the child's hand. Three trials may be given.

Tower of 8 cubes (TOWER8\_1): With the child sitting high enough at the table so that elbows are level with table top and hands are on the table, place the cubes in front of the child on the table. Show the child how to build a tower with the cubes, and ask him or her to build one using the same cubes. It may be helpful to hand the cubes to the child, one at a time. Three trials may be given.

Thumb wiggle (WIGGLE1): Demonstrate with one or both hands by making a fist with your thumb pointing upward. Wiggle only your thumb. Ask the child to wiggle his or her thumb (or thumbs) the same way. Do not help put the child's hand in position. You may ask the child to make a 'thumbkin'.

Copy circle (COPYC1): Give the child a pencil and piece of plain paper. Show him or her the circle on the back of the test form. Without naming it, or moving your finger or pencil to show how to draw it, ask the child to draw one like the picture. Three trials may be given.

Draw person 3 parts (DRP3\_1): Give the child a pencil and piece of plain paper. Ask him or her to draw a picture of a person. Be sure the child has finished before scoring the drawing.

Copy + (COPYPL1): Give the child a pencil and piece of plain paper. Show him or her the cross on the back of the test form. Without naming it, or moving your finger or pencil to show how to draw it, ask the child to draw one like the picture. Three trials may be given.

Pick longer line (PICKLL1): Make sure that the lines are presented vertically, show the child the parallel lines on the back of the test form and ask the child: which line is longer? (Do not say 'bigger'). After the child has pointed to a line, turn the paper

upside down and ask the question again. Turn the paper the correct way round and repeat the question a third time. If the child does not answer correctly all 3 times, repeat the exercise.

### ***Language skills***

Speech half understandable (SPHALF1): Speech half understandable.

Name 4 pictures (NAME4P1): Show the child the pictures on the back of the form. Point to the cat, bird, horse, dog and man, one at a time, and ask: what is this?

Know 2 actions (KN2ACT1): Show the child the pictures on the back of the form. Instruct the child to point to the correct picture as the following questions are asked:

Which one flies?

Which one says meow?

Which one talks?

Which one barks?

Which one gallops?

Know 2 adjectives (KN2ADJ1): Ask the child the following questions, one at a time:

What do you do when you are cold?

What do you do when you are tired?

What do you do when you are hungry?

Name 1 colour (NM1COL1): Place a red, blue, yellow and green block on the table in front of the child. Point to 1 block and ask the child: what colour is this? After the child answers, move the blocks around and ask the child to tell you the colour of another block. Repeat for all 4 colours.

Use of 2 objects (USE2OBJ1): Ask the child the following questions, one at a time:

What do you do with a cup?

What is a chair used for?

What is a pencil used for?

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Count 1 block (CT1BL1): Put 8 blocks on the table in front of the child. Place a piece of paper next to the blocks. Ask the child to put 1 block on the paper. When the child appears to be finished, ask: how many blocks are on the paper?

Use of 3 objects (USE3OBJ1): Ask the child the following questions, one at a time:

What do you do with a cup?

What is a chair used for?

What is a pencil used for?

Know 4 actions (KN4ACT1): Show the child the pictures on the back of the form.

Instruct the child to point to the correct picture as the following questions are asked:

Which one flies?

Which one says meow?

Which one talks?

Which one barks?

Which one gallops?

Speech all understandable (SPALL1): If you have understood all, or nearly all, of what the child has said.

Understand 4 prepositions (U4PREP1): While the child is standing, give him or her a block. Give the following instructions to the child, one at a time:

Put the block on the table.

Put the block under the table.

Put the block in front of me.

Put the block behind me.

Name 4 colours (NM4COL1): Place red, blue, yellow and green block on the table in front of the child. Point to 1 block and ask the child: what colour is this? After the child answers, move the blocks around and ask the child to tell you the colour of another block. Repeat for all 4 colours.

Define 5 words (D5WORD1): Make sure the child is listening to you and then say: "I am going to say a word and I want you to tell me what it is". Ask each word, one at a time:

What is a ball?

What is a lake?

What is a desk?

What is a house?

What is a banana?

What is a curtain?

What is a fence

What is a ceiling?

Each word may be asked 3 times if necessary. You may say: "tell me something about it", but do not ask the child to tell you what the object is for or what to do with it.

Know 3 adjectives (KN3ADJ1): Ask the child the following questions, one at a time:

What do you do when you are cold?

What do you do when you are tired?

What do you do when you are hungry?

### ***Gross motor skills***

Throw ball overhand (THRBALL1): Give the child the ball and stand at least 3 feet in front of him or her. Ask the child to throw the ball to you using an overhand throw. You may show the child how to throw overhand. Three trials may be given.

Broad jump (BRJUMP1): Place a piece of paper (8-8½" by 11") on the floor, and show the child how to do a standing broad jump across the width of the paper (8-8½" by 11"). Then ask the child to do it. You may give three trials, if necessary.

Balance each foot 1 second (BAL1SEC1): Have the child stand away from all support. Show the child how to balance on 1 foot. Ask him or her to do this, giving three trials (unless he or she balances for 6 seconds or more on the first trial). Record the longest time of these three trials. Then ask the child to balance on the other foot, giving three trials if necessary. Record the longest time of these three trials.

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Balance each foot 2 seconds (BAL2SEC1): Have the child stand away from all support. Show the child how to balance on 1 foot. Ask him or her to do this, giving three trials (unless he or she balances for 6 seconds or more on the first trial). Record the longest time of these three trials. Then ask the child to balance on the other foot, giving three trials if necessary. Record the longest time of these three trials.

Hops (HOPS1): With the child away from all support, ask him or her to hop on 1 foot. You may show the child how to do this.

Balance each foot 3 seconds (BAL3SEC1): Have the child stand away from all support. Show the child how to balance on 1 foot. Ask him or her to do this, giving three trials (unless he or she balances for 6 seconds or more on the first trial). Record the longest time of these three trials. Then ask the child to balance on the other foot, giving three trials if necessary. Record the longest time of these three trials.

Balance each foot 4 seconds (BAL4SEC1): Have the child stand away from all support. Show the child how to balance on 1 foot. Ask him or her to do this, giving three trials (unless he or she balances for 6 seconds or more on the first trial). Record the longest time of these three trials. Then ask the child to balance on the other foot, giving three trials if necessary. Record the longest time of these three trials.

***Personal-social skills individual cut-points***

If (WASHDRY1 eq 1) then passes = passes + 1.

If (WASHDRY1 eq 2) then fails = fails + 1.

If (NAMEFR1 eq 1) then passes = passes + 1.

If (NAMEFR1 eq 2) then fails = fails + 1.

If (PUTONTS1 eq 1) then passes = passes + 1.

If (PUTONTS1 eq 2) then fails = fails + 1.

If (DRESSNH1 eq 1) then passes = passes + 1.

If (DRESSNH1 eq 2) then fails = fails + 1.

If (PLAYBCG1 eq 1) then passes = passes + 1.

If (PLAYBCG1 eq 2) then fails = fails + 1.

If (BRTEETH1 eq 1) then passes = passes + 1.

If (BRTEETH1 eq 2) then fails = fails + 1.

If (PREPCER1 eq 1) then passes = passes + 1.

If (PREPCER1 eq 2) then fails = fails + 1.

***Personal-social skills overall cut-points***

- Overall cut-points: pass in personal-social skills (percentage  $\geq 65$ ) = 1, and fail in personal-social skills (percentage  $< 65$ ) = 0.

***Fine-motor adaptive skills individual cut-points***

If (TOWER6\_1 eq 1) then passes = passes + 1.

If (TOWER6\_1 eq 2) then fails = fails + 1.

If (IMVERT1 eq 1) then passes = passes + 1.

If (IMVERT1 eq 2) then fails = fails + 1.

If (TOWER8\_1 eq 1) then passes = passes + 1.

If (TOWER8\_1 eq 2) then fails = fails + 1.

If (WIGGLE1 eq 1) then passes = passes + 1.

If (WIGGLE1 eq 2) then fails = fails + 1.

If (COPYC1 eq 1) then passes = passes + 1.

If (COPYC1 eq 2) then fails = fails + 1.

If (DRP3\_1 eq 1) then passes = passes + 1.

If (DRP3\_1 eq 2) then fails = fails + 1.

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If (COPYPL1 eq 1) then passes = passes + 1.

If (COPYPL1 eq 2) then fails = fails + 1.

If (PICKLL1 eq 1) then passes = passes + 1.

If (PICKLL1 eq 2) then fails = fails + 1.

***Fine-motor adaptive skills overall cut-points***

Overall cut-points: pass in fine-motor adaptive skills (percentage  $\geq 65$ ) = 1, and fail in fine-motor adaptive skills (percentage  $< 65$ ) = 0.

***Language skills individual cut-points***

If (SPHALF1 eq 1) then passes = passes + 1.

If (SPHALF1 eq 2) then fails = fails + 1.

If (NAME4P1 eq 1) then passes = passes + 1.

If (NAME4P1 eq 2) then fails = fails + 1.

If (KN2ACT1 eq 1) then passes = passes + 1.

If (KN2ACT1 eq 2) then fails = fails + 1.

If (KN2ADJ1 eq 1) then passes = passes + 1.

If (KN2ADJ1 eq 2) then fails = fails + 1.

If (NM1COL1 eq 1) then passes = passes + 1.

If (NM1COL1 eq 2) then fails = fails + 1.

If (USE2OBJ1 eq 1) then passes = passes + 1.

If (USE2OBJ1 eq 2) then fails = fails + 1.

If (CT1BL1 eq 1) then passes = passes + 1.

If (CT1BL1 eq 2) then fails = fails + 1.

If (USE3OBJ1 eq 1) then passes = passes + 1.

If (USE3OBJ1 eq 2) then fails = fails + 1.

If (KN4ACT1 eq 1) then passes = passes + 1.

If (KN4ACT1 eq 2) then fails = fails + 1.

If (SPALL1 eq 1) then passes = passes + 1.

If (SPALL1 eq 2) then fails = fails + 1.

If (U4PREP1 eq 1) then passes = passes + 1.

If (U4PREP1 eq 2) then fails = fails + 1.

If (NM4COL1 eq 1) then passes = passes + 1.

If (NM4COL1 eq 2) then fails = fails + 1.

If (D5WORD1 eq 1) then passes = passes + 1.

If (D5WORD1 eq 2) then fails = fails + 1.

If (KN3ADJ1 eq 1) then passes = passes + 1.

If (KN3ADJ1 eq 2) then fails = fails + 1.

### ***Language skills overall cut-points***

Overall cut-points: pass in language Skills (percentage  $\geq 65$ ) = 1, and fail in language

Skills (percentage  $< 65$ ) = 0.

### ***Gross motor skills individual cut-points***

If (THRBALL1 eq 1) then passes = passes + 1.

If (THRBALL1 eq 2) then fails = fails + 1.

If (BRJUMP1 eq 1) then passes = passes + 1.

If (BRJUMP1 eq 2) then fails = fails + 1.

If (BAL1SEC1 eq 1) then passes = passes + 1.

If (BAL1SEC1 eq 2) then fails = fails + 1.

If (BAL2SEC1 eq 1) then passes = passes + 1.

If (BAL2SEC1 eq 2) then fails = fails + 1.

If (HOPS1 eq 1) then passes = passes + 1.

If (HOPS1 eq 2) then fails = fails + 1.

If (BAL3SEC1 eq 1) then passes = passes + 1.

If (BAL3SEC1 eq 2) then fails = fails + 1.

If (BAL4SEC1 eq 1) then passes = passes + 1.

If (BAL4SEC1 eq 2) then fails = fails + 1.

***Gross motor skills overall cut-points***

- Overall cut-points: pass in gross motor skills (percentage  $\geq 65$ ) = 1, and fail in gross motor skills (percentage  $< 65$ ) = 0.

## **APPENDIX III**

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### **MEASURES**

Microsoft Word versions of all the measures administered are provided in this appendix, except the Schedules of Clinical Assessment in Neuropsychiatry (SCAN; Wing et al., 1990). SCAN is too large to be provided as a Microsoft Word version, but it is provided, in its entirety, on a CD ROM at the back of this thesis, in appendix IV.

With regard to the measures in this appendix, the components that were administered by telephone appear in bold type. All the measures are presented in the order that they were administered in person, which was as follows:

1. Pre-consent (Wheatley, 1998).
2. 30 item version of the General Health Questionnaire (GHQ-30; Goldberg, 1972).
3. Leicester Housing Schedule (Wheatley, 1998).
4. Service Contact (devised from work undertaken by the Office of National Statistics; ONS; Meltzer et al., 1995).
5. Interview Measure of Social Relationships (IMSR; Brugha et al., 1987).
6. Obstetric and General Life Events (based on life event scales; Barnett et al., 1983; and threatening life events; Brugha et al., 1985).
7. Fetal Health Locus of Control Scale (Labs & Wurtele, 1986).
8. General Difficulties (devised from work undertaken by the ONS; Meltzer et al., 1995).
9. Problem Solving Inventory (Heppner & Petersen, 1982).
10. Antenatal Social Support (based on a screening tool designed by Brugha et al., 1998a).
11. Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987).
12. Denver II Scale (Frankenberg et al., 1992).
13. Alcohol Use Disorders Identification Test (AUDIT; Babor & Grant, 1989).

**PRE-CONSENT**

**I would like to begin by asking you some background details, if that is alright?**

1) Do you expect to be living at this address when your child is about 5 years old?

0. No.

1. Yes.

If NO:

(A) Do you have an address for where you think you will be living when your child is 5 years old?

0. No.

1. Yes: what is the address?

2) Do you live with your child's father at present?

0. No.

1. Yes.

If NO:

(A) Where does your child's father live?

3) Please can you give me the names and phone numbers of two people through whom I may contact you if you move from your present address at any time within the length of the study (2 years)?

4) Do you have any children living at home, that is, children for whom you are responsible?

0. No.

1. Yes.

If YES:

(A) How old are they? (Include step, foster, adopted children of relatives or friends being cared for.)

1. 0-4 years.

2. 5 years.

3. 6-10 years.

4. 11-14 years.

5. 15 years and older.

(B) Are any of the children usually at home during the day?

0. No.

1. Yes: do you look after them?

(5) Do you intend to have more children?

0. No.

1. Yes.

EITHER

If NO:

Why not?

OR

If YES to 'Do you intend to have more children?':

(A) When do you hope your next child will be born?

0. In the next 3-6 months.

1. In the next 6-12 months.

2. In the next 12-18 months.

3. In the next 18-24 months

4. In the next 24-30 months.

5. In the next 30-36 months.

6. In over 36 months.

(B) What did you take into consideration when planning your next child?

(C) How many children do you hope to have?

0. 2.

1. 3.

2. 4.

3. 5.

4. More than 5.

(D) How many children do you think you will actually have?

0. 2.

1. 3.

2. 4.

3. 5.

4. More than 5.

*Appendix III*

6) Please tell me which of the categories best describes your employment status?

1. Employed full-time.
2. Employed part-time (1-30 hours).
3. Unemployed (1 month, including sick leave and no job).
4. Off sick for more than 1 month (job kept open).
5. Full-time housewife or household duties.
6. Maternity leave.

If employed full-time or part-time, or full-time housewife or household duties:

(A) Is this because of personal reasons, financial reasons or both?

1. Personal reasons.
2. Financial reasons.
3. Both.

7) Have you yourself, ever been in hospital, had any operations or treatment from a specialist, since you were last seen when your child was about 12 months old?

0. No.
1. Yes.

If YES:

(A) Which hospital or medical service, and when?

GHQ-30

I would like to know how your health has been over the past month.

HAVE YOU RECENTLY:

- |  |                     |                     |                         |                       |
|--|---------------------|---------------------|-------------------------|-----------------------|
| 1) Been able to concentrate on whatever you are doing?       | Better than usual.  | Same as usual.      | Less than usual.        | Much less than usual. |
| 2) Lost much sleep over worry?                               | Not at all.         | No more than usual. | Rather more than usual. | Much more than usual. |
| 3) Been having restless, disturbed nights?                   | Not at all.         | No more than usual. | Rather more than usual. | Much more than usual. |
| 4) Been managing to keep yourself busy and occupied?         | More so than usual. | Same as usual.      | Rather less than usual. | Much less than usual. |
| 5) Been getting out of the house as much as usual?           | More than usual.    | Same as usual.      | Less than usual.        | Much less than usual. |
| 6) Been managing as well as most people would in your shoes? | Better than most.   | About the same.     | Rather less well.       | Much less well.       |

*Appendix III*

7) Felt on the whole you were doing things well?	Better than usual.	About the same.	Less well than usual.	Much less well.
8) Been satisfied with the way you have carried out your tasks?	More satisfied.	About the same as usual.	Less satisfied than usual.	Much less satisfied.
9) Been able to feel warmth and affection for those near to you?	Better than usual.	About the same as usual.	Less well than usual.	Much less well.
10) Been finding it easy to get on with other people?	Better than usual.	About the same as usual.	Less well than usual.	Much less well.
11) Spent much time chatting with people?	More time than usual.	About the same as usual.	Less than usual.	Much less than usual.
12) Felt that you are playing a useful part in things?	More so than usual.	Same as usual.	Less useful than usual.	Much less useful.
13) Felt capable of making decisions about things?	More so than usual.	Same as usual.	Less so than usual.	Much less capable.

14) Felt constantly under strain?	Not at all.	No more than usual.	Rather more than usual.	Much more than usual.
15) Felt you could not overcome your difficulties?	Not at all.	No more than usual.	Rather more than usual.	Much more than usual.
16) Been finding life a struggle all the time?	Not at all.	No more than usual.	Rather more than usual.	Much more than usual.
17) Been able to enjoy your normal day-to-day activities?	More so than usual.	Same as usual.	Less so than usual.	Much less than usual.
18) Been taking things hard?	Not at all.	No more than usual.	Rather more than usual.	Much more than usual.
19) Been getting scared or panicky for no good reason?	Not at all.	No more than usual.	Rather more than usual.	Much more than usual.
20) Been able to face up to your problems?	More so than usual.	Same as usual.	Less able than usual.	Much less able.
21) Found everything is getting on top of you?	Not at all.	No more than usual.	Rather more than usual.	Much more than usual.

*Appendix III*

22) Been feeling unhappy and depressed?	Not at all.	No more than usual.	Rather more than usual.	Much more than usual.
23) Been losing confidence in yourself?	Not at all.	No more than usual.	Rather more than usual.	Much more than usual.
24) Been thinking of yourself as a worthless person?	Not at all.	No more than usual.	Rather more than usual.	Much more than usual.
25) Felt that life is entirely hopeless?	Not at all.	No more than usual.	Rather more than usual.	Much more than usual.
26) Been feeling hopeful about your own future?	More so than usual.	Same as usual.	Less so than usual.	Much less than usual.
27) Been feeling reasonably happy, all things considered?	More so than usual.	Same as usual.	Less so than usual.	Much less than usual.
28) Been feeling nervous and strung up all the time?	Not at all.	No more than usual.	Rather more than usual.	Much more than usual.
29) Felt that life is not worth living?	Not at all.	No more than usual.	Rather more than usual.	Much more than usual.

30) Found at times you could not do anything because your nerves were too bad?	Not at all.	No more than usual.	Rather more than usual.	Much more than usual.
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## **LEICESTER HOUSING SCHEDULE**

**The next set of questions are mostly about your home.**

- 1) How long have you lived in Leicestershire?
  1. Less than 3 months.
  2. 3 months.
  3. 3-6 months.
  4. 6-12 months.
  5. 1-2 years.
  6. 2-3 years.
  7. 3-5 years.
  8. Over 5 years: please specify.
  
- 2) How long have you lived where you are now?
  1. Less than 3 months.
  2. 3 months.
  3. 3-6 months.
  4. 6-12 months.
  5. 1-2 years.
  6. 2-3 years.
  7. 3-5 years.
  8. Over 5 years: please specify.
  
- 3) How long do you expect to stay where you are now?
  1. Less than 3 months.
  2. 3 months.
  3. 3-6 months.
  4. 6-12 months.
  5. 1-2 years.
  6. 2-3 years.
  7. 3-5 years.
  8. Over 5 years: please specify.
  
- 4) **Which of the following best describes the kind of housing you live in now?**
  1. **Owner occupation.**
  2. **Private tenant.**
  3. **Housing Association tenant.**
  4. **Council tenant.**
  5. **Housing Coop.**

6. **Hostel.**
7. **Night Shelter.**
8. **In Care.**
9. **Lodgings.**
10. **Hotel or Bed and Breakfast.**
11. **Squatting.**
12. **Other: please specify.**

**5) Of which of the following rooms are you the only user?**

1. **Living room.**
2. **Kitchen.**
3. **Bathroom.**
4. **Bedroom.**
5. **None of these.**
6. **All of these.**

**If YOU SHARE**

**(A) How many people do you share the living room with?**

**How many people do you share the kitchen with?**

**How many people do you share the bathroom with?**

**How many people do you share the bedroom with?**

**(B) Do you prefer to share?**

**No.**

**Yes.**

In your home, do you have:

A fridge?

0. No.

1. Yes.

A freezer?

0. No.

1. Yes.

A washing machine?

0. No.

1. Yes.

A telephone?

0. No.

1. Yes.

Central heating?

0. No.

1. Yes.

- 7) Why did you have to move from your last home to here or this house?**
- 1. Overcrowding.**
  - 2. To move to a nicer area.**
  - 3. To be near a new job.**
  - 4. To be near an existing job.**
  - 5. Disagreements with other people in the same house.**
  - 6. Unsatisfactory relationship with parents.**
  - 7. Wanted a larger house or flat.**
  - 8. Wanted a smaller or cheaper place.**
  - 9. Marriage or began cohabiting.**
  - 10. You became pregnant.**
  - 11. Marital breakdown or separation from cohabitee.**
  - 12. Asked to leave friends and/or relatives other than parents.**
  - 13. Other family or personal reasons.**
  - 14. Violence from partner**
    - i) Physical.**
    - ii) Verbal or mental cruelty.**
  - 15. Sexual harassment**
    - i) From a relative.**
    - ii) From a neighbour.**
  - 16. Could not afford the rent on previous home.**
  - 17. Could not afford the mortgage on previous home.**
  - 18. Other: please specify.**
- 8) Why do you think you would move from your present home?**
- 1. Overcrowding.**
  - 2. To move to a nicer area.**
  - 3. To be near a new job.**
  - 4. To be near an existing job.**
  - 5. Disagreements with other people in the same house.**
  - 6. Unsatisfactory relationship with parents.**
  - 7. Wanted a larger house or flat.**
  - 8. Wanted a smaller or cheaper place.**
  - 9. Marriage or began cohabiting.**
  - 10. You became pregnant.**
  - 11. Marital breakdown or separation from cohabitee.**
  - 12. Asked to leave friends and/or relatives other than parents.**
  - 13. Other family or personal reasons.**
  - 14. Violence from partner**
    - i) Physical.**
    - ii) Verbal or mental cruelty.**
  - 15. Sexual harassment**
    - i) From a relative.**
    - ii) From a neighbour.**
  - 16. Could not afford the rent on previous home.**

**17. Could not afford the mortgage on previous home.**

**18. Other: please specify.**

**9) Do you rent your current home?**

**0. No**

**1. Yes.**

**If YES:**

**(A) Have there been any problems with the landlord, any restrictions, that kind of thing?**

**0. No.**

**1. Yes: did this affect you? 0. No.**

**1. Yes: in what way did it affect you?**

**10) Have there been any problems that you know of about paying for the house, like keeping up with the rent or mortgage?**

**0. No.**

**1. Yes.**

**Not applicable.**

**If YES:**

**(A) Did this affect you?**

**0. No.**

**1. Yes: in what way did this affect you?**

**11) Are you receiving any of the following State Benefits?**

**1. Income Support.**

**2. Housing Benefit.**

**3. Unemployment Benefit.**

**4. Maternity Allowance.**

**5. Other: please specify.**

**12) In addition to these, do you receive any:**

**1. Earned income or salary.**

**2. Income from self-employment.**

**3. Income from any other source.**

13) Which of the following categories represents your own personal gross income (i.e. before deductions for Income Tax and National Insurance) from all sources mentioned?

PER WEEK	OR	PER YEAR
1. Less than £20	or	Less than £1000
2. £20 - £39	or	£1000 - £1999
3. £40 - £59	or	£2000 - £2999
4. £60 - £79	or	£3000 - £3999
5. £80 - £99	or	£4000 - £4999
6. £100 - £119	or	£5000 - £5999
7. £120 - £139	or	£6000 - £6999
8. £140 - £159	or	£7000 - £7999
9. £160 - £179	or	£8000 - £8999
10. £180 - £199	or	£9000 - £9999
11. £200 - £219	or	£10000 - £10999
12. £220 - £239	or	£11000 - £11999
13. £240 - £259	or	£12000 - £12999
14. £260 - £279	or	£13000 - £13999
15. £280 - £299	or	£14000 - £14999
16. £300 or more	or	£15000 or more

14) In your neighbourhood, are any of the following a problem?

1. **Vandalism and hooliganism.**
2. **Graffiti.**
3. **Crime.**
4. **Dogs.**
5. **Litter and rubbish in the streets.**
6. **Racial harassment.**
7. **Noise.**
8. **None of these.**

If ANY:

(A) Which of these problems is the most serious?

1. **Vandalism and hooliganism.**
2. **Graffiti.**

3. **Crime.**
4. **Dogs.**
5. **Litter and rubbish in the streets.**
6. **Racial harassment.**
7. **Noise.**
8. **None of these.**

**15) How do you get on with your neighbours?**

1. **Really well.**
2. **Fairly well.**
3. **Not at all.**
4. **Don't really know them.**

**16) Have you ever felt cut off in your present home: too far from friends or work?**

0. **No.**
1. **Yes.**

**17) Have you considered living anywhere else?**

0. **No.**
1. **Yes.**

**If YES:**

**(A) Are you on a Council waiting list?**

0. **No.**
1. **Yes: (A) How long have you been on the Council waiting list?**
  1. **Less than 3 months.**
  2. **3 months.**
  3. **3-6 months.**
  4. **6-12 months.**
  5. **1-2 years.**
  6. **2-3 years.**
  7. **3-5 years.**
  8. **Over 5 years.**

**(B) Which Council?**

**(C) Have you turned down any offers?**

**0. No.**

**1. Yes: what was, or were, the reason(s) for turning down the offers?**

**18) On the whole, do you like living in your present home?**

**0. No.**

**1. Yes.**

**If NO:**

**(A) Please can you tell me why?**

**1. All of the above.**

**2. Additional dislikes to the above: please specify.**

**19) What kind of housing do you feel you need now?**

**1. Council flat.**

**2. Council maisonette.**

**3. Council house.**

**4. Council bungalow.**

**5. Privately rented flat.**

**6. Privately rented bedsit.**

**7. Privately rented house.**

**8. Bed and Breakfast.**

**9. Housing Association accommodation.**

**10. To own your own house.**

**11. Supported accommodation.**

**20) What kind of accommodation will you need in the future?**

**1. Council flat.**

**2. Council maisonette.**

**3. Council house.**

**4. Council bungalow.**

**5. Privately rented flat.**

**6. Privately rented bedsit.**

**7. Privately rented house.**

- 8. Bed and Breakfast.**
- 9. Housing Association accommodation.**
- 10. To own your own house.**
- 11. Supported accommodation.**

**21) Do you want to live:**

- 1. Alone.**
- 2. With child or children only.**
- 3. With child or children and partner.**

**22) Would you describe yourself as in housing need in any way?**

- 0. No.**
- 1. Yes.**

**If YES: (A) Please go into more detail.**

## **SERVICE CONTACT**

**This part is about contact with the NHS.**

**1) During the 2 weeks ending yesterday, apart from any visit to a hospital, did you talk to a GP or family doctor on your own behalf, either in person or by telephone?**

**0. No.**

**1. Yes.**

**If YES:**

**(A) How many times have you talked to your GP or family doctor in the past 2 weeks?**

**(B) When you spoke to the doctor did you talk about:**

**1. A physical illness or complaint?**

**2. A nervous or emotional problem?**

**3. Both of these?**

**(C) Were you satisfied or dissatisfied with the consultation?**

**1. Satisfied.**

**2. Dissatisfied:**

**(D) If DISSATISFIED: in what way were you dissatisfied?**

**1. Doctor did not listen, was not interested or ignored me.**

**2. The treatment was inappropriate, not given tests, treatments or hospitalisation.**

**3. Doctor was not helpful.**

**4. Doctor said there was nothing wrong or that**

**5. nothing could be done.**

**6. Other: please specify.**

**2) During the past 12 months, have you been in hospital as an in-patient, overnight or longer for treatment or tests?**

**0. No.**

**1. Yes.**

**If YES:**

- (A) In the past 12 months, how many separate stays have you had in hospital as an in-patient?**
- (B) Please recall the most recent stay. How many nights altogether were you in hospital?**
- (C) Were you in hospital because of:**
- 1. A physical health problem?**
  - 2. A nervous or emotional problem?**
  - 3. Both of these?:**

**If it was a NERVOUS AND/OR EMOTIONAL PROBLEM:**

- (A) Who referred you to hospital?**
- 1. GP.**
  - 2. Community psychiatric nurse.**
  - 3. Social worker.**
  - 4. Consultant psychiatrist.**
  - 5. Clinical psychologist.**
  - 6. Via casualty.**
  - 7. Via law courts, probation service or police.**
  - 8. Self-admitted.**
  - 9. Other: please specify.**
- (B) When you were in hospital, which people did you see?**
- 1. Psychiatrist or psychotherapist.**
  - 2. Other consultant or hospital doctor.**
  - 3. Psychiatric nurse.**
  - 4. Social worker or counsellor.**
  - 5. Occupational therapist.**
  - 6. Psychologist.**
  - 7. Other.**

**3) Apart from seeing your own doctor or when you stayed in hospital, in the past 12 months, have you been to a hospital, clinic or any where else for treatment or check ups?**

- 0. No.**
- 1. Yes.**

**If YES:**

**(A) How many different places have you been for out-patient or day patient visits in the past year?**

**(B) Was your out-patient or day patient visit because of:**

1. A physical health problem?
2. A nervous or emotional problem?
3. Both of these?

**(C) What type of place(s) did you go to?**

1. Outpatient department of a hospital.
2. Casualty department of a hospital.
3. Clinic or health Centre.
4. Private consulting rooms.
5. Day Centre.
6. Other: please specify.

**(D) How many times have you been to the place(s) in the past year?**

**(E) Which of these people did you normally see at this hospital or clinic?**

1. Psychiatrist or psychotherapist.
2. Other consultant or hospital doctor.
3. Psychiatric nurse.
4. Social worker or counsellor.
5. Occupational therapist.
6. Psychologist.
7. Other: please specify.

**(F) Are you currently attending this place on a regular basis?**

0. No: did you stop on your own accord or were you discharged?
1. Yes.

**4) Here is a list of people who visit at home to give help and support when needed:**

1. Community psychiatric nurse.
2. Occupational therapist.
3. Social worker.
4. Psychiatrist.
5. Home care worker or home help.
6. Voluntary worker.

**(A) Have any of these people visited you in the past year?**

0. No.
1. Yes.

**If NO:**

**(B) Have you been offered any help or support from any of the people listed below, or any other service you have turned down?**

1. Community psychiatric nurse.
2. Occupational therapist or industrial therapist.
3. Social worker or counselling service.
4. Psychiatrist.
5. Home care worker or home help.
6. Voluntary worker.
7. Other: please specify.

**If SO:**

**(A) Did you turn it down because you did not want or need the help, or other reason(s)?**

1. Did not want or need help.
2. Could not face it or handle it.
3. Did not like the people or not the right people offering help.
4. Did not think it could or would help.
5. Inconvenient time or location.
6. Other reason: please specify.

**OR**

**If YES to 'Here is a list of people who visit at home to give help and support when needed. Have any of these people visited you in the past year?'**

1. Community psychiatric nurse.
2. Occupational therapist.
3. Social worker.
4. Psychiatrist.
5. Home care worker or home help.
6. Voluntary worker.

**(A) How often did this person come?**

1. 4 or more times a week.
2. 2-3 times a week.

3. **Once a week.**
4. **Less often than once a week, but at least once a month.**
5. **Less often than once a month.**

**(B) How satisfied or dissatisfied were you with the help or support they gave you? Were you:**

1. **Very satisfied?**
2. **Fairly satisfied?**
3. **Fairly dissatisfied?**
4. **Very dissatisfied ?**

**(C) If they came from a VOLUNTARY ORGANISATION, from which one did they come?**

**5) Sometimes people do not see a doctor or other professional about mental, nervous or emotional problems when perhaps they should. Was there ever a time when you decided not to see a doctor or other professional when either you, or people around you, thought you should?**

0. **No.**
1. **Yes.**

**If YES:**

**(A) Please think about the last time this happened, what was, or were, your reason(s) for not going to a doctor or other professional?**

1. **Did not know who to go to or where to go.**
2. **Did not think anyone could help.**
3. **Hour inconvenient or did not have the time.**
4. **Thought the problem would get better by itself.**
5. **Too embarrassed to discuss it with anyone.**
6. **Afraid what family or friends would think.**
7. **Family or friends objected.**
8. **Afraid of the consequences (eg treatment, tests, hospitalised).**
9. **Afraid of the side effects of any treatment.**
10. **Did not think it was necessary or there was a problem.**
11. **A problem one should be able to cope with.**
12. **Other: please specify.**

**IMSR**

**Now I would like to collect some information about your friends, relatives and acquaintances.**

- 1) I would like to begin by asking you about the people who were living with you in your household during the last seven days. Household: people who would, on most days, sit down together for a meal. How many people were living with you in your household during the last seven days?**
  
- 2) What are their first names?**
  
- 3) Now I want you to think about all the people who you would consider to be close relatives. It does not matter where they live, or whether you saw them in the last week or not. Please decide who, for you, is a close relative: someone who is close to you as a person. How many people do you consider to be close relatives?**
  
- 4) Could you tell me their first names please? (If more than 25 people are named: are you quite happy that all of these people you have named are close relatives, or are there some who you really have not had enough contact with in recent times?)**

**FOR EACH PERSON NAMED, PLEASE ASK THE FOLLOWING QUESTIONS:**

- A. What relation is this person to you?**
  - 1. Parent.**
  - 2. Sibling.**
  - 3. Child.**
  - 4. Other relative.**
  - 5. Spouse or partner.**
  - 6. Other sexual partner.**
  - 7. Good friend.**

**8. Acquaintance.**

**B. What is the gender of this person?**

1. Male.
2. Female.

**C. Have you had any contact with this person in the last week? (Include letter and telephone).**

0. No.
1. Any contact (including letter and telephone).
2. Not known.

**D. I am now going to ask you some questions about the way this person spoke to you. Please think about their expression, tone of voice and how you felt about the way he or she spoke to you. During the time you spent talking to this person in the last week, did there seem to be any matter that you felt or thought differently about, or that he or she felt differently to you?**

1. Did you agree to differ? You need not necessarily have argued. If NO: no differences of opinion. If YES: how did you deal with it? Did you keep it to yourself?
2. Was there cooperation? Cooperation: if once attention was focused on an issue, even if difficult, it was quickly, easily and satisfactorily resolved. The issue was shared openly, there was cooperation, conciliation and responsiveness to each other's views or feelings.
3. Was there avoidance? Avoidance: if there was an awareness of a problem that was not aired, just kept under wraps.
4. Was there competitiveness? Competitiveness: if there was an area of disagreement, rivalry or opposite feelings, difficulties in resolving the disagreement, lack of cooperation, lack of compromise, insincerity, protracted conciliation and point scoring.
5. Was there hostility? Hostility: if there was a definite unpleasant exchange of words or actions (e.g. argument or row) vindictive, rancorous, spiteful, unpleasant criticisms unresolved, unyielding, worsening of the situation.
6. Unsure: if the participant does not understand question.

**7. Inappropriate: if the participant or the other person was unable to interact.**

**EITHER:**

**E. If participant has been in contact with this person in last 7 days ask: do you feel that you needed support – practical help, emotional support or advice from this person during the week?**

**If YES: did you get sufficient support from him or her?**

- 1. Not needed last week.**
- 2. If needed, insufficient support.**
- 3. Sufficient support.**

**OR:**

**F. If the participant has not in been contact with this person in last 7 days ask: although you did not have contact with this person, do you feel that you needed support – practical help, emotional support or advice from him or her during the week?**

**IF YES: would you say that you have had insufficient support from this person then?**

- 1. Not needed last week.**
- 2. If needed, insufficient support.**
- 3. Sufficient support.**

**5) Now I would like you to think about all of the people who you would regard as being good friends at the present time, no matter where they live, or whether or not you saw them in the last week. How many people do you consider to be good friends?**

**6) Could you tell me their first names please? (If more than 25 people are named: are you quite happy that all of these people you have named are close relatives, or are there some who you really have not had enough contact with in recent times?)**

**FOR EACH PERSON NAMED, PLEASE ASK THE FOLLOWING QUESTIONS:**

**A. What relation is this person to you?**

1. Parent.
2. Sibling.
3. Child.
4. Other relative.
5. Spouse or partner.
6. Other sexual partner.
7. Good friend.
8. Acquaintance.

**B. What is the gender of this person?**

1. Male.
2. Female.

**C. Have you had any contact with this person in the last week? (Include letter and telephone).**

1. No.
2. Any contact (including letter and telephone).
3. Not known.

**D. I am now going to ask you some questions about the way this person spoke to you. Please think about their expression, tone of voice and how you felt about the way he or she spoke to you. During the time you spent talking to this person in the last week, did there seem to be any matter that you felt or thought differently about, or that he or she felt differently to you?**

1. Did you agree to differ? You need not necessarily have argued. If NO: no differences of opinion. If YES: how did you deal with it? Did you keep it to yourself?
2. Was there cooperation? Cooperation: if once attention was focused on an issue, even if difficult, it was quickly, easily and satisfactorily resolved. The issue was shared openly, there was cooperation, conciliation and responsiveness to each other's views or feelings.

3. **Was there avoidance? Avoidance:** if there was an awareness of a problem that was not aired, just kept under wraps.
4. **Was there competitiveness? Competitiveness:** if there was an area of disagreement, rivalry or opposite feelings, difficulties in resolving the disagreement, lack of cooperation, lack of compromise, insincerity, protracted conciliation and point scoring.
5. **Was there hostility? Hostility:** if there was a definite unpleasant exchange of words or actions (e.g. argument or row) vindictive, rancorous, spiteful, unpleasant criticisms unresolved, unyielding, worsening of the situation.
6. **Unsure:** if the participant does not understand question.
7. **Inappropriate:** if the participant or the other person was unable to interact.

**EITHER:**

**E. If participant has been in contact with this person in last 7 days ask: do you feel that you needed support – practical help, emotional support or advice from this person during the week?**

**If YES: did you get sufficient support from him or her?**

1. Not needed last week.
2. If needed, insufficient support.
3. Sufficient support.

**OR:**

**F. If the participant has not in been contact with this person in last 7 days ask: although you did not have contact with this person, do you feel that you needed support – practical help, emotional support or advice from him or her during the week?**

**IF YES: would you say that you have had insufficient support from this person then?**

1. Not needed last week.
2. If needed, insufficient support.
3. Sufficient support.

- 7) Now that we have finished talking about good friends and close relatives, we will try to complete the picture by looking at any contact with acquaintances during the last 7 days. How many people do you consider to be acquaintances?
- 8) Could you tell me their first names please? (If more than 25 people are named: are you quite happy that all of these people you have named are close relatives, or are there some who you really have not had enough contact with in recent times?)

FOR EACH PERSON NAMED, PLEASE ASK THE FOLLOWING QUESTIONS:

A. What relation is this person to you?

1. Parent.
2. Sibling.
3. Child.
4. Other relative.
5. Spouse or partner.
6. Other sexual partner.
7. Good friend.
8. Acquaintance.

B. What is the gender of this person?

1. Male.
2. Female.

C. Have you had any contact with this person in the last week? (Include letter and telephone).

1. No.
2. Any contact (including letter and telephone).
3. Not known.

EITHER:

D. If participant has been in contact with this person in last 7 days ask: do you feel that you needed support – practical help, emotional support or advice from this person during the week?

If YES: did you get sufficient support from him or her?

1. Not needed last week.
2. If needed, insufficient support.
3. Sufficient support.

OR:

E. If the participant has not in been contact with this person in last 7 days ask: although you did not have contact with this person, do you feel that you needed support – practical help, emotional support or advice from him or her during the week?

IF YES: would you say that you have had insufficient support from this person then?

1. Not needed last week.
2. If needed, insufficient support.
3. Sufficient support.

## OBSTETRIC AND GENERAL LIFE EVENTS

The next part is about events that may have occurred in your life. If any of the following life events have happened to you in the last 12 months, please say 'yes' and we shall go into a little more detail. If the life events have not happened, please say 'no'. Some of the questions are very personal, if you would prefer to read them rather than have me ask them, please say.

IN THE LAST 12 MONTHS:

NO.      YES.

- 1) Were you separated from your family or a close friend?
- 2) Has a major financial crisis arisen?
- 3) Have increasingly serious arguments developed with your in-laws?
- 4) Have you had a serious illness or were badly injured, and had to be off work and/or in hospital for at least a month?
- 5) Has someone close to you (in the family or outside) developed a serious illness?
- 6) Have increasingly serious arguments developed with you mother?
- 7) Have you had a pregnancy terminated?
- 8) Has your first-born child needed some special treatment?
- 9) Has your husband or partner become unemployed?

- 10) Has a new person come to live in your household (not baby)?
- 11) Has a baby or child of yours died?
- 12) Has someone close to you (in the family or outside) died?
- 13) Has your husband or partner died?
- 14) Were you the cause of a traffic accident in which someone was badly injured?
- 15) Have increasingly serious arguments developed with your husband or partner?
- 16) Has your husband or partner been unfaithful?
- 17) Were you were told by your husband or partner that you were no longer loved?
- 18) Have you miscarried?
- 19) Were you were involved in a legal action which could have damaged your reputation?
- 20) Have you been separated from your husband or partner?
- 21) Thank-you. Have you given birth in the last 12 months?

If YES:

- (A) Did you want your husband or partner to be present at the delivery, but he did not want to be present?

(B) Did your husband or partner want to be present at the delivery, but you did not want him to be present?

(C) Did you have an emergency caesarean section?

(D) Did medical complications arise during the delivery?

Are you pregnant now?

If YES:

(A) Did you become pregnant and your husband or partner did not want you to be?

(B) Have you had an X-ray during your pregnancy?

(C) Have there been problems in the sexual relationship during pregnancy?

(D) Did you almost miscarry before you were 3 months pregnant?

(E) Did you find discover you were pregnant and did not want to be?

(F) Have you been seriously ill during pregnancy?

(G) Have you heard that something you have taken (e.g. medication, alcohol, cigarettes) during your pregnancy might in fact, be harmful to the baby?

(H) Have you almost miscarried after you were 3 months pregnant?

- (I) Have you been in contact with someone who had an infectious disease, like german measles, which might affect your baby?

PLEASE ASK THE FOLLOWING QUESTIONS EACH TIME A 'YES' ANSWER IS GIVEN (EXCEPT WHERE INDICATED ABOVE):

- 1) How many times has this happened in the past 12 months?
- 2) What month did this first happen?  
(Repeat this question and the subsequent questions each time the event occurred).
  1. January.
  2. February.
  3. March.
  4. April.
  5. May.
  6. June.
  7. July.
  8. August.
  9. September.
  10. October.
  11. November.
  12. December.
- 3) Can you tell me about this please?
- 4) Please estimate the date the event is known to have begun?
- 5) Please input the number of months between the event and the date of this assessment.
- 6) How many months is it between the end of the difficulty and the assessment date?
- 7) Did you seek any practical help?
  0. Not sought.
  1. Sought.
  2. Not applicable.
- 8) Did you seek any emotional support?
  0. Not sought.
  1. Sought.

2. Not applicable.

9) Did anyone offer you any practical help at the time?

0. No help offered.

1. Some help offered.

2. Good help offered.

10) Did anyone offer you any emotional support at the time?

0. No help offered.

1. Some help offered.

2. Good help offered.

**FETAL HEALTH LOCUS OF CONTROL SCALE**

This section is about fetal health. There is a list of 16 statements which are accompanied by a selection of responses. I will read each of the statements and responses to you. I would like you to tell me the extent to which you agree or disagree with the statements.

Responses available:

1. **STRONGLY DISAGREE.**
2. **Quite strongly disagree.**
3. **Moderately disagree.**
4. **Slightly disagree.**
5. **NEITHER AGREE OR DISAGREE.**
6. **Slightly agree.**
7. **Moderately agree.**
8. **Quite strongly agree.**
9. **STRONGLY AGREE.**

	<b>STRONGLY DISAGREE</b>					<b>STRONGLY AGREE</b>			
	1	2	3	4	5	6	7	8	9
1) By attending prenatal classes taught by competent health professionals, I greatly increased the odds of having a healthy, normal child.	1	2	3	4	5	6	7	8	9
2) Even if I took excellent care of myself when I was pregnant, fate determined whether my child will be normal or abnormal.	1	2	3	4	5	6	7	8	9

	<b>STRONGLY DISAGREE</b>					<b>STRONGLY AGREE</b>			
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>3) My child was born healthy, only because I did everything my doctor told me to do during the pregnancy.</b>									
<b>4) If my child is unhealthy or abnormal, nature intended it to be that way.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>5) The care I received from health professionals was what was responsible for the health of my unborn child.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>6) My unborn child's health could have been seriously affected by my dietary intake during pregnancy.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>

	<b>STRONGLY DISAGREE</b>					<b>STRONGLY AGREE</b>				
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	
<b>7) Health professionals were responsible for the health of my unborn child.</b>										
<b>8) If I got sick during pregnancy, consulting my doctor was the best thing I could do to protect the health of my unborn child.</b>										
<b>9) No matter what I did when I was pregnant, the laws of nature determined whether or not my child would be normal.</b>										
<b>10) Doctors and nurses were the only ones who were competent to give me advice concerning my behaviour during pregnancy.</b>										

	<b>STRONGLY DISAGREE</b>					<b>STRONGLY AGREE</b>			
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>11) God will determine the health of my child.</b>									
<b>12) Learning how to care for myself before I became pregnant helped my child to be born healthy.</b>									
<b>13) My child's health is in the hands of the health professionals.</b>									
<b>14) Fate determined the health of my unborn child.</b>									
<b>15) What I did right up to the time that my child was born could have affected my child's health.</b>									
<b>16) Having a miscarriage means to me that my child was not destined to live.</b>									

## **GENERAL DIFFICULTIES**

**This part is mostly about difficulties you may have experienced with day-to-day activities in the past month.**

**1) In the past month, did you have any difficulty getting out and about or using transport?**

**0. No.**

**1. Yes.**

**If YES:**

**(A) Did you need anyone to help you get out and about?**

**No: did this difficulty arise recently?**

**Yes: who helped you? and did this difficulty arise recently?**

**2) In the past month, did you have any difficulty with medical care, such as taking medicines or pills, making and keeping hospital or GP appointments?**

**0. No.**

**1. Yes.**

**If YES:**

**(A) Did you need anyone to help you with medical care?**

**No: did this difficulty arise recently?**

**Yes: who helped you? and did this difficulty arise recently?**

**3) In the past month, did you have any difficulty with household activities like preparing meals, shopping, laundry and housework?**

**0. No.**

**1. Yes.**

**If YES:**

**(A) Did you need anyone to help you with household activities?**

**0. No: did this difficulty arise recently?**

**1. Yes: who helped you? and did this difficulty arise recently?**

**4) In the past month, did you have any difficulty with practical activities, such as gardening, decorating or doing household repairs?**

**0. No.**

**1. Yes.**

**If YES:**

**(A) Did you need anyone to help you with practical activities?**

**No: did this difficulty arise recently?**

**Yes: who helped you? and did this difficulty arise recently?**

**5) In the past month, did you have any difficulty dealing with paperwork, such as writing letters, sending cards or filling in forms?**

**0. No.**

**1. Yes.**

**If YES:**

**(A) Did you need anyone to help you to deal with paperwork?**

**No: did this difficulty arise recently?**

**Yes: who helped you? and did this difficulty arise recently?**

**6) In the past month, did you have any difficulty managing money, such as budgeting for food or paying bills?**

**0. No.**

**1. Yes.**

**If YES:**

**(A) Did you need anyone to help you manage money?**

**0. No: did this difficulty arise recently?**

**1. Yes: who helped you? and did this difficulty arise recently?**

**7) Have you worked in the past 3 years?**

**0. No.**

**1. Yes.**

**IF YES: (A) Has your health, or the way you have been feeling, caused you to take time off work in the past month?**

**0. No.**

**1. Yes: how many days have you taken off work in the past month?**

**(B) Has your health, or the way you have been feeling, caused you to take time off work in the past 3 years?**

**0. No.**

**1. Yes: how many days have you taken off work in the past 3 years?**

**PROBLEM SOLVING INVENTORY**

The next part is about problem solving. Please base your responses on general problems that you have resolved recently, instead of large and/or unresolved problems. There are a series of statements accompanied by a section of responses, which I will read to you. Please decide which response you feel best describes the extent to which you agree or disagree with the statements. Please do not spend a long time on any one statement. Also, please do not refer back to your previous answers, all the statements differ from each other, and I am not testing you for consistency.

**Responses available:**

1. **STRONGLY AGREE.**
2. **Moderately agree.**
3. **Slightly agree.**
4. **Slightly disagree.**
5. **Moderately disagree.**
6. **STRONGLY DISAGREE.**

	<b>Strongly Agree</b>				<b>Strongly Disagree</b>	
	1	2	3	4	5	6
1) <b>When a solution to a problem was unsuccessful, I do not examine why it did not work.</b>	1	2	3	4	5	6
2) <b>When I am confronted with a complex problem, I do not bother to develop a strategy to collect information so I can define exactly what the problem is.</b>	1	2	3	4	5	6

	<b>Strongly Agree</b>				<b>Strongly Disagree</b>		
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>3) When my first efforts to solve a problem fail, I become uneasy about my ability to handle the situation.</b>							
<b>4) After I have solved a problem, I do not analyse what went right or what went wrong.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>5) I am usually able to think up creative and effective alternatives to solve a problem.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>6) After I have tried to solve a problem with a certain course of action, I take time and compare the actual outcome to what I thought should have happened.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>7) When I have a problem, I think up as many possible ways as I can to handle it until I cannot come up with any more ideas.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>8) When confronted with a problem, I consistently examine my feelings to find out what is going on in the problem situation.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	

*Appendix III*

	<b>Strongly Agree</b>				<b>Strongly Disagree</b>		
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>9) I have the ability to solve most problems, even though initially, no solution immediately apparent.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>10) Many problems I face are too complex for me to solve.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>11) I make decisions and am happy with them later.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>12) When confronted with a problem, I tend to do the first thing that I can think of to solve it.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>13) Sometimes I do not stop and take time to deal with my problems, but just kind of muddle ahead.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>14) When deciding on an idea or possible solution to a problem, I do not take time to consider the chances of each alternative being successful.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>15) When confronted with a problem, I stop and talk about it before deciding on a next step.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	

	<b>Strongly Agree</b>				<b>Strongly Disagree</b>		
<b>16) I generally go with the first good idea that comes to my mind.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>17) When making a decision, I weigh the consequences of each alternative and compare them against each other.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>18) When I make plans to solve a problem, I am almost certain that I can make them work.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>19) I try to predict the overall result of carrying out a particular course of action.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>20) When I try to think up possible solutions to a problem, I do not come up with very many alternatives.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>21) Given enough time and effort, I believe can solve most problems that confront me.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>22) When faced with a novel situation, I have confidence that I can handle problems that may arise.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	

*Appendix III*

	<b>Strongly Agree</b>				<b>Strongly Disagree</b>		
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>23) Even though I work on a problem, sometimes I feel like I am groping or wandering, and am not getting down to the real issue.</b>							
<b>24) I make snap judgements and later regret them.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>25) I trust my ability to solve new and difficult problems.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>26) I have a systematic method for comparing alternatives and making decisions.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>27) When I am confronted with a problem, I do not usually examine what external things in my environment may be contributing to my problem.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>28) When I am confronted with a problem, one of the first things I do is survey the situation, and consider all the relative bits of information.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	

	<b>Strongly Agree</b>				<b>Strongly Disagree</b>		
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>29) Sometimes I get so charged up emotionally that I am unable to consider many ways of dealing with my problem.</b>							
<b>30) After making a decision, the outcome I expected usually matches the actual outcome.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>31) When confronted with a problem, I am unsure of whether I can handle the situation.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	
<b>32) When I become aware of a problem, one of the first things I do is to try to find out exactly what the problem is.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	

## ANTENATAL SOCIAL SUPPORT

You may recognise some of the following questions from those you completed at other times. The questions are being asked again to elaborate on your answers, and to find out if how you feel has changed. I am not trying to see if you can remember what you answered originally.

1) Does the father of your child know that he is the father?

0. No.

1. Yes.

EITHER

If NO: (A) Why have you not told him that he is the father?

(B) Do you intend to tell him?

0. No.

1. Yes.

What do you think his reaction would be?

OR

If YES to 'does the father of your child know that he is the father?':

(A) Have his feelings about the child changed since he or she was born?

0. No.

1. Yes: how have his feelings changed?

2) Are you in contact with the father of your child?

0. No.

1. Yes.

If NO: (A) Have you tried to contact the father?

0. No: do you think you will try to contact him? If 'yes', when?

1. Yes: what happened?

3) Has the relationship with the father of your child been stable or not since you got together?

1. Stable.

2. Intermittent.

3. Currently broken up.

4. Permanently broken up.

If STABLE:

(A) Why do you think it is stable?

OR

If INTERMITTENT:

(A) Would you say the relationship is more on than off, or more off than on?

1. More on than off: why is this so?

2. More off than on: why is this so?

OR

If CURRENTLY BROKEN UP:

(A) Why do you think the relationship is currently broken up?

(B) Do you think you will eventually get back together?

0. No.

1. Yes.

2. Not sure.

OR

If PERMANENTLY BROKEN UP:

(A) Why do you think the relationship is permanently broken up?

(B) Will he around in the coming months?

0. No.

1. Yes.

2. Not sure.

(C) Do you think you are likely to begin another relationship at the moment?

0. No.

1. Yes.

2. Not sure.

4) Practical support is often needed after you have had your first child. For example, help may be needed with work around the home, or with looking after your child. Such help may come from friends, family or Welfare Agencies. Which of the following set of statements best sums up your current situation with regard to practical support?

1. I have no need for practical support.

2. I have sought practical support, but have been unsuccessful in getting it.

3. I have sought practical support and have obtained it successfully.
4. I have needed practical support, but have not yet sought it.
5. I have needed practical support, but have never sought it.
6. I have obtained practical support successfully without actively seeking it from anyone.

IF YOU HAVE NO NEED FOR PRACTICAL SUPPORT:

Why do you say you have no need for practical support?

OR

IF YOU HAVE SOUGHT PRACTICAL SUPPORT, BUT HAVE BEEN UNSUCCESSFUL IN GETTING IT:

(A) Who did you seek it from?

(B) Did you ask anybody else?

0. No.

1. Yes.

(C) What kind of practical support did you ask for?

(D) Do you think you will be able to ask them again?

0. No.

1. Yes.

2. Not sure.

OR

IF YOU HAVE SOUGHT PRACTICAL SUPPORT AND HAVE OBTAINED IT SUCCESSFULLY:

(A) Who have you obtained it from successfully?

(B) Do you think you will be able to ask them again?

0. No.

1. Yes.

2. Not sure.

OR

IF YOU HAVE NEEDED PRACTICAL SUPPORT, BUT HAVE NOT YET SOUGHT IT:

(A) When do you think you will seek it?

(B) From whom do you think you will seek it?

(C) Do you think you will be able to ask them for support in the future?

0. No.

1. Yes.
2. Not sure.

OR

IF I HAVE NEEDED PRACTICAL SUPPORT, BUT HAVE NEVER SOUGHT IT:

(A) Why have you never sought it?

(B) Do you think you will try to seek it in the future?

0. No.

1. Yes: who will you seek it from? and do you think you will be able to ask them for support in the future?

2. Not sure.

OR

IF YOU HAVE OBTAINED PRACTICAL SUPPORT SUCCESSFULLY WITHOUT ACTIVELY SEEKING IT FROM ANYONE:

(A) Who have you obtained it from?

(B) Do you think you will be able to ask them for support in the future?

0. No.

1. Yes.

2. Not sure.

5) Emotional support is often needed after you have your first child. Is there anyone you can talk freely to about your feelings? This person may be someone else in the same situation as you, or someone who understands what it feels like to be a fairly new mother. Which of the following set of statements best sums up your current situation with regard to emotional support?

1. There is nobody I can talk freely to.

2. I have not sought emotional support from anyone.

3. I have sought emotional support, but have not obtained it successfully.

4. I have sought emotional support and have obtained it successfully.

IF THERE IS NOBODY YOU CAN TALK FREELY TO:

(A) Has there ever been somebody you can talk to?

0. No: do you think there ever will be?

1. Yes: who were they? and why can you not talk to them now?

OR

IF YOU HAVE NOT SOUGHT EMOTIONAL SUPPORT FROM ANYONE:

(A) Do you think you will seek it?

0. No.

1. Yes: from who? and do you think you will be able to ask them again? If  
'no' or 'not sure', why?

2. Not sure.

OR

IF YOU HAVE SOUGHT EMOTIONAL SUPPORT, BUT HAVE NOT  
OBTAINED IT SUCCESSFULLY:

(A) Who did you seek it from?

(B) Did you ask anybody else?

No: what kind of emotional support did you ask for?

Yes: please tell me about this? and what kind of support did you ask for?

(C) Do you think you will be able to ask them again?

0. No.

1. Yes.

2. Not sure.

OR

IF YOU HAVE SOUGHT EMOTIONAL SUPPORT AND OBTAINED IT  
SUCCESSFULLY:

(A) Who have you obtained it from successfully?

(B) Do you think you will be able to ask them again?

0. No.

1. Yes.

2. Not sure.

EPDS

There are 10 statements in this section, as before, each statement is accompanied with a selection of responses. I will read the statements and responses to you, and I would like you to choose the response which comes closest to how you have been feeling in the past 7 days.

- |  |                            |                             |                                 |                  |
|--|----------------------------|-----------------------------|---------------------------------|------------------|
| 1) I have been able to laugh and see the funny side of things. | As much as I always could. | Not quite as much now.      | Definitely not so much now.     | Not at all.      |
| 2) I have looked forward with enjoyment to things.             | As much as I ever did.     | Rather less than I used to. | Definitely less than I used to. | Hardly at all.   |
| 3) I have blamed myself unnecessarily when things went wrong.  | Yes, most of the time.     | Yes, some of the time.      | Not very often.                 | No, never.       |
| 4) I have been anxious or worried for no good reason.          | No, not at all.            | Hardly ever.                | Yes, sometimes.                 | Yes, very often. |
| 5) I have felt scared or panicky for no good reason.           | Yes, quite a lot.          | Yes, sometimes.             | No, not much.                   | No, not at all.  |

*Appendix III*

6) Things have been getting on top of me.	Yes, most of the time I have not been able to cope at all.	Yes, sometimes I have not been coping as well as usual.	No, most of the time I have coped quite well.	No, I have been coping as well as ever.
7) I have been so unhappy that I have had difficulty sleeping.	Yes, most of the time.	Yes, sometimes.	Not very often.	No, not at all.
8) I have felt sad or miserable.	Yes, most of the time.	Yes, quite often.	Not very often.	No, not at all.
9) I have been so unhappy that I have been crying.	Yes, most of the time.	Yes, quite often.	Only occasionally.	No, never.
10) The thought of harming myself has occurred to me.	Yes, quite often.	Sometimes.	Hardly ever.	Never.

## DENVER II SCALE

### ITEM SCORING

The following scores are used for the Denver II Scale:

1. Pass: The child successfully performs the item, or the caregiver reports (when appropriate) that the child performs the item.
2. Fail: The child does not successfully perform the item, or the caregiver reports (when appropriate) that the child does not perform the item.
3. No opportunity: The child has not had the chance to perform the item, due to restrictions from the caregiver or other reasons. This score may only be used on report items.
4. Refusal: The child refuses to attempt the item. Refusals can be minimised by telling the child what to do rather than asking. If given instruction in correct administration, the caregiver may administer the item. Report items cannot be scored as refusals.

### DENVER II SCALE TASKS AND ADMINISTRATION

#### *Preliminary questions*

- 1) What is the participant number for the mother?
- 2) How many children are there?
- 3) Do you have the mother's consent to assess the first child?
  0. No.
  1. Yes.
- 4) What is the name of the first child?
- 5) What is the child's recorded date of birth?
- 6) What is the assessment date?

*Personal-social skills*

- 1) Wash and dry hands: Ask the parent if the child can wash his or her own hands without help, except for turning on faucets that are out of reach. PASS if the parent reports that the child can do this, using soap, rinsing and drying well.
  
- 2) Name friend: Ask the child to name some of his or her friends or playmates (not living with the child). PASS if the child gives the first name of at least one friend. Names of cousins or siblings are acceptable if they do not live with the child. Names of pets are not acceptable.
  
- 3) Put on t-shirt: Ask the parent if the child can get his or her t-shirt or pullover on without help. PASS if the child can pull the shirt on over his or her head, and get his or her arms in the sleeves. The shirt may be on backwards or inside out.
  
- 4) Dress, no help: Ask the parent if the child can dress without any help. PASS if the child can dress completely and correctly without help. He or she must usually pick out his or her own clothes (at least play clothes), and may have help only for tying shoelaces, buttoning or zipping the back of a dress. A pass of 'dress, no help' also passes 'put on t-shirt'.
  
- 5) Play board or card games: Ask the parent if the child plays simple board or card games. Specify that the child must really play and understand the game. PASS if the parent reports that the child understands and plays board games with others, sitting and taking turns.
  
- 6) Brush teeth, no help: Ask the parent if the child brushes his or her teeth without help or supervision some of the time, including putting toothpaste on the brush, and brushing all teeth with back and forth strokes at the gum line. PASS if the parent reports that the child brushes his or her teeth without help or supervision at least some of the time.
  
- 7) Prepare cereal: Ask the parent if the child can prepare a bowl of cereal without help (other than being given items that are hard to reach), including getting the bowl, spoon, cereal and milk, and pouring the cereal and milk into the bowl

without spilling much. If the parent says the child cannot do this because the container of milk is too large, ask if the child can pour it from a nearly empty container, small pitcher or glass. PASS if the parent reports that the child can do this, including pouring milk from any kind of container.

*Fine motor-adaptive skills*

- 1) Tower of 6 cubes: With the child sitting high enough at the table so that elbows are level with table top and hands are on the table, place the cubes in front of the child on the table. Show the child how to build a tower with the cubes, and ask him or her to build one using the same cubes. It may be helpful to hand the cubes to the child, one at a time. Three trials may be given. PASS if a tower of 6 cubes is constructed within three trials.
  
- 2) Imitate vertical line: The child should be seated at the table at a comfortable writing level. Place a pencil and piece of plain paper in front of the child, and ask him or her to draw lines like yours. On the paper, demonstrate how to draw vertical lines, drawing toward the child. Do not guide the child's hand. Three trials may be given. PASS if the child makes one line or more on the paper, at least 2 inches long and not varying from your vertical line by more than 30 degrees. Lines do not have to be perfectly straight.
  
- 3) Tower of 8 cubes: With the child sitting high enough at the table so that elbows are level with table top and hands are on the table, place the cubes in front of the child on the table. Show the child how to build a tower with the cubes, and ask him or her to build one using the same cubes. It may be helpful to hand the cubes to the child, one at a time. Three trials may be given. PASS if a tower of 8 cubes is constructed within three trials. A pass of 'tower of 8 cubes' also passes 'tower of 6 cubes'.
  
- 4) Thumb wiggle: Demonstrate with one or both hands by making a fist with your thumb pointing upward. Wiggle only your thumb. Ask the child to wiggle his or her thumb (or thumbs) the same way. Do not help put the child's hand in position.

You may ask the child to make a 'thumbkin'. PASS if the child moves the thumb of either or both hands without moving any fingers.

- 5) Copy circle: Give the child a pencil and piece of plain paper. Show him or her the circle on the back of the test form. Without naming it, or moving your finger or pencil to show how to draw it, ask the child to draw one like the picture. Three trials may be given. PASS if any form approximating a circle that is closed or very nearly closed. FAIL if continuous spiral motions are made.
- 6) Draw person 3 parts: Give the child a pencil and piece of plain paper. Ask him or her to draw a picture of a person. Be sure the child has finished before scoring the drawing. PASS if the child has drawn 3 or more body parts. A pair (ears, eyes, arms, hands, legs, feet) is considered one part. To get credit, both parts of the pair must be drawn unless the drawing is in profile (in which case one eye, ear, etc, gets credit). Make note in your test observations of any unusual drawing, even though the child has identified the acceptable parts.
- 7) Copy +: Give the child a pencil and piece of plain paper. Show him or her the cross on the back of the test form. Without naming it, or moving your finger or pencil to show how to draw it, ask the child to draw one like the picture. Three trials may be given. PASS if the child draws two lines which intersect at least somewhat near the midpoint. The lines do not need to be exactly straight, but the intersecting lines do need to be drawn using only two strokes.
- 8) Pick longer line: Make sure that the lines are presented vertically, show the child the parallel lines on the back of the test form, and ask the child: which line is longer? (Do not say 'bigger'). After the child has pointed to a line, turn the paper upside down and ask the question again. Turn the paper the correct way round and repeat the question a third time. If the child does not answer correctly all three times, repeat the exercise. PASS if the child picks the longer line 3 out of 3 times or 5 out of 6 times.



*Language skills*

- 1) Speech half understandable: PASS if you have understood at least half of the child's speech.
  
- 2) Name 4 pictures: Show the child the pictures on the back of the form. Point to the cat, bird, horse, dog, and man, one at a time, and ask: what is this? PASS if he or she names 4 pictures correctly. Also if the child uses the name of a pet, providing it is the same animal as pictured. 'Daddy' or 'boy' are acceptable answers for the man.
  
- 3) Know 2 actions: Show the child the pictures on the back of the form. Instruct the child to point to the correct picture as the following questions are asked:  
Which one flies?  
Which one says meow?  
Which one talks?  
Which one barks?  
Which one gallops?  
PASS if 2 or 3 pictures are pointed to correctly.
  
- 4) Know 2 adjectives: Ask the child the following questions, one at a time:  
What do you do when you are cold?  
What do you do when you are tired?  
What do you do when you are hungry?  
PASS if two of the questions are answered correctly. Examples of correct answers are:  
Cold: Put on coat, go inside, cover up. (Do not pass an answer about having a cold, such as 'cough' or 'take medicine').  
Tired: Go to bed, lie down, sleep.  
Hungry: Eat, have lunch, ask for something to eat.
  
- 5) Name 1 colour: Place a red, blue, yellow and green block on the table in front of the child. Point to 1 block and ask the child: what colour is this? After the child answers, move the blocks around and ask the child to tell you the colour of

another block. Repeat for all 4 colours. PASS if the child correctly names 1, 2 or 3 colours.

- 6) Use of 2 objects: Ask the child the following questions, one at a time:

What do you do with a cup?

What is a chair used for?

What is a pencil used for?

PASS if knowledge of the use of 2 objects is evidenced. Action words, such as 'drink', 'sit' and 'write' must be included in the answers. Unconventional uses, such as 'pour' for cup or 'climb on' for a chair are acceptable. Answers such as 'milk' for cup or 'table' for chair are unacceptable.

- 7) Count 1 block: Put 8 blocks on the table in front of the child. Place a piece of paper next to the blocks. Ask the child to put one block on the paper. When the child appears to be finished, ask: how many blocks are on the paper? PASS if the child places 1 block and says that 1 block is on the paper.

- 8) Use of 3 objects: Ask the child the following questions, one at a time:

What do you do with a cup?

What is a chair used for?

What is a pencil used for?

PASS if knowledge of the use of 3 objects is evidenced. Action words, such as 'drink', 'sit' and 'write' must be included in the answers. Unconventional uses, such as 'pour' for cup or 'climb on' for a chair are acceptable. Answers such as 'milk' for cup or 'table' for chair are unacceptable. A pass of 'use of 3 objects' also passes 'use of 2 objects'.

- 9) Know 4 actions: Show the child the pictures on the back of the form. Instruct the child to point to the correct picture as the following questions are asked:

Which one flies?

Which one says meow?

Which one talks?

Which one barks?

Which one gallops?

PASS if 4 pictures are pointed to correctly. A pass of 'know 4 actions' also passes 'know 2 actions'.

10) Speech all understandable: if you have understood all, or nearly all, of what the child has said. A pass of 'speech all understandable' also passes 'speech half understandable'.

11) Understand 4 prepositions: While the child is standing, give him or her a block.

Give the following instructions to the child, one at a time:

Put the block on the table.

Put the block under the table.

Put the block in front of me.

Put the block behind me.

PASS if the child performs all 4 tasks correctly.

12) Name 4 colours: Place a red, blue, yellow and green block on the table in front of the child. Point to 1 block and ask the child: what colour is this? After the child answers, move the blocks around and ask the child to tell you the colour of another block. Repeat for all 4 colours. PASS if the child correctly names 4 colours. A pass of 'name 4 colours' also passes 'name 1 colour'.

13) Define 5 words: Make sure the child is listening to you and then say:

I am going to say a word and I want you to tell me what it is.

Ask each word, one at a time:

What is a ball?

What is a lake?

What is a desk?

What is a house?

What is a banana?

What is a curtain?

What is a fence?

What is a ceiling?

Each word may be asked 3 times if necessary. You may say: “tell me something about it”, but do not ask the child to tell you what the object is for or what to do with it. PASS if the child defines 5 or 6 words acceptably in terms of:

- (1) Use.
- (2) Shape.
- (3) What it is made of.
- (4) General category.

Examples of correct answers:

Ball: Bounces, circle, toy, play with.

Lake: Water, fish in it.

Desk: Write on it, put paper in, wood.

House: To live in, made of wood (bricks, etc)

Banana: Fruit, to eat.

Curtain: To cover the window, so people cannot see in.

Fence: To keep the dog in, to climb on, around the yard.

Ceiling: Top of the room, to keep the rain off.

14) Know 3 adjectives: Ask the child the following questions, one at a time:

What do you do when you are cold?

What do you do when you are tired?

What do you do when you are hungry?

PASS if all questions answered correctly. Examples of correct answers:

Cold: Put on coat, go inside, cover up. (Do not pass an answer about having a cold, such as ‘cough’ or ‘take medicine’).

Tired: Go to bed, lie down, sleep.

Hungry: Eat, have lunch, ask for something to eat.

A pass of ‘Know 3 adjectives’ also passes ‘know 2 adjectives’.

### *Gross motor skills*

- 1) Throw ball overhand: Give the child a ball and stand at least 3 feet in front of him or her. Ask the child to throw the ball to you using an overhand throw. You may show the child how to throw overhand. Three trials may be given. PASS if the child throws the ball within arms reach of you between your knees and head, using

an overhand throw (not sideways or underhand). The ball may bounce before it gets to you if it was between your knees and head before beginning the downward arc. Throwing the ball directly downward or away from you are failures.

- 2) Broad jump: Place a piece of paper (8-8½" by 11") on the floor, and show the child how to do a standing broad jump across the width of the paper (8-8½"). Then ask the child to do it. You may give three trials, if necessary. PASS if the child jumps, with both feet together, over the paper without touching it.
- 3) Balance each foot 1 second: Have the child stand away from all support. Show the child how to balance on 1 foot. Ask him or her to do this, giving three trials (unless he or she balances for 6 seconds or more on the first trial). Record the longest time of these three trials. Then ask the child to balance on the other foot, giving three trials if necessary. Record the longest time of these three trials. PASS if the child balances on each foot for 1 second or more within three trials.
- 4) Balance each foot 2 seconds: Have the child stand away from all support. Show the child how to balance on 1 foot. Ask him or her to do this, giving three trials (unless he or she balances for 6 seconds or more on the first trial). Record the longest time of these three trials. Then ask the child to balance on the other foot, giving three trials if necessary. Record the longest time of these three trials. PASS if the child balances on each foot for 2 seconds or more within three trials. A pass of 'balance each foot 2 seconds' also passes 'balance each foot 1 second'.
- 5) Hops: With the child away from all support, ask him or her to hop on 1 foot. You may show the child how to do this. PASS if the child hops of 1 foot 2 or more times in a row, either in place or over a distance, without holding on to anything.
- 6) Balance each foot 3 seconds: Have the child stand away from all support. Show the child how to balance on 1 foot. Ask him or her to do this, giving three trials (unless he or she balances for 6 seconds or more on the first trial). Record the longest time of these three trials. Then ask the child to balance on the other foot, giving three trials if necessary. Record the longest time of these three trials. PASS if the child balances on each foot for 3 seconds or more within three trials. A pass

of 'balance each foot 3 seconds' also passes 'balance each foot 1 second' and 'balance each foot 2 seconds'.

- 7) Balance each foot 4 seconds: Have the child stand away from all support. Show the child how to balance on 1 foot. Ask him or her to do this, giving three trials (unless he or she balances for 6 seconds or more on the first trial). Record the longest time of these three trials. Then ask the child to balance on the other foot, giving three trials if necessary. Record the longest time of these three trials. PASS if the child balances on each foot for 4 seconds or more within three trials. A pass of 'balance each foot 4 seconds' also passes 'balance each foot 1 second', 'balance each foot 2 seconds' and 'balance each foot 3 seconds'.

#### ASSESSMENT BEHAVIOUR RATINGS

The assessment behaviour ratings are scored after completion of the assessment. Using the rating scale provided, the assessor can compare the behaviour of the child during the assessment with the child's usual behaviour. Always ask the caregiver if the child's performance was typical of his or her ability and behaviour at other times. Sometimes a child may be too ill, tired, hungry or upset when assessed to display actual capabilities. In such cases, the assessment may be rescheduled on a different day at a time when the child is likely to be more cooperative.

#### *Questions on assessment behaviour*

- 1) Typical behaviour: Was the behaviour of the child typical in general, that is, not specific to the assessment? Focus on temperament rather than ability.
0. No.  
1 Yes.
- 2) Compliance: Is the child usually as cooperative with others as he or she has been today?
- Always.  
Usually.

Rarely compliant.

3) Interest in surroundings: How alert was the child in general?

Alert.

Somewhat disinterested.

Seriously disinterested.

4) Fearfulness: Did the child appear comfortable in the presence of someone he or she has not seen before?

No fearfulness.

Mild fearfulness.

Extreme fearfulness.

5) Attention span: What was the child's attention span like during assessment?

Appropriate.

Somewhat distractible.

Very distractible.

*Closing questions*

1) Are you working at the moment?

0. No.

1. Yes.

EITHER

If NO:

(A) Are you planning to return to work in the next 12 months?

0. No.

1. Yes.

Don't know.

(B) Is that because of personal preference, financial reasons or perhaps a bit of both?

Personal preference.

Financial reasons.

Both.

(C) When do you intend to return to work?

(D) Are you going to work full-time or part-time?

Full time.

Part time.

Don't know.

(E) Did you consider alternative times to return to work?

0. No.

1. Yes: earlier or later?

(F) How did you decide when to return? (e.g. finances, boredom.)

(G) How satisfied are you with your decision? (e.g. very, fairly, not at all.)

OR:

If YES to Are you working at the moment?:

(A) Are you working full-time or part-time?

1. Full-time.

2. Part-time.

3. Don't know.

2) Have you made any child care arrangements?

0. No.

1. Yes.

If YES:

(A) What child care arrangements have you made?

(B) Who looks after your child? (e.g. registered child minder, child minder, nanny, au pair, nursery, friend, relative.)

(C) Where do they look after your child? (e.g. at home, elsewhere.)

(D) Did you consider any alternatives?

0. No.

1. Yes: what were they?

(E) Did you visit any nurseries?

0. No.

1. Yes.

(F) Please rank the following factors (from 1-6) in order of importance to you when deciding on care for your child:

Cost.

Vicinity.

Number of carers.

Age range of nursery attendees.

Quality of environment.

Facilities.

3) Are you planning to have any more children?

0. No.
1. Yes.
2. Not sure.

If NO:

- (A) What possibilities did you consider?
- (B) How did you decide not to have any more children?
- (C) How satisfied are you with your decision?

OR

If YES or NOT SURE to 'are you planning to have any more children?':

- (A) When do you hope to have another child?
- (B) Has the number of children you were planning to have prior to becoming pregnant with your first child changed since you have had your first child?
  0. No.
  1. Yes: is it more or less?
  2. No sure.
- (C) What factors did you take into consideration when deciding how many children you would like to have? (e.g. finances, your age, not wanting your child to be an only child.)
- (D) Did you discuss the size of the family you hope to have with anyone?
  0. No.
  1. Yes: with who? and what aspects did you discuss?
  2. Not sure.
- (E) Did you and your partner discuss how many children you would like to have?
  1. No.
  2. Yes.
- (F) Do you and your partner agree on how many children you would like to have?
  1. No: do you want more or less than him? and how will you resolve this?
  2. Yes.

(G) How satisfied are you with your decision?

1. Very.
2. Fairly.
3. Not at all.

## AUDIT

The following questions are all about alcohol. As always, your answers will be completely confidential, so please give honest answers to the questions. An envelope is provided, which I would like you to seal your answers in as soon as you have finished the questions. You will not be asked to give your name, instead, I will give you a participant number, which I will ask you to write on the sealed envelope. So all in all, you will be able to answer the questions as anonymously as possible.

Please write today's date in the spaces given: ...../...../.....

Please circle ONE answer for EACH question that applies to you.

1) How often do you have a drink containing alcohol?

- 0. Never.
- 1. Monthly or less often.
- 2. 2-4 times a month.
- 3. 2-3 times a week.
- 4. 4 or more times a week.

2) How many standard drinks containing alcohol do you have on a typical day when you are drinking?

A standard drink is half a pint of beer, a single measure of spirits or a glass of wine.

- 0. 1 or 2.
- 1. 3 or 4.
- 2. 5 or 6.
- 3. 7, 8 or 9.
- 4. 10 or more.

- 3) How often do you have 6 or more drinks on one occasion?
- A. Never.
  - B. Less than monthly.
  - C. Monthly .
  - D. Weekly.
  - E Daily or almost daily.
- 4) How often during the last year have you found that you were not able to stop drinking once you had started?
- 0. Never.
  - 1. Less than monthly.
  - 2. Monthly.
  - 3. Weekly.
  - 4. Daily or almost daily.
- 5) How often during the last year have you failed to do what was normally expected from you because of drinking?
- 0. Never.
  - 1. Less than monthly.
  - 2. Monthly.
  - 3. Weekly.
  - 4. Daily or almost daily.

- 6) How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?
0. Never.
  1. Less than monthly.
  2. Monthly.
  3. Weekly.
  4. Daily or almost daily.
- 7) How often during the last year have you had a feeling of guilt or remorse after drinking?
0. Never.
  1. Less than monthly.
  2. Monthly.
  3. Weekly.
  4. Daily or almost daily.
- 8) How often during the last year have you been unable to remember what happened the night before because you had been drinking?
0. Never.
  1. Less than monthly.
  2. Monthly.
  3. Weekly.
  4. Daily or almost daily

9) Have you or someone else been injured as a result of your drinking?

- 0. No.
- 2. Yes, but not in the last year.
- 4. Yes, during the last year.

10) Has a relative, friend, doctor or other health worker been concerned about your drinking or suggested you cut down?

- 0. No.
- 2. Yes, but not in the last year.
- 4. Yes, during the last year.

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