



**A University of Sussex PhD thesis**

Available online via Sussex Research Online:

<http://sro.sussex.ac.uk/>

This thesis is protected by copyright which belongs to the author.

This thesis cannot be reproduced or quoted extensively from without first obtaining permission in writing from the Author

The content must not be changed in any way or sold commercially in any format or medium without the formal permission of the Author

When referring to this work, full bibliographic details including the author, title, awarding institution and date of the thesis must be given

Please visit Sussex Research Online for more information and further details

# **Assessment of perinatal mental health problems**

**Rose Coates**

Submitted in fulfilment of the requirements for the degree of Doctor of  
Philosophy in Psychology

School of Psychology

University of Sussex

February 2017

## DECLARATION

The thesis conforms to an ‘article format’ in which the middle chapters consist of discrete articles written in a style that is appropriate for publication in peer-reviewed journals in the field. The first, second and final chapters present synthetic overviews and discussions of the field and the research undertaken. References to these chapters are at the end of the thesis.

-----

All of the papers in this thesis have been accepted or submitted for publication in peer-reviewed journals and the versions presented here are the final published or submitted manuscripts. The papers reflect my own work with supervisory input from the second and third authors. I wrote the first draft and took the lead on all subsequent revisions including those suggested as part of the peer-review process. Full references are detailed below:

Chapter 3 is published in BMC Pregnancy and Childbirth as:

Coates, R., Ayers, S., de Visser, R. (2014). Women’s experiences of postnatal distress: a qualitative study. *BMC Pregnancy and Childbirth*, 14, 359. DOI: 10.1186/1471-2393-14-359

The author contributions are as follows: Rose Coates contributed to the design, coordinated and carried out the interviews and data analysis and drafted the manuscript. Susan Ayers participated in the design, data analysis and drafting of the manuscript. Richard de Visser participated in data analysis and drafting of the manuscript.

Chapter 4 is published in the Journal of Psychosomatic Obstetrics and Gynecology as:

Coates, R., de Visser, R., Ayers, S. (2015). Not identifying with postnatal depression: a qualitative study of women’s postnatal symptoms of distress and need for support. *Journal of Psychosomatic Obstetrics and Gynecology*, 36(3):114-21. doi: 10.3109/0167482X.2015.1059418

The author contributions are as follows: Rose Coates contributed to the design, coordinated and carried out the interviews and data analysis and drafted the manuscript. Susan Ayers participated in the design, data analysis and drafting of the manuscript. Richard de Visser participated in data analysis and drafting of the manuscript.

Chapter 5 is published in the Journal of Affective Disorders as:

Meades, R., Ayers, S. (2011). Anxiety measures validated in perinatal populations: a systematic review. *Journal of Affective Disorders*, 133, 1-15. doi: 10.1016/j.jad.2010.10.009

The author contributions are as follows: Rose Coates (nee Meades) designed the study, wrote the protocol, undertook the literature searches, analysed the data and wrote the first draft. Susan Ayers contributed to the subsequent drafts and the design of the study.

Chapter 6 is accepted for publication subject to minor revisions in Psychological Assessment as:

Coates, R., Ayers, S., de Visser, R. (2016). *Factor structure of the Edinburgh Postnatal Depression Scale in a population-based sample*. Manuscript submitted for publication.

The author contributions are as follows: Rose Coates contributed to the conception, design, analysis and interpretation of data and drafted the manuscript. Susan Ayers participated in the design, data analysis and drafting of the manuscript. Richard de Visser participated in analysis and interpretation of data and drafting of the manuscript.

Chapter 7 is submitted to the Journal of Affective Disorders as:

Coates, R., Ayers, S., de Visser, R., Thornton, A. (2016). *Psychological distress in pregnancy: Pilot evaluation of the CORE-10 as an assessment tool*. Manuscript submitted for publication.

The author contributions are as follows: Rose Coates designed the study, analysed the data, and drafted the manuscript. Susan Ayers and Richard de Visser contributed to subsequent drafts and the design of the study. Alexandra Thornton collected the data and contributed to analysis.

-----

I hereby declare that this thesis has not been and will not be, submitted in whole or in part to another University for the award of any other degree.

Signature:

## Acknowledgements

Many people have supported me in completing this thesis. I am indebted to Professor Sam Cartwright-Hatton for enabling me to access data from the Avon Longitudinal Study of Parents and Children (chapter six), and to the Wellbeing in Pregnancy Study team at City University, London for allowing me access to the CORE-10 data (chapter seven). Thanks also to Rod Bond for impromptu statistical support, Andy Field for feedback on progress of the thesis, and Jenny Rusted for inspiring me to do a PhD.

Thanks to Alex Sawyer for all-round PhD wisdom and for assessing a sample of articles for quality in chapter five, and to Donna Moore for productive comments on the interview schedule for chapter three.

I would also like to thank all of the pregnant women and new mothers who have taken part; you are incredibly kind to have given up your time when life is so busy.

I am so grateful and fortunate to have had such brilliant supervisors - Susan Ayers and Richard de Visser. Susan, you are an inspiration and have always been supportive, kind and encouraging, and have an amazing way of making everything seem possible. It is down to you that I want to work in perinatal research. Richard, thanks so much for your easy-going approach, the great chats about this thesis and about research in general. Thanks also for the coffee, and the maddeningly pedantic grammatical correction.

Thank you to Barbara and Brian Coates and Sally and Jim Bugden, the amazing grandparents who enabled me to work whilst you looked after the little ones.

Tom, I can't thank you enough for all of your support and for never doubting me. You always manage to calmly put life in perspective.

Finally, I would like to dedicate this thesis to my little boys, Robin and Laurie. I couldn't ask for more than being your mummy.

UNIVERSITY OF SUSSEX

Rose Coates

Thesis submitted for the degree of Doctor of Philosophy

**ASSESSMENT OF PERINATAL MENTAL HEALTH PROBLEMS**

**Summary**

Mental health problems in pregnancy and the postnatal period can have long-term negative effects on women and their children. A key barrier to helping women in this period is the low level of identification of mental health problems. Depression has commonly been screened for using the Whooley Questions or Edinburgh Postnatal Depression Scale (EPDS) but women may experience a broad range of symptoms of distress not captured by these measures.

The research reported in this dissertation was designed to address several aims. The first strand aimed to explore women's experiences of postnatal mental health problems and how they conceptualise their symptoms. The focus of the first qualitative study was the lived experience of 17 women who had experienced psychological distress in the first postnatal year, and used interpretative phenomenological analysis. The second qualitative study used thematic analysis with the same sample to explore different symptoms of distress and women's experiences of being assessed for these.

The second strand reviewed and evaluated currently existing measures of commonly reported affective symptoms with a view to informing future assessment. A systematic review found a lack of measures of anxiety designed for or validated sufficiently with perinatal women. Factor analyses of the EPDS then explored the structure of depression and anxiety symptoms in the perinatal period in the Avon Longitudinal Study of Parents and Children (N = 11,195 – 12,166). Results suggested symptom clusters of anhedonia, depression and anxiety. Finally, validity of the CORE-10, a short measure of psychological distress was evaluated in a sample of 366 pregnant women. The CORE-10 showed promising psychometric properties. Anxiety was the most reported symptom. Overall findings suggest that perinatal women need to be assessed for a variety of mental health problems and that further work is needed to identify the most effective assessment tool and process.

## TABLE OF CONTENTS

Declaration.....	ii
Acknowledgements.....	iv
Summary.....	v
TABLE OF CONTENTS.....	vi
List of abbreviations.....	xi
1. Introduction.....	1
1.1 The importance of identifying perinatal mental health problems.....	1
1.1.1 Prevalence of psychological problems.....	2
1.1.2 Consequences of psychological problems.....	4
1.2 Concepts in perinatal mental health.....	5
1.2.1 Problems with definitions: the example of postnatal depression....	6
1.2.2 Symptoms versus disorders.....	7
1.2.3 Comorbidity of symptoms and disorders.....	9
1.3 Theories of distress.....	11
1.3.1 Tripartite model of anxiety and depression.....	12
1.3.2 Transdiagnostic approach to cognitive behavioural processes across disorders.....	13
1.3.3 Biosocial model of common mental disorders.....	14
1.4 Perinatal mental health screening and assessment.....	15
1.4.1 Screening for perinatal mental health problems.....	15
1.4.2 Assessment of perinatal mental health problems.....	17
1.5 Current issues in perinatal mental health assessment.....	20
1.5.1 Assessment is too narrow.....	20
1.5.2 Barriers to assessment.....	20

1.6 Summary and rationale.....	22
1.7 Outline of studies.....	23
2. Methodological overview.....	26
2.1 Methodological issues.....	26
2.1.1 Definition of mixed methods.....	26
2.1.2 Appropriateness of mixing methods.....	27
2.1.3 Paradigm considerations.....	28
2.2 Choice of qualitative methods.....	31
2.2.1 Grounded theory.....	32
2.2.2 Discourse analysis.....	32
2.2.3 Interpretative phenomenological analysis.....	33
2.2.4 Thematic analysis.....	34
2.3 Adopting a mixed methods approach to answer the research questions.....	35
<b>MANUSCRIPTS (Chapters 3 – 7)</b>	
3. Women’s experiences of postnatal distress: a qualitative study.....	36
3.1 Abstract.....	36
3.2 Background.....	38
3.3 Methods.....	41
3.3.1 Analysis.....	44
3.4 Results.....	46
3.5 Discussion.....	62
3.6 References.....	68
4. Not identifying with postnatal depression: A qualitative study of women’s postnatal symptoms of distress and need for support.....	76
4.1 Abstract.....	76



4.2 Introduction.....	78
4.3 Methods.....	79
4.3.1 Design and procedure.....	79
4.3.2 Data analysis.....	80
4.4 Results.....	81
4.5 Discussion.....	92
4.6 References.....	97
4.7 Appendix One: Interview schedule.....	101
5. Anxiety measures validated in perinatal populations: A systematic review.....	102
5.1 Abstract.....	102
5.2 Introduction.....	104
5.3 Methods.....	108
5.3.1 Data search.....	108
5.3.2 Inclusion / exclusion criteria.....	108
5.3.3 Data quality.....	109
5.3.4 Validity.....	109
5.3.5 Reliability.....	110
5.4 Results.....	110
5.4.1 Methods of validation and assessment of reliability.....	110
5.4.2 Self-report measures.....	123
5.4.3 Hospital Anxiety and Depression Scales – Anxiety (HADS-A).....	123
5.4.4 State Trait Anxiety Inventory (STAI).....	124
5.4.5 General Health Questionnaire (GHQ).....	128
5.4.6 Other measures.....	134
5.5 Discussion.....	138

5.6 References.....	143
6. Factor structure of the Edinburgh Postnatal Depression Scale in a population-based sample.....	157
6.1 Abstract.....	157
6.2 Introduction.....	158
6.3 Method.....	171
6.3.1 Sample.....	171
6.3.2 Measures.....	172
6.3.3 Statistical analysis.....	172
6.4 Results.....	174
6.4.1 EPDS scores.....	174
6.4.2 Exploratory factor analysis.....	175
6.4.3 Confirmatory factor analysis.....	180
6.5 Discussion.....	185
6.6 References.....	189
7. Psychological distress in pregnancy: Pilot evaluation of the CORE-10 as an assessment tool.....	200
7.1 Abstract.....	200
7.2 Introduction.....	201
7.3 Methods.....	203
7.3.1 Design.....	203
7.3.2 Participants.....	203
7.3.3 Measures.....	204
7.3.4 Statistical analysis.....	205
7.4 Results.....	207

7.4.1 Participant characteristics.....	207
7.4.2 Prevalence and distribution of the CORE-10.....	209
7.4.3 Correlations and concordance with other measures.....	210
7.4.4 Factor analysis.....	215
7.4.5 Reliability analysis.....	218
7.5 Discussion.....	219
7.6 References.....	224
8. Discussion.....	231
8.1 Summary of findings.....	231
8.1.1 Qualitative exploration of women’s conceptualisations of postnatal mental health and need for support .....	231
8.1.2 Review findings on validated self-report measures of anxiety for perinatal women .....	232
8.1.3 Validation of existing self-report measures of affective symptoms in ante- and postnatal women.....	233
8.2 Implications of findings for thesis aims and for future research.....	233
8.2.1 Implications for target areas for assessment of distress.....	234
8.2.2 Implications for the assessment environment.....	241
8.2.3 Implications for use of existing measures of perinatal distress....	243
8.3 Limitations of the research programme.....	246
8.4 Reflexive account.....	252
8.5 Conclusion.....	254
9. References.....	256

### List of Abbreviations

AIC	Akaike Information Criterion
ADNOS	Anxiety disorder not otherwise specified
ALSPAC	Avon Longitudinal Study of Parents and Children
BDI	Beck Depression Inventory
CBT	Cognitive Behaviour Therapy
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CORE-10	Clinical Outcomes in Routine Evaluation -10
DASS	Depression Anxiety Stress Scales
DSM	Diagnostic and Statistical Manual of Mental Disorders (fifth edition)
EFA	Exploratory Factor Analysis
EPDS	Edinburgh Postnatal Depression Scale
GAD	Generalised anxiety disorder
GAD-2	Generalised Anxiety Disorder Scale -2
GHQ	General Health Questionnaire
HADS	Hospital Anxiety and Depression Scales
HCP	Healthcare professional
ICD	International Classification of Diseases
IDAS	Inventory of Depression and Anxiety Symptoms
IPA	Interpretative phenomenological analysis
K-10	Kessler-10 scale
NC	Normed Chi square
NICE	National Institute for Health and Care Excellence
OCD	Obsessive compulsive disorder
PCA	Principal Components Analysis
PHQ	Patient Health Questionnaire
PND	Postnatal Depression

PTSD	Posttraumatic Stress Disorder
RCT	Randomised Controlled Trial
RMSEA	Route Mean Squared Error of Approximation
ROC	Receiver Operating Characteristic
PCFI	Parsimony Normed Comparative Fit Index
SCL-90	Symptom Checklist -90
STAI	State Trait Anxiety Inventory
TLI	Tucker-Lewis Index
UK NSC	United Kingdom National Screening Committee
UMACL Checklist	University of Wales Institute of Science and Technology Mood Adjective
WiP	Wellbeing in Pregnancy Study

# 1 Introduction

Perinatal mental health has recently become a national priority in the UK. It is estimated that in the long-term, perinatal depression, anxiety and psychosis cost £8.1 billion for each year of births in the UK and 72% of this cost relates to adverse effects on the child (Bauer, Parsonage, Knapp, Iemmi, & Adelaja, 2014). For the period between 2016 and 2021 parliament has dedicated £350 million to perinatal mental health and the National Institute for Health and Care Excellence (NICE) recently published a quality standard related to antenatal and postnatal mental health pathways (Hansard, 2016; NICE, 2016). This identifies perinatal mental health as an area of high priority for quality improvement. Identifying mental health problems is one area that is targeted for quality improvement (NICE, 2016). Clinical guidelines now exist to identify depression and anxiety in the perinatal period but a number of debates continue in the literature concerning screening and assessment of mental health at this time. This chapter provides an overview of research on perinatal mental health screening and assessment. The chapter begins with a consideration of the breadth of perinatal mental health problems experienced, their prevalence and associated consequences. The chapter then discusses key relevant conceptual issues to identifying perinatal mental health: how they are defined and classified and the high rates of comorbidity of different symptoms and disorders. Relevant theories and current and past assessment practices are then discussed. The chapter finishes with a consideration of barriers to successful identification of problematic perinatal mental health.

## 1.1 The importance of identifying perinatal mental health problems

Mental illness during pregnancy and in the first postnatal year (the perinatal period) affects 10-20% of women and has well established negative effects on the mother, her partner (if present) and their child (Bauer et al., 2014; Gavin et al., 2005). Antenatal and postnatal depression and/or anxiety, postpartum psychosis and posttraumatic stress disorder can all be experienced by women during the perinatal period (Brockington, 2004). Additionally women may experience problems specific to childbearing such as extreme fear of childbirth

(tokophobia; Hofberg & Brockington, 2000), disorders of the mother-infant relationship (Brockington, 2004; Klier, 2006), or maternally focussed worry disorder (Phillips et al., 2009) which do not have a psychiatric classification.

#### 1.1.1 Prevalence of psychological problems

It is difficult to specify the overall prevalence of perinatal mental health problems because research uses different time points and measures of perinatal mental health. Large-scale population-representative epidemiological studies, smaller studies using self-report instruments, and those employing clinical interviews give differing rates. The largest evidence base exists for depression. The most recent meta-analysis of studies using clinical diagnostic interviews gave estimates of 6.5 – 12.9% of women experiencing major or minor depression at different trimesters of pregnancy and months of the first postnatal year (Gavin et al., 2005). Studies using self-report measures tend to show higher estimates (e.g. 16.6% antenatal depression using the PHQ-9 in a population based study in the USA; Ashley et al., 2016) but this is dependent on the interview and self-report measure used (Bennett et al., 2004). In England and Wales it is estimated that between 64,000 and 94,000 women per year, or 2 to 3 women on the average General Practitioner (GP) list, will be identified as experiencing postnatal depression (between ten and fifteen per hundred live births) (NICE, 2007).

Prevalence rates and patterns also vary concerning anxiety in pregnancy and postnatally. In the Avon Longitudinal Study of Parents and Children (ALSPAC), a large epidemiological study of over 8,000 women in the Bath area of England, anxiety symptoms were stable at around 14% during pregnancy and then dropped to 8% after birth, and were slightly higher at 9% eight months into the first postnatal year (Heron et al., 2004). In Australia, the pattern was different with a large cohort longitudinal study finding higher anxiety after birth whereby 7.3% of pregnant women experienced intense anxiety or panic attacks occasionally or often, rising to 15.7% in the first three postnatal months (Woolhouse et al., 2009). Whatever the pattern, it is important not to consider pregnancy and the postnatal period as a homogenous

phase, because each has its own stressors and physiological characteristics. Furthermore, within each period there may be fluctuations in mood and symptoms, for example, in pregnancy there may be more anxiety in the first trimester due to nausea and risk of miscarriage, and again in the third trimester with potential anxiety about childbirth and the nearing transition to parenthood (Newham & Martin, 2013).

When clinical interviews are used, generalised anxiety disorder (GAD) is the most commonly diagnosed anxiety disorder in perinatal women with between 2% and 8% of women at six to eight postnatal weeks experiencing GAD (Ballard, Davis, Handy, & Mohan, 1993; Matthey, Barnett, Howie, & Kavanagh, 2003; Wenzel, Haugen, Jackson, & Brendle, 2005). GAD and obsessive compulsive disorder<sup>1</sup> show higher prevalence rates in perinatal women than in the general population (Ross & McLean, 2006), whilst prevalence of panic disorder (1.4%, Wenzel et al., 2005) and posttraumatic stress disorder<sup>1</sup> (1.7-9%, Beck, Gable, Sakala, & Declercq, 2011) are similar in perinatal women and the general population (Ross & McLean, 2006). NICE considers that a similar amount of women to those experiencing depression will experience an anxiety disorder (NICE, 2015).

National linkage studies which combine data from a number of registers (e.g. civil service and health service) have shown higher rates of hospitalisation for mental health disorders for mothers in the early postpartum period as compared with pregnant and non-postpartum women in Scotland and in Denmark (Martin, McLean, Cantwell, & Smith, 2016; Munk-Olsen, Munk Laursen, Pedersen, Mors, & Mortensen, 2006). Risk of admission was highest for psychosis, unipolar depression, bipolar depression and schizophrenia-type disorders (Martin et al., 2016; Munk-Olsen et al., 2006). The increased risk of psychiatric hospital admission was highest in the first three months postpartum, and increased risk for psychiatric outpatient contacts was also highest in this period (Munk-Olsen et al., 2006). These national

---

<sup>1</sup> In the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V; APA, 2013) the former single category of Anxiety Disorders has been reclassified into three groups: Anxiety Disorders, Obsessive- Compulsive Disorders (including Obsessive Compulsive Disorder) and Trauma- and Stressor-Related Disorders (including Posttraumatic Stress Disorder).



studies highlight the importance of identifying women with emerging mental health problems in the perinatal period.

#### 1.1.2 Consequences of psychological problems

**Depression:** The effects of depression, which has the most comprehensive evidence base, include harmful effects on development of the foetus through to adolescence. Immediate consequences of antenatal depression include increased fetal activity and delayed fetal growth, and increased risk of prematurity and low birthweight (Field, Diego, & Hernandez-Reif, 2006). Mothers with postnatal depression show reduced face-to-face interaction with their infant, reduced frequency of positive facial expressions and poor quality interactions during feeding and playing which can contribute to the development of insecure attachment styles (Field et al., 2006, Madigan, Moran, Schuengel, Pederson, & Otten, 2007). In children there is a relationship between postnatal depression and language development, IQ and behavioural difficulties (Brand & Brennan, 2009; Grace, Evindar, & Stewart, 2003). Later, in adolescence, postnatal depression is associated with poor cognitive outcomes, mood disorders, impaired social competence and increased emotional sensitivity (Sanger, Iles, Andrew, & Ramchandani, 2015). It may be that ante- and/or post-natal depression as individual episodes, in combination, or added to subsequent episodes of depression have cumulative negative consequences for the mother and child (Grace et al., 2003; Hay, Pawlby, Waters, & Sharp, 2008).

**Anxiety:** As well as being detrimental to the development of the foetus, anxiety symptoms and disorders in the antenatal period predict not only further anxiety, but also depression after the birth of the baby (Mauri et al., 2010; Milgrom et al., 2008). A range of adverse birth, infant and childhood consequences include low birthweight and poor apgar scores (Field et al., 2010), attention, conduct and emotional problems at age 4-6 (O'Connor, Heron, Golding, Beveridge, & Glover, 2002; O'Connor, Heron, Golding, Glover, & the ALSPAC Study Team, 2003), high impulsivity and low scores on cognitive tests aged 14-15 (Van den Bergh et al. 2005). There is much less research on anxiety experienced postnatally but similar consequences have been found (Glasheen, Richardson & Fabio, 2010).

**Other disorders:** There is little research on the consequences for children of other postpartum disorders. In one study, mothers admitted to mother and baby units with severe mental health problems had children who were at higher risk of insecure attachment at 12 months compared to infants whose mothers were well (Hipwell, Goossens, Melhuish, & Kumar, 2000). Babies of mothers admitted to these units were more likely to develop a psychiatric disorder as an adult compared to siblings who had not experienced an episode (Abbott, Dunn, Robling, & Paykel, 2004).

The consequences of postnatal mental illness are severe, but interventions can improve outcomes. For pregnant and postnatal women with anxiety and depression, psychosocial and psychological interventions can reduce symptoms and improve wellbeing (Dennis & Hodnett, 2007; Green, Haber, Frey, & McCabe, 2015; Thomas, Komiti, & Judd, 2014). However, reducing symptoms alone does not necessarily improve mother-child interactions (Poobalan et al., 2007). This indicates that interventions need to target the family as a whole, particularly given the association between paternal perinatal depression and poor outcomes for children (Kvalevaag et al., 2013). For example, parenting interventions have shown favourable results in improving mother-child relationships in mothers with depression (Stein et al., 2014). For intervention to be possible, mental health problems first need to be identified, which in turn requires definition and classification of what is meant by a mental health problem.

## **1.2 Concepts in perinatal mental health**

Classification of mental health problems in the perinatal period can be problematic, partly due to the use of postnatal depression as a label for any mental health problem in the postnatal period (NICE, 2014). The problems associated with the classification of mental disorders in general are relevant to and exacerbated in perinatal women, for example high rates of subclinical symptoms, comorbidity, use of the ‘not elsewhere classified’ category and the complexity of subsequent editions of the Diagnostic and Statistical Manual of Mental Disorders (DSM; American Psychiatric Association) (Goldberg, 2010). Furthermore, it is questionable whether DSM criteria for some diagnostic disorders are valid for pregnant and postnatal women

who may experience normative changes to appetite and sleep for example (Matthey & Ross-Hamid, 2011). A fundamental issue concerns how we define postnatal mental health problems.

### 1.2.1 Problems with definitions: the example of postnatal depression

It is likely that the concept of postnatal (postpartum in the USA) depression has different meanings dependent on context. Firstly, it could mean a diagnosis of major or minor depression according to the DSM criteria, whereby a woman is experiencing the specified number of symptoms within the specified time frame as ascertained by a structured clinical interview carried out by a trained professional. There is debate about whether postnatal depression is a distinct nosological entity, or is similar to other types of depression but experienced in the postnatal period (diFlorio & Meltzer-Brody, 2015; Hoertel, Lopez, Peyre, & Blanco, 2015). The DSM-V considers that the balance of evidence does not support postnatal depression as a unique disorder and instead includes an ‘onset specifier’. The onset specifier was changed from the first four postnatal weeks in the previous edition (DSM-IV), to also include pregnancy in DMS-V. Only including the first four postnatal weeks is problematic as there is evidence that postnatal depression can start later on in the postnatal period (e.g. Gale & Harlow, 2003). Other diagnostic systems have similar specifiers (diFlorio & Meltzer-Brody, 2015). The onset specifier allows for prognostic information for future pregnancies, treatment approaches suitable for perinatal women, and development of guidelines for clinicians working with perinatal women.

A second way in which the term postnatal depression is used is when a mother visits her GP and is diagnosed with ‘postnatal depression’. The process takes place by way of the GP’s clinical skills and experience rather than by a structured clinical interview. Prescriptions of selective serotonin reuptake inhibitors (SSRIs) or other ‘antidepressants’ may be used as a proxy for prevalence of depression and or anxiety, but these may be may be prescribed for these disorders alone, in combination, or for a different problem, and are sometimes prescribed unnecessarily (Oates, 2003). Furthermore, not all people diagnosed with depression use medication.

Third, despite its lack of diagnostic category, the term ‘postnatal depression’ remains in widespread use in society, by mothers, researchers and by health professionals. This may have been useful historically to reduce stigma and encourage women to seek help for what may have been a hidden problem (Brockington, 2004). However, one concern with this is that the term is misleading as it used to refer to a wide range of psychological problems, from the ‘baby blues’, a brief transient period of disrupted mood in the early postnatal days, to diagnosed, severe and sometimes fatal cases of puerperal psychosis (Jones & Cantwell, 2010). Thus it has been recommended that the use of postnatal depression as a medical concept should only be that of a rubric (Jones & Venis, 2001; Brockington, 2004), or not be employed at all as it is too wide to have any useful meaning (Jones & Cantwell, 2010; Lewis, 2007).

The five research papers in this dissertation each specify how terms such as postnatal depression and postnatal anxiety are used. For example, in the review (Chapter 5) and quantitative papers (Chapters 6 and 7), diagnosed disorder or reaching a threshold on self-report measure are used to refer to perinatal depression or anxiety. In the qualitative papers (Chapters 3 and 4) the terms are used more flexibly in response to how women conceptualised and spoke about their experiences of distress.

### 1.2.2 Symptoms versus disorders

The diagnostic disorder approach to mental health aspires to categorise disorders as mutually exclusive and jointly exhaustive (Goldberg, 2010). The strategy for reaching this goal is to continuously revise diagnostic classification systems in light of new research on each disorder, their temperamental antecedents, symptoms, course, and response to treatment and is seen in the process of continually updating the criteria in diagnostic manuals to identify people who meet them. The disorder approach is widespread and allows for identification of those who may need treatment as well as comparison of prevalence, incidence and prognosis with other populations.

The diagnostic approach taken in the DSM was originally based on expert consensus relating to the clustering of symptoms, in the absence of knowledge about the structure and functioning of the brain (Cuthbert & Insel, 2010). One problem with the disorder approach is that it dichotomises symptoms into being present or absent, whilst in practice symptoms may occur on a continuum. This has led to development of the Research Domain Criteria (RDoC) in the USA, a neuroscience-based framework which supports the continuum rather than categorical approach to psychiatric research (diFlorio & Meltzer-Brody, 2015). This approach will encompass dimensions of observable behaviour and neurobiological measures, but will not address the social aspect of mental health which is fully present in perinatal mental health (Cuthbert & Insel, 2010, National Institute of Mental Health, 2008). Therefore whilst this approach will address shortcomings with the current diagnostic approach, it will not address the key social dimension.

Another problem with using the disorder approach is that DSM-V only specifies major depressive disorder, bipolar I/II disorder and brief psychotic disorder as having a specific postpartum onset modifier (Sharma & Mazmanian, 2015). Other perinatal specific problems, such as parent-infant attachment disorders and childbirth-related posttraumatic stress disorder do not feature (Condon, 2010). Furthermore, Phillips et al. (2009) showed in a sample of mothers taking part in an intensive early parenting intervention that equal numbers of mothers (10.8%) were diagnosed with generalised anxiety disorder (GAD) as were diagnosed with an anxiety disorder not otherwise specified (ADNOS), defined as the primary symptoms not being associated with obsessive compulsive disorder (OCD), social anxiety, specific phobias or panic disorder. These mothers considered their infants to be unsettled, described as involving feeding or sleeping problems, fussing, crying, negative mood, dislike of new situations and stimuli, and slow adaptability to change (McMahon, Barnett, Kowalenko, & Don, 2001). The primary uncontrollable worry for these women was about motherhood or their infant, which has led to the suggestion of a classification of a distinguishable maternally focussed anxiety disorder (Brockington, 2004).

A further issue with the disorder approach is that symptoms required in the general population to meet diagnostic thresholds may not be relevant or appropriate to perinatal women. In the DSM major depression can be indicated by weight loss, sleep disturbance, fatigue and concentration difficulties which are likely to be expected for some new mothers (Matthey & Ross-Hamid, 2011) not because they are specifically related to psychological ill-health, but because they are common features of the postnatal experience. Similarly, key symptoms of GAD include sleep disturbance, being easily fatigued, and concentration difficulties, which may inflate levels of postnatal psychopathology when endorsed by new mothers who see these 'symptoms' as a normal part of their experience as new mothers (Matthey & Ross-Hamid, 2011). Thus, diagnostic categories may miss women who are experiencing distress specific to motherhood, whilst also overinflating prevalence of distress when women endorse symptoms as a normal part of motherhood. Using the current diagnostic system and not taking equal account of all presenting symptoms can have multiple consequences, for example the optimal form of therapy may not be received, or the patient may not receive reassurance for symptoms that are bothering them the most but which are not addressed because they are not part of the diagnosis (Goldberg, 2010).

To summarise, instead of a diagnostic approach, symptoms-based research (Kroenke, 2001) may be appropriate in perinatal women. Firstly, because perinatal women often do not fit the DSM criteria and secondly, because symptoms of mental health may be confounded by physical and social concomitants of pregnancy and the postnatal period. A further issue with the disorder approach is the high level of comorbidity of multiple symptoms of mental health problems in perinatal women, as outlined below.

### 1.2.3 Comorbidity of symptoms and disorders

Perinatal women often experience symptoms of more than one mental health disorder. In a study of women referred for perinatal psychiatric treatment, the number of women presenting with major depressive disorder alone (3.3%) or GAD alone (5.5%) was low and the most common diagnosis was GAD with major depressive episode (50%; Grigoriadis et al.

2011). Contrastingly, in a sample of women referred for early parenting services (non-psychiatric brief residential programmes for mothers with caretaking difficulties), 11% had comorbid anxiety and depression, 16% had major depression alone and 14.5% had an anxiety disorder alone (Rowe et al., 2008).

In a community sample of 497 pregnant women who completed a diagnostic interview Sutter-Dallay, Giaconne-Marcasche, Glatigny-Dallay, and Verdoux (2004) found that 24.1% of women presented with at least one anxiety disorder, and that those women were four times more likely to also present with major depressive disorder. These women were nearly three times more likely to present with high symptoms of depression at 6 postnatal weeks. Similarly, Wenzel et al. (2005) found that dependent on the anxiety disorder diagnosed, between 25% and 50% also met diagnostic criteria for depression. In a comparison of women who had given birth in the last six weeks and women who had not given birth, all of whom had been diagnosed with major depression, it was found that 73% of the women in the postnatal period had prominent symptoms of anxiety, compared with only 16% of those who were not postnatal (Hendrick et al., 2000). The relationship between anxiety and depression is complex, with symptoms being both comorbid and predictive of each other at future time-points. For example, depressive symptoms in early pregnancy have been found to predict high anxiety levels in later pregnancy which in turn can predict higher depressive symptoms in the postnatal period, providing further evidence of the importance of identifying both types of distress (Heron et al., 2004; Skouteris, Wertheim, Rallis, Milgrom, & Paxton, 2009; Mauri et al., 2010).

Women can also experience high levels of clinically significant symptoms when they do not meet the threshold for disorder. For example, in a study where 8.2% of women were diagnosed with GAD, a further 19.7% experienced subsyndromal GAD (Wenzel et al., 2005). This is similar to levels of subsyndromal anxiety experienced in the general population (Olsson et al., 1996; Rucci et al., 2003). People with subsyndromal levels of anxiety experience poor levels of clinically meaningful outcomes such as subjective health, distress, quality of life, functionality and disability similar to those with full disorders (Rucci et al., 2003; Schwartz et al., 2004). This indicates that either current classifications of diagnostic disorders need to be

modified for postnatal women or that a different approach to identifying distress may be useful (Ross, Evans, Sellers, & Romach, 2003; Wenzel et al., 2005, Matthey et al., 2003).

In addition to anxiety disorders and major depression, research using self-report measures of postnatal depression and diagnostic interviews has shown that postnatal women commonly experience a broad range of comorbid psychological problems including minor depression, nonspecific anxiety disorder, adjustment disorders and posttraumatic stress following childbirth (Agius, Borg Xuereb, Carrick-Sen, Sultana, & Rankin, 2016; Alcorn et al., 2010; Navarro et al., 2007). All of these problems need to be correctly identified in order to enable the most suitable treatment approach to be delivered (Navarro et al., 2007).

### **1.3. Theories of distress**

In line with most empirical research, theory relating to perinatal distress has also largely focused on postnatal depression. A number of theories of postnatal depression exist. Largely, theories from areas of health, clinical and social psychology and sociology have been used to explain depression in the perinatal period. Examples are the cognitive-behavioural theory of postnatal depression (O'Hara, Rehm, & Campbell, 1982); the feminist theory of postnatal depression (Nicolson, 1986); and the attachment theory of postnatal depression (Whiffen & Johnson, 1998). In line with other research in perinatal mental health, these theories focus on postnatal depression as opposed to anxiety or other types of distress in the whole perinatal period. Even in the large postnatal depression literature it has been highlighted that new model development and testing needs to be undertaken as there is little published work in the last 15 years (O'Hara & McCabe, 2013). There is little theory to explain perinatal distress as defined by symptoms of multiple mental health problems.

As outlined above, there are a number of problems with using a disorder-based approach to assessment of perinatal mental health problems. A key problem is comorbidity of symptoms of different disorders. There are two theoretical approaches that address the problem of comorbidity. First, the tripartite model of anxiety and depression which addresses the co-



occurrence of symptoms of these two disorders or syndromes (Clark & Watson, 1991). Second, the transdiagnostic approach to mental health research which can address covariation and co-occurrence of symptoms of a wider range of mental health problems (Harvey et al., 2004). These approaches are outlined below. Furthermore, the biosocial model of common mental disorders (Goldberg & Huxley, 1992) is drawn upon because it proposes to include functioning as a component of assessing mental health problems.

### 1.3.1 Tripartite model of anxiety and depression

The tripartite model of anxiety and depression has as its central tenet the understanding that anxiety and depression have both shared and individual characteristics. Specific to anxiety is physiological hyperarousal, encompassing autonomic arousal and motor tension whereas a lack of positive affect (or presence of anhedonia) is specific to depression. High positive affect is characterised by enthusiasm, interest and pleasant engagement with the environment whereas the lack of positive affect associated with depression is characterised by lethargy, fatigue and an inability to experience pleasure from normally enjoyable activities (Clark & Watson, 1991). Both anxiety and depression share a component of nonspecific general distress or negative affect and the syndrome-specific factor must be considered alongside the general distress factor in order to fully describe the syndrome being experienced. There is substantial evidence supporting the tripartite model in both clinical and non-clinical populations (e.g. Jacques & Mash, 2004; Chorpita, Albano, & Barlow, 1998; Mineka et al., 1998; Watson et al., 1995) and one recent study supporting the model in a postnatal sample (Cunningham et al., 2016).

The nonspecific shared symptoms of general distress extant in both anxiety and depression syndromes can explain the strong correlations found between self-report measures of anxiety and depression. For example, the anxiety subscale of the Hospital Anxiety and Depression Scales (HADS; Zigmond & Snaith, 1983) correlates more highly with the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, and Sagovsky, 1987) than with the HADS depression subscale in antenatal women (Jomeen & Martin, 2004). In postnatal women

the State Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970) has been found to correlate at a similar level with measures of both depression and anxiety (Stuart, Couser, Schilder, O'Hara, & Gorman, 1998). Furthermore, Roy-Byrne et al. (1994) found that it was the general distress symptoms that characterised cases of subsyndromal anxiety and depression and these cases differed to diagnostic cases of anxiety and depression in the lack of physiological arousal and negative affect respectively. This evidence taken with evidence for mixed diagnoses of anxiety and depression, and subthreshold disorders including adjustment disorders supports the tripartite model in perinatal women (Phillips et al., 2009; Wenzel et al., 2005).

However, there is also evidence that anhedonia is associated with both social anxiety and depression (Gibb, Coles, & Heimberg, 2005), and that physiological hyperarousal is associated with panic disorder but not with other anxiety disorders (Brown, Chorpita, & Barlow, 1998). This has led to a revision of the tripartite model which takes account of the differences between anxiety disorders. The integrative hierarchical model (Mineka et al., 1998) proposes that each individual syndrome contains a common component of general distress and each individual syndrome also comprises a unique component, therefore physiological arousal is the distinct component of panic disorder but not of every anxiety disorder (Watson, 2005).

Thus, in terms of screening, a measure of anxiety would need to include general distress and physiological hyperarousal but not anhedonia, and a measure of depression would need to include general distress and anhedonia but not physiological hyperarousal (Brouwers et al., 2001). To put it more broadly, any measure of mental health problems would need to include the general distress component, and if it were intended to identify particular mental health problems then it would also need to include those syndrome-specific components.

### 1.3.2 Transdiagnostic approach to cognitive behavioural processes across disorders

In response to the problems with a diagnostic system, the transdiagnostic approach proposes that there are a number of cognitive behavioural processes encompassing attention,

memory, reasoning, thought and behaviour that are common across disorders and which help to maintain disorders (Harvey et al., 2004).

It is hypothesised that psychological disorders are more similar in terms of their maintaining cognitive behavioural processes than they are different. There are three sources of evidence for this hypothesis. First, the high rates of comorbidity across psychological disorders (e.g. Kessler et al., 1994). Second, research showing that experiential avoidance and self-focused attention are frequent processes across disorders (Harvey et al., 2004; Hayes, Wilson, Storhsal, Gifford, Follette, 1996; Ingram, 1990). Thirdly, in models of cognitive behavioural therapy (CBT) that focus on specific disorders, attentional processes, memory processes, thought processes and reasoning processes and behavioural processes are frequently included (Harvey et al., 2004).

Harvey et al. (2004) found evidence for the following processes to be considered as definitely transdiagnostic, as defined by a majority of evidence of at least moderate quality across at least four disorders finding the processes in existence: selective attention to external and internal stimuli; avoidance and attention towards safety, explicit selective and recurrent memory; interpretation, expectancy and emotional reasoning; recurrent thinking; positive and negative metacognitive beliefs; avoidance and safety behaviours and experiential avoidance (Harvey et al., 2004). This evidence relates to general populations but may be valuable to test in perinatal populations with a view to targeting specific cognitive-behavioural processes in screening, in addition to symptoms.

### 1.3.3. Biosocial model of common mental disorders (Goldberg & Huxley, 1992)

It may be useful to conceptualise screening in terms of identifying the needs of women presenting as distressed. It has been argued that models of illness based entirely on symptoms may be suitable for more severe mental illnesses, but they are not appropriate for less severe problems (Goldberg & Huxley, 1992). Instead, a model of common disorders incorporating symptoms, personality, and social functioning has been proposed as being more appropriate at

these lower levels experienced within the community (Goldberg & Huxley, 1992). Common disorders are considered: mood, anxiety, somatoform and adjustment disorders. These disorders account for approximately 90% of disorders seen in community settings and only 25% of those admitted to psychiatric wards (Goldberg & Huxley, 1992). In a study in primary care, overall prevalence of subthreshold disorders exceeded International Classification of Diseases-10 (ICD-10) disorders. Those with subthreshold disorders experienced levels of psychological distress, disability in daily activities and perceived health comparable to full disorders (Rucci et al., 2003). There were no significant differences in health characteristics of individuals with subthreshold disorders with or without lifetime depression, indicating that subthreshold disorders are clinically significant and imply substantial degrees of personal suffering and disability whether primary or secondary to formal depression or anxiety disorders. This implies that primary care healthcare professionals should attach adequate importance to perceived poor health, distress and inability to fulfil daily tasks in addition to symptoms. In terms of screening it may be important to include questions that tap into this domain.

## **1.4 Perinatal mental health screening and assessment**

### **1.4.1 Screening for perinatal mental health problems**

Population screening is the process of identification of healthy individuals who could be at an increased risk of a disease or condition (Public Health England, 2013). Identified individuals who are at increased risk are then more fully assessed. The decision on whether to implement a national screening programme is taken by the National Screening Committee (UK NSC) based on criteria for appraising the viability, effectiveness and appropriateness of a screening programme for a particular health problem. There are 20 criteria relating to five areas. The first area is the condition - i.e., the condition should be an important health problem and its natural history should be well understood. Second, the screening test - i.e., there should be a validated, simple and precise test which is acceptable to those being screened. Third, the

intervention – i.e. there should be an agreed policy on who should be offered interventions. Interventions must be effective and lead to better outcomes for the individuals receiving them. The fourth area is the screening programme - there must be strong evidence from randomised controlled trials that the entire programme leads to reduced mortality or morbidity and that benefits should outweigh harms such as overtreatment, misdiagnosis and false positives. The programme also needs to show value for money. The fifth area concerns implementation and includes the clinical management of the condition being optimised in all health care providers before a screening programme is implemented. Appropriate resources such as staff and facilities for screening, further diagnosis, treatment and management of the screening programme also need to be available (Public Health England, 2015).

The UK NSC undertakes evaluation of the evidence for screening for postnatal depression, but not for any other perinatal mental health problems. In the last published review in 2010, the evidence was not sufficient to meet the criteria above and therefore a universal screening programme for postnatal depression is not recommended by the UK NSC (Hill, 2010). There are a number of key areas in which the criteria were not met. There was a lack of randomised controlled trials providing evidence of screening to reduce mortality and morbidity (Hill, 2010). The report cites a number of systematic reviews which demonstrated that there were too few existing trials and those trials were too small to guide national policy (Gaynes et al., 2005) or to show beneficial outcomes of screening for mothers and babies (Hewitt et al., 2009). More recently further systematic reviews concluded that the situation regarding scant evidence from randomised controlled trials (RCTs) remained unchanged (Berkman et al., 2013; Thombs et al., 2014). The criteria for cost-effectiveness were also not met (Hewitt et al., 2009). This is because the EPDS was the only screening instrument with a sufficient evidence base from which conclusions could be drawn, and screening with the EPDS resulted in high numbers of false-positives (Hewitt et al., 2009; Hill, 2010). However, the EPDS was considered to be a safe, valid and precise screening instrument for identifying postnatal depression.

The UK NSC review highlighted that further research was needed to demonstrate the screening or case-finding ability of the Whooley questions and instruments other than the

EPDS, as well as acceptability of different screening or case-finding strategies (Hill, 2010). A further gap in research related to understanding the effects of postnatal depression on health-related quality of life (Hill, 2010).

#### 1.4.2 Assessment of perinatal mental health problems

Instead of a universal screening programme, clinical practice guidelines for perinatal mental health assessment are provided by the National Institute for Health and Care Excellence in the UK (NICE; 2007, 2014). At the beginning of the period of study for the PhD (2009), the relevant NICE guidelines were those published in 2007 (NICE, 2007). At that time, it was recommended that healthcare professionals (HCPs; midwives, health visitors, obstetricians and GPs) should ask women two questions focusing on mood and interest to assess for possible depression, known as the Whooley questions (Whooley et al., 1997). They are the same as the Patient Health Questionnaire-2 (PHQ-2; Kroenke et al., 2003) questions but are scored with a yes or no, instead of on a Likert scale. The questions were intended to be asked at the first contact in pregnancy (the booking visit) and postnatally, usually at 4-6 weeks and again at 3-4 months (NICE, 2007). If there was a positive response to either of the questions, a third question, developed by Arroll et al. (2005) about the need or want for help was asked (NICE, 2007). The next step was to consider using a further questionnaire as part of a fuller assessment or to monitor outcomes. The suggested further questionnaires were the EPDS, the Hospital Anxiety and Depression Scale (HADS) or the Patient Health Questionnaire-9 (PHQ-9). The guidance suggested asking about previous severe mental illness but concerning the assessment questions only depression was addressed.

The guidelines were updated in 2014 and now ask healthcare professionals to consider asking two additional questions assessing anxiety using the Generalized Anxiety Disorder scale (GAD-2; Kroenke et al., 2007). The questions are scored from 0 - 3 and if a woman has a total score of 3 or above, the next step is to consider using the GAD-7 scale for further assessment or to refer the woman to her GP. If the score is less than 3 but the healthcare professional is still

concerned, a third question about avoiding places or activities and whether this causes problems can be asked. A positive response can then be followed by the GAD-7 or referral to the GP. The timing of when to ask the assessment questions has also been extended. Practitioners who have regular contact with the woman in pregnancy and the first postnatal year are asked to consider asking the questions at all contacts as a broader discussion of mental health and wellbeing (NICE, 2014). The Whooley questions remain the recommended assessment questions for depression. The importance of building a trusting relationship, the attitude of staff and the way in which they deliver the case-finding questions is also stressed in response to a concern with the recent decrease in detection of postnatal mental illness (NICE, 2014).

The recommendations of NICE (2014) are based on a systematic review of the diagnostic accuracy of brief screening instruments (fewer than 12 items) which were validated against a 'gold standard' diagnostic interview to diagnose depression and anxiety in pregnancy and the postpartum. Instruments meeting inclusion criteria were the Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987), Patient Health Questionnaire- 9 (PHQ-9, Kroenker et al., 2001), Kessler-10 (K-10; Spies et al., 2009) and Whooley questions (Whooley et al., 1997).

Concerning depression, the review concluded that the evidence base was limited for all instruments other than the EPDS. The guidelines still recommend that the Whooley questions, which had one postnatal (Gjerdingen, Crow, McGovern, Miner, & Center, 2009) and one ante- and postnatal study (Mann, Adamson & Gilbody, 2012) validating them, were used by healthcare professionals as a quick screen. Both these studies showed a sensitivity of 100% and combined with brevity and no need for additional (e.g. paper) resources, and ease of use by Healthcare professionals (HCPs) not trained in mental health, led to their recommendation as a first step in eliminating women who did not need further assessment. However, the Guideline Development Group noted concern that the Whooley questions may not identify all women with depression and therefore if the HCP has any doubt they should use one of the longer questionnaires. The use of the further 'help' question was discontinued based on evidence that it did not discriminate well between true- and false-positives so may lead to those women possibly

depressed being missed (Mann et al., 2012; NICE, 2014). A more recent meta-analysis has provided further evidence of this (Bosanquet et al., 2015). A positive response to either question could then be followed up with either the PHQ-9 or the EPDS which showed the best sensitivity and specificity of included measures (NICE, 2014). No recommendation could be given about the EPDS in pregnancy due to heterogeneity of studies included. There was not enough evidence to recommend the Kessler 10 (NICE, 2014).

Concerning anxiety, the evidence base was still more limited. One study assessed the ability of the K-10 at detecting panic disorder, social anxiety and posttraumatic stress disorder (PTSD) in pregnancy (Spies et al., 2009), and two assessed the EPDS at detecting anxiety in the postnatal period (Phillips et al., 2009; Matthey, 2008). Neither the full nor the 3 -item anxiety subscale of the EPDS or the K-10 demonstrated good sensitivity or specificity at detecting anxiety disorders resulting in the committee drawing on the larger evidence base of instruments in general (not perinatal) populations. Based on this, they recommend the Generalized Anxiety Disorders -2 scale (GAD-2; Kroenker et al., 2007 ) with a further question about avoidance, to identify anxiety disorders, followed by the GAD-7 (Spitzer, Kroenke, Williams, & Löwe, 2006) if further exploration is needed (NICE, 2014). Since the NICE (2014) review, one paper has compared the GAD-7 with the EPDS at detecting anxiety in the ante- and postnatal periods and found sensitivity of 61.3% and specificity of 72.7% for the GAD-7 at a cut-off of 13, which would be considered 'moderate' by the NICE criteria (Simpson, Glazer, Michalski, Steiner & Frey, 2014). The GAD-7 was more accurate at a variety of different cut-off points and showed better specificity than the EPDS (Simpson et al., 2014). A further paper validated a Spanish version of the GAD-7 in pregnant women against diagnostic interview and found sensitivity of 73.3% and specificity of 67.3% (Zhong et al., 2015).



## **1.5 Current issues in perinatal mental health assessment**

### **1.5.1 Assessment is too narrow**

As stated above, current clinical guidance that suggests healthcare professionals should ask perinatal women two questions about anxiety and two items about depression to assess mental health. However, as there are many more forms of distress that women may experience (and which do not have validated instruments to identify them) a different approach may be warranted.

One issue is the complexity of an individual's distress. Women may experience one type of distress (e.g. anxiety, stress or depression) or multiple types, and each woman's profile of symptoms may differ. Studies often show high correlations between different types of distress which may mean that they are truly comorbid, or it may mean that self-report measures are unable to differentiate between them. For example, in a recent study 21% of pregnant women who tested positive for depression on the EPDS also tested positive for bipolar disorder and may have been at risk of a misdiagnosis of unipolar depression (Merrill et al., 2015). Furthermore, the symptoms of anxiety and depression can overlap making it difficult to separate them (Grigoriadis et al., 2011, Wisner et al., 2013). Combined with it being unlikely that an assessment tool could include every symptom of every type of distress, the approach of using multiple measures of distress may not be feasible in terms of time, resources and acceptability to women. This is reflected in the current assessment questions recommended by NICE (2014).

### **1.5.2 Barriers to assessment**

Currently rates of identification of perinatal mental illness in primary care are low – approximately 50% with postnatal depression or anxiety go unidentified (Hewitt et al., 2009). Barriers to effective assessment and treatment occur both on an individual level for each woman being screened, and on a universal level within the healthcare system.

A successful assessment (or screening) programme will only work if it is acceptable to women in the perinatal period, meaning that they are comfortable enough to disclose their feelings. There is no uniform measure of acceptability of assessment, but a systematic review revealed that the majority of perinatal women and healthcare professionals describe positive attitudes towards assessment in different settings and with different instruments (El Den, O'Reilly, & Chen, 2015). Some qualitative studies have found that women do not reveal their symptoms during assessment because of fear of having their children referred to social services, fear of being prescribed antidepressants, worry about being perceived as a bad mother, or ambiguity about the role of the health visitor (Chew-Graham et al., 2009; Kingston et al., 2015b; Slade et al., 2010). Women may also be reluctant to disclose feelings because of their perception that family and healthcare professionals treat their symptoms as an expected part of motherhood or cannot address their emotional and practical needs (Kingston et al., 2015c, Dennis & Chung-Lee, 2006). Additionally, women may not know themselves which emotions are 'normal' in pregnancy and postnatally (Kingston et al., 2015c). Women who experience stigma in the perinatal period prefer to talk to their family and friends, rather than healthcare providers about their concerns, reinforcing the benefit of a whole-family approach to assessment and treatment (Reilly et al., 2014, Kingston et al., 2015a)

A good relationship with a sensitive, interested healthcare provider is a clear facilitator of disclosure, as shown in qualitative and quantitative research (Chew-Graham et al., 2009; Kingston et al., 2015c). For example, a recent quantitative study of 460 women found that 79% of women felt they could be 'completely honest' during assessment (Kingston et al., 2015b). Women were more comfortable with disclosing their feelings if they received an explanation about why sensitive questions were being asked, if they were reassured that mental healthcare is a normal part of perinatal care, and if they heard that other women had mental health problems in the perinatal period (Kingston et al., 2015c).

Within the healthcare system women and healthcare providers recognise similar provider- and systems-level barriers to perinatal mental health care (Byatt et al., 2013). These include difficulty in getting an appointment, a hurried environment, providers not having

adequate training in postnatal mental healthcare and/ or relevant communication skills, a lack of consistent procedures to identify and treat postnatal mental illness, reluctance to treat perinatal women, absence of referral networks and insufficient follow-up and care coordination capacity (Byatt, Moore Simas, Lundquist, Johnson, & Ziedonis, 2012; Chew-Graham et al., 2009). In order for assessment or screening to be successful all of these factors will need to be addressed.

## **1.6 Summary and Rationale**

This brief review of current perinatal mental health assessment highlights some important areas of research, a number of which this thesis hopes to address. First, there is a growing body of research that psychological problems in the perinatal period are wide-ranging and encompass anxiety disorders and problems without psychiatric classification such as bonding disorders and maternally-focussed worry. However, there is little research in which women have been able to put forward their experiences of psychological problems other than depression and how these symptoms have had an impact on their life. If the aim of assessment is to identify multiple mental health problems that need further assessment, there is a need to investigate what other symptoms are experienced. Furthermore, it will be important to know how women perceive that they are asked about those symptoms. Given the lack of assessment questions that healthcare professionals ask concerning other mental health problems, it is important to ask how comfortable women feel with raising any such concerns. Second, at the inception of this thesis, clinical guidelines for assessment of perinatal mental health problems only recommended asking questions to identify depression. Given the growing body of research that anxiety symptoms and disorders are equally prevalent and disabling in the perinatal period, research was needed to ascertain which measures could be appropriately used to identify anxiety in pregnant and postnatal women, evidenced by good psychometric properties and appropriate validation in perinatal populations. With these areas in mind, this thesis set out to investigate the following:

- 1 To determine how women conceptualise their postnatal distress (chapters 3 and 4).
  - 1.1 Explore women's lived experiences of broadly defined 'emotional difficulties' so as not to categorise them by existing diagnostic classifications that may not be appropriate for perinatal women (chapter 3).
  - 1.2 Identify women's self-disclosed symptoms of distress and the impact of those symptoms (chapter 4).
  - 1.3 Explore women's views and feelings about being assessed for postnatal mental health problems (chapter 4)
- 2 Review current measures of anxiety that could be used in perinatal populations (chapter 5).
  - 2.1 Systematically identify measures of anxiety that have been validated in pregnant and postnatal women.
  - 2.2 Review the psychometric properties and methods of validation of identified measures.
- 3 To examine the psychometric properties and validate measures that may be appropriate to identify symptoms of postnatal anxiety and distress (chapters 6 and 7)
  - 3.1 Assess the validity of the Edinburgh Postnatal Depression Scale in a population-based sample of pregnant and postnatal women (chapter 6)
  - 3.2 Explore the validity and case-finding ability of a brief measure of psychological distress in pregnant women (chapter 7)

These objectives were addressed through a systematic review of published studies, and a series of research studies reported in the articles that make up chapters three to seven of this dissertation. The questions addressed in each study and the methods used are outlined below.

### **1.7 Outline of studies**

The overall research goals were to gain an understanding of the conceptualisation of postnatal distress, and the optimal ways in which to identify women experiencing distress. This section

contains a brief description of the series of studies and how they relate to the overall research objectives stated above.

In order to explore the feelings of distress that women experience with minimal effect of the constraints of diagnostic categories, an approach was required that would enable me to access and understand as far as was possible the women's lived experiences, and how they made sense of such experiences. I believed that these aims would be best met through a qualitative approach of talking and listening to women who had experienced postnatal distress. Chapter three is an in-depth exploration of the experiences of postnatal distress of 17 women, analysed using interpretative phenomenological analysis (IPA) to retain an idiographic focus before moving on to describe themes across the sample. Chapter four focused on the same women's descriptions of their symptoms of distress and how they had been assessed for them, and broadly showed that individual women experienced a diverse combination of symptoms.

Exploring forms of postnatal distress other than depression necessitated a systematic review of objective measures used thus far to attempt to classify non-depressive disorders or symptoms. This is reported in chapter five. Health services and researchers in the area of perinatal distress need to make informed decisions about which objective measure they choose to use, and therefore a comparison of the properties, reliability and validity of measures used to detect and measure perinatal anxiety was carried out.

Continuing the theme of addressing multiple symptoms of distress a large data-set was sought which would enable a factor analysis of symptoms at the population level to add another facet to the conceptualisation of postnatal distress. Chapter six used data from the Avon Longitudinal Study of Parents and Children, a population-based study ( $n > 11,000$ ), to explore the structure of symptoms of depression and anxiety as measured by the Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987). Exploratory and confirmatory factor analysis were employed to test previous models of the EPDS, to determine whether the factor structure was the same in pregnancy and in the first postnatal year, and to see which factor structure best fit the data.

Finally, chapter seven explored the validity of a newer measure of distress that has not previously been trialled with perinatal women. The CORE-10 (Connell & Barkham, 2007) includes items related to a broader range of symptoms of distress than currently used measures of postnatal depression and therefore may be viable for use with perinatal women. Exploratory and confirmatory factor analyses, psychometric properties, and response patterns were assessed in a sample of pregnant women.

## **2 Methodological overview**

This chapter provides the rationale for using mixed (quantitative and qualitative) methodology to answer the research questions. Descriptions of the methods employed for each study are provided in the relevant sections of those papers, but here the overarching methodology which draws the research programme together is discussed. Detail is also given on the choice and justification of Interpretative Phenomenological Analysis and thematic analysis as the qualitative methods employed.

### **2.1 Methodological issues**

Methodology concerns the general approach or strategy taken to researching a specific area, as opposed to ‘method’ which points to specific techniques employed in a research study (Willig, 2008). Methodology arises from the aims of the study and incorporates philosophical as well as theoretical considerations and justifies the choice of methods employed (Finlay, 2006). The methodology should be congruent with the research questions and aims, the researcher’s epistemological and ontological positions, the theoretical framework and the data analysis and collection methods. To ensure this, the research questions and aims were returned to frequently in order to choose and justify the use of mixed methods in the research programme.

#### **2.1.1 Definition of mixed methods**

The mixed methods approach in this research programme can be defined as a combination of qualitative and quantitative methods, based on a pragmatic philosophy. The aim was for the quantitative parts to measure and establish statistical relationships, with the qualitative elements included to explore, gain insights, and understand underlying issues, in order to give the most balanced, complete and useful research (Burke Johnson, Onwuegbuzie & Turner, 2007; Dures, Rumsey, Morris & Gleeson, 2011). Despite the advantages related to completeness, mixed methods research has been criticised because researchers often do not provide a thorough explanation of, and justification for, employing such a research design and

in particular for not being transparent about the qualitative component (O’Cathain, Murphy & Nicholl, 2008). This chapter addresses these concerns.

### 2.1.2 Appropriateness of mixing methods

Broadly, the reason for mixing methods in this research programme was the belief that complex human phenomena, such as emotional distress, call for complex and multiple ways of researching that phenomenon; multiple methods open up multiple ways of viewing the world (Cresswell, 2011). One method alone is not able to reflect the complexity of human experience. It is not suggested here that a complete picture of postnatal distress is provided, but that a more complete one is given than would have been provided had solely quantitative or qualitative methods alone been used.

The term *triangulation* has been used to indicate that more can be known about a phenomenon when the results of two or more methods of data collection are used (Moran-Ellis et al., 2006). Indeed, in certain cases it is important to know that how one measures phenomena affects what one is able to learn. It is not implied here, however, that if research methods produce different results then one of those methods is ‘wrong’ in its measurement, as the definition of triangulation would conclude in a navigational sense. Rather, it is acknowledged that all methods have their own limitations and biases, and that the use of multiple methods aims to make up for the limitations of individual methods and to balance the biases of each method. Each method can produce knowledge about a different facet of the phenomenon. It has been proposed that this approach to mixing methods would best be described as *complementarity* (Moran-Ellis et al., 2006). To go further, it could be argued that “to see a phenomenon in a certain way is to change that phenomenon” (Sandelowski, 2000, p.247) and therefore this research could reflect multiple constructs of postnatal distress rather than facets of the same construct.



### 2.1.3 Paradigm considerations

A paradigm is a fundamental set of beliefs about the world, our place in it and the relationships we can have with it (Lyons, 1999). A paradigm has specific ontological (what is the nature of reality?), epistemological (what and how can we know?) and methodological (what should our approach be to seeking knowledge?) premises on which it is built. In turn, different paradigms govern different kinds of research (Lincoln, Lynham & Guba, 2011).

The methods typically associated with the development of psychology as a discipline are quantitative. The ‘quantitative imperative’ in psychology concerns the belief that science is about quantification, and because early psychology tried to model itself on the natural sciences, and specifically physics, it embraced quantification (Howitt, 2010). This stance is tied to the paradigms of positivism and post-positivism. Epistemologically positivists and post-positivists believe in a single reality, identifiable in the former paradigm and estimable in the latter, that should be measured and studied objectively (Lincoln et al., 2011). The aim is for prediction and control of nature which can be realised through verifying or falsifying hypotheses. The value of the research is found in the scientific method itself and the researcher takes the stance of the “disinterested scientist” (Lincoln et al., 2011, p.101). Essentially, the belief is that truth can be discovered.

These aspects of positivism and post-positivism are not seen to be congruent with the philosophical foundations of critical theorist, constructionist, and participatory paradigms, within which qualitative methods often lie (Lincoln et al., 2011). These paradigms are more relativist in their ontology, believing that there are multiple realities or that individuals create their own reality. They are epistemologically subjectivist, considering the researcher and the participant inextricably linked and the research findings are a synthesis of the two perspectives (Lincoln et al. 2011). The aim of inquiry in these paradigms is directed towards understanding what meanings people attach to their experiences, and subsequently to lead to social change (Lyons, 1999). As qualitative research focuses on meaning and sense-making, which will not be universal, the value of the research is found in such aspects as credibility (to researchers and

others who have experienced the phenomenon under study), dependability (different investigators would produce a similar construction in a similar context), and confirmability (*do* similar others have similar constructions) (Lincoln et al., 2011; Lyons, 1999). Essentially then, in these paradigms, truth is constructed rather than discovered.

Having recognised this range of differing epistemological and ontological stances, it can be seen how a programme of mixed methods studies could raise tensions. Indeed, between the 1970s and the 1990s the expression “paradigm wars” was used to describe the view that qualitative and quantitative approaches to research were incompatible, based on their underlying, differing and irreconcilable philosophical foundations (Bryman, 2006). Although it is largely considered that this “war” is over, within qualitative research there is still a diversity of sometimes seemingly incompatible approaches which need to be taken into consideration when deciding on the appropriate qualitative method to employ (Bryman, 2006; Teddlie & Tashakkori, 2003). This will be returned to below.

The research programme described in this dissertation was based on a pragmatic approach, broadly aligned with Bryman’s (2006) definition whereby primacy was given to technical decisions regarding appropriate research methods (quantitative or qualitative) according to particular circumstances. Thus, the ability to answer the research question is the key determinant of the research method chosen, rather than a commitment to a single (quantitative or qualitative) paradigm and the philosophical foundation on which it is based. Nonetheless, mixed methods research has also been described as the “third paradigm” (Dures et al. 2011) and this paradigm is associated with the philosophy of pragmatism.

The philosophy of pragmatism has its basis in the late 19<sup>th</sup> century America, in the works of Charles Sanders Pierce, George Herbert Mead, John Dewey and William James (Dures et al. 2011). Mead considered that reality exists in the present, for an individual; that we exist surrounded by change which is real and not a simple subjective and perceptual phenomenon (Aboulafia, 2012), or in other words:

“fixed distinctions of thought and reality are not reflected in nature where one thing flows off into the next, one flows into another, and the complexity of our thought is clarified only by theories that give tentative illumination to reality.” (Pfeiffer, 2003, paragraph 9)

Therefore, to a pragmatist some principles are true and others are not true, but no knowledge is totally dependable and uncertainty is always present. However, it is considered important to seek out knowledge by trying to identify and state general categories of phenomena insofar as they are meaningful to human beings in their lives (Dures et al. 2011; Pfeiffer, 2003). Perhaps the simplest way of seeing how pragmatism fits with a mixed methods approach is given by James (1907, cited in Hookway, 2008) in his consideration of the scientific theory, which he considered to be an instrument conceived to realise a purpose. The purpose is to enable action or increase understanding rather than to define causes and laws by which society functions.

The constructionist view argues that the world is constructed by the cultural and linguistic structures of humans. The relationship between the object and the observer depends on the meaning that the observer has imbued in that object, despite the existence of that object independent of the meaning ascribed to it (Reichert & Zielke, 2008). Meaning is not inherent in objects, waiting to be discovered but is constructed by the interaction between the person and the objects in the world they occupy. Thus two people can live in the same world, but the objects in that world may have very different meanings to them (Patton, 2002).

The philosophy of pragmatism has commonalities with a constructionist standpoint (Hastings, 2002), and a constructionist approach is taken, to an extent, in this research. For example, scepticism about any objective form of knowledge is a tenet of my epistemological position. The social constructionist viewpoint that phenomena we consider to be internal or private are actually socially constructed, and achieve their sense through a process of social interactions (Willig, 2008), is recognised. But whilst it may be true that women have ways of talking about distress that construct a social reality of distress, the research presented here considers that the cognitive and affective functioning of the individual often disregarded in

social constructionist research (Reichert & Zielke, 2008) is still worthy of investigation, largely in that it may be relevant for screening and for interventions to lessen distress.

Furthermore, a literal reading of social constructionism, i.e. that there is “absolutely no reality whatsoever” (Patton, 2002, p.101) is not taken here, but rather the more realist ontological perspective that the existence of things, events, structures, societies, feelings, as independent from people’s experience with them, is taken seriously (Schwandt, 1997; Patton, 2002).

Thus, the epistemological position taken in this research could be called pragmatic critical realism and argues that although there is a ‘real world’ independent of individuals and society, this can only be viewed through people’s reports which are culturally and socially influenced and shaped. Furthermore, experience is always a product of interpretation of both the individual going through that experience and the researcher trying to capture that experience, and is therefore flexible rather than determined in its description, but importantly it is acknowledged that the experience is ‘real’ to the person going through it.

## **2.2 Choice of qualitative method**

One of the overarching aims of the PhD was to investigate ways of identifying postnatal distress, with the view to increasing knowledge about questionnaire measures that could be used to identify women in need of more comprehensive assessment. Screening measures to assess mood are concerned with the current time, or a recent time period, and focus on how the respondent is feeling. Thus, the first qualitative study in this report aimed to address the question of ‘what is the lived experience of postnatal distress?’ The second qualitative study aimed to explore the symptoms postnatal women experienced and examine which of those symptoms women had been assessed for by healthcare professionals.

When choosing a qualitative method to answer a psychological question, although many options abound, four are particularly prevalent (Starks & Trinidad, 2007; Frost et al., 2010): grounded theory, interpretative phenomenological analysis, discourse analysis and thematic

analysis. A brief outline of the perceived suitability of each for the current research questions is given.

### 2.2.1 Grounded Theory

Grounded theory was developed in a sociological context and originally had the aim of developing explanatory theories of social processes (Starks and Trinidad, 2007). Whilst many of the stages of the method of conducting grounded theory research are similar to those in IPA (Willig, 2008; Smith, 1999), for example, categorisation of data into themes to enable a general understanding of the phenomenon under study, the end result: i.e., establishing a *theory* built from the data, is different. Grounded theory aims to “generate theories that can *account for* patterns of behaviour and social processes” (Frost et al., 2010, p.4, italics added). The aim of the qualitative studies reported here was not to provide a theory or conceptual framework of the process of postnatal distress (although the way in which women make sense of their experiences involved them theorising explanations), but rather to capture the essence of distress as it is experienced by women through their detailed accounts of distress (chapter 3), and to report descriptions of their symptoms (chapter 4).

### 2.2.2 Discourse Analysis

Discourse analysis is focused on the way in which language creates meaning. Whilst grounded theory and IPA both hold a realist epistemology to an extent (they believe that categories reside in and emerge from the data), discourse analysis takes a relativist position and theorises that language creates meaning; language constructs our understanding of social reality (Willig, 2008; Frost et al. 2010). The proposition of discourse analysis, that there are always potentially many readings of an experience, fits with the epistemological position taken but the proposition that subjects and objects are not represented by, but constructed through, language is considered problematic for evaluation of questionnaires (Chapters Six and Seven).

This is for two reasons. Firstly, because discourse analysis does not consider valid the idea that cognitions can be represented through verbal reports (Smith, Jarman & Osborn, 1999).

Rather it is concerned with revealing the certain ways-of-seeing the world and ways-of-being in the world that are made available by pre-existing sets of statements that construct objects and subject positions (Willig, 2008). So although discourse analysis views the conversation of the interview *itself* as the behaviour to be analysed, the research questions posed in this thesis required an approach that accepted the validity of cognition and tried to understand what the respondent thought and believed about postnatal distress.

Relatedly, in terms of research, discourse analysis considers that the responses an interviewee gives will be dependent upon the position in which they find themselves in that interview, and the discourses at play, which are in turn influenced by the relationship between the interviewee and interviewer. Therefore different results would arise on different occasions. Again this disavows the existence of cognition and is not conducive to measurement of mental health. Whilst it is accepted that the relationship of the two participants in the research (interviewee and interviewer) is an important one, it is posited that the interviewee believes in a reality ready to come forward and that the interviewer's role is to facilitate that surfacing and make sense of it (Smith, Flowers, & Larkin, 2009).

### 2.2.3 Interpretative Phenomenological Analysis (IPA)

IPA is concerned with individuals' personal perceptions about their experience. Its concern with cognitions as well as its commitment to the importance of language and its focus on the relationship between verbal report, cognition and physical state makes it particularly suited to the topic of postnatal mental health where physical and psychological states can be intertwined (Smith et al., 1999).

IPA has its roots in European phenomenological philosophy, specifically those branches which emphasised understanding, interpretation, meaning and subjectivity: phenomenology and hermeneutics. Phenomenology gives importance to experience and its perception; the person is understood as connected to a lived world that is personal but dependent upon relationships to objects and to others. Understanding a person's experience focuses on the meanings a person ascribes to events happening to them (Smith et al., 2009). Furthermore, hermeneutics inform

IPA in acknowledging that the sense made of the phenomenon under question is an interpretative undertaking by the researcher. Gadamer's work on hermeneutics considered the social sciences 'non-methodical' and that they could only achieve 'truth' through renouncing any claims to methodological objectivity and instead being dependent on the fundamental human capacity for understanding (West, 1996). Lastly, IPA is influenced by idiography. This commitment to the individual and the particular contrasts with much research in psychology which makes claims at the group level. Specifically, IPA is concerned with detail, and depth of analysis, and takes a case-by-case approach before moving on to look at themes across interviewees. Therefore it does not avoid generalisations but goes about making them in a different way that tries to locate them in the detail (Smith et al., 2009). This is aided by the selection of small, purposively-selected samples.

Returning to the philosophy of pragmatism, it is considered that different aspects of reality lend themselves to different methods of inquiry. Pierce (cited in Hookway, 2008) considered that "the object presented is the real" (section 3.1, paragraph 1), which fits with the use of IPA for exploring how women conceptualise their postnatal distress (Chapter Three). Although women will experience distress in many forms, and may or may not reach a cut-off point on an objective measure, the distress is real and meaningful to her in life and accounts of this distress will add to the overall picture of postnatal distress in the psychological literature.

#### 2.2.4 Thematic analysis

Thematic analysis aims to identify, analyse and report patterns (or themes) in qualitative data. It is a method that is independent of any epistemology and theory and which is compatible with essentialist and constructionist paradigms (Braun & Clarke, 2006). It can be conducted in an inductive (bottom up, data-driven) or deductive (top-down, theory-driven) way. Given its flexibility and aim of identifying patterns across data, this method was deemed appropriate for addressing the variety of symptoms of distress that different women had experienced. However, the flexibility of thematic analysis means that it is important to make clear the way in which it is going to be used. In this dissertation thematic analysis was used in an inductive manner, where

the themes are as closely linked to the data as possible (Patton, 2002) rather than being driven by a theoretical standpoint. Furthermore it was used as a ‘contextualist’ method in that it sits between essentialism and constructionism and acknowledges how women make meaning of their experience but also the way in which society impacts those meanings (Braun & Clarke, 2006; Willig, 1999).

### **2.3. Adopting a mixed methods approach to answer the research questions**

In line with a pragmatic approach to choosing research methods, the research questions and aims were revisited frequently. It is argued that a combination of quantitative and qualitative methods was necessary in order to give a more complete understanding of the nature of distress in postnatal women than would be possible by the use of a single method. This research meets many of the frequently found characteristics of health psychology (Dures et al., 2011): being concerned with taking action or solving complex problems; being tailored towards client needs rather than academic peers, and answering questions derived from the real world experiences of service users and/ or healthcare providers. Mixed methods are particularly suitable for such research, being able to combine the individual with the group level when appropriate. Furthermore, the potential for the dissertation to be useful or applied in postnatal healthcare was a key consideration. One of the aims of publication of the research is to inform postnatal healthcare providers (particularly midwives and health visitors) about differing forms and experiences of postnatal distress and to add to the body of information that will aid postnatal healthcare policymakers to make decisions about the best ways to screen and treat women experiencing distress in this period. The current use of questionnaire measures and/or screening questions about postnatal depression with postnatal women (NICE, 2014) meant that the use of ‘objective’ questionnaire measures was considered in this thesis (see also section *1.4.2 Assessment of perinatal mental health problems*). If health services do decide to try and identify forms of postnatal distress other than depression and anxiety, it may be more possible to do this within the current approach.



### 3 Women's Experiences of Postnatal Distress: an Interpretative Phenomenological Analysis

Coates, R., Ayers, S., de Visser, R. (2014). Women's experiences of postnatal distress: a qualitative study. *BMC Pregnancy and Childbirth*, 14, 359. DOI: 10.1186/1471-2393-14-359

#### 3.1 Abstract

**Background:** Women can experience a range of psychological problems after birth, including anxiety, depression and adjustment disorders. However, research has predominantly focused on depression. Qualitative work on women's experiences of postnatal mental health problems has sampled women within particular diagnostic categories so not looked at the range of potential psychological problems. The aims of this study were to explore how women experienced and made sense of the range of emotional distress states in the first postnatal year.

**Methods:** A qualitative study of 17 women who experienced psychological problems in the first year after having a baby. Semi-structured interviews took place in person (n = 15) or on the telephone (n = 2). Topics included women's experiences of becoming distressed and their recovery. Data were analysed using Interpretative Phenomenological Analysis (IPA). Themes were developed within each interview before identifying similar themes for multiple participants across interviews, in order to retain an idiographic approach.

**Results:** Psychological processes such as guilt, avoidance and adjustment difficulties were experienced across different types of distress. Women placed these in the context of defining moments of becoming a mother; giving birth and breastfeeding. Four superordinate themes were identified. Two concerned women's unwanted emotions and difficulties adjusting to their new role. "*Living with an unwelcome beginning*" describes the way mothers' new lives with their babies started out with unwelcome emotions, often in the context of birth and breastfeeding

difficulties. All women spoke about the importance of their postnatal healthcare experiences in *“Relationships in the healthcare system”*. *“The shock of the new”* describes women’s difficulties adjusting to the demands of motherhood and women emphasised the importance of social support in *“Meeting new support needs”*.

**Conclusions:** These findings emphasise the need for exploration of psychological processes such as distancing, guilt and self-blame across different types of emotional difficulties, as these may be viable targets for therapeutic intervention. Breastfeeding and birth trauma were key areas with which women felt they needed support with but which was not easily available.

**Keywords:** postnatal anxiety, postnatal depression, childbirth, birth trauma, breastfeeding

### 3.2 Background

Giving birth and having a new baby are emotive experiences, and many women are vulnerable to psychological problems during this time. Research examining psychological problems after birth has been largely quantitative and focused on major depression in the postnatal period (O'Hara & McCabe, 2013; Mazure, Keita & Blehar, 2002). More recently, researchers have shown that anxiety symptoms and disorders are as common as depression in the postpartum period (Ross & McLean, 2006). Levels of postnatal posttraumatic stress disorder (PTSD) following childbirth are also of clinical significance (Verreault et al., 2012). In this article we used the terms 'distress', 'emotional distress,' 'emotional difficulties' and 'psychological problems' interchangeably to refer to any psychological problem which impairs daily functioning. It was considered that mothers may identify more with terms such as 'emotional distress' and 'emotional difficulties' than with 'psychological problems' which is used in the academic discussion of concepts. Such psychological problems have a significant impact on women and their children, with evidence that depression and anxiety can lead to altered mother-infant interaction and developmental difficulties (O'Hara & McCabe, 2013; Mazure, Keita & Blehar, 2002; Ross & McLean, 2006; Glasheen, Richardson & Fabio, 2010; Matthey, Barnett, Howie & Kavanagh, 2003; Nicol-Harper, Harvey & Stein, 2007 ).

Symptoms of distress particular to the postnatal period may be missed in research using general measures of distress and psychopathology that are not designed for use in postnatal populations (e.g., Heron et al., 2004; Navarro et al., 2007). The postnatal period has unique physiological and psychological aspects such as fatigue, interrupted sleeping and the adoption of new routines such as breastfeeding. These unique aspects may affect responses on self-report measures which include items that are not appropriate for the postnatal period (Meades & Ayers, 2010). For example, the General Health Questionnaire (GHQ; Goldberg, 1972) asks if the respondent has been able to leave the house as often as usual which may result in endorsement of a 'symptom' that is a normal component of new motherhood, leading to false 'cases' and, ultimately, the pathologising of motherhood (Matthey, 2010).

Another issue is that self-report measures are validated against diagnostic criteria which may not be relevant to postnatal women. In a sample of mothers with unsettled infants, equal numbers of mothers (11%) were diagnosed with generalised anxiety disorder (GAD) as were diagnosed with an anxiety disorder not otherwise specified (ADNOS), defined as the primary symptoms not being associated with OCD, social anxiety, specific phobias or panic disorder (Phillips, Sharpe, Matthey & Charles, 2009). All of these women experienced uncontrollable worry about motherhood or their infant. It is therefore perhaps unsurprising that postnatal women consistently report clinically significant symptoms of both depression and anxiety (Matthey et al., 2003; Ross, Gilbert Evans, Sellers, & Romach, 2003; Wenzel, Haugen, Jackson, & Brendle, 2005) indicating that only part of a woman's experience of distress is explored when using symptom measures of a specific disorder. As a result of these limitations in measurement, there could be a disparity between women's lived experiences of distress in the postnatal period, whether those symptoms are problematic to women or a normal part of motherhood, and how those experiences are reported subject to current measurement practices.

Qualitative research examining women's experiences of psychological disorders has also commonly worked within diagnostic categories of postnatal depression (PND; e.g., Beck, 1992; Beck, 1993; Haga, Lynne, Slinning, & Kraft, 2011; Homewood, Tweed, Cree, & Crossley, 2009; Nicholson, 1999); anxiety (Wardrop & Popaduik, 2013); or post-traumatic stress disorder following childbirth (e.g., Beck, 2004; Nicholls & Ayers, 2007). Despite focusing on different diagnostic categories, there is much overlap in findings. Beck (1992, 1993) conceptualised PND as a loss of former self and loss of control over one's life, in both phenomenological and grounded theory studies of women attending a postnatal depression support group. High anxiety was also a key part of these women's experiences. Subsequent qualitative studies have identified important experiential aspects of PND such as: a sense of loss of autonomy, time, appearance, femininity, sexuality and occupational identity and feelings of loneliness, depression and panic (Nicholson, 1999); feeling overwhelmed with their new responsibility and negative self-evaluation related to being unsure about being able to meet their baby's needs (Homewood et

al., 2009); and limited social support and breastfeeding difficulties (Haga et al., 2011). Hall (2006) interviewed 10 women who had experienced postnatal depression: they commonly described their unrealistic expectations of motherhood as a key aspect in the development of depression.

There is far less qualitative research examining experiences of postnatal anxiety. Wardrop and Papaduik (2013) interviewed six women for whom anxiety was the primary mental health concern in the first six months postpartum. A key theme for these women related to feeling misunderstood and alienated because their symptoms did not fit with the dominant concept of postnatal depression. In common with qualitative research on postnatal depression women spoke of a relationship between high expectations, perceived lack of competence as a mother and anxiety, loneliness and feeling overwhelmed. Lack of social support was also an important factor in experiences of anxiety.

In contrast, there is a substantial body of qualitative work on PTSD following childbirth. A meta-synthesis of ten qualitative studies of women's perceptions and experiences of traumatic birth identified themes of feeling out of control, feeling inhumanely treated, feeling trapped with the childbirth experience, a 'rollercoaster of emotions', disrupted relationships and finding ways of succeeding as a mother after feeling their mothering ability had been hampered by a traumatic birth (Elmir, Schmied, Wilkes, & Jackson, 2010). These qualitative studies also show the potential debilitating effect of traumatic births on breastfeeding (Beck, 2008), and the mother's relationships with the father and the baby (Nicholls & Ayers, 2007; Ayers, Eagle, & Waring, 2006).

In the research to date women were selected due to their experience of one specific type of disorder (i.e., depression, anxiety or posttraumatic stress disorder following childbirth) in line with the disorder-focus of most contemporary research. However several themes appear in qualitative reports that span anxiety, depression and postnatal post-traumatic stress disorder, particularly high expectations, feeling overwhelmed, perceived lack of competence as a mother,

lack of social support and breastfeeding. This suggests that a transdiagnostic approach to postnatal distress may be useful. Such an approach could explain high comorbidity through establishing causal factors and maintaining processes across disorders, improve screening and identification of multiple types of postnatal distress, and help develop specific treatment components effective across a broad range of mental health problems (Harvey, Watkins, Mansell, & Shafran, 2004).

Qualitative research that focuses on women's actual experiences and conceptualisations of postnatal distress outside of diagnostic categories is therefore necessary. The key research question was to determine how women themselves conceptualise their postnatal distress and there is a need for more information about what women themselves consider problematic or impairing and what help they would like with their distress. This study develops insight into the experiences of mothers who experienced postnatal distress. In contrast to previous research, the data highlight psychological processes experienced across different types of distress in the context of defining moments in becoming a mother; birth and breastfeeding.

### **3.3 Methods**

A sample of 17 women aged 23-42 took part in the study. Inclusion criteria were that women had given birth to a baby in the past year and experienced "emotional difficulties" at some point during this year. All except one woman were white and one was Chinese. Two had completed GCSE level education; six had completed A level education; five had a degree or higher degree; four had completed professional qualifications. Further characteristics of the sample are presented in Table 1. Although smaller sample sizes are often advocated in Interpretative Phenomenological Analysis (IPA) (Smith & Osborn, 2003), larger samples are common (a review of 48 studies found samples ranged from 1-35 with a mean of 14 participants; Brocki & Wearden, 2006). We acknowledge that there is often a sacrifice of depth of analysis with larger samples (Smith & Osborn, 2003). However, we also felt that because the current discourse of postnatal mental health largely focuses on postnatal depression, a larger sample size would be

required to reflect the range of other emotional difficulties experienced in the postnatal period.

The sampling strategy was opportunistic allowing the researchers to select participants on the basis of their experiential knowledge (Smith, Flowers, & Larkin, 2009). Advertisements were placed on relevant websites (e.g., local postnatal group Facebook pages), in local National Childbirth Trust (NCT) newsletters, and through instructors at relevant antenatal and postnatal classes (e.g., pregnancy yoga classes) and word of mouth.

Table 1. Characteristics of the sample

Participant no.	Age group	Age of baby at interview	Parity	Method of delivery	Referred /requested psychological services in 1 <sup>st</sup> year postpartum?	Self-reported lifetime mental health problem?
<b>1</b>	23-29	2 months	3	NVD	Yes	Yes
<b>2</b>	35-39	6 months	1	Assisted – Forceps	No	No
<b>3</b>	30-34	2 months	1	NVD	No	Yes
<b>4</b>	23-29	4 months	1	Emergency caesarean	No	No
<b>5</b>	23-29	3 months	2	NVD	No	No
<b>6</b>	30-34	6 months	1	Elective caesarean	No	No
<b>7</b>	30-34	6 months	1	Emergency caesarean	Yes	Yes
<b>8</b>	23-29	8 months	1	NVD	No	Yes
<b>9</b>	30-34	11 months	1	Emergency caesarean	No	No
<b>10</b>	23-29	8 months	3	Emergency caesarean	Yes	Yes
<b>11</b>	35-39	1 month	2	Elective caesarean	No	No
<b>12</b>	23-29	11 months	1	NVD	Yes	Yes
<b>13</b>	35-39	8 months	1	Assisted –	Yes	No

Participant no.	Age group	Age of baby at interview	Parity	Method of delivery	Referred /requested psychological services in 1 <sup>st</sup> year postpartum?	Self-reported lifetime mental health problem?
				ventouse		
<b>14</b>	35-39	12 months	2	Emergency caesarean	No	Yes
<b>15</b>	30-34	8 months	2	Elective caesarean	No	No
<b>16</b>	30-34	3 months	1	NVD	No	No
<b>17</b>	35-39	6 months	1	Emergency caesarean	Yes	No

NVD = normal vaginal delivery

All women who responded to the advertisement, met the inclusion criteria and wanted to take part were sent an information sheet, a consent form and demographics and pregnancy/birth questionnaire to complete, sign and send back should they wish to participate. All women who initially showed an interest took part; due to this sampling method there were not any women who were not included in the study. Ethical approval was obtained from the university Research Governance Committee and NCT Research Office. The information sheets, consent forms and interview questions were careful to avoid the term ‘depression’ and instead focused on ‘distress’ to be congruent with the study aims of exploring different types of emotional difficulties that women experience.

Interviews were conducted between September 2010 and February 2011, at women’s homes in the South East of England (n = 15) or via telephone when women lived in other areas of England and had heard about the study through word of mouth (n = 2). Present at the interview were (RC) and the mother participating in the interview, and in most cases her baby and / or other young children. Participants gave their consent for the interviews to be recorded and were made aware that they could stop the interview at any time without giving a reason. The interviews followed a semi-structured format whereby an interview schedule was used but the order in which questions were asked and answered could vary according to the responses of the



participant. Follow-up questions were asked and the clarification of points which arose was also sought. Participants were first asked ‘Can you tell me about when you first started to feel distressed?’ Examples of further questions included:

- ‘What thoughts and feelings did you experience?’
- ‘How did you cope with your symptoms?’
- ‘What was your experience of seeking help (if you did so) during this period?’
- ‘What was your experience of being offered help?’

Participants were further encouraged to discuss any issues that they felt were relevant to their experience of distress. Interviews ranged from 22-72 minutes (Mean = 43 minutes). Various factors may help to explain variation in interview times. In the first interviews the questions were asked in a sequential manner to ensure that the entire schedule was covered, however, it became clear that a more open and flexible strategy would produce the most rich data as it would allow participants to follow their own stories and discuss further aspects that were not covered on the interview schedule but were important in their stories of distress (e.g. breastfeeding). Beyond this, although all mothers self-selected to take part in the study, some were more willing or better able to elaborate on their experiences.

The telephone interviews followed the same process, including being recorded. It is acknowledged that they can limit the building of rapport and non-verbal communication cannot be tended to in the same way as face-to-face interviews; however they were no less rich in terms of outcome. The second telephone interview was one of the shortest interviews (25 minutes) whilst the first was 48 minutes.

### 3.3.1 Analysis

Interviews were transcribed verbatim by (RC). Participant numbers are used to ensure confidentiality. Data analysis was conducted according to the principles of interpretative

phenomenological analysis (IPA; Smith & Osborn, 2003; Brocki & Wearden, 2006; Smith, Flowers, & Larkin, 2009; Larkin, Watson, & Clifton, 2006): pre-identified themes were not used to guide analysis. This method was suitable for the purpose of the study as it aims to examine underlying cognitions and emotions as well as describe the participants' experience.

The method involved using emic (insider) and etic (interpretative, outsider) positions (Larkin, Watson, & Clifton, 2006). The analysis followed a four stage process as follows. In step (1) of the analysis, transcripts were read repeatedly to identify accounts of experiences that were important to the interviewee. The emic phenomenological position employed here concerned hearing and understanding the participant's story in their own words and keeping their experience at the centre of their account. In step (2), the etic phase, the accounts identified were re-read and pertinent sections summarized and given shorthand labels (codes) representing the researcher's interpretation. Steps (1) and (2) reflect the 'double hermeneutic' aspect of IPA whereby the participant interprets their own life experience and the researcher further interprets the participant's account. Step (3) involved a shift to identifying how these codes clustered together into themes and how themes were related to each other. Interviews were coded on a case-by-case analysis and themes labelled using key words and phrases from participants where possible to retain an idiographic approach. In step (4) comparisons were made across the body of interviews to determine how prevalent themes were and how important they were to interviewees. The authors agreed on an approach to analysis prior to commencing analysis. The first author discussed emerging themes with the second and third authors to ensure that a consistent and balanced approach was applied to all four steps described above. Self-reflexive application of these four steps meant that the authors gave priority to the interviewees' accounts rather than their own personal or professional knowledge of the experiences of pregnancy, birth, and the postnatal period. The results section provides descriptions of these themes, using verbatim quotes to illustrate these interpretations.

### 3.4 Results

Four major themes were identified: “Living with an unwelcome beginning” concerning mothers’ early days with their new baby; “Relationships within the healthcare system” speaks of mothers’ experiences with healthcare providers; “The shock of the new” relates the instant, permanent and challenging change to one’s life immediately after having a baby; and “Meeting new support needs” considers the types of needs mothers have to adapt to and satisfy. These themes will be discussed in turn using direct quotes to support them. Superordinate themes and the subthemes are presented in Table 2.

Table 2. Themes and sub-themes identified in interviews

Theme and subthemes	Percentage (n) of women who mentioned the theme
<b>Living with an unwelcome beginning</b>	<b>100% (17)</b>
Distancing and avoidance of emotions	65% (11)
Birth-related distress	65% (11)
Guilt and self-blame	59% (10)
Breastfeeding experiences	71% (12)
<b>Relationships in the healthcare system</b>	<b>100% (17)</b>
Uncared for in the healthcare system	82% (14)
Unknown in the healthcare system	59% (10)
Positive experiences	71% (12)
<b>The shock of the new</b>	<b>88% (15)</b>
Adjustment to the unknown	82% (14)
Overwhelming responsibility	47% (8)

Theme and subthemes	Percentage (n) of women who mentioned the theme
Inexperience	53% (9)
<b>Meeting new support needs</b>	<b>100% (17)</b>
Needing and seeking support	65% (11)
Action to help move on	100% (17)

### **Living with an unwelcome beginning**

Eleven mothers described their new life with their baby as starting in a way that was not as they had hoped. This theme is characterised by a sense of feeling removed, or distant, from their day-to-day life with their baby. Some mothers acknowledged this sense of distance whilst others avoided their own negative emotions. The characterisation of distress as an overarching feeling of remoteness was explained by many women in terms of negative birth experiences that women often blamed themselves for, and which they found difficult to move on from. These negative experiences were often compounded by difficulties faced in one of the central aspects of caring for a new baby; breastfeeding. Women reflected on a subsequent feeling of having lost the important new-baby stage of their own and their baby's life.

#### Distancing and avoidance of emotions

Rather than being an easily describable phenomenon, or feeling categorically unhappy or worried, there was often an underlying feeling of something not being quite right or feeling out of character and somehow detached from their own life. The sense of feeling outside of one's own head or body was described by *participant 1*, who could not pinpoint discrete emotions or feelings at first but felt an unusual sense of unease:

It is as if I was playing a part, going through the motions, so I was doing all the right things for him, playing with him, chatting to him, but not feeling like it was me or that it was very natural.

This highlights the idea that there are both 'natural' and 'right' ways of caring for a baby or of feeling about one's baby, and for this participant, that an unsatisfactory comparison with these ways is related to feelings of disconnection. For *participant 8* the feeling of detachment was more pronounced and alien:

I really just felt like I was watching myself in day-to-day life and I wasn't actually in my own body. It's quite strange.

Feelings of detachment were also embodied in experiences of bonding that were not as desired. In recounting her immediate feelings of not connecting with her baby, *participant 1* alluded to the expectation of instant and intense love that new mothers sometimes expect to feel:

As soon as she was born I didn't feel right, like I didn't have a connection with her ... I felt like it was someone else's baby I was holding, it was really weird.

Furthermore, for *participant 12*, feeling better was characterised by starting to feel a connection with her baby:

I hadn't spoken to anybody for weeks, so I was starting to ring people that week and said 'I love her [her daughter], you know I'm having a nice time, I'm going for walks' and it was just brilliant.

For some mothers, the feelings of distance were acknowledged, with a desire for those feelings to change, whilst others actively tried to avoid dealing with their feelings of distress in the hope that they would change in the near future or that keeping busy would keep them at bay. There was a sense of hope that life as a mother as it 'should be' would present itself if one was able to deal with the present unwanted feelings of distance. In describing her avoidance of emotions, *participant 1* drew on her intense desire for a happy family life:

I didn't want to admit that I had something wrong because I didn't want things to go wrong ... I thought it's like a perfect kind of thing, a perfect family, like everything could be OK, maybe next week I'll feel a bit better, but it didn't feel any better the next week.

### Birth- related distress

Whilst for some mothers the sense of an unwelcome beginning related to a general feeling of distress in their new life as a mother, for others this theme was exemplified by reference to the temporal beginning of life; an unexpected or difficult birth experience. For most, a sense of disappointment that the birth had not been as they had hoped or expected led to feelings of their new life being at fault from the outset:

[Labour and birth] was just nothing like what I'd imagined so I just felt . . . like just at a disadvantage. Like I'd been thwarted all the way through and um something was taken away from me so I felt like I couldn't really recover, to get back to square one, how I wanted to start out with this new life. (*Participant 7*)

Mothers made sense of their unmet expectations of birth in differing ways; some mothers felt unprepared, others felt that having prepared for the experience it should have been more as they would have expected. Premature, late, quick, or complex births all led to feelings of distress.

Feelings of distress around birth experiences left mothers feeling that they could not move on without some kind of resolution of the birth. Such resolution was described through needing to know fully about the birth, or being able to explore what had happened to them during birth, or through having space and sleep to 'process' what had happened, which was unlikely with a new baby to care for. In recounting her need to move on, *participant 17* stressed how she considered finding out the specifics of her experience to be the most important factor in this:

I don't know what happened when he went into the Special Care. I never managed to find out, so I'm quite keen to find out exactly what happened, and I'm hoping that will just put a lid on it to be honest, and put it to bed.

Other factors they were not so able to influence could prevent women from moving on. Reminders of lost birth experiences revived early feelings of distress and other negative emotions, as *participant 8* recounted:

I had some friends who had children around the same time who had normal births, and when I heard that they'd had their babies I felt quite jealous and angry inside that everything was OK . . . I kind of felt "Why should they have everything perfect and I shouldn't?"

### Guilt / Self-blame

Feelings of guilt about negative birth experiences were frequent, with mothers often feeling defeated through the birth not being the commonly-desired birthing without intervention. *Participant 13* expressed ambivalence about self-blame, seemingly unwilling to rationally blame herself but feeling something akin to it:

I don't know if I was blaming...I wasn't blaming myself but I still felt in some way a bit useless about it. I wanted to be the mummy who just did it all naturally and it was all gorgeous and the way it should be.

For some mothers the feelings of culpability were more explicit. Discussing birth experiences, mothers spoke of a separation between their mind and their body, blaming their body for opposing their will, and indicating the complex nature of interaction between physical and psychological control during birth and labour. Reflecting on her own experience as well as that of other mothers, *participant 16* described her feeling that her body let down both herself and her baby:

I've spoken to other new mums you know, and no matter what kind of experiences they've had, a lot of them mention the guilt word [...] I had this guilt, and probably still do a little bit that my body let me and her down because she came so early, and you kind of have this guilt that you know, you somehow have caused your baby to suffer...

### Breastfeeding experiences

All but two women who experienced birth-related distress went on to experience difficulties with breastfeeding. The perception of having no control over their birth experience led to an attempt to regain control over childbearing via breastfeeding. A determination to breastfeed was present even if women felt that it took all their time and resources to succeed at this.

Sometimes the determination to breastfeed led to women feeling that they were engaged in a fight to succeed. *Participant 5* was ‘desperate’ to breastfeed but described it as the ‘hardest thing’ she’d ‘ever had to do.’ Many women expected breastfeeding to be either something ‘amazing’ (*participant 4*) or a process that would ‘be the most natural thing in the world’ (*participant 2*); or that ‘everyone thinks it’s really easy’ (*participant 11*). There was a feeling that the mechanics of breastfeeding were explained at antenatal classes but problem-solving of breastfeeding issues was not raised. *Participant 5* explained that mothers could be better prepared for feeding difficulties:

Everyone has feeding problems . . . sometimes you feel like you’re the only one, and I think if maybe they’re more open about the problems you can face, because no one actually tells you, “Oh your baby might not feed from you”. . . then it’s not such a shock.

Breastfeeding overshadowed all other aspects of daily life with women reporting feelings of anxiety, stress and frustration about their feeding experiences. The nature of new-born babies needing frequent feeding meant that these emotions could be experienced periodically throughout the day, as *participant 4* recounted:

I had anxiety every time I fed her - she would go to sleep and I would build up this worry about what would happen when she woke up again you know, would feeding go well? How long would it take? . . . I would find myself willing her to stay asleep for as long as possible just so that I wouldn’t have to do that again.



All women reported feeling unsupported with breastfeeding by healthcare professionals and were proactive with trying to access support, trying multiple helplines and charities as well as the NHS. When accessible, advice from helplines was no replacement for practical help:

I just got the usual spiel you know, lots of skin to skin contact, and all the stuff that I knew and I remember saying to her you know “I really need practical help to tell me whether we’re doing it right” and she was like ‘well, that’s the health visitor really I’m just here to...’ and you kind of get bounced from person to person. (*Participant 4*)

*Participant 11* felt that a more proactive stance from healthcare professionals was required:

A lot of women don’t realise it’s going to be difficult or don’t realise they’re not doing it properly, I think there should be a bit more hands on help, people coming round and saying “I’m actually going to check that you’re doing it right,” without waiting for people to ask.

Some women felt that pressure to breastfeed compounded their distress. *Participant 9*, who developed acute pre-eclampsia and experienced a traumatic birth, felt shocked that health professionals would or could not suggest artificial feeding to her overtly:

One of the ward nurses came in and sat down on my bed when I was trying to feed him and said ‘you don’t, I shouldn’t be telling you this, but you don’t have to do this’ and it was such a relief, again to be authorised to not beat myself up about it.

### **Relationships in the healthcare system**

Women’s relationships with midwives, GPs and health visitors and with the processes surrounding maternity and postnatal care were at the forefront of their described experiences. Many women felt they had been mistreated or ignored. They often associated this with a lack of staff being available, and with the perceived limited staff not having sufficient time to help to the extent mothers felt necessary. Positive experiences were often in the context of developing a supportive relationship with one healthcare provider.

### Uncared for in the healthcare system

Most women spoke of feeling uncared for in the healthcare system at some point during their postnatal period. Most often, women felt that a dialogue with health professionals was missing; that they were not listened to; not asked how they were feeling or not treated as equals in decision-making. *Participant 1* felt that health professionals often did not probe sufficiently to determine whether women were distressed :

Health visitors should be as supportive as they can and *talk* more to people . . . they always seem to refer you on to somebody else, like they don't want to.

Many experiences of feeling uncared for related to a perceived lack of maternity and neonatal staff, and a perception that time-constrained staff who were available were not approachable, could only deal with major emergencies, or did not fulfil offers of help. *Participant 2* related her experience of hours waiting for help with breastfeeding her new-born:

One of the midwives said to me, “Oh don't feed your baby, we'll come in and we'll help with the breastfeeding”, and like five, six hours later, I'm thinking “Well I've got to feed my baby, where are you?”

Once home, women similarly felt that health visitors were often in a rush and did not have time to talk about mothers' emotions, or did not have sufficient time to assess breastfeeding efficacy. Almost half of the sample perceived that the hospital where they gave birth had made direct errors contributing to their feelings of being uncared for and disrespected. These errors varied greatly, but examples included: being unable to access food or medication whilst catheterised, being sent home before breastfeeding was established or without telling mothers what happened during their labour and birth when complications arose, feeding a baby artificial milk without the mother's knowledge, not changing blood-stained sheets, being put on inappropriate hospital wards, stitches not being checked resulting in subsequent infections, and, mainly, not being listened to or feeling that staff were unsupportive, as *participant 7* recalled:

The way that I was being talked to during my labour it just made me feel like I didn't know what I was doing and I should just put it in their hands.

#### Unknown in the healthcare system

Beyond feeling directly or indirectly uncared for, many women felt anonymous within the healthcare system. This was characterised by feeling that they did not have one point of contact or one healthcare professional who knew them, their baby and their situation. Women described a 'tick box' approach to women's postnatal wellbeing. This did not facilitate building a relationship within which they could disclose distress. *Participant 1* felt that her depression was not taken seriously at first:

I think the doctors should be more like . . . 'cause he just said "Oh you need to talk to the health visitor," he didn't seem that interested.

Furthermore, women felt uninformed about sources of support that they could access, and felt that health professionals could do more to link women to local support networks. Consequently there was a sense that mothers could only get support if they were proactive enough to research and access it themselves:

I didn't think that the care was there easily. I mean there's a lot of care there if you ask for it, but it isn't easily accessible. (*Participant 12*)

#### Positive experiences

Women did also describe times where they had felt supported within the healthcare system. Almost always this was in the context of having formed a close empathic relationship with one healthcare professional (GP, midwife, health visitor or lactation consultant) within which women felt they could discuss their feelings without being hurried. *Participant 14* commented:

My GP was just, he was understanding, he's got kids of his own and kids that are quite close together in age and he was telling me about his family, he was very compassionate, understanding, I didn't feel rushed, um it was, I just got more empathy.

In almost all cases, women experienced these positive relationships through sharing of experiences on the health professional's part, as *participant 16* recalled after her baby was born prematurely:

There was one particularly great nurse who took good care of the mums . . .but she'd had a premature baby herself, she'd had a baby I think at 33 weeks, the same as [baby] and she really knew what to say to the mums and what to do for the mums, and how to be there for them and to, was really nurturing and really looked after us.

Understanding and unrushed healthcare professionals were viewed as a great help when navigating the new and immediate challenges of motherhood. The immediacy of the challenge is discussed in the next section.

### **The shock of the new: diving into motherhood**

The term 'transition' to motherhood has purposefully been avoided here as women's reports throughout the interviews were not of transition but more a sudden and challenging change to their life. From being self-sufficient and independent throughout life, many mothers felt vulnerable and dependent for the first time whilst having to learn to manage with a new baby.

#### Adjustment to the unknown

A conflict often existed for women, who felt on the one hand that the emotions they were experiencing were 'normal' parts of the role of a new mother and were to be expected, yet on the other hand they felt distressed. *Participant 10* had given birth to her third child, but still found it difficult to decide if her distress was 'normal':

I was burning myself out by trying to do everything on my own and post-caesarean. Um so it was just really difficult but I kind of didn't think I had a problem it was kind of like new mums do this all the time and get on with it.

For first time mothers, the lack of a point of reference made it difficult to decide whether feelings of distress were normal, particularly when mothers felt they needed to disentangle

tiredness, hormonal changes or feelings of trauma from birth. Sometimes mothers needed to talk to other new or experienced mothers or to a health visitor to decide if they should take some action about their distress. If distress was not encountered as a constant feeling, it could be difficult to decide if action needed to be taken, as *participant 6* described:

It takes quite a while to work out that you do have a problem um and to work out what it is. . . I've been . . . Points of terrifying thoughts of having postnatal depression and um then other periods of, you know, thinking I'm absolutely fine.

There was an expectation that life with a baby would be difficult at first but would get easier. Women spoke of the impact of sleep deprivation on their well-being and the sense of eagerly awaiting their baby to sleep for longer stretches so that they could feel better emotionally, as *participant 16* recalled:

Now she's starting to sleep a little bit more of a stretch of sleep at night ...you have more of a normal existence rather than this thing where you're up all night watching the hours tick by until it's morning again but you've not slept and you just, yeah, you just live in a weird world for a while.

#### Overwhelming responsibility

Many women spoke about feeling overwhelmed once their baby was born. Being the responsible adult with total care for their baby left mothers feeling overpowered by a new person that they did not yet know and who demanded so much of them. Sometimes this led to a feeling of wanting to pass the baby over or walk away from their situation, as *participant 16* described:

That's what makes having a baby hard, is that it's not something you can give back or to say I've had enough of doing this now, it's not working out, someone else can take over, so um yeah I guess maybe there was the occasional thought of yeah it would be nice to get dressed and walk out the front door and just go out for the day and not ever, or that day think about having a baby.

### Inexperience

Feeling overwhelmed and uncertain was often put in the context of a lack of experience with babies. The new-born period and its challenges were something that was previously inaccessible and that women were not prepared for, having focused on positive aspects throughout their pregnancy. Women tended to feel that being pregnant should have prepared them for being a mother, although *participant 14* described how this was not the real picture:

The whole range of things that are suddenly thrust upon you that you should know, you should know when they need a feed, you should know when they're thirsty, you *should* know but you don't, they're not born with a manual and it's only through experience and advice that's passed on...but yet you think 'I should know, you know, I've carried them, they're mine, I should know what to do.'

Even when women had supportive partners and families, inevitably there came a point when mothers would be at home on their own with the baby. This was a significant time-point for *participant 10*, who highlighted the scary nature of a perceived disconnection between advice about, and reality of, caring for a baby:

You can read as many books as you want but when you get that baby home and you're kind of on your own you're like "Right. OK. What do I do now?" Then all the visitors go away and everyone goes back to work and you know then two, three weeks later it's just you and this baby. It's very, very scary.

### **Meeting new support needs**

Women spoke of an increased need for emotional and practical support from partners and close family, as well as a desire to share experiences with others in similar situations.

### Needing and seeking support

Often the relationship women had with their partners was the closest they had and was the only one in which they could disclose everything they were feeling. With the partner usually at work

for a large part of the day, there was a build-up of need to talk through how the day with the baby had been, but which had to wait until the partner returned. Women recognised the pressure placed on their partners from working and now supporting them at home with the baby as *participant 7* described:

[Husband]'s having to work really long hours to support us but also coming home and I haven't been able to do housework . . . he's just had to have this massive emotional resource for me, and have [baby] and sort the flat out and do all the work so that's been really affected.

Partners often suggested, encouraged or facilitated accessing additional support. However, even with the most supportive partner, it was sometimes felt that partners simply could not understand what mothers had been through during birth and in looking after the baby all day.

Thus, many women spoke about the importance of accessing support and help outside their relationship with their partner. Whilst it was acknowledged that sometimes professional help was necessary, as a first step there was a sense that mothers had to ensure they got out and met supportive peers. Trying hard to talk to people, to find out what was wrong, and to admit that there was a problem were all considered imperative, if difficult. For example, *participant 10* spoke of a need to persevere with going to postnatal groups to find one that would suit the mother and be source of support:

I think with all new mums, if there's support there take it. You know it's very hard to be sort of, you're 'I'm a new mum, I'm going to do it all on my own' but there will come points where being on your own is very, very isolating, very lonely, um, get out there, go to one or two groups you know, you're not going to know if they're for you unless you go.

Nonetheless, it was recognised that seeking support was difficult. Women often did not feel like talking when they were feeling particularly distressed. Similarly, admitting to a problem felt like a compromise of their independence and ability to cope. However, when feelings of distress

lessened, it was easy to convince oneself that there was not a problem, sometimes resulting in family or close friends demanding that women sought help. Even if women did want to access help, sometimes they felt that their problems were not serious enough to warrant ‘bothering’ health professionals, as *participant 11* recalled when trying to find help with breastfeeding:

The midwives all said ‘Call if you have any problems’ and they did leave a number, but you feel like you’re bothering them, you know, really busy hospital department with people having babies, you don’t really feel like you can phone up and say well I’m having a few problems with breastfeeding.

#### Action to help move on

When talking about improvements in how they were feeling, most often women brought up how helpful they had found talking on a one-to-one basis. *Participant 1* felt that if talking did not directly affect the symptoms of distress, social support was appreciated:

Once people realise that I do have, might possibly have, postnatal depression then I’ve started to feel better because they were talking to me, because they were concerned. I didn’t feel better but I had more people to talk to about it.

Some mothers felt more comfortable discussing distress on a one-to-one basis before being comfortable in groups, but many women found that discussing experiences with others in a similar situation was invaluable, ‘to feel like you’re not the only one who’s completely mad having a baby’ (*participant 5*). Groups did not need to be highly-structured or run by health professionals but just needed to include other new mothers, as *participant 2* described:

You also feel like you’re the only one that’s ever had all these problems, then you sit in a group with ten people all having the same problems as you breastfeeding and you think ‘oh’ that it’s not me, you know, it’s not me, it’s not because I’m a bad mum, it’s because that’s life. So that was definitely a help.



However, some mothers felt that they had not found the appropriate place to discuss their feelings. *Participant 6* felt that it would be ‘helpful to be put in touch with other mums in a more similar position’ and *Participant 4* related how she wanted, but felt unable, to discuss her birth experience at a local postnatal group:

The parenting class I went to in [village], everyone had relatively good births, so you kind of feel like the black sheep walking in saying mine was really horrible and I hated it and etcetera etcetera because you feel like a bit of a black cloud to everybody else.

Many mothers felt that beyond talking, the experience of ‘purely getting out of the house’ (*participant 14*) and changing surroundings was important for alleviating distress. *Participant 6* described how vital it was for her to leave the house once a day:

The best thing I did was have a plan for getting out the house every day. That was literally my survival plan so, and it really did work . . . at least you’re out and you don’t feel quite as wracked.

#### Parity, birth trauma and previous mental health

It is acknowledged that factors such as parity, mother’s age, previous mental health condition, lower education and traumatic birth are significant predictors of postnatal distress. It was not our intention however to try and explain the reasons for women’s postnatal distress in terms of socio-demographic or maternal factors. Rather, we attempt to illustrate how mothers themselves come to interpret, understand and make sense of their lived experience of distress. Having said that, some interesting patterns emerged within the sample, each of which is described below

#### *Parity*

As noted above, six mothers in the sample (35%) had given birth to a second or subsequent baby (pp. 1, 5, 10, 11, 14, 15). Half of the multiparous mothers reported birth-event related distress (10, 11, 15) compared with 8 of 11 (73%) primiparous women. Although multiparous mothers appeared to be less likely than primiparous to report breastfeeding issues (3 of 6

multiparous compared with 9 of 11 primiparous), it is notable that half of the mothers with more than one baby still reported breastfeeding issues. Multiparous mothers appeared less likely to report feelings of detachment or distancing (2 of 6 multiparous compared with 9 of 11 primiparous). Whereas 7 of the 11 primiparous mothers reported feeling stuck or unable to move on, none of the multiparous mothers did. All except one mother with more than one baby (and all primiparas) were represented by the theme 'The shock of the new'. All multiparous mothers reported positive experiences of the healthcare system (as opposed to 6/11 primiparas), but all women (regardless of parity) reported feeling uncared for *or* anonymous. More multiparous (4 of 6) than primiparous women (5 of 11) were represented in the theme 'Inexperience,' which suggests that it is important to consider not only experience with a first child, but also with multiple children. All multiparous women who had a partner spoke of increased need of support from them, compared with 4 of the 11 primiparous women. However, only one multiparous woman described new support needs (compared with 8 of 11 primiparous women). Thus, it appears that in our sample, multiparous and primiparous women comparably endorsed themes, even where it may be expected that one group (primiparas) would endorse a theme such as 'Inexperience' more.

#### *Traumatic vs not traumatic birth*

Eleven mothers (65%) experienced distress related to the labour and birthing experience (pp. 2, 4, 7, 8, 9, 10, 11, 13, 15, 16, 17). Nine of these eleven mothers (82%) spoke of feeling guilty and of blaming themselves, whereas such feelings were reported by only one of the six women who did not experience a traumatic birth. Women who experienced a traumatic birth appeared to have more negative post-natal experiences, they were more likely to speak of feeling distant and detached from their life with their baby (8 of 11 compared with 3 of 6), and more likely to experience difficulties with breastfeeding (9 of 11 compared with 3 of 6). Women who experienced a traumatic birth were more likely to speak of feeling uncared for by the healthcare system (10 of 11 compared with 4 of 6), but a majority in each group spoke of positive experiences of the healthcare system (7 of 11 and 5 of 6). Similar proportions of women who

did (6 of 11) and did not experience traumatic births (2 of 6) reported feeling overwhelmed by the responsibility of motherhood, and both groups reported similar support needs.

#### *Previous mental health issue*

In our sample, seven mothers (41%) disclosed a previous mental health issue (pp. 1, 3, 7, 8, 10, 12, 14). On almost all themes, similar proportions of women with and without a previous mental health issue endorsed each theme. For example, five of the seven (71%) women with a previous mental health issue (compared with 6 of 10 other women) described feelings of distance and detachment from their new life with their baby, and four of the 7 women with a previous issue (compared with 5 of 10 other women) described an increased need of support from their partner. However, it is notable that only one of the seven (14%) women with a previous mental health issue spoke of the overwhelming responsibility of motherhood, whereas 7 of 10 (70%) women without a previous issue reported this.

### **3.5 Discussion**

This study explored experiences of postnatal distress phenomenologically by giving priority to the accounts of women interviewed, outside of diagnosed disorders. The results showed the importance to mothers of multiple factors in their experience of becoming distressed and their journey to feeling better. This discussion focuses on three insightful ways in which women explained their distress. First, through temporal points in the process of becoming a mother; distress around birth experiences and establishing and maintaining breastfeeding. Second, through the psychological processes that characterised and maintained distress states, such as feeling overwhelmed, guilt, avoidance and distancing. Third, the importance to mothers of postnatal support: their old, new and changing relationships, for example with healthcare professionals, partners, and other mothers.

### The process of becoming a mother

This study demonstrates the importance of the birth experience to mothers' subsequent mental health. Birth factors mentioned were largely consistent with previous research which has shown, for example, that low perceived control is associated with low satisfaction with birth, postnatal depression and perceiving the birth as traumatic (Slade, MacPherson, Hume, & Maresh, 1993; Goodman, Mackay, & Tavakoli, 2004; Soet, Brack, & Dilorio, 2003). Furthermore, women in this study corroborated the importance of health-practitioner support in maternal satisfaction with birth, and possibly depression (Scott, Klaus, & Klaus, 1999; Zhang, Bernasko, Leybovich, Fahs, & Hatch, 1996). Quality and continuity of care were also perceived by all participants to be key in their experience of distress around the birth and the early days of caring for their new babies. This is consistent with previous research (Nicholls & Ayers, 2007; Czarnocka & Slade, 2000; Beake, Rose, Bick, Weavers & Wray, 2010). This study suggests that research into postnatal distress would benefit from including a measure of how well-supported mothers feel by healthcare professionals, with the aim of understanding the relationship between support during childbirth and multiple types of postnatal distress, beyond PTSD, and in informing development of postnatal care.

Breastfeeding rates in the UK are around the lowest of developed countries (81% breastfeed at least once, but only 42% breastfeed for at least 6 months; McAndrew et al, 2012). The women in this study wanted to breastfeed but often felt that they had to battle to establish and maintain breastfeeding alone due to the lack of time and lack of practical assistance afforded to helping them in this area by healthcare professionals. Women's views of having limited support for breastfeeding is consistent with previous research showing that breastfeeding women's needs for information, practical and emotional support are often unmet due to a lack of health practitioner time and no established relationship with women in need of support (Beake, McCourt, & Bick, 2005; Dykes, 2005). Women did not experience a lack of services to assist with breastfeeding but were frustrated at the lack of clarity over which service would provide the help needed. This fits with the national picture that women in the UK felt less supported

with breastfeeding in 2010 than they did in 2005, possibly due to a reduction in the number of health visitors (McAndrew et al., 2012). Of particular importance to women in this study was the all-encompassing nature of feeding problems. With new-born feeding being faced every few hours, the emotions and challenges are compounded perhaps explaining the definite causal stressor status women attributed to it. It is likely that interventions aimed at resolving breastfeeding difficulties, which could be delivered through primary care, could also resolve emotional difficulties in the mother, as has been the case with other infant-care issues (Hiscock, Bayer, Hampton, Ukoumunne, & Wade, 2008).

### Psychological processes

Feelings of being overwhelmed, inexperienced and unsure about their ability to be competent mothers are consistent with previous qualitative research of postnatal depression, anxiety, and posttraumatic stress disorder. A sense of feeling overwhelmed after a traumatic birth merged into feeling a lack of competence at mothering for some women in this study, feelings of guilt, and a struggle to find ways of taking back the mothering role. In this study, breastfeeding was discussed as a way of re-asserting the mother role, a finding observed in other studies (Elmir et al., 2010). This suggests that breastfeeding could act as a moderator between traumatic birth experience and subsequent distress states. Outside of the traumatic birth literature, a perceived lack of competence in the mothering role contributed to feelings of anxiety, feeling overwhelmed, loneliness (Wardrop & Popadiuk, 2013) and depressive symptoms (Haga et al., 2011). Therefore, further research may show that building self-confidence in domains of motherhood could be a valid target for interventions to reduce postnatal distress across disorders.

Mothers' experiences of avoidance and distancing are also worth further investigation. In a review of coping strategies and maternal well-being, researchers concluded that avoiding focusing on the problematic situation (distancing) is associated with higher odds of developing postnatal depressive symptoms (Razurel, Kaiser, Sellenet, & Epiney, 2013). Avoidance also

comprises one of the symptom clusters of PTSD. Mothers in the present study reported avoidance of emotions, thoughts, breastfeeding and of seeking help. Outside the perinatal literature, there is evidence that overt avoidance behaviour is a transdiagnostic process for which behavioural activation (replacing patterns of avoidance with adaptive patterns) has been an effective treatment (Harvey et al., 2004).

### Social Support

Researchers have consistently shown that poor communication with healthcare staff and perceived unhelpful staff attitudes are detrimental to new mothers (Beake, Rose, Bick, Weavers, & Wray, 2010; Brown, Davey, & Bruinsma, 2005; Rudman & Waldenstrom, 2007; Bhavnani & Newburn, 2010). The women in this study largely corroborated the negative effect on their wellbeing of feeling ignored, uncared for, or poorly communicated with during birth, the postnatal hospital stay, postnatal home-care and concerning breastfeeding. Conversely, women in this study described a positive effect of the presence of healthcare staff who were parents themselves, who were experienced in the challenges of motherhood and who were able to provide high levels of empathy. This supports previous research showing that feeling ‘mothered’, cared for and listened to helps new mothers to feel confident and well-recovered from birth (Dykes, 2005; Smythe, Payne, Wilson, & Wynard, 2013). Regarding in-patient care, Brown et al. (2005) found that the sensitivity and understanding in interactions with caregivers had the greatest effect on women’s ratings of care. The findings of this study confirm that listening and communicating skills of postnatal staff are an important area for development (Beake et al., 2010). The well-voiced view that postnatal services were understaffed and the staff working were perceived as too busy was also apparent for women in this study (Beake et al., 2012). A key issue in perceptions of care is how individual healthcare providers interact with and listen to women (Beake et al., 2010; Dykes, 2005]. In line with research showing that multiple psychological approaches to intervention can be beneficial to a mother’s mental health (e.g., for PTSD (Meades, Pond, Ayers & Warren, 2011); for postnatal depression (Milgrom, Negri, Gemmill, McNeil, & Martin, 2005)) it may be that training in listening and counselling

skills combined with time to practise these skills with new mothers may be enough to reduce levels of distress.

Social support from a partner is well-documented as being a protective factor against depressive symptoms (Razurel et al., 2013). Women in this study spoke of increased demands on their partner but felt that these were largely met and that support was lacking in other areas, primarily from health professionals. Furthermore, the voiced need of mothers to connect with and speak to others in a similar situation was universal. Peer support has led to fewer depressive symptoms in high-risk mothers and this type of support may be useful across different types of distress (Dennis et al., 2009).

#### Parity, birth trauma and previous mental health

Clear differences between multiparous and primiparous women were not seen in experiences of distress in this sample. This largely reflects the picture from quantitative studies which shows that the relationship between parity and postnatal distress is unclear. In a sample of 5252 Danish mothers of whom 5.5% were depressed at 4 months postpartum, previous psychiatric illness and high parity were important risk factors for developing postnatal depression (Forman, Videbech, Hedegaard, Salvig, & Secher, 2000), whereas in 944 Swiss mothers experiencing distress in the early postpartum days, primiparity was a risk factor for maternal distress (Staehelin, Kurth, Schindler, Schmid, & Zemp Stutz, 2013).

Concerning birth trauma, it is estimated that up to 30% of women experience subclinical debilitating symptoms of posttraumatic stress disorder after birth (Ayers & Pickering, 2001; 55]. Although our study was not diagnostic in nature, many mothers reported feeling debilitated by their birth experience. There is also evidence that anxiety and symptoms of posttraumatic stress following childbirth are strong predictors of postnatal depression (Heron et al., 2004; Beck, Gable, Sakala, Declercq, 2011).

Previous psychiatric illness is a risk factor for postnatal distress that has been confirmed in multiple large cohort studies (Forman et al., 2000; Heron et al., 2004) and seven mothers in our

sample disclosed a previous mental health issue. However, this group's experience of distress did not qualitatively differ in our sample. Further longitudinal qualitative research to examine the experiences of women who are not distressed antenatally and follow them into the postpartum period would help to address this question.

### Limitations

We do not claim that these findings apply to all mothers who have experienced postnatal distress. The sample was self-selected and it is probable that participants were motivated to talk about their experiences and take action. The women who took part were mostly white, well-educated, employed before having their baby, and in long-term relationships. Further exploration with women of different ethnicities, relationship statuses, and ages would be beneficial to expand on and compare with the findings in our study. It could be considered that using a broad definition of distress ('any emotional difficulties') could lead to inclusion of women with normal levels of adjustment difficulties that would dissipate over time. However, all the women in this study experienced distress that they felt they needed extra support with, regardless of diagnosis.

### Conclusions

This study has addressed two important issues that need to be explored in order to improve understanding of postnatal distress. The first is how women experience and make sense of their distress. Women clearly explained their emotional difficulties as relating to both key temporal points in the process of becoming a mother (particularly childbirth and breastfeeding) and in terms of psychological processes across different types of distress (particularly feelings of detachment, avoidance, guilt and social comparison). The second issue concerns the aspects of distress mothers felt they needed help with and how they experienced that help. Breastfeeding again emerged as a key area with which women felt they needed support with but which was not easily available. Mothers also felt that they needed support with resolving feelings around traumatic births. A desire to validate and normalise feelings through talking both in groups and



on a one-to-one basis with healthcare providers such as midwives or health visitors was universal.

### 3.6 References

- Ayers, S., Eagle, A., & Waring, H. (2006). The effects of childbirth-related post-traumatic stress disorder on women and their relationships: A qualitative study. *Psychology, Health and Medicine, 11*(4), 389-398. doi:10.1080/13548500600708409
- Ayers, S., & Pickering, A. (2001) Do women get posttraumatic stress disorder as a result of childbirth? A prospective study of incidence. *Birth, 2*, 111-118.
- Beake, S., McCourt, C., & Bick, D. (2005). Women's views of hospital and community-based postnatal care; the good, the bad, and the indifferent. *Evidence Based Midwifery, 3*, 69-72. Retrieved from: <http://www.rcm.org.uk/ebm/ebm-2005/>
- Beake, S., Rose, V., Bick, D., Weavers, A., & Wray, J. (2010). A qualitative study of the experiences and expectations of women receiving in-patient postnatal care in one English maternity unit. *BMC Pregnancy and Childbirth, 10*, article no.70. doi:10.1186/1471-2393-10-70.
- Beck, C.T. (2008). Impact of birth trauma on breastfeeding: A tale of two pathways. *Nursing Research, 57*(4), 228-236. doi: 10.1097/01.NNR.0000313494.87282.90
- Beck, C.T. (2004). Birth trauma: In the eye of the beholder. *Nursing Research, 53*(1), 28-35. Retrieved from:

[http://journals.lww.com/nursingresearchonline/Abstract/2004/01000/Birth\\_Trauma\\_\\_In\\_the\\_Eye\\_of\\_the\\_Beholder.5.aspx](http://journals.lww.com/nursingresearchonline/Abstract/2004/01000/Birth_Trauma__In_the_Eye_of_the_Beholder.5.aspx)

Beck, C.T. (1993). Teetering on the edge: a substantive theory of postpartum depression.

*Nursing Research*, 42(1), 42-48. doi: 10.1097/00006199-199301000-00008

Beck, C.T. (1992). The lived experience of postpartum depression: a phenomenological study.

*Nursing Research*, 41(3), 166-170. doi: 10.1097/00006199-199205000-0000818.

Beck, C.T., Gable, R.K., Sakala, C., Declercq, E. (2011). Postpartum depressive

symptomatology: Results from a two-stage US national survey. *Journal of Midwifery and Women's Health*, 427-435, doi: 10.1111/j.1542-2011.2011.00090.x

Bhavnani, V., & Newburn, M. (2010). *Left to your own devices: The postnatal care experiences of 1260 first-time mothers*. The National Childbirth Trust: London.

Brocki, J.M., Wearden, A.J. (2006). A critical evaluation of the use of interpretative

phenomenological analysis (IPA) in health psychology. *Psychology and Health*, 21, 87-108. doi: 10.1080/14768320500230185.

Brown, S.J., Davey, M.A., & Bruinsma, F.J. (2005). Women's views and experiences of

postnatal hospital care in the Victorian Survey of Recent Mothers 2000. *Midwifery*, 21, 109-126. doi: 10.1016/j.midw.2004.09.006

Czarnocka, J., & Slade, P. (2000). Prevalence and predictors of post-traumatic stress symptoms

following childbirth. *British Journal of Clinical Psychology*, 39, 35-51. doi: 10.1348/014466500163095

Dennis, C.L., Hodnett, E., Kenton, L., Weston, J., Zupancic, J., Stewart, D.E., & Kiss, A.

(2009). Effect of peer support on prevention of postnatal depression among high risk women: Multisite randomized controlled trial. *BMJ (Online)*, 338 (7689), 280-283. doi:10.1136/bmj.a3064

Dykes, F. (2005). A critical ethnographic study of encounters between midwives and

breastfeeding women in postnatal wards in England. *Midwifery*, 21, 241-252. doi: 10.1016/j.midw.2004.12.006

Elmir, R., Schmied, V., Wilkes, L., & Jackson, D. (2010) Women's perceptions and experiences

of a traumatic birth: a meta-ethnography. *Journal of Advanced Nursing*. 66(10), 2142–2153. doi:10.1111/j.1365-2648.2010.05391.x

Forman, D.N., Videbech, P., Hedegaard, M., Salvig, J.D, Secher, N.J. (2000). Postpartum

depression: Identification of women at risk. *British Journal of Obstetrics and Gynaecology*, 107, 1210-1217.

Glasheen, C., Richardson, G.A., & Fabio, A. (2010). A systematic review of the effects of

postnatal maternal anxiety on children. *Archives of Women's Mental Health*. 13, 61-74. doi:10.1007/s00737-009-0109-y

Goldberg, D.P. (1972) *The Detection of Psychiatric Illness by Questionnaire*. Oxford: Oxford University Press.

Goodman, P., Mackay, M., & Tavakoli, A. 2004. Factors related to childbirth satisfaction.

*Journal of Advanced Nursing*, 46: 212–219. doi:10.1111/j.1365-2648.2003.02981.x

- Haga, S.M., Lynne, A., Slinning, K., & Kraft, P. (2011). A qualitative study of depressive symptoms and well-being among first-time mothers. *Scandinavian Journal of Caring Sciences*. 26, 458-466. doi:10.1111/j.1471-6712.2011.00950.x
- Hall, P. (2006). Mothers' Experiences of postnatal depression: An interpretative phenomenological analysis. *Community Practitioner: the Journal of the Community Practitioners' and Health Visitors' Association*, 79(8), 256-260
- Harvey, A.G., Watkins, E., Mansell, W., & Shafran, R. (2004). *Cognitive behavioural processes across psychological disorders: A transdiagnostic approach to research and treatment*. Oxford: Oxford University Press.
- Heron, J., O'Connor, T.G., Evans, J., Golding, J., Glover, V., & ALSPAC Team. (2004). The course of anxiety and depression through pregnancy and the postpartum in a community sample. *Journal of Affective Disorders*. 80, 65-73. doi:10.1016/j.jad.2003.08.004
- Hiscock, H., Bayer, J.K., Hampton, A., Ukoumunne, O.C., & Wade, M. (2008). Long-term mother and child mental-health effects of a population-based infant sleep intervention: Cluster-randomized, controlled trial. *Pediatrics*, 122 (3), e621-e627. doi:10.1542/peds.2007-3783
- Homewood, E., Tweed, A., Cree, M., & Crossley, J. (2009) Becoming Occluded: The Transition to Motherhood of Women with Postnatal Depression. *Qualitative Research in Psychology*, 6(4), 313-329. doi:10.1080/14780880802473860
- Larkin, M., Watts, S., Clifton, E. (2006). Giving voice and making sense in interpretative phenomenological analysis. *Qualitative Research in Psychology*, 3(2), 102-120. doi:10.1191/1478088706qp062oa

McAndrew, F., Thompson, J., Fellows, L., Large, A., Speed, M., & Renfrew, M.J. (2012).

*Infant Feeding Survey 2010*. London: Health and Social Care Information Centre.

Matthey, S. (2010) Are we overpathologising motherhood? *Journal of Affective Disorders*, 120, 263-266. doi:10.1016/j.jad.2009.05.004

Matthey, S., Barnett, B., Howie, P., & Kavanagh, D.J. (2003). Diagnosing postpartum depression in mothers and fathers: whatever happened to anxiety? *Journal of Affective Disorders*, 74, 139-147. doi:10.1016/S0165-0327(02)00012-5

Mazure, C. M., Keita, G. P., & Blehar, M. C. (2002). *Summit on women and depression: Proceedings and recommendations*. Washington, DC: American Psychological Association. Retrieved from <http://www.apa.org/pi/women/programs/depression/summit-2002.pdf>

Meades, R., Pond, C., Ayers, S., & Warren, F. (2011). Postnatal debriefing: Have we thrown the baby out with the bathwater? *Behaviour Research and Therapy*, 49, 367-372. doi:10.1016/j.brat.2011.03.002

Meades, R., & Ayers, S. (2010). Anxiety measures validated in perinatal populations: A systematic review. *Journal of Affective Disorders*, 133 (1-2), 1-15. doi:10.1016/j.jad.2010.10.009

Milgrom, J., Negri, L.M., Gemmill, A.W., McNeil, M., & Martin, P.R. (2005). A randomized controlled trial of psychological interventions for postnatal depression. *British Journal of Clinical Psychology*, 44 (4), 529-542. doi:10.1348/014466505X34200

- Navarro, P., Ascaso, C., Garcia-Esteve, L., Aquado, J., Torres, A., & Martin-Santos, R., (2007).  
Postnatal psychiatric morbidity: a validation study of the GHQ- 12 and the EPDS as  
screening tools. *General Hospital Psychiatry*, 29, 1–7.  
doi:10.1016/j.genhosppsych.2006.10.004
- Nicholls, K., & Ayers, S. (2007). Childbirth-related post-traumatic stress disorder in couples: A  
qualitative study. *British Journal of Health Psychology*, 12, 491-509.  
doi:10.1348/135910706X120627
- Nicol-Harper, R., Harvey, A.G., & Stein, A. (2007). Interactions between mothers and infants:  
Impact of maternal anxiety. *Infant Behaviour and Development*, 30(1), 161-167.  
doi:10.1016/j.infbeh.2006.08.005
- Nicolson, P. (1999). Loss, happiness and postpartum depression: the ultimate paradox.  
*Canadian Psychology*. 40,162-78. doi:10.1037/h0086834
- O'Hara, M.W., & McCabe, J.E. (2013). Postpartum depression: Current status and future  
directions. *Annual Review of Clinical Psychology*. 9, 370-407. doi:10.1146/annurev-  
clinpsy-050212-185612
- Phillips, J., Sharpe, L., Matthey, S., & Charles, M. (2009). Maternally focussed worry. *Archives  
of Women's Mental Health*. 12, 409-418. doi:10.1007/s00737-009-0091-4.
- Razurel, C., Kaiser, B., Sellenet, C., & Epiney, M. (2013). Relation between perceived stress,  
social support, and coping strategies and maternal well-being: A review of the literature.  
*Women and Health*, 53, 74-99. doi:10.1080/03630242.2012.732681

- Ross, L.E., Gilbert Evans, S.E., Sellers, E.M., & Romach, M.K. (2003). Measurement issues in postpartum depression part 1: Anxiety as a feature of postpartum depression. *Archives of Women's Mental Health*, 6, 51-57. doi:10.1007/s00737-002-0155-1
- Ross, L.E., & McLean, L.M. (2006). Anxiety disorders during pregnancy and the postpartum period: A systematic review. *Journal of Clinical Psychiatry*. 67, 1285-1298. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/16965210>
- Rudman, A., & Waldenstrom, U. (2007). Critical views on postpartum care expressed by new mothers. *BMC Health Services Research*, 7, 178. doi:10.1186/1472-6963-7-178.
- Scott, K.D., Klaus, P.H., & Klaus, M.H. (1999). The obstetrical and postpartum benefits of continuous support during childbirth. *Journal of Women's Health and Gender-based Medicine*, 8, 1257–1264. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/10643833>
- Slade, P., MacPherson, S., Hume, A., & Maresh, M. (1993). Expectations, experiences and satisfaction with labour. *British Journal of Clinical Psychology*, 32, 469–483. doi:10.1111/j.2044-8260.1993.tb01083.x
- Smith, J.A., Flowers, P., & Larkin, M. (2009) *Interpretative Phenomenological Analysis: Theory, method and research*. London: Sage.
- Smith, J.A., Osborn, M. (2003) Interpretative Phenomenological Analysis. In: Smith JA (ed.) *Qualitative Psychology: A practical guide to research methods*. London: Sage.
- Smythe, E.A., Payne, D., Wilson, S., Wynard, S. (2013). The dwelling space of postnatal care. *Women and Birth*, 26, 110-113 [doi:10.1016/j.wombi.2012.05.001]

- Soet, J., Brack, G., & Dilorio, C. (2003). Prevalence and predictors of women's experience of psychological trauma during childbirth. *Birth*, 30, 36–46. doi:10.1046/j.1523-536X.2003.00215.x
- Staehelin, K., Kurth, E., Schindler, C., Schmid, M., Zemp Stutz, E. (2013). Predictors of early postpartum mental distress in mothers with midwifery home care – results from a nested case-control study. *Swiss Medical Weekly*, 143 w13862, doi: 10.4414/smw.2013.13862
- Verreault, N., Da Costa, D., Marchand, A., Ireland, K., Banack, H., Dritsa, M., & Khalifé, S. (2012). PTSD following childbirth: A prospective study of incidence and risk factors in Canadian women. *Journal of Psychosomatic Research*, 73(4), 257-263. doi:10.1016/j.psychores.2012.07.010
- Wardrop, A.A., & Popaduik, N.E. (2013). Women's experiences with postpartum anxiety: Expectations, relationships and sociocultural influences. *The Qualitative Report*, 18(6), 1-24. Retrieved from <http://www.nova.edu/ssss/QR/QR18/wardrop6.pdf>
- Wenzel, A., Haugen, E.N., Jackson, L.C., & Brendle, J.R. (2005). Anxiety symptoms and disorders at eight weeks postpartum. *Journal of Anxiety Disorders*. 19, 295-311. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/15686858>
- Zhang, J., Bernasko, J.W., Leybovich, E., Fahs, M., Hatch, M.C. (1996). Continuous labour support from labour attendant for primiparous women: A meta-analysis. *Obstetrics and Gynaecology*, 88(2), 739-744. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/8841285>



## 4 Not identifying with postnatal depression: A qualitative study of women's postnatal symptoms of distress and need for support

Coates, R., de Visser, R., Ayers, S. (2015). Not identifying with postnatal depression: a qualitative study of women's postnatal symptoms of distress and need for support. *Journal of Psychosomatic Obstetrics and Gynecology*, 36(3):114-21. doi: 10.3109/0167482X.2015.1059418

### 4.1 Abstract

**Introduction:** Diagnoses and symptoms of postnatal mental health problems are associated with adverse outcomes for women and their families. Current classification and assessment of postnatal mental health problems may not adequately address the range or combination of emotional distress experienced by mothers. This study aims to explore symptoms of mental health problems reported by new mothers and their experiences of being assessed for these.

**Methods:** In-depth interviews with 17 women in southeast England with a baby under one year old who experienced a postnatal mental health problem. Data were analysed using inductive thematic analysis.

**Results:** Women described a lack of identification with the concept of postnatal depression and felt that other forms of emotional distress were not recognised by the healthcare system. Women felt that support seeking for postnatal mental health problems needed to be normalised and that support should be available whether or not women were diagnosed. Assessment needs to be well timed and caringly implemented.

**Discussion:** Identification and recognition of symptoms and disorders other than postnatal depression needs to be improved. Awareness of multiple types of distress needs to be raised both for women experiencing such distress, and for healthcare professionals, to enable them to

support women at this time. Different approaches to assessment that include the range of symptoms reported should be piloted.

Keywords: postnatal mental health, postnatal anxiety, postnatal depression, screening, assessment.

## 4.2 Introduction

Assessment and research on postnatal mental health has predominantly focused on the most common or severe disorders, namely depression and puerperal psychosis. However, recent research suggests anxiety and adjustment disorders may be as prevalent; for example, anxiety disorders and Post-Traumatic Stress Disorder (PTSD) combined may affect 16% of postnatal women (Wenzel, Haugen, Jackson, & Brendle, 2005; Ross & McLean, 2006). Maternal anxiety is detrimental to both the mother and the baby and has been associated with preterm birth and low birth weight, emotional and conduct problems, negative effects on cognitive and social development in children (Ding et al., 2014; Glasheen, Richardson and Fabio, 2010). It is therefore clear that we need to consider a range of possible emotional responses during the postnatal period, and how best to identify these. A number of issues are pertinent to this.

First, diagnostic criteria may not be optimally defined for postnatal women – either through ignoring common postnatal psychological problems (Brockington, 2004; Condon, 2010), or through including ‘symptoms’ that may be normal postnatal factors such as fatigue or sleep disturbance (Matthey, 2010). For example perinatal specific problems, such as parent-infant attachment disorders and childbirth-related posttraumatic stress disorder are missing from the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-V) (Glasheen et al., 2010; APA, 2013). Furthermore, although the DSM-V has changed the onset specifier for depression in the postnatal period from the first four weeks postnatally to also include depression during pregnancy, it does not recognise later onset of symptoms, or specifiers for the anxiety disorders, obsessive disorders or hypomania. There is also evidence that existing categories do not capture important mental health problems; for example in a sample of mothers with unsettled infants (i.e., enduring sleep, settling and/or feeding issues) equal numbers of mothers (10.8%) were diagnosed with generalised anxiety disorder (GAD) as were diagnosed with an anxiety disorder not otherwise specified (ADNOS), defined as the primary symptoms not being associated with obsessive compulsive disorder (OCD), social anxiety, specific phobias or panic disorder (Phillips, Sharpe, Matthey, & Charles, 2009). All of these women experienced

uncontrollable worry about motherhood or their infant, suggesting that a classification of a distinguishable maternally focussed anxiety disorder may be warranted (Brockington, 2004).

Second, a diagnostic (according to DSM diagnoses) approach to postnatal disorders can ignore significant subclinical or transdiagnostic symptoms, meaning many women with substantial distress might not be identified (Wenzel et al., 2005; Phillips et al., 2009; Muzik et al., 2000). Additionally, the symptoms required for diagnosis in the general population may be incorrect for diagnosis of postnatal women. For example, four of the nine symptoms of major depression in the DSM are: weight loss; sleep disturbance; fatigue; and concentration difficulties. These are likely concomitants of being a new mother therefore current classifications of diagnostic disorders may need to be modified for postnatal women (Matthey, 2010). Alternatively, a different approach to identifying the postnatal psychological problems outlined above could be explored. In order to do this we need to examine the range of symptoms women report and how women conceptualise their distress, as well as how best to assess these.

The aims of this study were therefore to 1) qualitatively explore the different psychological symptoms postnatal women experience and 2) examine which of these symptoms women had been assessed for or asked about.

## **4.3 Methods**

### **4.3.1 Design and procedure**

As we were interested in a broad range of symptoms not specific to predefined disorders, we purposefully defined distress as “any postnatal psychological and emotional difficulties” in line with the expectation that mental health professionals are expected to recognise mild to severe mental health problems throughout the perinatal period (Jomeen , Glover, Jones, Garg, & Marshall, 2013). We interviewed women who: had experienced distress (but were not currently

distressed); had a baby less than one year old; and lived in southeast England. We did not specify a minimum time since delivery. Recruitment was via websites relevant to mothers (local postnatal group Facebook pages), advertisements in local National Childbirth Trust (NCT) newsletters and through instructors at local ante- and post-natal groups, who were asked to inform members of their groups about the study. All women who showed an interest in taking part by contacting us were sent further information about the study, and all subsequently took part. Interviews were carried out within two weeks of first contact, at participants' homes ( $n = 15$ ) or by telephone ( $n = 2$ ) and lasted 25-80 minutes. Prior to the interview the study was explained again and written informed consent obtained. The interview schedule contained eight open-ended questions: six questions about symptoms experienced, one question about the impact of distress and one question about assessment (see Appendix 1). The results from these questions are reported here. Further questions about the individual and social context in which women's distress arose are reported elsewhere (Coates, Ayers, & De Visser, 2014). Ethical approval was granted by the host University (reference number SARM0510).

#### 4.3.2 Data analysis

Data were analysed using inductive thematic analysis (Braun & Clarke, 2006; Willig, 1999) where the way in which participants made sense of their distress was emphasised. Interviews were transcribed verbatim. Transcripts were read multiple times to identify aspects of distress important to the participant. These identified sections were re-read and labelled with attention paid to how the themes clustered and related to each other. Once completed for the first interview, all codes and themes were examined by the authors. The process of coding and clustering was done for each interview before moving on to the next, to retain an idiographic approach to analysis. Once all interviews had been coded in this way, comparisons were made across interviews to determine weight, range and prevalence of themes. The authors agreed on an approach to analysis before this phase began. The first author discussed emerging themes with the second and third authors to ensure that a consistent and balanced approach was applied to the process of coding and clustering. Self-reflexive application of the process meant that the

authors gave priority to the interviewees' accounts rather than their own personal or professional knowledge of the experiences of the postnatal period. A number of techniques were employed to establish credibility, or confidence in creating an accurate description of the meaning of the data (Whittemore, Chase, & Mandle, 2001). It was recognised that threats to validity of distortion, bias and inadequate portrayal of participants' experiences exist and that techniques need to be in place to address these threats (Maxwell, 1996). Therefore regular meetings of the authors took place where problematic issues, such as ambiguity in assigning codes, were discussed and resolved. Additionally, to try and achieve authenticity in the analysis, the list of themes was sent to participants to ensure they felt they were representative of their experience. Participants were allocated numbers to protect anonymity. Data were coded using NVivo qualitative data analysis software (QSR International Pty Ltd).

#### **4.4 Results**

Seventeen women aged 23-42 took part. The sample were predominantly white European ( $n = 16$ ) and there was one Chinese woman. Eleven of the 17 women were primiparous and 7 had previously experienced what they considered to be a mental health problem. Information about previous diagnosis was not sought. Two women had completed GCSE level education; six had completed A level education; five had a degree or higher degree; four had completed professional qualifications. Eight of the women had vaginal deliveries (of these, two were assisted) and nine had caesarean births (of which three were planned). Age of babies at the time of interview ranged from 2 months to 11 months. Fifteen women reported that their distress emerged within the first six postnatal weeks and six women were referred to or requested psychological or psychiatric services. The sample is more fully described elsewhere (Coates et al., 2014).

Women's descriptions of symptoms of distress were collated on the basis of their responses to the questions 'Can you describe how you felt when you were experiencing distress?' and 'Did you feel bad in one way only, or did you experience different ways of feeling bad?' The most

prevalent symptoms spontaneously described are shown in Table 1 with examples from the participants. The most frequently reported symptoms were feeling tearful and anxious.

Tearfulness was not necessarily related to feeling low but with various emotions or situations such as frustration and feeling unable to cope. Feelings of anxiety were reported by two thirds of women and were described as relating to the new mothering role, the health of mother and baby or a general state of arousal that mothers could not find a specific reason for.

Less frequent symptoms that were reported in under half of the sample were: feeling stressed (n = 8), feelings of isolation, loneliness and anger (n = 7), feeling low (n = 6), feeling panicky and overthinking. Just under a third of women reported feeling frustrated and worried and scared. The same amount experienced flashbacks or nightmares which related to negative birth experiences, or neonatal illness. One women experienced intrusive thoughts about killing herself.

Table 1. Accounts of symptoms (and number of sample of 17 women endorsing each symptom)

Symptom / N (%)	Quote
<b>Tearful</b> 14 (82%)	
	I was just crying all of the time, maybe ten times a day. (P1)
	I didn't feel depressed, I felt sad. Yeah, well I've never been depressed so I don't know whether I actually felt depressed but I did feel really sad and tearful more than, like, low I think. (P2)
	I've cried at her [mother] more than I ever...especially over the breastfeeding thing, I shed more tears over that than I've ever done over anything before. (P4)
	There were times when I just went to bed and just cried and cried and cried you know 'cause I just couldn't, I felt like I just couldn't cope, you know, and like I didn't know what I was doing. (P16)

Symptom / N (%)	Quote
<b>Anxious</b> 11 (65%)	<p>Lots of it is just kind of non-specific fear I think of what might happen which I've realised isn't even really logical. (P6)</p> <p>I was having anxiety about sort of illness of me, and illness for [baby] and I'd constantly check him when he was asleep to check he was still alive, and it was those, that's how the anxieties came out. (P9)</p> <p>It was very much an anxiety based thing about um my new life. (P12)</p> <p>I started feeling, during the day and into the evenings kind of sick with worry, I'd wake up in the morning and I'd just start crying...(P17)</p>
<b>Stressed</b> 8 (47%)	<p>There are just certain points in the day when I've had enough. Um you know a few times like, "She won't feed!" and just bursting into tears. (P5)</p> <p>The other night I did just sort of hand her to [partner] and say "Can you please just take her!" you know you do get to the end of your tether a bit. (P11)</p> <p>I was just wound up, I was tense, frustrated, um these two would sort of... I mean she was only a few months old um and I just felt like everything was slipping through my fingers. (P14)</p> <p>I was exhausted, I'd had the caesarean, I was still a bit ill um and I remember talking to a health visitor then saying "You know I'm finding everything that's happened really stressful, you know, it's been a massive amount of stress." (P15)</p> <p>I'd had in my mind he'd get to six months and start to sleep through the night and actually he started waking up earlier...so that I found quite stressful, when you think it's about to start getting easier it actually started</p>



Symptom / N (%)	Quote
	getting harder. (P17)
<b>Isolated and lonely</b>	
7 (41%)	<p>I just felt really isolated you know that everybody else's life seemed trundling along and I was just in here in the dark in my pyjamas feeding her. (P4)</p> <p>Having gone back to work, because there is nobody, there is no other mothers with young children, so you feel alone and isolated. (P9)</p> <p>...All the visitors go away and everyone goes back to work and you know then two, three weeks later it's just you and this baby, it's very very scary. (P10)</p> <p>I want a bit more understanding. A bit more understanding from other people who are close to me...to be around or to meet more like-minded people and I mean this is, in this town there's not, there's nothing- that I know about anyway. (P13)</p> <p>I had four walls you know, and the most I could do perhaps was get out at the weekend when my husband was at home. (P14)</p>
<b>Angry 7 (41%)</b>	
	<p>But it's as if, in the heat of the moment, uh, I go further than I'd want to go and there's just so much rage and I've run into the kitchen and given the bin such a hard kick...(P6)</p> <p>I was quite actually, really angry, I mean things, um, it sounds awful, I felt um that my baby was to blame slightly...(P8)</p> <p>I'm getting really cross when really I shouldn't, I should just let things go. ...Even though it's nine months ago, I still feel very angry and probably</p>

Symptom / N (%)	Quote
	<p>always will about [the birth]. (P11)</p> <p>I just had rage coursing through my veins, absolute sheer rage and I couldn't, I couldn't rationalise it...(P14)</p> <p>...So this kind of feeling really angry about things that... were, I can't really do anything about, they've never really made me that angry before, it was really weird. (P17)</p>
<b>Overthinking</b>	
6 (35%)	<p>...Maybe I got a bit paranoid - overthinking – you know, oh my god, will it have an effect on [baby] for the rest of her life? (P2)</p> <p>I'm trying to think back when I first started thinking about it a lot. I think, [the birth] was constantly on my brain, I constantly at least thought about what happened about 5 times a day. (P8)</p> <p>'Cause I was "Oh my life's going to be like this in six months," or "What's my life.." you know and they were like "You don't need to think about that, you need to get through today." (P12)</p> <p>Int: So you were always looking for a reason?</p> <p>P 14: Yeah yeah and analysing it and reanalysing it.</p>
<b>Feeling low</b>	
6 (35%)	<p>...That kind of constant low feeling, that things would never change or never be back to normal or I'd never know how to quite be her mum properly...(P4)</p> <p>It's not just a normal low, it's a "I hate the world" low. (P8)</p> <p>...It would be very very low and like actually everything is terrible and this</p>

Symptom / N (%)	Quote
	<p>happened and that means that'll happen in two weeks' time and the low points where everything would be twenty times worse than realistically what it was...(P10)</p> <p>I'd wake up every morning and dread getting up, that just awful, I just wanna stay in bed, I can't deal with [the children] they're two people that want everything from me all the time and I just, I can't give it. (P14)</p> <p>I just got really low just thinking "God, we're just never going to get out of [the hospital]" you know and I was just starting to feel like I couldn't cope with it anymore, because it was such a kind of ...toll on me. (P16)</p>
<b>Panicky 6 (35%)</b>	<p>The only time I would cry is if he was, if he'd driven me to a panic, basically. (P6)</p> <p>I sit here and I have moments when I get quite panicky about dying, it's quite strange. (P8)</p> <p>It's just like the world suddenly closed in on me and I just couldn't be there I couldn't be in that spot anymore. (P9)</p> <p>I was having panic attacks, um you know lots of palpitations, yeah a lot at night...(P12)</p> <p>I was in such a panic, in such a... doubting myself, I suppose that is lack of confidence isn't it really but I wouldn't have called it that at the time. (P13)</p>
<b>Flashbacks/intrusions / nightmares</b>	<p>5 (29%) I had a flashback about a week and a half ago and um still have nightmares.</p> <p>I had a nightmare about um I'd killed someone and they were giving me an</p>

Symptom / N (%)	Quote
	epidural as the death penalty. (P7)
	...We've got a bottle of diet-coke and I know it's 2 litres of coke and I just think that's how much blood I lost, you just start thinking these really random things sometimes. (P8)
	...Although she was home, she was fine, I still could just see her in the incubator, you know that I couldn't touch her, she was mine but I couldn't touch her. (P10)
	My mind was constantly, you know, had thoughts in it that shouldn't have been there. (P12)
<b>Frustration</b>	
5 (29%)	They say "Well to me you sound depressed," and I know that I wasn't, it was a mountain of frustration...(P4)
	[The GP] needed to see how upset I was and how I wasn't coping and how frustrated I was...(P9)
	I'm still left with this, sort of I don't know what to call it, either frustration or sadness. (P13)
	...There was no moments of...quiet and calm and I just felt wound up all the time, frustrated. (P14)
<b>Worried and scared</b>	
5 (29%)	I was just worried, scared. I had physical pain and hurting, physical hurting. And then without experience, you've got no order. (P3)
	Worried that just, you know, what was I meant to do with him? How was I meant to look after him? (P10)
	...It was frightening, it was really frightening to not feel like me and to be

Symptom / N (%)	Quote
	so far away from anything I'd ever felt before. (P12)
	I walked away, I left all three of them, I didn't go far, just fifty yards down the road but there was part of me that sort of said "You know, you can just keep walking" and that's frightening, that's really frightening, 'cause this is everything I've ever wanted. (P14)
	Worried about the fact that I've been so worried and not feeling myself, so that turns into a bit of a cycle, um how it's going to impact on my sleep so that makes me more tired. (P17)

In addition to the symptoms reported in table 1, the main themes that emerged from the analysis were: (1) not identifying with postnatal depression; (2) the need to normalise support seeking; (3) the need for support irrespective of diagnosis; (4) the importance of timing; and (5) that a questionnaire is not sufficient.

#### Not identifying with postnatal depression

Twelve of the seventeen women in the sample found themselves bereft of information, advice and support about types of distress other than depression. Thus women largely judged their own distress against descriptions of depression. Awareness of others with depression and reading information about depression led many mothers to decide that they were experiencing a different kind of distress that either they could not access information about, or that was not recognised:

*'I didn't really identify with a lot of the um postnatal depression symptoms. And then I really did not feel like I fitted the box. You know I definitely had the baby blues, they didn't completely go away, but I don't think I've got postnatal depression, but I am finding things difficult.'* (P6)

*'Everything was postnatal depression, you know, do you look after yourself? Have you stopped looking after yourself? And it's like, "no, but I hate my friends who have had babies".' (P8)*

Additionally, there was a perception that health professionals were focussed on postnatal depression and once it had been ruled out there was no further investigation. Acknowledgment by health professionals of different types of postnatal distress was necessary but sometimes lacking:

*'It's almost like once you've said "No I don't" [feel depressed], then that's it, I've ticked that box, she's not depressed she's not going to go home and throw herself off the roof or anything so that's that sorted.' (P4)*

Health professionals would sometime suggest to women that they were depressed even when it did not fit the symptoms women described. This was perceived as being a way of avoiding exploration of women's complex feelings. At an appointment to talk about a difficult birthing experience, one mother felt that exploration of complex feelings was avoided by the midwife:

*'It's just very easy to sort of simplify it for someone else, say 'Oh you're depressed, now you need to deal with it, you need to get some counselling and then it'll be fixed.' (P13)*

Having filled out the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987), one mother felt that her negative result for postnatal depression left further distress unidentified:

*'I ticked it all honestly and it came out as "no I'm not depressed", but I still at that time had really strong feelings of... about... after the birth.' (P13)*

### Need to normalise support seeking

Women were keen to promote the message that emotional difficulties are common in the postnatal period, and that help-seeking is a normal and positive action. It was felt that potential postnatal difficulties needed to be discussed but were not:

*'Making more of an issue that it is actually all right to ask for help, and making people more aware that actually everyone gets a problem at some [point] ... because sometimes you feel like you're the only one.'* (P5)

*'There does need to be more acknowledgement that finding things difficult and stuff is common.'* (P9)

*'I was never offered postnatal um groups, [I] had antenatal care, groups and stuff but I didn't have any postnatal groups which possibly would have been more helpful.'* (P14)

Once a need for support had been identified, women were not clear how best to access help. Going to the GP could be considered *'a bit serious, somehow like your last resort'* (P13) whilst *'the midwives are so busy... I didn't feel like I could really pick up the phone and ask for help'* (P11). It was felt that a more proactive stance needed to be taken by relevant groups / healthcare professionals in reaching out to mothers.

Moreover, women reported a fear of stigma related to mental illness. When considering antidepressant treatment, one participant felt that if she took them *'then [I] would be depressed, that kind of puts it there doesn't it? Which I'd rather avoid I think.'* (P17). More generally, it was felt that it would be useful to increase awareness of distress affecting most women, and thus reduce stigma.

Stigma was also related to support-seeking. Feelings of shame or an acknowledgement of weakness were reported if women had to facilitate accessing help. If support was *'widely and openly available there's no sort of, you know, stigma about it really.'* (P10)

### Need for support irrespective of diagnosis

Whether women had been diagnosed with a postnatal mood disorder or not, they felt that the impact on their daily functioning and relationship with their infant meant they warranted support. This did not have to be formal support, but time talking with a health visitor or midwife who was visiting for another reason. Women reported that if depression had been discounted as the form of distress, sources of support were unclear or lacking:

*'You're not wanting great things from [the health visitors and midwives], maybe just you know a bit of a chat or for someone to be more aware. You know even the health visitor said, that the main thing is she's here now and we can move on.'* (P4)

*'My health visitor sort of gave me a leaflet about this postnatal depression group saying that it was going to be a CBT type thing and um saying "You know probably it's not for you" because I didn't really classify myself... in that category.'* (P7)

It was generally felt that if a diagnosis of postnatal depression was given, support was available. However, if the threshold for diagnosis was not met, or mothers were not proactive in seeking support, available sources of support were not easily accessible:

*'I didn't think that the care was there easily. I mean there's a lot of care there if you ask for it, but it isn't easily accessible.'* (P12)

### Importance of timing

The timing of support was considered crucial, particularly for women who experienced acute distress, and who felt that they needed immediate help: *'I needed [support] there, I needed it when she was two or three weeks old and there was nothing.'* (P12)

Women wanted support whether diagnosed or not, but accepted that being assessed for distress was necessary. It was difficult for mothers to establish when would be the optimal time to be assessed for distress or to discuss their feelings. Experiences of filling out the Edinburgh Postnatal Depression Scale (EPDS) came too early for some, who filled it in whilst still under



the care of the midwife: *'they do it earlier on when things are pretty easy I would say. I think maybe it could be done a bit further down the line.'* (P5) and too late for others:

*'By the time they did [the EPDS] I was feeling much better anyway because I think that was on her 3 month check. So maybe I would have benefitted had they asked me sooner perhaps.'* (P2)

#### A questionnaire is not sufficient

Most women had experienced filling out a questionnaire (likely to be the EPDS based on its wide usage in the UK) to assess for postnatal depression. Women who found it a useful experience did so because they felt it clarified their symptoms: *'it did highlight...that it is more of an anxiety issue than a depression issue,'* (P17) or it led to some action being taken: *'[health visitor] contacted the community nurse straight away and then I saw her within a couple of weeks.'* (P1). For some, the simplicity of assessment was experienced as *'just a bit unsatisfactory, a bit impersonal'* (P7), *'a little bit embarrassing'* (P12), *'a complete waste of time, but also worse than that, misleading'* (P13) and *'a bit silly because you can say anything'* (P15). It was felt that *'an honest respectful chat'* (P13) would elicit more about women's feelings than the questionnaire which could be interpreted as *'[health visitors] ticking the box of having checked up on you'* (P7).

Whether women were positive, negative or indifferent about the questionnaire approach, it was felt that a questionnaire alone is not sufficient to identify distress. The relationship with the healthcare provider who administered the questionnaire was vital in facilitating honest disclosure:

*'It was actually being spoken to which picked up the problem, not necessarily the questionnaire. I think the questionnaire by its own I don't think would pick up how I was feeling.'* (P9)

## **4.5 Discussion**

This study presents an in-depth exploration of women's feelings of postnatal distress, the symptoms they experienced (in Table 1) and their experiences of assessment and support.

Results show that women in this sample often did not identify with the descriptions of postnatal depression and instead described a broad range of symptoms found in various disorders including anxiety, depression and posttraumatic stress. This non-identification left many women feeling alienated and discounted by healthcare professionals, whom women perceived as being focussed on postnatal depression. Subsequently women only experienced being assessed for or asked about postnatal depression. Women felt that more should be done to prepare women and support them in the early stages of the postnatal period, regardless of whether they had a diagnosis of postnatal depression or not.

The range of symptoms reported indicates that depression was not the most common emotional difficulty encountered in this sample. However, disorders and symptoms of psychological distress (other than depression) in the postnatal period are not mentioned in the DSM-V (APA, 2013). This absence may inadvertently silence discussion of other types of distress with healthcare professionals by promoting the idea that they do not exist. Previous research has suggested that the concept of postnatal depression may limit our understanding of a broader postnatal distress and that indicators of negative mood, such as anxiety and stress are required (Green, 1998; Miller, Pallant, & Negri, 2006). The most common symptoms reported by women in this sample were tearfulness and anxiety. Feeling low was only reported by six women (35% of the sample). Whilst the qualitative design means we cannot establish the frequency with which women experience different symptoms this is suggestive and warrants further quantitative research.

This research has a number of implications for postnatal care and assessment. In particular, the type of assessment tool used, the timing of assessment and the nature of subsequent support provided. Women in this study who were assessed for postnatal distress were done so with the Edinburgh Postnatal Depression Scale, which is the most widely used assessment instrument for postnatal depression (Boyd, Le, & Somberg, 2005). Studies show the EPDS to be simple, reliable and acceptable to women (Schaper, Rooney, Kay, & Silva, 1994), but acceptability will be dependent on the timing and method of administration of the questionnaire. Of the symptoms

most mentioned by women in this study, some are covered by individual items on the EPDS (e.g. feeling tearful, anxious, panicky, worried and scared). Although the EPDS was not designed to detect anxiety, subsequent research suggests three items can be used as an anxiety subscale (Brouwers, van Baar, & Pop, 2001; Petrozzi & Gagliardi, 2013). However, this is not effective at identifying all women with anxiety (Matthey, Valenti, Souter, & Ross-Hamid, 2013). In addition, many symptoms that women described in this study are not included in the EPDS. Although no assessment tool is going to include every symptom felt by every distressed mother, the absence of items relating to feeling stressed, angry and frustrated particularly warrants attention. It is notable that when developing the EPDS, Cox et al. (1987) included a subscale measuring 'irritability' but subsequently deleted it from the final version as it did not measure depression (Beck & Gable, 2000). Similarly, feeling stressed or overwhelmed is not captured by the EPDS and has been linked to postnatal depressive symptoms (Terry, Mayocchi, & Hynes, 1996). Furthermore, research points to chronic stress as a prominent risk factor in developing postnatal depression (Robertson, Grace, Wallington, & Stewart, 2004).

This presence of symptoms relating to psychological problems other than depression suggests a number of possibilities for assessment. First, if an assessment questionnaire is to be used, it may be beneficial to include items about birth trauma, anxiety, anger/irritability and depression. However, incorporating aspects of multiple disorders relating to the mother and child relationship may require a long measure which may not be feasible to administer in practice. Focusing on one screening tool being used at a single point in time may even hinder acquiring appropriate care and support for some women; rather, multiple opportunities for women to discuss their emotions are necessary (Armstrong & Small, 2010). The Healthy Child Programme (Department of Health, 2009), currently being instated in the UK proposes that health visitors have more ante- and postnatal contacts with women, which may facilitate better identification of multiple symptoms and risk factors. However, assessment of maternal mental health in the Healthy Child programme still only recommends asking questions to identify postnatal depression (Department of Health, 2009). A different approach could be to ask women

a small number of questions, an approach that has shown similar characteristics to other case-finding approaches whilst being less time-consuming (Matthey et al., 2013; Whooley, Avins, Miranda, & Browner, 1997). For example, Matthey et al. (2013) proposed using a generic mood measure (“In the last 2 weeks have you felt very stressed, anxious or unhappy, or found it difficult to cope, for some of the time?” plus a follow up question for those answering positively) but this has only been tested in antenatal samples. Studies testing other case-finding approaches in the postnatal period are necessary.

There are also a number of implications for timing of assessment. Firstly, the most appropriate time to identify distress must be considered. In this sample all but two women felt distressed within the first six postnatal weeks, and 13 felt distressed at birth. A recent systematic review (Gavin et al., 2005) based on diagnostic interviews, concluded that of the 19.2% of women who experienced major or minor depression in the first three postnatal months, most episodes began after birth. In the present sample, many women also reported distress related to the birth experience, indicating that assessment closer to the time of birth may be helpful. Secondly, assessment needs to fit with timings of interactions with healthcare professionals. The current model of postnatal care (Department of Health, 2009) involves repeated visits from healthcare professionals in the early days, a health check at 6-8 weeks and immunisations for the baby at 3-4 months providing times for assessment and monitoring of women who may be distressed resulting from the birth or at risk of becoming distressed in other ways.

Proactive support from healthcare professionals and other involved groups is particularly important given the difficulty women had with seeking support. Support-seeking is seen as showing inadequacy, an inability to cope with competing demands of caring for a baby, domestic work, caring for others and often a career. This fits with research showing the pressure women feel to fit the ideal of the perfect woman who can cope and does not need help (Choi, Henshaw, Baker, & Tree, 2005). In line with previous research, our findings highlight the need for ongoing relationships with caregivers and different models of postnatal care (Morrell et al., 2009). For example, the involvement of psychologically aware health visitors who could

provide simple psychological interventions as required has been shown to be beneficial (Morrell et al., 2009). Women in this sample wanted both the opportunity to talk about their distress in-depth with a non-judgemental empathic person who could reassure them, and peer support from other women with children (Scope, Booth, & Sutcliffe, 2012; Dennis & Chung-Lee, 2006).

### Limitations

Although qualitative studies can enrich our understanding of women's experiences of postnatal distress, the results cannot necessarily be generalised. Women in this sample were predominantly cohabitating and Caucasian so it is important to see whether similar results are found in other socio-demographic groups, and according to parity and time since birth. Women who had caesarean births were over-represented, and it is possible that these women experienced more symptoms of birth trauma although research suggests subjective birth experience is more important than birth type (Andersen, Melvaer, Videbech, Lamont, & Joergensen, 2012).

### Conclusion

This study provides an in-depth exploration of women's feelings of postnatal distress, the symptoms they experienced and their experiences of assessment and professional support. Issues of assessment for multiple types of distress in postnatal women have been raised. Identification and recognition of symptoms and disorders beyond postnatal depression needs to be improved, through evaluating different approaches to assessment and their acceptability to women. Awareness of multiple types of distress needs to be raised both for women experiencing such distress and for healthcare professionals, to enable them to support mothers. Incorporating a holistic approach focussing on the birth, the mother and her relationships into recent initiatives such as the Healthy Child Programme could be timely and beneficial.

#### 4.6 References

- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5)*. USA: American Psychiatric Association; 2013.
- Andersen, L. B., Melvaer, L.B., Videbech, P., Lamont, R.F., & Joergensen, J.S. (2012). Risk factors for developing post-traumatic stress disorder following childbirth: a systematic review. *Acta Obstetrica et Gynecologica Scandinavica*, 91 (11), 1261-72.
- Armstrong, S.J., & Small, R.E. (2010). The paradox of screening: Rural women's views on screening for postnatal depression. *BMC Public Health*, 10 (744). doi:10.1186/1471-2458-10-744
- Beck, C.T., & Gable, R.K. (2000). Postpartum depression screening scale: development and psychometric testing. *Nursing Research*, 49 (5), 272-82.
- Boyd, R.C., Le, H.N., & Somberg, R. (2005). Review of screening instruments for postpartum depression. *Archives of Women's Mental Health*, 8 (3), 141-53.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2): 77-101.
- Brockington, I. (2004). Postpartum psychiatric disorders. *The Lancet*, 363 (9405), 303-10.
- Brouwers, E.P.M., van Baar, A.L., & Pop, V.J.M. (2001). Does the Edinburgh Postnatal Depression Scale measure anxiety? *Journal of Psychosomatic Research*, 51 (5), 659-63.
- Choi, P., Henshaw, C., Baker, S., & Tree, J. (2005). Supermum, superwife, supereverything: performing femininity in the transition to motherhood. *Journal of Reproductive and Infant Psychology*, 23 (2), 167-180
- Coates, R., Ayers, S., & De Visser R. (2014). Women's experiences of postnatal distress: a qualitative study. *BMC Pregnancy and Childbirth*, 14, 359. doi:10.1186/1471-2393-14-359.

- Condon, J. (2010). Women's mental health: A wish-list for the DSM-V. *Archives of Women's Mental Health*, 13 (1), 5-10.
- 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, 782-6.
- Dennis, C-L., Chung-Lee, S. (2006). Postpartum depression help-seeking barriers and maternal treatment preferences: A qualitative systematic review. *Birth*, 33 (4), 323-31.
- Department of Health (2009). *The Healthy Child Programme – Pregnancy and the first five years*. Retrieved from: <https://www.gov.uk/government/publications/healthy-child-programme-pregnancy-and-the-first-5-years-of-life>
- Ding, X-X., Wuc, Y-L., Xu, S-J., Zhua, R-P., Jia, X-M., Zhang, S-F., Huang, K., Zhu, P., Hao J-H., & Tao, F-B. (2014) Maternal anxiety during pregnancy and adverse birth outcomes: A systematic review and meta-analysis of prospective cohort studies. *Journal of Affective Disorders*, 159, 103–110. doi: 10.1016/j.jad.2014.02.027.
- Gavin, N.I., Gaynes, B.N., Lohr, K.N., Meltzer-Brody, S., Gartlehner, G., & Swinson, T. (2005). Perinatal depression: a systematic review of prevalence and incidence. *Obstetrics and Gynecology*, 106 (5 pt 1), 1071-83.
- Glasheen, C., Richardson, G.A., & Fabio, A., (2010). A systematic review of the effects of postnatal maternal anxiety on children. *Archives of Women's Mental Health*, 13, 61-74.
- Green, J.M. (1998). Postnatal depression or perinatal dysphoria? Findings from a longitudinal community-based study using the Edinburgh Postnatal Depression Scale. *Journal of Reproductive and Infant Psychology*, 16, 143-155.
- Jomeen, J., Glover, L., Jones, C., Garg, D., Marshall, C. (2013). Assessing women's perinatal mental health: exploring the experiences of health visitors. *Journal of Reproductive and Infant Psychology*, 31 (5), 479-489. doi: 10.1080/02646838.2013.835038

- Matthey, S. (2010). Are we overpathologising motherhood? *Journal of Affective Disorders*, 120 (1-3), 263-6.
- Matthey, S., Valenti, B., Souter, K., Ross-Hamid, C. (2013). Comparison of four self-report measures and a generic mood question to screen for anxiety during pregnancy in English-speaking women. *Journal of Affective Disorders*, 148 (2-3), 347-51.
- Maxwell, J.A. (1996). *Qualitative research design: An interactive approach*. Thousand Oaks, CA: Sage.
- Morrell, C.J., Slade, P., Warner, R., Paley, G., Dixon, S., Walters, S.J., Brugha, T., Barkham, M., Parry, G., & Nicholl, J.P. (2009). Clinical effectiveness of health visitor training in psychologically informed approaches for depression in postnatal women: pragmatic cluster randomised trial in primary care. *British Medical Journal*, 338, a3045. doi: <https://doi.org/10.1136/bmj.a3045>
- Miller, R.L., Pallant, J.F., & Negri, L.M. (2006). Anxiety and stress in the postpartum: Is there more to postnatal distress than depression? *BMC Psychiatry*, 6 (12). doi:10.1186/1471-244X-6-12
- Muzik, M., Klier, C.M., Rosenblum, K.L., Holzinger, A., Umek, W., Katschnig, H. (2000). Are commonly used self-report inventories suitable for screening postpartum depression and anxiety disorders? *Acta Psychiatrica Scandinavica*, 102, 71-73.
- Petrozzi, A., & Gagliardi, L. (2013). Anxious and depressive components of Edinburgh Postnatal Depression Scale in maternal postpartum psychological problems. *Journal of Perinatal Medicine*, 41 (4), 343-8
- Phillips, J., Sharpe, L., Matthey, S., & Charles, M. (2009). Maternally focussed worry. *Archives of Women's Mental Health*, 12 (6), 409-18.
- QSR International Pty Ltd. (2010). NVivo qualitative data analysis, software version 9 [computer software].



- Robertson, E., Grace, S., Wallington, T., & Stewart, D.E. (2004). Antenatal risk factors for postpartum depression: a synthesis of recent literature. *General Hospital Psychiatry*, 26 (4), 289-95.
- Ross, L.E., & McLean, L.M. (2006). Anxiety disorders during pregnancy and the postpartum period: A systematic review. *Journal of Clinical Psychiatry*, 67, 1285-1298.
- Schaper, A.M., Rooney, B.L., Kay, N.R., & Silva, P.D. (1994). Use of the Edinburgh Postnatal Depression Scale to identify postpartum depression in a clinical setting. *Journal of Reproductive Medicine*, 39 (8), 620-624.
- Scope, A., Booth, A., & Sutcliffe, P. (2012). Women's perceptions and experiences of group cognitive behaviour therapy and other group interventions for postnatal depression: a qualitative synthesis. *Journal of Advanced Nursing*, 68 (9), 1909-19.
- Terry, D.J., Mayocchi, L., & Hynes, G.J. (1996). Depressive symptomatology in new mothers: A stress and coping perspective. *Journal of Abnormal Psychology*, 105 (2), 220-31.
- Wenzel, A., Haugen, E.N., Jackson, L.C., & Brendle, J.R. (2005). Anxiety symptoms and disorders at eight weeks postpartum. *Journal of Anxiety Disorders*, 19, 295-311.
- Whittemore, R., Chase, S.K., & Mandle, C.L. (2001). Validity in qualitative research. *Qualitative Health Research*, 11, 522-537.
- Whooley, M.A., Avins, A.L., Miranda, J., & Browner, W.S. (1997). Case-finding instruments for depression. Two questions are as good as many. *Journal of General Internal Medicine*, 12 (7), 439-45.
- Willig, C. (1999). Beyond appearances: A critical realist approach to social constructionism. In Nightingale, D.J., & Cromby, J, (Eds.) *Social Constructionist Psychology: A critical analysis of theory and practice*. (pp.37-51). Milton Keynes: Open University Press.

## 4.7 Appendix One

### Interview questions

#### Symptoms

1. Can you tell me about when you first started to feel bad / not like yourself?
2. Can you describe how you felt?
3. Did you feel bad in one way only, or did you experience different ways of feeling bad?
4. Could you notice any pattern to your symptoms?
5. What kinds of thoughts were you having?
6. Can you remember a time in your life when you have felt similar? If so, can you describe that time?

#### Impact of distress

7. How did your difficulties / these feelings impact on different areas of your life?

#### Screening

8. What was your experience of being asked about your feelings or being given a questionnaire about them?

## 5 Anxiety measures validated in perinatal populations: A systematic review

Meades, R., & Ayers, S. (2011). Anxiety measures validated in perinatal populations: a systematic review. *Journal of Affective Disorders*, 133, 1-15. doi: 10.1016/j.jad.2010.10.009

### 5.1 Abstract

#### *Background*

Research and screening of anxiety in the perinatal period is hampered by a lack of psychometric data on self-report anxiety measures used in perinatal populations. This paper aimed to review self-report measures that have been validated with perinatal women.

#### *Methods*

A systematic search was carried out of four electronic databases. Additional papers were obtained through searching identified articles. Thirty studies were identified that reported validation of an anxiety measure with perinatal women.

#### *Results*

Most commonly validated self-report measures were the General Health Questionnaire (GHQ), State Trait Anxiety Inventory (STAI), and Hospital Anxiety and Depression Scales (HADS). Of the 30 studies included, 11 used a clinical interview to provide criterion validity. Remaining studies reported one or more other forms of validity (factorial, discriminant, concurrent and predictive) or reliability. The STAI shows criterion, discriminant and predictive validity and may be most useful for research purposes as a specific measure of anxiety. The Kessler 10 (K-10) may be the best short screening measure due to its ability to differentiate anxiety disorders. The Depression Anxiety Stress Scales 21 (DASS-21) measures multiple types of distress, shows appropriate content, and remains to be validated against clinical interview in perinatal populations.

*Limitations*

Nineteen studies did not report sensitivity or specificity data. The early stages of research into perinatal anxiety, the multitude of measures in use, and methodological differences restrict comparison of measures across studies.

*Conclusion*

There is a need for further validation of self-report measures of anxiety in the perinatal period to enable accurate screening and detection of anxiety symptoms and disorders.

Key words: anxiety, pregnancy, postpartum period, psychometrics, validation, reliability.

## 5.2 Introduction

Anxiety symptoms and disorders are an important area of research in perinatal populations (Matthey, Barnett, Howie & Kavanagh, 2003; Ross, Gilbert Evans, Sellers, & Romach, 2003). Symptoms of anxiety are common in the perinatal period. In a UK study of 8,323 women, 13% of women reported anxiety symptoms at either eight weeks or eight months postpartum and of these two-thirds had experienced anxiety in pregnancy (Heron et al., 2004). A prospective study of 1,507 women expecting their first child found 8.5% of women reported intense anxiety or panic attacks occasionally or often between 6 and 9 months postpartum in a computer assisted telephone interview (Woolhouse, Brown, Krastev, Perlen, & Gunn, 2009). A study using diagnostic interviews with women eight weeks postpartum found 8.2% of women had generalised anxiety disorder (GAD), 2.7% had obsessive compulsive disorder (OCD), 1.4% had panic disorder and 4.1% social anxiety disorder (Wenzel, Haugen, Jackson, & Brendle, 2005). A further 19.7% of women had sub-syndromal GAD, 5.4% sub-syndromal OCD and 15% sub-syndromal social anxiety. GAD was more prevalent in postpartum women than in the general population, OCD and panic disorder were as prevalent as in the general population, whilst social anxiety was less common in postpartum women (Wenzel et al., 2005).

Although prevalence data of anxiety disorders is limited, a review tentatively suggests that rates of OCD and GAD are higher in perinatal populations than in the general population, whilst rates of panic disorder and posttraumatic stress disorder (PTSD) are comparable (Ross & McLean, 2006). There is also preliminary evidence that a further proportion of women experience clinically significant anxiety symptoms that do not fit into DSM-IV anxiety diagnoses (Phillips, Charles, Sharpe, & Matthey, 2009). In a sample of women with unsettled infants, equal numbers of women were diagnosed by clinical interview with an anxiety disorder not otherwise specified (ADNOS; 10.8%) as were diagnosed with GAD (10.8%) (Phillips et al., 2009). None of the women diagnosed with ADNOS had primary symptoms related to OCD, social anxiety, specific phobias or panic disorder indicating that anxiety disorders in postnatal women may not be optimally defined. Furthermore, the occurrence of pregnancy-specific anxiety that needs to be

treated as a relatively distinct syndrome has been proposed (Huizink, Mulder, Robles de Medina, Visser, & Buitelaar, 2004). State anxiety explains a small part of important fears of giving birth, having a disabled child, and concerns about a woman's appearance when she is pregnant (Huizink et al., 2004). Pregnancy specific stress has predicted poor birth outcomes better than state anxiety and perceived stress (Lobel, Fisk, & Glover, 2008). Thus in both antenatal and postnatal women, general measures of anxiety may not be appropriate screening tools.

Anxiety disorders and subthreshold anxiety symptoms can be detrimental to the mother-infant relationship (Zelkowitz & Papageorgiou, 2005). Prenatal anxiety has been linked with intrauterine artery resistance leading to low birthweight (Teixeira et al., 2009; Field et al., 2010), low apgar scores (Berle et al., 2005), suboptimal changes in fetal heart rate and motor activity (DiPietro, 2010) and complications of labour and delivery (Johnson & Slade, 2003). Longer term effects of high antenatal anxiety can include externalizing problems and self-reported anxiety at ages 8-9 (Van den Bergh & Marcoen, 2004) and high impulsivity and lower scores on cognitive tests at ages 14-15 (Van den Bergh et al., 2005). History of an anxiety disorder before pregnancy is a greater risk factor for postnatal anxiety or depression than a history of depressive disorder (Matthey et al., 2003). Additionally, anxiety disorders *during* pregnancy predict postnatal depression symptoms independent of antenatal depression. One study shows that women with anxiety disorders in pregnancy are nearly three times more likely to present with postnatal depression (Sutter-Dallay, Giacomme-Marcasche, Glatigny-Dallay, & Verdoux, 2004). A large prospective study ( $n = 12,361$ ) confirms that antenatal anxiety is one of the strongest predictors of postnatal depression indicating that antenatal screening for anxiety may be helpful in reaching women at risk of postnatal depression (Milgrom et al., 2008). A recent review indicates that postnatal maternal anxiety is associated with deleterious outcomes for children such as alterations in emotional and conduct problems, and adverse effects on cognitive and social developments, although effects on infant temperament are inconclusive (Glasheen, Richardson, & Fabio, 2010).

As in other clinical populations, there is substantial comorbidity between anxiety and depression in perinatal women. Studies using clinical interviews to diagnose disorders show that up to 50% of women with affective disorders have comorbid anxiety and depression. For example, a study of anxiety and depression at 36 weeks gestation, 6 weeks postpartum and 16 weeks postpartum found that nearly 50% of clinically depressed women experienced clinically significant comorbid anxiety (Ross et al., 2003). Depending on the domain of anxiety being considered, Wenzel et al. (2005) found that 10-50% of women reporting anxiety symptoms also endorsed depressive symptoms. In two samples of women interviewed at 6 weeks postpartum Matthey et al. (2003) found 16.2% and 10.4% of women had anxiety disorders only, whereas 5.6% and 2.6% had major or minor depression only, and 4.2% and 2.1% had comorbid depression and anxiety highlighting the importance of screening for both depression and anxiety. These studies all used clinical interviews to diagnose anxiety and depression.

Given the high prevalence (but also variation) of perinatal anxiety, it is important to identify valid questionnaire measures of anxiety that can be used in research and clinical practice. Two broad approaches can be taken: (i) to use measures of anxiety developed with other populations and validate them for use with perinatal women; or (ii) to develop specific measures of perinatal anxiety. Research and screening for perinatal depression has taken the latter approach, as illustrated by the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987) which is the most widely used screening tool used for postnatal depression (Boyd, Le, & Somberg, 2005).

The creation of the EPDS and other measures of depression specific to the perinatal period derived partly from the inappropriateness of general depression measures to perinatal women, largely because of the inclusion of items measuring somatic symptoms. Specific depression measures such as the EPDS were therefore developed and validated for use in the perinatal period. However, the utility of the EPDS appears to vary in different samples (Gibson, McKenzie-McHarg, Shakespeare, Price, & Gray, 2009) and there is evidence that the EPDS has three items that also measure anxiety. Some propose it therefore contains an unofficial anxiety

subscale, but this only contains three items which is likely to be insufficient to capture the complexity of anxiety as a construct. Muzik et al., (2000) found that women with anxiety disorders had significantly lower scores on the EPDS than women with major depressive disorder. These women would therefore not be identified using only the EPDS. Thus, if the EPDS is the only measure used to screen perinatal women, it will be unclear whether the anxiety symptoms are features of depression or are a separate clinical entity (Ross et al., 2003). There is also evidence that the depression subscale of the EPDS correlates more highly with other measures of anxiety than the anxiety subscale does, indicating poor convergent validity (Brouwers, van Baar, & Pop, 2001).

With the exception of measures of pregnancy-specific worries or anxiety, no specific measures of anxiety have been developed for use in perinatal populations. Most measures used were originally designed for use in generic samples. Validity of any self-report measure depends on recalibration for the population under study (Geisinger, 1994). Self-report measures constructed for use with one population may produce flawed results in another population because the distribution of the variable will differ according to a number of factors including culture, development and time of measurement in the perinatal period. Normative values and cut-offs may also vary in samples that differ from the original sample. Therefore an evaluation must be made as to whether the sample with whom the test was designed is sufficiently similar to the test sample to ensure little variability in functioning of the self-report measure (Myers & Winters, 2002). Self-report measures created for use in populations in western countries are often validated for use in different languages and cultures (Prince, 2008). However measures designed for use in general populations are not as frequently validated for use in perinatal populations despite the unique nature of this period.

Research into perinatal anxiety uses a variety of self-report measures including the State Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970), Crown-Crisp Experiential Index (Crisp, Jones, & Slater, 1978) and Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988). These general measures are rarely validated for use in perinatal populations which



could lead to erroneous interpretation and incomparable data. A variety of different cut-off points on measures have also been used to indicate severe anxiety or disorder. For example the STAI has been used in perinatal samples with cut-offs of >40 (Grant, McMahon, & Austin, 2008) to >45 (Moss, Skouteris, Wertheim, Paxton, & Milgrom, 2009) or >48 (Field et al., 2010) to indicate disorder, without prior validation in this population.

In sum, there is as yet no measure specifically devised to screen for anxiety disorders or symptoms in perinatal populations. Psychometrically robust measures of anxiety are needed for screening and research purposes. This paper therefore aims to systematically identify and review measures of anxiety that have been validated in perinatal populations.

### 5.3 Methods

#### 5.3.1 Data Search

A systematic search of the following computerised databases was undertaken: SCOPUS V.4 (Elsevier), MEDLINE (CSA), PsycINFO (CSA) and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) for the time period from inception of the database to 30 September 2010. The following search terms were used to search all databases: *anx\**, *pregnan\** or *\*natal* or *\*partum*, *diagnos\** or *screen* or *questionnaire* or *tool* or *scale*. In addition the reference lists of included papers were searched.

#### 5.3.2 Inclusion / exclusion criteria

Inclusion criteria were that published studies i) were written in English; ii) examined the reliability and/or validity of a self-report anxiety measure; iii) the sample were antenatal or postnatal women (up to one year postpartum). A number of studies validated more than one measure on the same sample resulting in more than one publication. These papers are included with a note indicating the multiple use of the sample. To enable comparison, all measures were originally devised in English.

### 5.3.3 Data quality

Quality of studies was assessed using a combined checklist based on the quality assessment of diagnostic accuracy studies (QUADAS) (Whiting, Rutjes, Reitsma, Bossuyt, & Kleijnen, 2003) and a checklist developed by Mirza and Jenkins (2004). Criteria were assessed as present or absent on 11 dimensions (range 0 – 11): 1) explicit study aims; 2) adequate sample size; 3) sample described in sufficient detail; 4) sample representative of population receiving test in practice; 5) clear inclusion and exclusion criteria; 6) use of appropriate reference standard; 7) reliability of measure reported 8) validity of measure investigated; 9) specification of dropouts and withdrawal of participants; 10) adequate description of data and, 11) discussion of generalisability. The studies were then given a total score of quality with the highest possible being eleven. Most studies were of good quality with 22 (73%) having a score of 8 or more. Inter-rater reliability was checked for four (13%) studies and agreement across all 11 dimensions for those studies was very high (mean agreement across studies was 97%).

### 5.3.4 Validity

Various types of validity data were extracted. *Criterion validity* is inferred by comparing the sample's score on the index measure with a more objective measure of the same construct. Criterion validity should be established against an existing gold standard (Greenhalgh, 1997). For determining anxiety disorders, the gold standard is defined as a diagnostic clinical interview (Gibson et al., 2009). Validity is inferred by a measure correctly identifying most people with the disorder (high sensitivity) and correctly excluding most people without the disorder (high specificity). In line with a review of measures to detect postnatal depression, the following criteria were applied to this type of psychometric data:  $>.90$  as excellent,  $.90-.80$  as good,  $.70-.50$  as moderate,  $.50-.30$  as low, and  $<.30$  as poor (Boyd et al., 2005). Overall misclassification rate is the proportion of people incorrectly diagnosed.

Available data were also extracted for *concurrent validity*, the ability of a test to correlate positively with measures of the same construct or negatively with measures of an opposing construct. Cohen's (1992) criteria were used to evaluate effect size:  $r = 0.1$ , small;  $r = 0.3$ ,

medium;  $r=0.5$ , large. *Discriminant validity* (the ability of the measure to discriminate between groups differing in levels of anxiety) and *factorial validity* (the ability of the construct to provide a clear factor structure) was also extracted.

### 5.3.5 Reliability

The reliability of measures was evaluated by examining *internal consistency* and *test-retest reliability*. *Internal consistency* represents the extent to which different items of the same construct are scored similarly. For a scale to be reliable a minimum Cronbach's alpha coefficient of 0.70 is recommended (Kline, 2000). Reliability is a measure of the properties of a test within a particular sample rather than a property of a test per se and therefore should be computed in each sample (Vacha-Haase, Kogan, & Thompson, 2000). *Test-retest reliability* (the ability of a test to yield consistent scores over time) should be greater than .80 over one to two weeks or .70 or greater over one month (Boyd et al., 2005). As it is expected that anxiety levels fluctuate throughout pregnancy and the postpartum, test-retest reliability is only relevant to trait anxiety which should remain stable over time (Spielberger et al., 1970).

## 5.4 Results

### 5.4.1 Methods of validation and assessment of reliability

Thirty studies were included. Studies often reported more than one type of validity. One study (Aboidun, 1994) validated two measures. Eleven studies (37%) used clinical interviews for criterion validity; 10 (33%) reported concurrent validity; 9 (30%) reported discriminant validity and 8 (27%) reported factorial validity. Three studies (10%) reported the validity of different scoring methods of a measure. Eleven studies (37%) reported internal consistency and two studies (7%) reported test-retest reliability. Eighteen studies (60%) did not report any reliability data. The heterogeneity of the studies and types of validity reported precluded any scope for meta-analysis in this review. An overview of included studies is given in Table 1.

Table 1. Overview of studies reviewed

Article citation	(#)	Country	<i>n</i>	Sample	Ante- / Post-natal period	Self-report Instrument(s)	Interview & (Diagnostic criteria)	Validity reported	Reliability reported	Quality Score
Abiodun et al., 1993 <sup>a</sup>	1	Nigeria	240	PC	Antenatal 28.8% 1 <sup>st</sup> trimester 33.3% 2 <sup>nd</sup> trimester 45.9% 3 <sup>rd</sup> trimester	GHQ-30	PSE  (ICD-9)	Criterion: Sens, Spec, MR	-	9
Abiodun, 1994 <sup>a</sup>	2	Nigeria	240	PC	Antenatal 28.8% 1 <sup>st</sup> trimester 33.3% 2 <sup>nd</sup> trimester 45.9% 3 <sup>rd</sup> trimester	GHQ-12 HADS	PSE  (ICD-9)	Criterion: Sens, Spec, MR	-	6
Aderibigbe et al., 1996 <sup>b</sup>	3	Nigeria	277	PC	Antenatal Late 2 <sup>nd</sup> - early 3 <sup>rd</sup> Trimester	GHQ-28	PAS  (DSM-III-R)	Factorial	-	9

Article citation	(#)	Country	<i>n</i>	Sample	Ante- / Post-natal period	Self-report Instrument(s)	Interview & (Diagnostic criteria)	Validity reported	Reliability reported	Quality Score
Aderibigbe & Gureje, 1992 <sup>b</sup>	4	Nigeria	277	PC	Antenatal  Late 2 <sup>nd</sup> –early 3 <sup>rd</sup> Trimester	GHQ-28	PAS  (DSM-III-R)	Criterion: Sens, Spec, MR, PPV, NPV Concurrent Compared 2 different scoring methods Discriminant Function Analysis	-	8
Barnett & Parker, 1985 <sup>c</sup>	5	Australia	147	PC	Postnatal i. 3-4 days ii. <3 weeks	STAI  CC-D&A BDI ENES	Researcher-devised semi structured	Discriminant	-	8

Article citation	(#)	Country	<i>n</i>	Sample	Ante- / Post-natal period	Self-report Instrument(s)	Interview & (Diagnostic criteria)	Validity reported	Reliability reported	Quality Score
Barnett & Parker, 1986 <sup>c</sup>	6	Australia	147	PC	Postnatal i. 3-4 days ii. <3 weeks	ISSI				
						HSPA				
						LES				
						STAI	Author-devised	Discriminant	-	10
							semi structured			
						CC-D&A				
						BDI				
						ENES				
						ISSI				
						HSPA				
						LES				

Article citation	(#)	Country	<i>n</i>	Sample	Ante- / Post-natal period	Self-report Instrument(s)	Interview & (Diagnostic criteria)	Validity reported	Reliability reported	Quality Score
Cox et al., 1983	7	UK	230	PC	Ante- and postnatal i. 12 weeks gestation ii. 23 weeks gestation iii. 1 week postnatal iv. 5 months postnatal	DSSI/sAD  Author-devised visual analogue scales	Standardised  Psychiatric Interview	Criterion: MR  Factorial	-	6
Grant et al., 2008	8	Australia	100	R	Ante- and postnatal i. 3 <sup>rd</sup> trimester ii. 7 months postnatal	STAI  EPDS	Mini-Plus  (DSM-IV)	Criterion: Sens, spec, PPV, NPV  Predictive	Internal consistency	11
Hundley et al., 1998	9	UK	217	PC	Ante- and postnatal i. 34 weeks gestation ii. 10 days postnatal	STAI	-	-	Test-retest (Trait scale)	4
Jomeen & Martin,	10	UK	101	PC	Antenatal	HADS	-	Factorial	Internal	8

Article citation	(#)	Country	<i>n</i>	Sample	Ante- / Post-natal period	Self-report Instrument(s)	Interview & (Diagnostic criteria)	Validity reported	Reliability reported	Quality Score
2004					Late 1 <sup>st</sup> –early 2 <sup>nd</sup> trimester	EPDS		Concurrent	consistency	
Kaaya et al., 2002	11	Tanzania	903	R	Antenatal 8-26 weeks gestation	HSCL-25 SF-36	SCID (DSM-IV)	Factorial Concurrent	Internal consistency	10
Karimova & Martin, 2003	12	UK, Uzbekista n	100	PC	Antenatal i. 12 weeks gestation ii. 34 weeks gestation	HADS	-	Factorial	Test-retest Internal consistency	8
Kitamura et al., 1989 <sup>d</sup>	13	Japan	108	PC	Antenatal <12 weeks gestation	GHQ-30	SADS (RDC)	Criterion: Sens, Spec, MR, PPV, NPV Discriminant Function Analysis	-	8



Article citation	(#)	Country	<i>n</i>	Sample	Ante- / Post-natal period	Self-report Instrument(s)	Interview & (Diagnostic criteria)	Validity reported	Reliability reported	Quality Score
Kitamura et al., 1993 <sup>d</sup>	14	Japan	108	PC	Antenatal  <12 weeks gestation	GHQ-30	-	Compared 4 different scoring methods of GHQ  Discriminant Function Analysis	-	8
Kitamura et al., 1994a <sup>d</sup>	15	Japan	108	PC	Ante- and postnatal  i. 1 <sup>st</sup> trimester  ii. 3 <sup>rd</sup> trimester  iii. 5 days postnatal  iv. 1 month postnatal	GHQ-30	SADS  (RDC)	Criterion: Sens, spec at 4 time points	-	9
Kitamura et al., 1994b <sup>d</sup>	16	Japan	108	PC	Antenatal  i. 1 <sup>st</sup> trimester  ii. 3 <sup>rd</sup> trimester	GHQ-30	SADS  (RDC)	Criterion: Sens, Spec, MR, PPV, NPV	-	9
Levin, 1991	17	USA	266	PC	Postnatal measurement of antenatal anxiety	Pregnancy Anxiety Scale	-	Factorial	-	9

Article citation	(#)	Country	<i>n</i>	Sample	Ante- / Post-natal period	Self-report Instrument(s)	Interview & (Diagnostic criteria)	Validity reported	Reliability reported	Quality Score
					i.After birth whilst mothers still in hospital	(PAS)				
Marrs et al., 2009	18	USA	215	Internet	Postnatal <30 days	Author devised scale	-	Factorial	Internal consistency	7
Marteau & Bekker, 1992	19	UK	200	PC	Pregnancy	STAI (state) 20, 4, 6 item versions	-	Concurrent	Internal consistency	5
Martin & Jomeen, 2003	20	UK	56	R	Ante- and postnatal i.Admission to hospital for birth ii. Labour iii. 28 day postnatal	GHQ-12	-	Compared 3 different scoring methods of GHQ Discriminant	Internal consistency	6

Article citation	(#)	Country	<i>n</i>	Sample	Ante- / Post-natal period	Self-report Instrument(s)	Interview & (Diagnostic criteria)	Validity reported	Reliability reported	Quality Score
Miller et al., 2006	21	Australia	325	R	Postnatal 6 weeks – 6 months	DASS-21 EPDS	-	Concurrent	Internal consistency	8
Muzik et al., 2000	22	Austria	50	R	Postnatal 3 or 6 months	SCL-90-R EPDS Zung SRDS	SCID (DSM-III-R)	Discriminant	-	4
Navarro et al., 2007	23	Spain	145 3	PC	Postnatal 6 weeks	GHQ-12 EPDS	SCID (DSM-IV)	Criterion: Sens, spec, NND Concurrent Discriminant	-	10
Nott & Cutts, 1982	24	UK	212	PC	Postnatal	GHQ-30	CIS	Criterion: Sens, spec, MR, PPV,	-	9

Article citation	(#)	Country	<i>n</i>	Sample	Ante- / Post-natal period	Self-report Instrument(s)	Interview & (Diagnostic criteria)	Validity reported	Reliability reported	Quality Score
					8-14 weeks			NPV Concurrent		
Sagrestano et al., 2001	25	USA	166	PC	Antenatal >20 weeks gestation	PSAI (single items)	-	Concurrent Discriminant	Internal consistency	9
						STAI				
Sharp, 1988	26	UK	179	PC	Antenatal <20 weeks gestation	GHQ-30	CIS	Criterion: Sens, spec, MR, PPV	-	9
Spies et al., 2001	27	South Africa	129	PC	Antenatal <20 weeks gestation	K-10	SCID  (DSM-IV)	Criterion: Sens, spec, LR+, LR-, PPV, NPV	-	9

Article citation	(#)	Country	<i>n</i>	Sample	Ante- / Post-natal period	Self-report Instrument(s)	Interview & (Diagnostic criteria)	Validity reported	Reliability reported	Quality Score
Stuart et al., 1998	28	USA	107	C	Postnatal i. 14 weeks ii. 30 weeks	STAI BAI EPDS BDI	-	Concurrent	-	9
Swallow et al., 2003	29	UK	273	PC	Antenatal 10-13 weeks Gestation	GHQ-28	-	Compared 2 different scoring methods of GHQ	Internal consistency	7
Watson et al., 2007	30	USA	830	C	Postnatal <4 months	IDAS BAI BDI EPDS	HRSD	Concurrent Factorial	Internal consistency	8

**Notes:** The same alphabet letter in superscript represents the same sample.

**Sample:** PC = primary care e.g. women at antenatal clinic; R = subsample of a research study; C = community

**Self-report instruments:** CC-D&A = Trait anxiety & depression scales (Costello & Comrey, 1967); BAI = Beck Anxiety Inventory (Beck & Steer, 1991); BDI = Beck Depression Inventory (Beck, 1961); ENES = Eysenck Neuroticism & Extroversion Scale (Eysenck & Eysenck, 1964); ISSI = Interview Schedule for Social Interaction (Henderson, 1981); HSPA = Hereford Scale of Parental Attitudes (Hereford, 1963); LES = Life Event Schedule (Barnett et al, 1983); DSSI/sAD = State of Anxiety and Depression (Bedford & Foulds, 1978); STAI = State Trait Anxiety Inventory (Spielberger, 1983); HADS = Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983); EPDS = Edinburgh Postnatal Depression Scale (Cox, Holden & Sagovsky, 1987); GHQ = General Health Questionnaire; DASS-21 = Depression Anxiety Stress Scales (Lovibond & Lovibond, 1995); SCL-90-R = Symptom Checklist 90 Revised (Derogatis, 1992); Zung SRDS = Zung self-rating depression scale (Zung, 1965); PSAI = Perinatal Self-Administered Inventory (clinic devised); Conflict Tactics Scale (Straus, 1979); CES-D = Centre for Epidemiological Studies Depression Scale (Radloff, 1977); PSS = Perceived Stress Scale (Cohen, Kamarck & Mermelstein, 1983); K-10 = Kessler 10 (Kessler et al., 2002); IDAS = Inventory of Depression and Anxiety Symptoms (Watson et al., 2007)

**Interview and diagnostic criteria:** ICD-9 = International classification of diseases; DSM = Diagnostic and Statistical Manual of Mental Disorders; SCID = Structured Clinical Interview for DSM; SADS = Schedule for Affective Disorders and Schizophrenia (Spitzer & Endicott, 1978); RDC = Research Diagnostic Criteria; CIS =

Clinical Interview Schedule (Goldberg et al., 1970); HRSD = Hamilton Rating Scale for Depression (Hamilton, 1960); PSE = Present State Examination (Wing et al., 1974); PAS = Psychiatric Assessment Schedule; SPI = Standardised Psychiatric Interview.

**Validity:** Sens = sensitivity; Spec = specificity; MR = misclassification rate; PPV = positive predictive value; NPV = negative predictive value; NND = number needed to diagnose; LR+ = Positive likelihood ratio; LR- = Negative likelihood ratio.

#### 5.4.2 Self-report measures

Thirteen studies validated the General Health Questionnaire (GHQ), five studies validated the State-Trait Anxiety Inventory (STAI) and three studies validated the Hospital Anxiety and Depression Scales (HADS). A further nine studies reported a different measure each. Following is a description of each measure, a summary of reported validity and reliability, and an indication of its utility in perinatal samples.

#### 5.4.3 Hospital Anxiety and Depression Scales – Anxiety subscale (HADS-A)

The HADS (Zigmond & Snaith, 1983) consists of an anxiety subscale (HADS-A) and a depression subscale (HADS-D), each comprising seven items to assess presence or absence of symptoms over the last week, on a four-point scale (0-3). Scores of 0-7 are considered 'normal,' 8-10 is considered suggestive of disorder, and 11+ indicates probable presence of a mood disorder (Snaith, 2003). A cut-off of 8 has optimal sensitivity and specificity in non-perinatal samples (Bjelland, Dahl, Haug, & Neckelmann, 2002). The scale was designed to include minimal reference to somatic symptoms (Snaith, 2003). A number of items on the HADS-A scale may have a different relevance to pregnant or postpartum women compared with other populations. For example 'I can sit at ease and feel relaxed' may be less likely in pregnant and postpartum populations.

Three studies assessed the validity of the HADS-A throughout pregnancy using the recommended cut-off of 8 to indicate possible anxiety disorders. No studies assessed the HADS-A in the postpartum. Only one study (Abiodun, 1994) reported validity coefficients. Sensitivity and specificity were particularly high (92.9% and 90.0%) and the misclassification rate was low (9.6%). This cut-off led to a high prevalence of possible cases of anxiety in the UK (36-56%) and Uzbekistani samples (38-42%) (Jomeen & Martin, 2004; Karimova & Martin, 2003) but low prevalence in Nigeria (5.8%; Abiodun, 1994).

One study reported concurrent validity. The HADS-A correlated more highly with the EPDS ( $r = 0.73$ ) than with the HADS-D ( $r = 0.46$ ) indicating a strong association with postnatal



depression (Jomeen & Martin, 2004). Test-retest correlation between 12 and 34 weeks gestation and was low ( $r = 0.31$ ) as may be expected over the course of pregnancy (Karimova & Martin, 2003). Internal consistency across the studies ranged between 0.62 and 0.78 (Karimova & Martin, 2003; Jomeen & Martin, 2004).

The factor structure of the HADS is unclear. In non-perinatal samples there is conflicting evidence of two, three or four factors (Bjelland et al., 2002). Two studies with perinatal women examined the factor structure of the HADS. Jomeen and Martin (2004) carried out principal components analysis (PCA) and confirmatory factor analysis (CFA). Both methods identified three factors: one anxiety (5 items) and two depression factors, although two anxiety items did not load on the anxiety factor. These factors only accounted for around half of the variance in the scale, as indicated by the PCA ( $r^2=.52$ ) and fit indices of the CFA. Another study comparing the HADS structure for UK and Uzbekistani women at 12 and 34 weeks gestation found between two and five factors optimally fitted the data dependent on the time of gestation and nationality of group (Karimova & Martin, 2003).

#### 5.4.4 State Trait Anxiety Inventory (STAI)

The STAI (Spielberger et al., 1970) consists of two subscales each with 20 items. The state subscale measures anxiety *at this moment* (related to a specific situation or time period). The trait subscale measures relatively stable individual propensity to respond with elevated anxiety i.e. *as you generally feel*. Respondents endorse items on a four-point scale (1-4). Some items such as 'I tire quickly' and 'I feel rested' may be confounded by pregnancy or postpartum factors.

Six studies reported use of the STAI in perinatal populations. Two of these used the same sample (Barnett & Parker, 1985, 1986). One paper (Grant et al., 2008) reported validity coefficients. A cut-off  $>40$  on both state and trait scales yielded optimal sensitivity (80.95%), specificity (79.75%), positive predictive value (51.50%) and negative predictive value (94.00%) to determine cases of anxiety in the third trimester of pregnancy. No studies have conducted a

factor analysis on STAI in perinatal populations. Norms available from included studies are given in Table 2.

Both the state and trait anxiety subscales are highly correlated with measures of depression. The subscales correlated more highly with the EPDS than with the BDI at 14 and 30 weeks postpartum. Correlations between the state subscale and a measure of anxiety (BAI) were similar to that observed with depression (Stuart, Couser, Schilder, O'Hara, & Gorman, 1998).

Barnett and Parker (1985, 1986) recommend cut-offs of high ( $\geq 40$ ), moderate (32 - 33) or low ( $\leq 25$ ) anxiety on the basis of mean trait scores of a sample of 94 primiparae ( $M=33.1$ ,  $SD = 8.1$ ; Barnett & Parker, 1985). Discriminant validity of these thresholds was shown by statistically significant differences in scores between groups on a number of self-report measures (Costello-Comrey trait anxiety and depression scales, Beck Depression Inventory, Eysenck Neuroticism Scale). More highly anxious women endorsed significantly more life events in the previous 12 months, and more distress associated with those life events, lower parental confidence and lower confidence in their maternal role (all  $ps < .05$ ). Barnett and Parker (1986) reported further discriminant validity through inspection of hospital files where nursing staff considered a significantly higher percentage of women in the high anxiety group to have 'mood problems' than in the moderate or low anxiety groups. The interviewer, who was blind to group allocation, rated women with anxiety in the anticipated direction, but differences between groups were not significant. Interviewer ratings of increased arousal and unassertiveness also significantly differentiated between anxiety groups.

Predictive validity of the STAI has been demonstrated in postnatal samples. A trait anxiety score of  $>40$  was associated with a six-fold increase in postnatal anxiety disorders (odds ratio = 6.44, CI = 1.28 - 32.28) and depression (odds ratio = 6.12, CI = 1.37 - 27.41) whilst antenatal state anxiety did not predict postnatal anxiety or depressive disorders (Grant et al., 2008).

Test-retest reliability would be expected to be low for the state scale of the STAI, which should measure momentary fluctuations in anxiety, and high for the trait anxiety, which should remain

stable. The latter is not the case in perinatal samples. Hundley, Gurney, Graham, and Rennie (1998) found test-retest correlations of between 0.37 - 0.85 on the trait scale. In addition, women all had lower trait scores after birth than in pregnancy. In Barnett and Parker's (1985) sample, trait scores decreased by 2 - 10% between 3 days and 12 months postpartum. This has also been found in a Greek sample of mothers, 10.3% of whom had substantially lower trait scores at 3 months postpartum than at 2-3 days postpartum (Giakoumaki, Vasilaki, Lili, Skouroliahou, & Liosis, 2009). In general, internal consistency is good, ranging from 0.91 – 0.95 for the state subscale of the full version (Marteau & Bekker, 1992; Grant et al., 2008) and 0.82 for the 6 item version (Marteau & Bekker, 1992). Reported trait scale internal consistency was 0.96 (Grant et al., 2008).

Six and four item versions of the state scale of the STAI have been constructed and validated for use in pregnant populations (Marteau & Bekker, 1992). Concurrent validity was demonstrated by pro-rating scores from the shortened versions and statistically testing for differences between original and pro-rated scores. The shortest scale score that did not differ significantly to the pro-rated total score consisted of 6 items correlating  $>.90$  with scores on the full scale.

Table 2. Obtained norms for the State-Trait Anxiety Inventory

Study	Population	M (SD)	
Time of measurement			
		State	Trait
<b>Barnett and Parker, 1985<sup>a</sup></b>			
< 3 weeks postpartum	High anxiety	41.2	45.1
	Moderate anxiety	32.2	32.4
	Low anxiety	24.9	23.0
<b>Grant et al., 2008</b>			
3rd trimester of pregnancy	Antenatal diagnosed anxiety disorder	48.38 (11.33)	52.10 (10.63)
	Antenatal no diagnosis	32.70 (9.25)	33.57 (10.09)
32 weeks postpartum	Postnatal diagnosed anxiety disorder	45.72 (12.26)	47.17 (10.76)
	Postnatal no diagnosis	33.32 (8.73)	33.24 (8.64)
<b>Marteau and Bekker, 1992</b>			
Pregnancy	Pregnant women, full form (20 items)	37.6 (9.1)	-
	Pregnant women, prorated from 6 items	37.1 (11.0)	-
	Pregnant women, prorated from 4 items	38.4 (12.0)	-
	Pregnant women, abnormal screen, full-form	46.4 (14.8)	-
	Pregnant women, abnormal screen, 6 items	47.7 (15.8)	-
	Pregnant women, abnormal screen, 4 items	-	-

Study	Population	M (SD)	
Time of measurement			
Stuart et al., 1998			
14 weeks postpartum	Postpartum women	30.43 (10.34)	33.21 (10.03)
30 weeks postpartum	Postpartum women	31.17 (9.91)	33.02 (9.45)

<sup>a</sup>Subjects were allocated to groups of high, moderate or low anxiety according to self-report scores on the STAI:  $\geq 40$

=high anxiety; 32-33 = moderate anxiety;  $\leq 25$  = low anxiety.

#### 5.4.5 General Health Questionnaire (GHQ)

The GHQ (Goldberg, 1972) is a widely used measure of non-psychotic psychopathology, used to screen for cases requiring further psychiatric consultation. It asks how the respondent has felt recently. Answers are given on a four-point scale with higher scores indicating increased likelihood of disorder. The GHQ has four different versions (60-item, 30-item; 28-item and 12-item versions) and can be scored in four different ways (Likert scoring 0 – 3; modified Likert scoring 0-0-1-2; C-GHQ scoring 0-1-1-1 for negative items (indicating illness) and 0-0-1-1 for positive items (indicating health); or dichotomous 0-0-1-1 scoring to indicate healthy and ill responses). The shorter versions of the GHQ do not result in greatly reduced sensitivity and specificity in non-perinatal populations (Ayers, 2001). Only the GHQ-28 has a specific anxiety subscale. Thirteen studies evaluated versions of the GHQ in perinatal samples. None of these used the 60 item version. Validity coefficients are shown in Table 3.

#### *GHQ-30*

Seven studies (comprising four different samples) used the GHQ-30. The GHQ-30 is the most widely validated version in non-perinatal populations and yields an overall total score. The recommended cut-off for identifying cases of psychiatric disorder is 4/5 for GHQ scoring and 23/24 for Likert scoring (GL Assessment, 2010). Cut-offs used in perinatal studies ranged from 5 in a Nigerian sample (Abiodun, 1993) to 7/8 in a Japanese sample (Kitamura, Sugawara,

Aoki, & Shima, 1989; Kitamura, Shima, Sugawara, & Toda, 1994a; Kitamura, Toda, Shima, & Sugawara, 1994b). Specificity ranged from 71 - 89% across studies. Sensitivity was mostly in the range of 77 - 83%. However a Japanese study in pregnancy and at different time points postpartum found no cut-off yielded satisfactory sensitivity (Kitamura et al., 1994a). In addition to validating the GHQ-30, Nott and Cutts (1982) reported validity coefficients for a moderated version with two items that may be confounded by perinatal circumstances removed. The modified version increased specificity and decreased overall misclassification.

Two studies performed discriminant function analyses. Kitamura et al. (1989) showed that only 13 out of 30 items significantly contributed to the power of the measure to differentiate cases from non-cases. Items that did not discriminate included: 'Have you been getting out the house as much as usual'; 'Have you been managing to keep yourself busy and occupied' and 'Have you spent much time chatting to people'. However Nott and Cutts (1982) found that 28 out of 30 items were related to 'caseness'. Their discriminant function analysis resulted in a combination of 12 items which if used together resulted in high sensitivity (98%) but low specificity (68%) and a high misclassification rate (27%).

The GHQ scoring method provided the greatest discriminatory power between cases on the GHQ-30 (Kitamura, Shima, Toda, & Sugawara. 1993).

### *GHQ-28*

Three studies validated the GHQ-28. The GHQ-28 (Goldberg & Hillier, 1979) contains four subscales measuring depression, somatic symptoms, anxiety/insomnia and social dysfunction. The factors do not have individual cut-off scores and caseness is determined from an overall score. Sensitivity and specificity ranged from 75 - 85% and were in keeping with a large study (n=5438) which also showed that cut-off points differed depending on culture and geographical locations (Goldberg et al., 1997). Across all studies sensitivity and specificity for all scoring methods were within 75 - 85% which is comparable with the overall sensitivity (79.7%) and

specificity (79.2%) in Goldberg et al. (1997). Positive predictive value ranged from 46 - 53% (Aderibigbe & Gureje, 1992).

Correlations between the somatic symptom scale and clinical interview scores and between the anxiety subscale and clinical scores were significant but low ( $r_s = 0.26$  to  $0.29$ ; Aderibigbe & Gureje, 1992). Social dysfunction and depression subscales did not correlate significantly (Aderibigbe & Gureje, 1992). Discriminant function analysis of the subscales showed that the social dysfunction subscale did not make a significant contribution to the GHQ-28's ability to discriminate cases from non-cases (Aderibigbe & Gureje, 1992).

The factor structure of the GHQ-28 in an antenatal Nigerian population (Aderibigbe, Riley, Lewin, & Gureje, 1996) differed to that found in UK primary care populations (Goldberg, 1979) although it is unclear whether this is due to cultural differences, the experience of pregnancy, or an interaction between the two. In the Nigerian sample, principal components analysis resulted in four factors explaining 40.1% of the variance in the data. Social dysfunction accounted for most variance (19%). Anxiety items were hypothesised to load onto a single factor but were divided between somatic-anxiety (9.7% of variance) and depression-anxiety (6.3% of variance) subscales. Severe depression accounted for 5.1% of the variance (Aderibigbe et al., 1996).

Two studies considered scoring methods of the GHQ in perinatal samples. One study found that the C-GHQ method of scoring resulted in higher sensitivity and specificity than the standard GHQ scoring in Nigerian women in the late second or early third trimester (Aderibigbe & Gureje, 1992). The other study of a UK sample in the late first trimester suggested that the number of cases identified depended on the scoring method used with the standardized cut-off of 4/5 classifying more women as cases than the Likert scoring (Swallow, Lindow, Masson, & Hay, 2003).

### *GHQ-12*

Three studies validated the GHQ-12 in perinatal samples. The GHQ-12 was compiled by removing items from the GHQ-60 that relate to physical symptoms and then selecting equal

numbers of health present and health absent items that discriminate well between cases. The GHQ-12 has the advantage of being free of somatic symptoms, although it cannot distinguish between mood states as it gives a total score only and is not divided into subscales. It is quick to administer (approximately two minutes) and sensitivity and specificity for anxiety disorders were good in antenatal and postnatal populations in the two studies examining this ( $>0.80$ ). The standardized threshold to indicate a case is 1/2 for GHQ scoring and 11/12 for Likert scoring (GL Assessment, 2010). Cut-off scores had to be increased from the suggested standardized thresholds in order to obtain satisfactory validity coefficients. After birth, the GHQ-12 detected 69.6% of pure anxiety cases and 86.9% of depression with or without comorbid anxiety using a cut-off of 4/5 (Navarro et al., 2007). Post-hoc tests showed that the GHQ-12 found significant differences in scores between cases and non-cases, but did not find differences between diagnostic groups of anxiety, depression, comorbid anxiety and depression, or adjustment disorder.

The EPDS and GHQ-12 showed good concurrent validity ( $r = 0.80$ ) (Navarro et al., 2007). An effect of scoring method on case identification was found with the GHQ-12 (Martin & Jomeen, 2003). GHQ scoring resulted in 34.5% cases, C-GHQ scoring in 52.7% cases and Likert scoring in 45.5% of cases. The scores from the C-GHQ method resulted in significant main and interaction effects in an analysis of variance (ANOVA) but no effects were found with the Likert and GHQ methods in this sample of women with pre-labour rupture of membrane at term (Martin & Jomeen, 2003). The difference in number of cases identified and interpretation of ANOVA results depending on scoring method raises concerns about the reliability of the GHQ-12 in late pregnancy/early postpartum or at least highlights that scoring methods need to be validated against clinical interviews in this population. Internal consistency ranged from 0.81 - 0.95 (Martin & Jomeen, 2003). Validity coefficients are shown in Table 3. Only one paper reported normative data (Navarro et al., 2007).



Table 3. GHQ validity coefficients and norms

Version (paper)	Author recommended cut- off	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)	Misclassification rate
<b>GHQ -12</b>						
(Abiodun, 1994)	3	83.3	81.4	-	-	18.3
(Navarro et al., 1997)	4/5	80.6	80.4	1.6 <sup>b</sup>	-	-
<b>GHQ-28</b>						
(Aderibigbe & Gureje, 1992)						
GHQ scoring	3/4	75	83	46	95	18
C-GHQ scoring	7/8	82	85	53	96	16
<b>GHQ-30</b>						
(Abiodun, 1993)	5	80	80.9	-	-	19.1
(Kitamura et al.) (year)						
1 <sup>st</sup> trimester (1989)	7/8	83.3	71.1	37	96	26.9
3 <sup>rd</sup> trimester (1994b)		38.5	82.4	25	90	-

<b>Version (paper)</b>	<b>Author recommended cut- off</b>	<b>Sensitivity (%)</b>	<b>Specificity (%)</b>	<b>Positive predictive value (%)</b>	<b>Negative predictive value (%)</b>	<b>Misclassification rate</b>
1 <sup>st</sup> day postnatal (1994a)		27.8	79.2	-	-	-
5 <sup>th</sup> month postnatal (1994a)		50.0	84.3	-	-	-
(Nott & Cutts, 1982)						
Unmodified	6/7	80	89	50	97	19
Author modified	6/7	83	87	53	96	16
(Sharp, 1988) <sup>a</sup>	5/6	77	78	52	96	22

Note: <sup>a</sup>Clinical Interview Schedule cut-off point of 17/18; <sup>b</sup>Sampling strategy prohibited calculation of positive predictive value, therefore the authors reported number needed to diagnose, a function of specificity and sensitivity which is stable across populations.

#### 5.4.6 Other measures

The Personal Disturbance Scale (DSSI/sAD; Bedford & Foulds, 1978) is a 12-item self-report measure of anxiety and depression. One study validated the DSSI/sAD against a clinical interview at four time points in pregnancy and postpartum (Cox & O'Connor, 1983). This study found that the standardized cut-off point of 6 was not appropriate for pregnant women: 13 women out of 230 scored  $\geq 6$  and of these only three had clinically significant psychiatric illness but not anxiety or depression. The scale did not identify two women with phobic neuroses. Increases in anxiety and depression at the first postpartum time point which were detected by clinical interview and visual analogue scales were not identified by the DSSI/sAD (Cox & O'Connor, 1983). Factor analysis in a non-perinatal population suggests the scale may be measuring one latent factor rather than two distinct anxiety and depression subscales (Shevlin, Brunson, & Miles, 1998).

Two studies examined variations of the Symptom Checklist 90 Revised (SCL-90-R; Derogatis, 1992). The SCL-90-R comprises 90 items covering 9 primary dimensions including anxiety, phobic anxiety, somatisation, depression and obsessive compulsive scales, each measured on a five point scale. In a small sample of 3 or 6 month postpartum women the SCL-90-R anxiety subscale scores distinguished women with anxiety disorders from women with no psychiatric diagnosis but did not distinguish anxiety cases from depression cases in post-hoc tests (Muzik et al., 2000). Women with major depressive disorder also had higher scores on the anxiety subscale than women with anxiety disorders although no women included in the analysis had comorbid anxiety and depression (Muzik et al., 2000).

The Hopkins-Symptom Checklist 25 (Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974) is a self-report inventory of 10 anxiety and 15 depression items derived from the SCL-90. A factor analysis in a large sample of pregnant HIV positive Tanzanian women yielded four factors representing depression-anxiety, anxiety, psycho-physiological and physiological constructs rather than two clear factors (Kaaya et al., 2002). This effect could be due to pregnancy or

diagnosis of HIV. Optimal cut-off points and validity coefficients were reported for detecting major depressive disorder only. The anxiety subscale showed good internal consistency (Cronbach's  $\alpha = 0.85$ ).

One study suggested that a single item 'Do you feel very anxious?' could be used to screen for anxiety in antenatal clinics where time is constrained (Sagrestano et al., 2001). This item correlated with standardized scores on the STAI showing a small to medium effect size ( $r = 0.24$ ). Women who answered 'yes' to feeling anxious had significantly higher scores on the STAI than those who had answered no. The same situation was true for single items measuring depression and social support but single items measuring stress, relationship conflict, verbal abuse or violence from partner did not reliably differentiate between women experiencing high and low levels of these constructs. The questions were asked as part of an interview rather than a self-report questionnaire which may have influenced women's decision to disclose such information (Sagrestano et al., 2001).

The Pregnancy Anxiety Scale (PAS; Levin, 1991) is the only measure developed specifically for pregnant women. It measures pregnancy-specific anxiety with 13 yes/no items.

Confirmatory factor analysis showed a clear structure of three latent factors measuring anxiety about being pregnant, anxiety about childbirth and anxiety about hospitalization with good model fit indices. However data about pregnancy anxiety was collected postpartum and no further studies have validated this measure.

The Depression Anxiety Stress Scales (DASS; Lovibond & Lovibond, 1995) has three subscales designed to maximally discriminate between depression, anxiety and stress in the last week (Antony, Bieling, Cox, Enns, & Swinson, 1998). The DASS excludes somatic items such as sleep disturbance, lack of energy and poor concentration which may not be valid markers for pregnant or postnatal women. The DASS is available in 42 or 21 item versions. The DASS-21 appears to measure anxiety without a large overlap with depression. In a study of 325 postnatal women, 240 women had EPDS scores  $< 9$  (a negative screen). Yet the DASS-21 identified eight

of these women (3% of the total sample) as anxious and a further 10 women (4% of the total sample) as stressed. Internal consistency was acceptable for all subscales: 0.84, depression; 0.77, anxiety and 0.86, stress (Miller, Pallant, & Negri, 2006).

The Kessler 10 (K-10; Kessler et al., 2002) is a short screening scale comprising 10 items designed to assess level of general psychological distress in the past four weeks. Scores can range from 10 (no distress) to 50 (severe distress). In a sample of women in early pregnancy the K-10 identified 69 - 76% of diagnosed cases of anxiety disorders (Spies et al., 2009). Sensitivity ranged from 0.50 to 1.00 and specificity from 0.75 - 0.98 dependent on the anxiety disorder in question. The scale performed best at detecting social anxiety disorder (sensitivity 1.00, specificity 0.98) but validity coefficients were lower for panic disorder (sensitivity 0.50, specificity 0.98) and PTSD (sensitivity 0.50, specificity 0.80). Numbers of women with anxiety disorders were low, limiting power to show representative sensitivity and specificity. However, the K-10 has shown robust psychometric properties in non-perinatal samples and had substantially better validity coefficients than the GHQ-12 in discriminating cases of anxiety and mood disorders in the Australian National Survey of Mental Health and Well-being (Kessler et al., 2002; Furukawa, Kessler, Slade, & Andrews, 2003). A Dutch study improved the ability of the K10 to identify anxiety disorders by adding five further items pertaining to GAD, social anxiety disorder, panic and agoraphobia (Donker et al., 2010).

Finally, two new measures have attempted to broaden the content of anxiety and psychological distress measures. Firstly, the Inventory of Depression and Anxiety Symptoms (IDAS; Watson et al., 2007) is a new multi-dimensional measure of symptoms of anxiety and depression, containing 64 items which yielded 10 factors in multiple samples relating to symptoms of: suicidality, lassitude (fatigue, lack of energy, hypersomnia), insomnia, appetite loss, appetite gain, ill temper, well-being, panic, social anxiety, and traumatic intrusions as well as two further scales assessing general depression scale and dysphoria. Responses refer to the previous two weeks and are scored on a scale from 0-3. In a large sample (n=832) of women less than 4 months postpartum, the 10 initial symptom scales all loaded onto a higher order factor of

general distress with loadings ranging from 0.38 (appetite loss) to 0.76 (social anxiety).

Dysphoria had loading of 0.91. These 11 factors accounted for 92% of the variance in the data.

All IDAS scales correlated significantly with the EPDS and with clinician ratings on the Hamilton Rating Scale for Depression (Watson et al., 2007). Internal consistency ranged from 0.74 (suicidality) to 0.91 (general depression). The IDAS remains to be validated against a clinical interview in perinatal populations but has shown strong correlations in a psychiatric sample particularly between SCID diagnoses of panic disorder and IDAS Panic, posttraumatic stress disorder and IDAS Traumatic Intrusions, and social anxiety disorder and IDAS Social Anxiety (Watson et al., 2008). However, GAD correlated most strongly with IDAS General Depression and Dysphoria, and OCD diagnoses did not show differentially high correlations with any IDAS subscales.

Secondly, an unnamed measure was constructed through an internet survey of 142 questions derived from case descriptions of postnatal psychiatric disturbance and DSM-IV-R, with participants asked to retrospectively rate the frequency with which they experienced symptoms in the first 30 days after birth (Marrs, Durette, Ferraro, & Cross, 2009). This measure was not intended for screening purposes but provides evidence from factor analysis for broadening the conceptualisation of postnatal distress. Exploratory factor analysis yielded 10 factors accounting for 58% of the variance: a general mental status factor (28% of the variance), psychoticism / morbid thoughts (6%), generalised anxiety (6%), panic (3%), guilt/self-criticism (3%), compulsive behaviour (3%), hyper-vigilance (2%), contentment (2%), negative body image (2%) and manic behaviour (2%) (Marrs et al., 2009). Depressive symptoms did not load clearly onto one factor and were not the most commonly endorsed items. Internal consistency ranged from 0.67 (manic behaviour) to 0.92 (mental status). Forty-three percent of the sample had a previous mental health diagnosis and thus the factor structure may differ in more representative perinatal samples. The mental status factor captures some of the core emotional and cognitive features of anxiety and depression that are similar to the dysphoria scale on the IDAS. This may indicate that perinatal distress is better conceptualised by an underlying factor of general

distress onto which anxiety and or depressive symptoms load, rather than as two distinct factors of anxiety and depression.

## **5.5 Discussion**

This systematic review highlights the paucity of research validating measures of anxiety in perinatal populations and the heterogeneity of studies that do. It also raises important issues concerning the choice of anxiety screening measure to use in perinatal populations. Given the limited data, recommendations for each of the measures reviewed are cautiously provided followed by key issues that have arisen from this review.

The limited number of studies validating the HADS-A makes it difficult to draw conclusions about the use of this measure in pregnant samples. Despite excellent sensitivity and specificity, low internal consistency and discrepancies in factor structure and the prevalence of probable anxiety disorder identified using the recommended cut-off of 8 are a concern, although these may be due to cultural or methodological differences. Therefore more research is required to validate the HADS-A in perinatal samples before it is possible to recommend use of this measure.

The STAI has demonstrated good criterion validity in pregnant samples although positive predictive value was low, which is an issue if the measure is to be used for screening. The six-item version may be as useful as the longer version for screening in pregnancy. In the postpartum period, discriminant validity has been demonstrated but more research is needed to demonstrate criterion validity. Factor analysis is also necessary in pregnant and postpartum samples. The overlap with depressive symptoms must be kept in mind when using the STAI. The STAI is the only measure that separates state from trait anxiety. More research is needed to investigate stability of the trait scale over time.

The GHQ may be suitable as a screen for general psychopathology in perinatal populations, with the GHQ-12 or the modified GHQ-30 offering the best sensitivity and specificity. Only the GHQ-28 can offer a specific measure of anxiety and further factor analysis is required to

determine the factor structure in perinatal populations. Results from different scoring methods are mixed. If different scoring methods result in different probable cases, the clinician or researcher cannot be confident that the measure accurately identifies women experiencing distress and in need of further assistance (Jomeen & Martin, 2004; Swallow et al., 2003).

Concerning other measures, the limited evidence suggests that the DSSI/sAD is not appropriate for use in perinatal populations in its current form. More research is needed before recommending the use of the SCL-90 and HSCL-25 in perinatal populations. The use of a single item 'Do you feel very anxious?' (Sagrestano et al., 2001) reflects the current guidelines for screening for postnatal depression but is unlikely to encompass enough information to successfully screen for different types of anxiety disorder and symptoms. The Pregnancy Anxiety Scale (Levin, 1991) may be useful in this specific population but studies are needed to validate it as none have been done since its creation. The K10 may be of similar use to the GHQ-12 with the benefit of showing further power to discriminate anxiety from general distress. The IDAS could be a useful measure in perinatal populations due to the inclusion of detailed scales of symptoms of anxiety disorders and depression in the same measure. It has shown a clear factor structure in multiple samples but needs to be validated against a clinical interview in perinatal samples.

The DASS-21 has the apparent advantage of differentiating between diagnoses of anxiety, depression and stress and it is largely free of somatic items. The DASS remains to be validated against a clinical interview in perinatal samples, although research in non-perinatal samples has shown that DASS and DASS-21 scores discriminated between diagnoses of major depressive disorder, panic disorder, social anxiety disorder, obsessive compulsive disorder and specific phobia; and there is a clear three-factor structure with items loading onto the expected factors (Antony et al., 1998).

A key issue arising from this review is the lack of measures of anxiety specific to pregnant or postnatal women. To date, only one anxiety measure has been published that is specific to this



population (the Pregnancy Anxiety Scale). No measures have been designed for use in the postpartum. This is in contrast to postnatal depression where a range of specific measures have been developed, such as the EPDS and the Postpartum Depression Screening Scale. This has not been so with measures of anxiety despite the overlap of physiological symptoms of anxiety and physiological symptoms occurring in pregnancy and the postpartum that may need to be disentangled.

Related to the need for specific measures, content validity of general measures has not been evidenced as many measures contain items that may not be appropriate to perinatal populations. In early pregnancy many symptoms (e.g. nausea, vomiting, aches, dizziness) may lead to inflated scores on measures that include somatic symptoms - leading to a higher number of false positives (Swallow et al., 2003). The high number of 'cases' of women identified by the GHQ supports this position. Physical symptoms in the postpartum are also likely to inflate scores, although women may feel such symptoms are acceptable and they do not contribute to psychological disorder. Inclusion of somatic symptoms is also likely to result in a different factor structure in data from perinatal populations and subscale scores may thus not be valid. Care must be taken to ensure that factor structure is determined in the population of choice before interpreting subscale scores because a subscale that purports to measure somatic distress and thus contribute to an overall ill health score may really just reflect the normal physical symptoms of pregnancy.

Thorough validation of measures is also required. Concurrent, discriminant and factorial validity are recognised as important components of ensuring a measure is valid but they do not provide a complete picture and it is important that measures are validated against a clinical interview when they are being used in a new population. The GHQ12, 28 and 30, STAI, and K-10 have been validated against a clinical interview in perinatal samples, but all other measures included remain to be validated in this way. Measures also need to be validated in pregnancy *and* in the postpartum if they are to be used in both populations. Only four studies validated measures against a gold standard in the postpartum. If the purpose of a measure is to screen for

anxiety and indicate those women who need further consultation, it is vital to know that it can detect as many true cases as possible as evidenced by sensitivity and positive predictive value, which can only be calculated if the measure has been validated against a gold standard. Clinician judgement and use of the gold standard will also have an effect on the utility of validity coefficients (Joiner, Walker, Pettit, Perez, & Cukrowicz, 2005). Only the GHQ had been validated enough in perinatal populations to enable comparison of validity coefficients, but not specifically for the anxiety subscale of the 28-item version.

Another issue is whether to use general measures of distress or anxiety specific measures. The measurement context will influence this decision. In the research context it may be desirable to use a questionnaire that can measure a continuum of anxiety symptoms associated with other variables, such as the STAI. However, in clinical practice and large surveys, the general measures included in this review (GHQ, SCL-90-R, K10) may offer the best utility in detecting cases of psychiatric morbidity. However these measures will not offer as much information about the experience of anxiety as a specific anxiety measure.

Additionally, general anxiety measures that have not been designed for the perinatal period may miss facets of anxiety that are particular to this period. The Pregnancy Anxiety Scale (Levin, 1991) measures anxiety related to pregnancy, anxiety related to childbirth, and anxiety related to hospitalization. A number of measures have been developed that are specific to pregnancy and consider aspects related to anxiety such as worry or daily hassles but do not measure anxiety itself (Cambridge Worry Scale: Green, Kafetsios, Statham, & Snowdon, 2003; Pregnancy Experience Scale: DiPietro, Ghera, Costigan, & Hawkins, 2004). These measures are not designed for the postpartum. Furthermore some women may be more prone to developing anxiety as consequence of specific physiological and psychological processes associated with birth which raise additional considerations for measurement (Heron et al., 2004). Further research and meta-analyses of prevalence of anxiety disorders in perinatal populations will assist in determining which anxiety disorders pose particular problems for perinatal populations.

A key issue arising from this review is the overlap of depression and anxiety symptoms in the perinatal period and how to differentiate them. Concurrent validity will only yield useful information in as much as the reference measure (or clinical interview) measures that which it purports to measure. Self-report measures of a construct should correlate more highly with another measure of the same construct, than with a purported measure of a different construct (Watson et al., 2008, Clark & Watson, 1991). For example, the EPDS is used as a measure of depression but evidence suggests a few items on the EPDS measure anxiety (Phillips, Sharpe, Matthey, & Charles, 2009; Jomeen & Martin, 2005). Thus one cannot know whether the measure being validated is correlating with anxiety or depression symptoms. In this review, both the HADS-A and the state scale of the STAI correlated more highly with the EPDS than with other measures of depression supporting the evidence that the EPDS does detect anxiety but obscuring the extent to which the STAI and HADS-A are specific to anxiety or share overlap with symptoms of depression in perinatal samples.

More generally, the case for broadening the measurement of postnatal distress has been put forward (Heron et al., 2004; Miller et al., 2006; Ross et al., 2003). This has begun to be captured in development of measures. The IDAS, although a general symptom measure, shows evidence of a general distress scale underlying factors of anxiety and depression. This may be useful in capturing the close relationship between depression and anxiety in the perinatal period. The DASS-21 is also of interest in perinatal populations due its separation of anxiety, stress and depression and exclusion of somatic factors. Both of these measures have the advantage of encompassing a broader concept of postnatal distress.

Researchers and clinicians will need to determine the best measure for their particular needs in screening or researching anxiety in pregnancy or the postpartum, although some tentative conclusions can be drawn. The STAI is a robust and specific measure of anxiety that has been validated against clinical interview and shows discriminant and predictive validity in perinatal samples and may therefore be most useful for research purposes. The K10 may be the best short screening measure due to its ability, over the GHQ-12, to differentiate anxiety disorders. The

DASS-21 shows appropriate content and a logical next step is to validate it against clinical interview. The DASS-21 and IDAS may be most useful for measuring specific but multiple types of distress in pregnancy and the postpartum.

Whilst some recommendations have been made about measures that are suitable for measuring perinatal anxiety, this review is limited by the small number of studies that have validated self-report measures of anxiety in perinatal populations. Studies vary widely on validation methods and sampling so are not easily comparable. Data is mixed for all measures of anxiety which may be due to methodological or cultural differences. The review may also be limited by the inclusion of studies in English only, and papers may have been missed due to the search strategy. A review of all measures of anxiety used at particular perinatal times (as opposed to studies validating self-report measures) would provide useful normative data for researchers. Perinatal anxiety is an increasingly recognised concern which will need brief, feasible and accurate self-report measures to assist research and screening of women.

## 5.6 References

Abiodun, O.A., (1994). A validity study of the Hospital Anxiety and Depression Scale in General Hospital Units and a community sample in Nigeria. *British Journal of Psychiatry*, 165, 669-672

Abiodun, O.A., Adetoro, O.O., & Ogunbode, O.O., (1993). Psychiatric morbidity in a pregnant population in Nigeria. *General Hospital Psychiatry*, 15, 125-128.

Aderibigbe, Y.A., Riley, W., Lewin, T., & Gureje, O., (1996). Factor structure of the 28-item general health questionnaire in a sample of antenatal women. *International Journal of Psychiatry and Medicine*, 26, 263-269.

- Aderibigbe, Y.A., & Gureje, O., (1992). The validity of the 28-item general health questionnaire in a Nigerian antenatal clinic. *Social Psychiatry and Psychiatric Epidemiology*, 27, 280-283.
- Antony, M.M., Bieling, P.J., Cox, B.J., Enns, M.W., & Swinson, R.P., (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment*, 10, 176-181.
- Ayers, A. (2001) Assessing psychopathology in pregnancy and the postpartum. *Journal of Psychosomatic Obstetrics and Gynaecology*, 22, 91-102.
- Barnett, B., & Parker, G., (1985). Professional and non-professional intervention for highly anxious primiparous mothers. *British Journal of Psychiatry*, 146, 287-293.
- Barnett, B., & Parker, G., (1986). Possible determinants, correlates and consequences of high levels of anxiety in primiparous mothers. *Psychological Medicine*, 16, 177-185.
- Beck, A.T., Epstein, N., Brown, G., & Steer, R.A., (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology*, 56, 893-897.
- Bedford, A. & Foulds, G.A., 1978. *Manual of the Personal Disturbance Scale (DSSI/sAD)*. Windsor: NFER-Nelson.
- Berle, J., Mykletun, A., Daltveit, A., Rasmussen, S., Holsten, F., & Dahl, A., (2005). Neonatal outcomes in offspring of women with anxiety and depression during pregnancy. A linkage study from the Nord-Trøndelag Health Study (HUNT) and Medical Birth Registry of Norway. *Archives of Women's Mental Health*, 8, 181-189.

- Bjelland, I., Dahl, A.A., Haug, T.T., & Neckelmann, D., (2002). The validity of the Hospital Anxiety and Depression Scale: an updated review. *Journal of Psychiatric Research*, 52, 69-77.
- Boyd, R.C., Le, H.N., & Somberg, R., (2005). Review of screening instruments for postpartum depression. *Archives of Women's Mental Health*, 8, 141-153.
- Brouwers, E.P.M., van Baar, A.L., & Pop, V.J.M., (2001). Does the Edinburgh Postnatal Depression Scale measure anxiety? *Journal of Psychosomatic Research*, 51, 659-663.
- Clark, L.A., & Watson, D., (1991). Tripartite model of anxiety and depression: Psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology*, 100, 316-336.
- Cohen, J., 1992. A power primer. *Psychological Bulletin*, 112, 155-159.
- Costello, C.G. & Comrey, A.L., 1967. Scales for measuring depression and anxiety. *Journal of Psychology*, 66, 303-313.
- Cox, J.L., & O'Connor, Y.M., (1983). Prospective study of the psychiatric disorders of childbirth by self-report questionnaire. *Journal of Affective Disorders*, 5, 1-7.
- 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.
- Crisp, A.H., Jones, M.G., & Slater, P., (1978). The Middlesex Hospital Questionnaire: A validity study. *British Journal of Medical Psychology*, 51, 269-280.

- Derogatis, L.R., (1992). *SCL-90-R Administration, Scoring and Procedures Manual-II*. Towson, MD: Clinical Psychometric Research.
- Derogatis, L.R., Lipman, R.S., Rickels, K., Uhlenhuth, E.H., & Covi, L., (1974). The Hopkins Symptom Checklist: A measure of primary symptom dimensions. *Modern Problems of Pharmacopsychiatry*, 7, 79-110.
- DiPietro, J.A., Ghera, M.M., Costigan, K., & Hawkins, M., (2004). Measuring the ups and downs of pregnancy stress. *Journal of Psychosomatic Obstetrics and Gynaecology*, 25, 189-201.
- DiPietro, J., (2010). Psychological and psychophysiological considerations regarding the maternal-fetal relationship. *Infant and Child Development*, 19, 27-38.
- Donker, T., Comijs, H., Cuijpers, P., Terluin, B., Nolen, W., Zitman, F., & Penninx, B., (2010). The validity of the Dutch K10 and extended K10 screening scales for depressive and anxiety disorders. *Psychiatry Research*, 176, 45-50.
- Field, T., Diego, M., Hernandez-Reif, M., Figueiredo, B., Deeds, O., Ascencio, A., Schanberg, S., & Kuhn, C., (2010). Comorbid depression and anxiety effects on pregnancy and neonatal outcome. *Infant Behaviour and Development*, 33, 23-29.
- Furukawa, T.A., Kessler, R.C., Slade, T., & Andrews, G., 2003. The performance of the K6 and K10 screening scales for psychological distress in the Australian National Survey of Mental Health and Well-Being. *Psychological Medicine*, 33, 357-362.

- Geisinger, K.F., (1994). Cross-cultural normative assessment: Translation and adaptation issues influencing the normative interpretation of assessment instruments. *Psychological Assessment*, 6, 304-312.
- Giakoumaki, O., Vasilaki, K., Lili, L., Skouroliahou, M., & Liosis, G., (2009). The role of maternal anxiety in the early postpartum period: Screening for anxiety and depressive symptomatology in Greece. *Journal of Psychosomatic Obstetrics and Gynaecology*, 30, 21-28.
- Gibson, J., McKenzie-McHarg, K., Shakespeare, J., Price, J., & Gray, R., (2009). A systematic review of studies validating the Edinburgh Postnatal Depression Scale in antepartum and postpartum women. *Acta Psychiatrica Scandinavica*, 119, 350-364.
- Glasheen, C., Richardson, G.A., & Fabio, A., (2010). A systematic review of the effects of postnatal maternal anxiety on children. *Archives of Women's Mental Health*, 13, 61-74.
- GL Assessment, General Health Questionnaire, Frequently asked questions, accessed 12 April 2010. [http://www.gl-assessment.co.uk/health\\_and\\_psychology/resources/general\\_health\\_questionnaire/faqs.asp?css=1](http://www.gl-assessment.co.uk/health_and_psychology/resources/general_health_questionnaire/faqs.asp?css=1)
- Goldberg, D.P., (1972). *The Detection of Psychiatric Illness by Questionnaire. (Maudsley monograph no 21)*. Oxford: Oxford University Press
- Goldberg, D.P., & Hillier, V.F., (1979). A scaled version of the General Health Questionnaire. *Psychological Medicine*, 9, 139-145.



- Goldberg, D.P., Gater, R., Sartorius, N., Ustun, T.B., Piccinelli, M., Gureje, O., & Rutter, C., (1997). The validity of two versions of the GHQ in the WHO study of mental illness in general health care. *Psychological Medicine*, 27, 191-197.
- Grant, K-A., McMahon, C., & Austin, M-P., (2008). Maternal anxiety during the transition to parenthood: A prospective study. *Journal of Affective Disorders*, 108, 101-111.
- Green, J.M., Kafetsios, K., Statham, H.E., & Snowden, C.M., (2003). Factor structure, validity and reliability of the Cambridge Worry Scale in a pregnant population. *Journal of Health Psychology*, 8, 753-764.
- Greenhalgh, T., (2006). *How to read a paper: the basics of evidence-based medicine (3<sup>rd</sup> edition)*. Oxford: Blackwell Publishing.
- Heron, J., O'Connor, T.G., Evans, J., Golding, J., Glover, V., & ALSPAC Team. (2004). The course of anxiety and depression through pregnancy and the postpartum in a community sample. *Journal of Affective Disorders*, 80, 65-73.
- Hundley, V., Gurney, E., Graham, W., & Rennie, A.M., (1998). Can anxiety in pregnant women be measured using the State-Trait Anxiety Inventory? *Midwifery*, 14, 118-121.
- Huizink, A.C., Mulder, E.J.H., Robles de Medina, P.G., Visser, G.H.A., & Buitelaar, J.K., (2004). Is pregnancy anxiety a distinctive syndrome? *Early Human Development*, 79, 81-91.
- Johnson, R.C., & Slade, P., (2003). Obstetric complications and anxiety during pregnancy: Is there a relationship? *Journal of Psychosomatic Obstetrics and Gynecology*, 24, 1-14.

- Joiner, T.E.Jr., Walker, R.L., Pettit, J.W., Perez, M., & Cukrowicz, K.C., (2005). Evidence-based assessment of depression in adults. *Psychological Assessment*, 17, 267-277.
- Jomeen, J., & Martin, C.R., (2005). Confirmation of an occluded anxiety component within the Edinburgh Postnatal Depression Scale (EPDS) during pregnancy. *Journal of Reproductive and Infant Psychology*, 23, 143-154.
- Jomeen, J., & Martin, C.R., (2004). Is the Hospital Anxiety and Depression Scale (HADS) a reliable screening tool in early pregnancy? *Psychology and Health*, 19, 787-800.
- Kaaya, S.F., Fawzi, M.C.S., Mbwapbo, J.K., Lee, B., Msamanga, G.I., & Fawzi, W., (2002). Validity of the Hopkins Symptom Checklist -25 amongst HIV-positive pregnant women in Tanzania. *Acta Psychiatrica Scandinavica*, 106, 9-19.
- Karimova, G.K., & Martin, C.R., 2003. A psychometric evaluation of the Hospital Anxiety and Depression Scale during pregnancy. *Psychology, Health and Medicine*, 8, 89-103.
- Kessler, R.C., Andrews, G., Colpe, L.J., Hiripi, E., Mroczek, D.K., Normand, S-L., Walters, E.E., & Zaslavsky, A.M., (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine*, 32, 959-976.
- Kitamura, T., Sugawara, M., Aoki, M., & Shima, S., (1989). Validity of the Japanese version of the GHQ among antenatal clinic attendants. *Psychological Medicine*, 19, 507-511.
- Kitamura, T., Shima, S., Toda, M.A., & Sugawara, M., (1993). Comparison of different scoring systems for the Japanese version of the General Health Questionnaire. *Psychopathology*, 26, 108-112.

- Kitamura, T., Shima, S., Sugawara, M., & Toda, M.A., (1994a). Temporal variation of validity of self-rating questionnaires: Repeated use of the General Health Questionnaire and Zung's Self-rating Depression Scale among women during antenatal and postnatal periods. *Acta Psychiatrica Scandinavica*, 90, 446-450.
- Kitamura, T., Toda, M.A., Shima, S., & Sugawara, M. (1994b). Validity of the repeated GHQ among pregnant women: A study in a Japanese General Hospital. *International Journal of Psychiatry and Medicine*, 24, 149-156.
- Kline, P. (2000). *A Psychometrics Primer*. London: Free Association Books.
- Levin, J.S. (1991). The factor structure of the Pregnancy Anxiety Scale. *Journal of Health and Social Behaviour*, 32, 368-381.
- Lobel, M., Cannella, D.L., Graham, J.E., DeVincent, C., Schneider, J., & Meyer, B.A. (2008). Pregnancy-specific stress, prenatal health behaviours, and birth outcomes. *Health Psychology*, 27, 604-615
- Lovibond, S.H., & Lovibond, P.F. (1995). *Manual for the Depression Anxiety Stress Scales* (2<sup>nd</sup> ed). Sydney: Psychology Foundation of Australia.
- Marrs, C.R., Durette, R.T., Ferraro, D.P., & Cross, C.L. (2009). Dimensions of postpartum psychiatric distress: Preliminary evidence for broadening clinical scope. *Journal Affective Disorders*, 115, 100-111.

- Marteau, T.M., & Bekker, H. (1992). The development of a six-item short form of the state scale of the Spielberger State-Trait Anxiety Inventory (STAI). *British Journal of Clinical Psychology*, 31, 301-306.
- Martin, C.R., & Jomeen, J. (2003). Is the 12-item General Health Questionnaire (GHQ-12) confounded by scoring method during pregnancy and following birth? *Journal of Reproductive and Infant Psychology*, 21, 267-278.
- Matthey, S., Barnett, B., Howie, P., & Kavanagh, D.J. (2003). Diagnosing postpartum depression in mothers and fathers: Whatever happened to anxiety? *Journal of Affective Disorders*, 74, 139-147.
- Milgrom, J., Gemmill, A.W., Bilszta, J.L., Hayes, B., Barnett, B., Brokks, J., Ericksen, J., Ellwood, D., & Buist, A. (2008). Antenatal risk factors for postnatal depression: A large prospective study. *Journal of Affective Disorders*, 108, 147-157.
- Miller, R.L., Pallant, J.F., & Negri, L.M. (2006). Anxiety and stress in the postpartum: Is there more to postnatal distress than depression? *BMC Psychiatry*, 6 (12). doi:10.1186/1471-244X/6/12
- Mirza, I., & Jenkins, R. (2004). Risk factors, prevalence, and treatment of anxiety and depressive disorders in Pakistan: A systematic review. *British Medical Journal*, 328, 794-797.

- Moss, K.M., Skouteris, H., Wertheim, E.H., Paxton, & S.J., & Milgrom, J. (2009). Depressive and anxiety symptoms through late pregnancy and the first year post birth: An examination of prospective relationships. *Archives Women's Mental Health*, 12, 345-349.
- Muzik, M., Klier, C.M., Rosenblum, K.L., Holzinger, A., Umek, W., & Katschnig, H. (2000). Are commonly used self-report inventories suitable for screening postpartum depression and anxiety disorders? *Acta Psychiatrica Scandinavica*, 102, 71-73.
- Myers, K., & Winters, N.C. (2002). Ten-year review of rating scales. I: Overview of scale functioning, psychometric properties, and selection. *Journal of the American Academy of Child and Adolescent Psychiatry*, 41, 114-122.
- Navarro, P., Ascaso, C., Garcia-Esteve, L, Aquado, J., Torres, A., & Martin-Santos, R. (2007). Postnatal psychiatric morbidity: A validation study of the GHQ-12 and the EPDS as screening tools. *General Hospital Psychiatry*, 29, 1-7.
- Nott, P.N., & Cutts, S. (1982). Validation of the 30-item General Health Questionnaire in postpartum women. *Psychological Medicine*, 12, 409-413.
- Phillips, J., Charles, M., Sharpe, L. & Matthey, S. (2009). Validation of the subscales of the Edinburgh Postnatal Depression Scale in a sample of women with unsettled infants. *Journal of Affective Disorders*, 118, 101-112. doi:10.1016/j.jad.2009.02.004
- Phillips, J., Sharpe, L., Matthey, S., & Charles, M. (2009). Maternally focussed worry. *Archives of Women's Mental Health*. 12, 409-418.

- Prince, M. (2008). Measurement validity in cross-cultural comparative research. *Epidemiologia e Psichiatria Sociale*, 17, 211-220.
- Ross, L.E., Gilbert Evans, S.E., Sellers, E.M., & Romach, M.K. (2003). Measurement issues in postpartum depression part 1: Anxiety as a feature of postpartum depression. *Archives of Women's Mental Health*, 6, 51-57.
- Ross, L.E., & McLean, L.M. (2006). Anxiety disorders during pregnancy and the postpartum period: A systematic review. *Journal of Clinical Psychiatry*, 67, 1285-1298.
- Sagrestano, L.M., Rodriguez, A.C., Carroll, D., Bieniarz, A., Greenberg, A., Castro, L., & Nuwayhid, B. (2002). A comparison of standardized measures of psychosocial variables with single-item screening measures used in an urban obstetric clinic. *Journal of Obstetric, Gynecologic and Neonatal Nursing*, 31, 147-155.
- Sharp, D. (1988). Validation of the 30-item General Health Questionnaire in early pregnancy. *Psychological Medicine*, 18, 503-507.
- Shevlin, M., Brunsten, V., & Miles, J.N.V. (1998). Alternative factor models of the Personal Disturbance Scale (DSSI/sAD). *Personality and Individual Differences*, 25, 569-574.
- Snaith, R.P. (2003). The Hospital Anxiety and Depression Scale. *Health and Quality of Life Outcomes*, 1 (29). doi:10.1186/1477-7525-1-29 Accessed 19 January 2010.
- Spielberger, C.D., Gorsuch, R.L., & Lushene, R.E. (1970). *Manual for the State-Trait Anxiety Inventory (STAI)*. Palo Alto, CA: Consulting Psychologists Press.

- Spies, G., Stein, D.J., Roos, A., Faure, S.C., Mostert, J., Seedat, S., & Vythilingum, B. (2009). Validity of the Kessler 10 (K10) in detecting DSM-IV defined mood and anxiety disorders among pregnant women. *Archives of Women's Mental Health, 12*, 69-74.
- Stein, G., & Van den Akker, O. (1992). The retrospective diagnosis of postnatal depression by questionnaire. *Journal of Psychosomatic Research, 36*, 67-75.
- Stuart, S., Couser, G., Schilder, K., O'Hara, M., & Gorman, L. (1998). Postpartum anxiety and depression: Onset and comorbidity in a community sample. *Journal of Nervous and Mental Disease, 186*, 420-424.
- Sutter-Dallay, A.L., Giaconne-Marcusche, V., Glatigny-Dallay, E., & Verdoux, H. (2004). Women with anxiety disorders during pregnancy are at increased risk of intense postnatal depressive symptoms: A prospective survey of the MATQUID cohort. *European Psychiatry, 19*, 459-463.
- Swallow, B.L., Lindow, S.W., Masson, E.A., & Hay, D.M. (2003). The use of the General Health Questionnaire (GHQ-28) to estimate prevalence of psychiatric disorder in early pregnancy. *Psychology, Health and Medicine, 8*, 213-217.
- Teixeira, J., Fisk, N., & Glover, V. (1999). Association between maternal anxiety in pregnancy and increased uterine artery resistance index: Cohort based study. *British Medical Journal, 318*, 153-157
- Vacha-Haase, T., Kogan, L. R., & Thompson, B. (2000). Sample compositions and reliabilities in published studies versus those in test manuals: Validity of score reliability inductions. *Educational and Psychological Measurement, 60*, 509-522.

- Van den Bergh, B.R.H., & Marcoen, A. (2004). High antenatal maternal anxiety is related to ADHD symptoms, externalizing problems, and anxiety in 8 and 9 year olds. *Child Development, 13*, 1085-1097.
- Van den Bergh, B.R.H., Mennes, M., Oosterlaan, J., Stevens, V., Stiers, P., Marcoen, A., & Lagae, L. (2005). High antenatal maternal anxiety is related to impulsivity during performance on cognitive tasks in 14- and 15- year olds. *Neuroscience and Biobehavioural Reviews, 29*, 259-269.
- Watson, D., O'Hara, M.W., Chmielewski, M., McDade-Montez, E.A., Koffel, E. Naragon, K., & Stuart, S. (2008). Further validation of the IDAS: Evidence of convergent, discriminant, criterion and incremental validity. *Psychological Assessment, 20*, 248-259.
- Watson, D., O'Hara, M., Simms, L.J., Kotov, R., Chmielewski, M., McDade-Montez, E.A., Gamez, W., & Stuart, S. (2007). Development and validation of the Inventory of Depression and Anxiety Symptoms. *Psychological Assessment, 19*, 253-268.
- Wenzel, A., Haugen, E.N., Jackson, L.C., & Brendle, J.R. (2005). Anxiety symptoms and disorders at eight weeks postpartum. *Journal of Anxiety Disorders, 19*, 295-311.
- Whiting, P., Rutjes, A.W., Reitsma, J.B., Bossuyt, P.M., & Kleijnen, J. (2003). The development of QUADAS: A tool for the quality assessment of studies of diagnostic accuracy included in systematic reviews. *BMC Medical Research Methodology, 3*, 25. doi: 10.1186/1471-2288-3-25
- Woolhouse, H., Brown, S., Krastev, A., Perlen, S., & Gunn, J. (2009). Seeking help for anxiety and depression after childbirth: Results of the maternal health study. *Archives of Women's Mental Health, 12*, 75-83.



Zelkowitz, P., & Papageorgiou, A. (2005). Maternal anxiety: An emerging prognostic factor in neonatology. *Acta Paediatrica*, 94, 12, 1704-1705.

Zigmond, A.S., & Snaith, R.P. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica*, 67, 361-370.

## 6 Factor structure of the Edinburgh Postnatal Depression Scale in a population-based sample

Coates, R., Ayers, S., de Visser, R. (2016). Factor structure of the Edinburgh Postnatal Depression Scale in a population-based sample. *Psychological Assessment*. Manuscript submitted for publication.

### 6.1 Abstract

To demonstrate validity, questionnaires should measure the same construct in different groups and across time. The Edinburgh Postnatal Depression Scale (EPDS) was designed as a unidimensional scale, but factor analyses of the EPDS have been equivocal, and demonstrate other structures: this may be due to sample characteristics and timing of administration. We aimed to examine the factor structure of the EPDS in pregnancy and postpartum at four time-points in a large population-based sample. We carried out exploratory and confirmatory factor analysis on the Avon Longitudinal Study of Parents and Children sample ( $n = 11,195 - 12,166$ ) randomly split in two. We used data from 18 and 32 weeks pregnancy gestation; and 8 weeks and 8 months postpartum. A three-factor solution was optimal at all time-points, showing the clearest factor structure and best model fit: Depression (four items) accounted for 43.5 - 47.2% of the variance; anhedonia (two items) 10.5 - 11.1%; and anxiety (three items) 8.3 - 9.4% of the variance. Internal reliability of subscales was good at all time points (Cronbach's alphas: .73 - .78). The EPDS appears to measure three related factors of depression, anhedonia and anxiety and has a stable structure in pregnancy and the first postnatal year.

*Keywords:* ALSPAC, depression, anxiety, postnatal, pregnancy, factor analysis

## 6.2 Introduction

In pregnancy and the first postnatal year 10-20% of women experience mental illness (Bauer et al., 2014) with detrimental effects on the whole family (Gavin et al., 2005). Interventions can ease symptoms and improve wellbeing of mothers (Dennis & Hodnett, 2007), however effective treatment is hampered by low levels of identification of perinatal mental illness with 50% of women with depression and anxiety not identified (Hewitt et al., 2009). Therefore clinical guidelines recommend screening for or assessing depression and anxiety in the perinatal period (American College of Obstetricians and Gynecologists, 2015; National Institute for Health and Care Excellence [NICE], 2014). The Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987) is well-established, convenient, and probably the most common self-report questionnaire used to assess postnatal depression (Gibson, McKenzie-McHarg, Shakespeare, Price, & Gray, 2009). There is some evidence that the EPDS also measures anxiety with three items and that the summed score of these items can differentiate between anxiety and depressive disorders (Bowen, Bowen, Maslany, & Muhajarina, 2008; Matthey, Fisher, & Rowe, 2012; Ross, Evans, Seller, & Romach, 2003) although further research is needed to determine its acceptability, validity and reliability and psychometric properties as a measure of anxiety (Milgrom & Gemmill, 2014).

One method of establishing validity of the EPDS to screen for depression (and possibly anxiety) is by examining its factor structure. If the same items load onto the same factors at different times, in different samples, it indicates that participants give the same meaning to items; and therefore that the same underlying construct is being measured (Milfont & Fischer, 2010). However, studies of the factor structure of the EPDS have been equivocal (see Table 1) and one, two or three factors have been identified. There is little evidence for one factor and almost equal support for two- and three-factor solutions. The predominant two-factor model comprises anxiety and depression factors and the predominant three-factor solution includes anxiety, depression and anhedonia factors, but there is variation within this.

Table 1

*Factor analyses of the EPDS in samples of perinatal women published in English.*

<u>Study</u>	<u>N / time-point</u>	<u>EPDS language</u>	<u>Method</u> (minimum factor loading if stated) / Rotation, factor extraction criteria	<u>Final factors and EPDS items</u>		
	<u>Population</u>  (gest = pregnancy gestation, pn = postnatal)			F1	F2	F3
1. Pop et al., 1992	293 / 4 weeks pn  <i>Unselected community sample</i>	Dutch	EFA (0.3) / Orthog (Varimax), - CFA	7, 8, 9, 10  Depression: 1, 2, 7, 8, 9, 10	3, 4, 5, 6  Anxiety: 3, 4, 5, 6	1, 2  -
2. Astbury et al., 1994	790 / 8-9 months pn	English	PCA (0.45) / Oblique (Oblimin), Eig>1.	Depression: 1, 2, 6, 7, 8, 9, 10	Anxiety: 3, 4, 5	
3. Guedeney & Fermanian 1998	87 / 3-16 weeks pn (M = 7 weeks)  <i>Half random, half probably depressed community sample</i>	French	PCA (0.3)/ Orthog (Varimax), scree plot only	Depressive symptoms: 3, 4, 5, 6, 7, 9	Depressive mood: 1, 2, 8, 10	

<u>Study</u>	<u>N / time-point</u>	<u>EPDS language</u>	<u>Method</u> (minimum factor loading if stated) / Rotation, factor extraction criteria	<u>Final factors and EPDS items</u>		
	<u>Population</u>  (gest = pregnancy gestation, pn = postnatal)			F1	F2	F3
4. Brouwers et al., 2001	197 / 24 weeks gest  <i>Community</i>	Dutch	PCA (0.4) / Orthog (Varimax), Eig. > 1	Depression: 1, 2, 8	Anxiety: 3, 4, 5	-
5. Berle et al., 2003	411 / 6-12 weeks pn  <i>Community: routine pn visits</i>	Norwegian	PCA (-) / Oblique, Eig. > 1	1-10	-	-
6. Ross et al., 2003	150 / 6 weeks pn  <i>Community obstetrical patients</i>	English	PCA (0.5)/ Orthog (Varimax), Eig. > 1 and scree plot	Depression: 1, 2, 8, 9	Anxiety: 3, 4, 5	Suicide: 10
7. Chabrol & Teissedre 2004	299 / 2-3 days pn (PCA), 4-6 weeks pn(CFA)  <i>Community</i>	French	PCA (-) /Orthog (Varimax), Eig. > 1 and scree plot  CFA	Anxiety: 3, 4, 5, 6, 7  CFA solution as above	Depressive mood/ self-harm: 8, 9, 10	Anhedonia: 1, 2

<u>Study</u>	<u>N / time-point</u>	<u>EPDS language</u>	<u>Method</u> (minimum factor loading if stated) / Rotation, factor extraction criteria	<u>Final factors and EPDS items</u>		
	<u>Population</u> (gest = pregnancy gestation, pn = postnatal)			F1	F2	F3
<hr/>						
	<i>obstetrical patients</i>					
8. Adouard et al., 2005	60 / 28-34 weeks gest  <i>High risk pregnancies</i>	French	PCA (0.4) / Orthog (Varimax), -	Depression + other: 3, 4, 5, 6, 10	Depression: 1, 2, 7, 8, 9	-
9. Jomeen & Martin 2005	101 / 14 weeks gest  <i>Community antenatal clinic</i>	English	PCA (0.6) / Oblique (Oblimin), Eig. > 1  CFA	1, 2, 6, 7, 8, 9 Depression: 1, 2, 8	3, 4, 5 Anxiety: 3, 4, 5	10
10. Jomeen & Martin 2007	117 / M = 31.5 weeks gest  <i>Community antenatal clinic</i>	English	CFA	1, 2, 8	3, 4, 5	10

<u>Study</u>	<u>N / time-point</u>	<u>EPDS language</u>	<u>Method</u> (minimum factor loading if stated) / Rotation, factor extraction criteria	<u>Final factors and EPDS items</u>		
	<u>Population</u>  (gest = pregnancy gestation, pn = postnatal)			F1	F2	F3
11. Montazeri et al., 2007	100 / 6-14 week pn  <i>Community health care centre</i>	Persian	PCA (0.4) / Orthog (Varimax), -	Anxiety: 3, 4, 5, 8	Depression: 6, 7, 8, 9, 10	Euthymic mood: 1, 2
12. Small et al., 2007	103 / 6-9 months pn	Vietnamese	PCA (0.3) / Orthog (Varimax) and	1, 2, 3, 6, 8, 9	3, 4, 5, 7	10
		Turkish	Oblique (not	3, 4, 5, 6, 7, 8	9, 10	1, 2
	104 / 6-9 months pn	Tagalog	presented), scree plot	3, 4, 5, 8	6, 7, 9, 10	1, 2
	106 / 6-9 months pn	English		3, 4, 5, 6, 7, 8	1, 2	9, 10
	1166 / 6-7 months pn  <i>Immigrant mothers in Australia</i>					

<u>Study</u>	<u>N / time-point</u>	<u>EPDS language</u>	<u>Method</u> (minimum factor loading if stated) / Rotation, factor extraction criteria	<u>Final factors and EPDS items</u>		
	<u>Population</u>  (gest = pregnancy gestation, pn = postnatal)			F1	F2	F3
13. Bowen et al., 2008	402 / 15 weeks gest  <i>Socially high-risk (Outreach program)</i>	English	EFA (0.5) / Orthog (Varimax), -	Anxiety: 3, 4, 5	Depression: 1, 2, 8	Self-harm: 10
14. Matthey 2008	238 / 6 weeks pn  <i>Women attending parenthood classes</i>	English	PCA (-) / Unrotated, -	Anxiety: 3, 4, 5	Depression: 1, 2, 6, 7, 8, 9, 10	-
15. Tuohy & McVey 2008	440 / 6 months pn  <i>Self-selected online</i>	English	EFA: PAF (-)/ Oblique (direct quartimin), parallel analysis	Depressive symptoms: 6, 7, 8, 9, 10	Anhedonia: 1, 2	Anxietal symptoms: 3, 4, 5
16. Phillips et al., 2009	309 / 1 wk – 12 months pn, M = 5.4 months  <i>Mothers with</i>	English	EFA: MLE (0.3) / Oblique (oblimin), Eig. > 1	Depression: 1, 2, 6, 7, 8, 9, 10	Anxiety: 3, 4, 5	-



<u>Study</u>	<u>N / time-point</u>	<u>EPDS language</u>	<u>Method</u> (minimum factor loading if stated) / Rotation, factor extraction criteria	<u>Final factors and EPDS items</u>		
	<u>Population</u>  (gest = pregnancy gestation, pn = postnatal)			F1	F2	F3
	<i>unsettled infants</i>		CFA			
17. Vivilaki et al., 2009	120 / 4 days-16 weeks pn  <i>Community maternity departments</i>	Greek	PCA (0.5) / Orthog (Varimax), Eig. > 1 and scree plot  CFA	Depression: 7, 8, 9	Anxiety: 4, 5, 6	-
18. Swalm et al., 2010	4,706 / Mdn = 26 weeks gest  3,853 / Mdn = 7 wks pn  <i>Representative community sample</i>	English	PCA (0.6) / Orthog (Varimax), Eig. > 1 and scree plot	Anxiety: 3, 4, 5	Other: 1, 2, 10	-
19. Reichenheim et al., 2011	811 / < 5 months pn (M = 59 days)	Brazilian Portuguese	E / CFA (-) / Oblique (geomin), forced 2-, 3- and 4-	Anhedonia: 1, 2, 6 Bifactor model	Anxiety: 3, 4, 5	Depression: 7-10

<u>Study</u>	<u>N / time-point</u>	<u>EPDS language</u>	<u>Method</u> (minimum factor loading if stated) / Rotation, factor extraction criteria	<u>Final factors and EPDS items</u>		
	<u>Population</u>  (gest = pregnancy gestation, pn = postnatal)			F1	F2	F3
	<i>Random community sample</i>		factors  CFA	with  general (g) factor	items as above but  conditional on the 3	also including a  specific factors
20. Lee King 2012	169 / 1wk – 9months pn (M = 1.51 months)  <i>Socially high risk pregnancies</i>	English	CFA	Anhedonia: 1, 2	Anxiety: 3, 4, 5	Depression: 7-10
21. Agampodi & Agampodi 2013	376 / 24-36wks gestation  <i>Community (antenatal clinics)</i>	Sinhalese	PCA (-) / Orthog (Varimax), Eig. > 1	Anhedonia: 1, 2	Depression and anxiety: 3-10	
22. Petrozzi & Gagliardi 2013	594 / 2-3 days pn  <i>Cohort (hospital</i>	Italian	EFA; PAF / Oblique (Promax),	Depression: 7-10	Anxiety: 3-6	Anhedonia: 1-2

<u>Study</u>	<u>N / time-point</u>	<u>EPDS language</u>	<u>Method</u> (minimum factor loading if stated) / Rotation, factor extraction criteria	<u>Final factors and EPDS items</u>		
	<u>Population</u> (gest = pregnancy gestation, pn = postnatal)			F1	F2	F3
	<i>maternity department)</i>		Scree test			
23. Toreki et al., 2013	219 / 12 weeks gest <i>Random community sample (routine prenatal check, hospital)</i>	Hungarian	PCA (0.5) / Orthog (Varimax), Eig.>1 and scree plot	2, 4, 5, 6, 10	3, 8, 9	1, 7
24. Hartley et al., 2014	M = 4 months pn		CFA			
	122	English		1, 2, 8, 9	3, 4, 5	
	98	Spanish		1, 2, 8, 9	3, 4, 5	
	<i>Community (pediatric primary care well/sick visit)</i>					

<u>Study</u>	<u>N / time-point</u>	<u>EPDS language</u>	<u>Method</u> (minimum factor loading if stated) / Rotation, factor extraction criteria	<u>Final factors and EPDS items</u>		
	<u>Population</u>  (gest = pregnancy gestation, pn = postnatal)			F1	F2	F3
25. Kubota et al., 2014	690 / 1 month pn  <i>Community maternity program</i>	Japanese	EFA; MLE (0.45) / Oblique (promax), scree plot  CFA	3, 4, 5  Anxiety: 3, 4, 5	1, 2  Anhedonia: 1, 2	7, 8, 9  Depression: 7, 8, 9
26. Toreki et al., 2014	266 / 6 weeks pn  <i>Community (routine postpartum check)</i>	Hungarian	PCA (0.5) / Oblique, Eig.>1 and scree plot. CFA	3, 4, 5, 6  Anxiety: 3, 4, 5, 6	1, 2, 9, 10  Depression: 1, 2, 9, 10	
27. Zhong et al., 2014	1517 / <16weeks gest (M = 9.8wks)  <i>Community (perinatal care establishment)</i>	Spanish	PCA (0.4)/ Orthogonal, Eig.>1 and scree plot  CFA	Anxiety and Depression: 3 – 10  Anhedonia: 1, 2	Anhedonia: 1, 2  Anxiety: 3, 4, 5, 6	Depression: 7, 8, 9, 10
28. Bina &	715 / 6 weeks pn	Hebrew	CFA	Depression: 1, 2, 7,	Anxiety: 3, 4, 5	

<u>Study</u>	<u>N / time-point</u>	<u>EPDS language</u>	<u>Method</u> (minimum factor loading if stated) / Rotation, factor extraction criteria	<u>Final factors and EPDS items</u>		
	<u>Population</u>  (gest = pregnancy gestation, pn = postnatal)			F1	F2	F3
Harrington 2015	<i>Community (hospital maternity department)</i>			8, 9,10		
29. Cunningham et al., 2015	636 / 0-13 months pn  <i>Admissions to Mother Baby Unit</i>  <i>Discharged patients</i>	English	EFA (0.3) / Oblique (Geomin), forced 1-2- & 3-factors  CFA	1, 2, 3, 6, 7, 8, 9, 10  1, 2	3, 4, 5  3, 4, 5, 6	  6, 7, 8, 9, 10
30. Kwan et al., 2015	920 / 0-14 weeks gest  <i>Population-based (antenatal clinics)</i>	English (Chinese, Malay & Indian participants)	EFA / Oblique (Geomin), forced 1- 2- & 3-factors (multiple criteria for extraction)  CFAs showed	1-10		

<u>Study</u>	<u>N / time-point</u>	<u>EPDS language</u>	<u>Method</u> (minimum factor loading if stated) / Rotation, factor extraction criteria	<u>Final factors and EPDS items</u>		
	<u>Population</u>  (gest = pregnancy gestation, pn = postnatal)			F1	F2	F3
			poor fit			
31. Odalovic et al., 2015	76 / M = 25.7 weeks gest	Serbian	EFA (0.4) / Orthog (Varimax) & PCA, Eig.>1.	3, 4, 5	7, 9, 10	1, 2
	125 / 37% <28 weeks pn		CFA	3, 4, 5	7, 9, 10	1, 2
	<i>Online, self-selected</i>					

*Note.* EFA = Exploratory Factor Analysis; PCA = Principal Components Analysis; PAF = Principal Axis Factoring; CFA = Confirmatory Factor Analysis; E/CFA = EFA modelled within a CFA framework; MLE = Maximum likelihood extraction; Orthog = Orthogonal; Eig. > 1 = Eigenvalues > 1

The different models may reflect methodological differences. Some studies use principal components analysis (PCA) which may inflate the amount of variance accounted for by factors as compared with exploratory factor analysis (EFA; Costello & Osborne, 2005; Preacher & MacCallum, 2003). Additionally, orthogonal rotations (for situations in which factors are not expected to correlate) are unlikely to be suitable for factor analyses of the EPDS as anxiety and depression are highly comorbid in perinatal populations (Heron, O'Connor, Evans, Golding, & Glover, 2004). Oblique rotations which allow factors to correlate are thus more suitable. The decision on how many factors to retain may also have an effect on factor solutions. Factors with eigenvalues greater than one are often retained, but this can result in misleading solutions and further methods (e.g. use of the scree plot) should be used (Costello & Osborne, 2005; Velicer & Jackson, 1990). The value of the factor loading (the correlation between the variable and the factor) that authors deem appropriate will also determine whether an item is allowed to load onto a factor, changing the final structure. Choosing higher loadings results in missing out items that would be included in studies using a lower cut-off. Sample size and characteristics will also affect factor structure. Of the previous studies, almost half had a sample size smaller than 250 whereas at least 300 is considered 'good' for factor analysis (Comrey & Lee, 1992). Concerning the perinatal period, the factor structure of the EPDS needs to be tested in both pregnancy and the postnatal period to show that the structure is the same (shows configural invariance) and therefore that the construct being measured is conceived in the same way. This study aimed to overcome some methodological shortcomings outlined above and address the following questions:

1. Is the factor structure of the EPDS the same in the 2<sup>nd</sup> and 3<sup>rd</sup> trimesters of pregnancy and at 8 weeks and 8 months postnatally in a population-based sample (i.e., does it show configural invariance)?
2. Do previous factor models of the EPDS hold in a large population-based sample? If not, which factor solution(s) provide the best fit to the data?

### 6.3 Method

#### 6.3.1 Sample

The sample consisted of participants from the Avon Longitudinal Study of Parents and Children (ALSPAC), an on-going population-based study established to evaluate genetic and environmental influences on health and development of mothers and children (Fraser et al., 2013). All women living in the Avon area of southwest England who were pregnant with an expected delivery date between 1 April 1991 and 31 December 1992 were eligible for enrolment. The initial number of women enrolled who had returned at least one questionnaire was 14,451. The sample has been described in full elsewhere (Boyd et al., 2013, Fraser et al., 2013). Please note that the study website contains details of all the data that is available through a fully searchable data dictionary (<http://www.bris.ac.uk/alspac/researchers/data-access/data-dictionary>). Ethical approval for the study was obtained from the ALSPAC Ethics and Law Committee and the Local Research Ethics Committees.

The current analyses were limited to mothers who had completed the EPDS fully at least at one time point during gestation and the first year after giving birth: EPDS data from 18 weeks gestation ( $N = 12,166$ ), 32 weeks gestation ( $N = 12,110$ ), 8 weeks postnatally ( $N = 11,710$ ) and 8 months postnatally ( $N = 11,195$ ) were used. Heron et al. (2004) found that women with mental health problems were less likely to return questionnaires at each time-point than women without self-reported anxiety or depression, although this bias was modest. A comparison of ALSPAC mothers with both Avon and UK mothers with infants under one using the ALSPAC 8 months postnatal data and the 1991 census showed that ALSPAC mothers were more likely to: be white, live in owner-occupied accommodation, be married, and have a car in the household (Fraser et al., 2013).

The initial sample was randomly divided by ID code into two groups. Sample one was used to generate the factor structure. As we only included participants who had fully completed the EPDS, and this differed at each time point, its  $N$  ranged from 5551 – 5988. Sample two ( $N =$



5688 – 6256) was used to cross-validate the results and test competing factor structures identified in previous research.

### 6.3.2 Measures

The EPDS includes 10 items each scored on a 0-3 Likert scale, thus total scores can range from 0-30 with higher total scores indicating higher frequency or severity of symptoms. Full item wording is given in Table 3. For brevity, items are referred to in the text as: 1) laugh; 2) enjoyment; 3) self-blame; 4) anxious; 5) scared; 6) things getting on top of me; 7) sleep; 8) sad; 9) crying; 10) self-harm. Items 1, 2 and 4 are reverse-scored. Items 1 and 2 are worded positively (agreeing with the statement indicates absence of symptoms); all other items are negatively worded (agreeing with the statement indicates presence of symptoms). Cox et al., (1987) suggested scores of 13 and above indicate that the mother is likely to be experiencing depressive illness; Murray and Carothers (1990) found that this cut-off predicted women with clinical depression in the postnatal period based on diagnostic criteria.

### 6.3.3 Statistical Analysis

**Exploratory Factor Analysis (EFA).** To test the number of factors and factor structure in the antenatal and postnatal periods, we conducted multiple EFAs of the 10 items, forcing 1, 2 and 3 factor solutions at each of the four time-points, with the first half of the sample, using maximum likelihood extraction. Multiple solutions were run as previous studies of the EPDS did not provide a definitive factor structure. As it was expected that factors would correlate, an oblique rotation (direct oblimin) was used. Eigenvalues, scree plots, and amount of variance explained were examined to determine number of factors to be retained. Traditionally factors with eigenvalues greater than 1 are retained (Kaiser, 1960), but many consider that this is likely to result in an incorrect solution and that the scree plot should also be examined (Cattell, 1966; Velicer & Jackson, 1990). A meaningful factor solution needs to explain at least 50% of the variance (Streiner, 1994). An item loading significantly on a factor was determined by a loading of  $\geq .3$  (Tabachnick & Fidell, 2012). All resulting solutions were examined for the clearest factor

structure: i.e., with items loading highly on only one factor and with few cross-loadings. Data were analysed using IBM SPSS Statistics 20 (IBM Corp. 2011).

**Confirmatory Factor Analysis (CFA).** We conducted CFAs using AMOS version 21 (Arbuckle, 2012) on the second half of the sample. Four models including all 10 items of the EPDS were tested:

- (i) The three-factor model was found to have the clearest factor structure in the EFA. This comprised anhedonia (items 1[laugh] & 2[enjoyment]), anxiety (items 3[self-blame], 4[anxious], 5[scared], 6[things getting on top of me]) and depression (items 7[sleep], 8[sad], 9[crying], 10[self-harm]) factors. Having run a forced 3-factor solution using EFA, despite cross-loadings, item 6 [things getting on top of me] loaded most highly with the anxiety items).
- (ii) The two-factor model found in the current EFA, with anhedonia (items 1[laugh]& 2[enjoyment]), and general distress (items 3-10) factors.
- (iii) The two-factor anxiety / depression model (anxiety: items 3[self-blame], 4[anxious], 5[scared] and depression: items 1[laugh], 2[enjoyment], 3-10) found in Astbury, Brown, Lumley, & Small (1994), Matthey (2008), Phillips, Sharpe, Matthey, & Charles, (2009).
- (iv) The one-dimensional original factor structure proposed by Cox et al., (1987) and found by Berle, Aarre, Mykletun, Dahl, & Holsten, (2003).

Three-factor models with item 10 [self-harm] comprising its own factor have been suggested (Brouwers, van Baar, & Pop, 2001, Ross et al., 2003) but as it is not possible to estimate a latent variable from one indicator, the two factor solutions (ii and iii) above were tested.

Additional models from previously published research were also run but are not reported as model fit was poorer than all the models which have been reported. Fit indices for these models are available in the online supplementary material.

The maximum likelihood procedure was used. In all models, independence of error terms was specified for all variables; factors (if more than one) were allowed to correlate; each observed variable loaded on only one factor and no post-hoc model fitting (by correlating error terms or cross-loading items) was conducted in order not to overfit the model (Manian et al., 2013). Missing data were dealt with using the Full Information Maximum Likelihood (FIML) procedure in AMOS. Multiple goodness-of-fit indices were used to assess the models. These were the model Chi-square ( $\chi^2$ ) test of exact fit, the Comparative Fit Index (CFI), the Root Mean Squared Error of Approximation (RMSEA), Tucker-Lewis Index (TLI), Parsimony Normed Comparative Fit Index (PCFI), Akaike Information Criterion (AIC); optimal values for each index are given below table 3 to aid interpretation. The model chi-square is sensitive to correlations and sample size, however it is reported for comprehensiveness. Each fit index indicates one aspect of model fit only, thus multiple fit indices have been considered (Cheung & Rensvold, 2002; Kline, 2005).

## 6.4 Results

### 6.4.1 EPDS scores

No statistically significant differences were found between Samples 1 and 2 on EPDS total scores at any time point ( $p$  values ranged from .50 -.86), thus EPDS scores are shown for the entire data set.

At both antenatal time-points the median EPDS score was 6 and the IQR 3-10 (18 week gestation range: 0-29, 32 week gestation range: 0-30). 18 week gestation  $M = 7.00$ , 32 week gestation  $M = 7.07$ . At 18 weeks 13.9% of women scored 13 or above and could be considered to be suffering from depressive illness. At 32 weeks this increased to 15.2%.

Postnatally, the median EPDS score was 5 at 8 weeks (IQR 2-9, range 0-28;  $M = 6.06$ ) and 10.1% scored 13 or above; at 8 months the median was 4 (IQR 2-8, range 0-29;  $M = 5.41$ ) and 8.8% scored 13 or above.

#### 6.4.2 Exploratory factor analysis

**Suitability.** The data set was suitable for factor analysis: the Kaiser-Meyer-Olkin Measure of Sampling Adequacy statistic ranged from 0.886 - 0.896 across time-points indicating compact patterns of correlations (possible range 0-1 with  $\geq 0.5$  considered appropriate for factor analysis (Tabachnick & Fidell, 2001)). Bartlett's test of sphericity was significant ( $p < .001$  at all time-points) indicating there were sufficient relationships within the data to be appropriate for factor analysis.

**Factor solutions.** The factor structure was stable across antenatal and postnatal time points. At all time-points one factor accounted for a large proportion of the variance, followed by two further components with Eigenvalues near to 1 (see Table 2). The scree plots showed that two or three factors may be appropriately retained; both are reported here and subsequently were tested in the confirmatory factor analysis.

Table 2

*Exploratory factor analysis: initial eigenvalues and amount of variance explained at each time-point for three factors extracted.*

<u>Time-point</u>	<u>Factor 1</u> <u>'Depression'</u>	<u>Factor 2</u> <u>'Anhedonia'</u>	<u>Factor 3</u> <u>'Anxiety'</u>	<u>Total variance</u> <u>explained</u>
T1 18 weeks gestation				
Eigenvalues	4.35	1.11	0.94	
Variance explained	43.48%	11.12%	9.40%	64.00%
T2 32 weeks gestation				
Eigenvalues	4.61	1.05	0.96	
Variance explained	46.07%	10.48%	9.66%	66.09%
T3 8 weeks postnatal				
Eigenvalues	4.60	1.08	0.87	
Variance	45.96%	10.77%	8.73%	65.46%

<u>Time-point</u>	<u>Factor 1</u> <u>'Depression'</u>	<u>Factor 2</u> <u>'Anhedonia'</u>	<u>Factor 3</u> <u>'Anxiety'</u>	<u>Total variance</u> <u>explained</u>
explained				
T4 8 months postnatal				
Eigenvalues	4.72	1.05	0.83	
Variance explained	47.17%	10.53%	8.32%	66.02%

**Two-factor solution.** Results revealed two components with Eigenvalues  $> 1$ . The first Eigenvalue ranged from 4.35-4.72 and represented a factor consisting of items 3-10 which could be considered 'general distress' or combined anxiety and depression. The second Eigenvalue ranged from 1.05 - 1.11 across time-points and comprised items 1 and 2 which describe a loss of pleasure or anhedonia. At each time point the two factors combined explained 54.6 – 57.7% of the variance. Item 10 [self-harm] consistently showed the lowest factor loading, and loaded below the cut-off of .3 at time 1. The two factors correlated between .55-.59 at each time point.

Internal reliability of the 'general distress' factor was very good at all time-points (Cronbach's alpha values ranged from .83-.85; Kline, 2005) and Pearson's correlations between items 1[laugh] & 2[enjoyment] (the 'anhedonia' factor) ranged from .57-.67.

**Three-factor solution.** A third factor with an Eigenvalue of 0.83-0.94 increased the amount of variance explained to 64.00 – 66.09% at different time-points (see Table 2). This solution comprised the anhedonia factor (items 1[laugh] and 2[enjoyment]) and split the general distress items into anxiety (items 3[self-blame], 4[anxious], 5[scared] and 6[things getting on top of me]) and depression (items 7 [sleep], 8[sad], 9[crying], 10[self-harm]) factors. Item loadings were higher in the three- (as opposed to two-) factor solution for items 2[enjoyment], 4[anxious], 8[sad], 9[crying], 10[self-harm]. Items 1[laugh], 5[scared] and 7[sleep] had similar loadings in both factor solutions. Item 3[self-blame] loaded slightly more highly (.63-.67) on the 'general distress' factor in the 2 factor solution (as compared with .55-.62 on the anxiety factor in the three factor solution). Item 6 [things getting on top of me] was complex, loading more highly on the anxiety factor (.36-.41) at all time-points in the three-factor solution but loadings

were only slightly lower on the depression factor (.30-.35). It loaded more strongly (.64-.68) on the 'general distress' factor in the two-factor solution. Table 3 shows factor loadings at each time-point for this factor structure.

Table 3. *Exploratory Factor structure of the EPDS using maximum likelihood extraction with oblique (direct oblimin) rotation (n = 5551-5988 due to missing data).*

<u>EPDS</u> <u>Item</u>	<u>EPDS item label</u>	<u>Factor 1 ‘Depression’</u>				<u>Factor 2 ‘Anhedonia’</u>				<u>Factor 3 ‘Anxiety’</u>			
		Antenatal		Postnatal		Antenatal		Postnatal		Antenatal		Postnatal	
		T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
1	I have been able to laugh and see the funny side of things	.10	.03	.14	.18	-.63	-.73	-.62	-.60	.03	.02	.03	.04
2	I have looked forward with enjoyment to things	-.05	-.03	-.06	-.06	-.86	-.85	-.95	-.97	-.03	-.03	-.02	.00
3	I have blamed myself unnecessarily when things went wrong	.07	.12	.07	.09	.00	-.01	.03	.03	.56	.55	.62	.60
4	I have been anxious or worried for no good reason	-.10	-.09	-.07	-.08	-.01	-.01	-.01	.00	.82	.78	.77	.84
5	I have felt scared or panicky for no very good reason	.08	.03	.01	.02	.01	.02	-.03	-.05	.63	.69	.65	.63
6	Things have been getting on top of me	.35	.30	.34	.33	-.10	-.13	-.06	-.07	.37	.41	.36	.37
7	I have been so unhappy that I have had difficulty sleeping	.45	.57	.40	.53	-.14	-.09	-.11	-.08	.12	.08	.14	.09

<u>EPDS Item</u>	<u>EPDS item label</u>	<u>Factor 1 ‘Depression’</u>				<u>Factor 2 ‘Anhedonia’</u>				<u>Factor 3 ‘Anxiety’</u>			
		Antenatal		Postnatal		Antenatal		Postnatal		Antenatal		Postnatal	
		T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
8	I have felt sad or miserable	.83	.80	.80	.84	-.04	-.04	-.04	.02	.01	.04	.03	.05
9	I have been so unhappy that I have been crying	.82	.87	.90	.83	.07	.05	.06	.05	-.02	-.04	-.06	-.03
10	The thought of harming myself has occurred to me	.29	.34	.35	.37	-.02	-.01	-.07	-.13	.00	-.00	.04	.00

*Note.* T1: 18 weeks gestation, T2: 32 weeks gestation, T3: 8 weeks postnatal, T4: 8 months postnatal.



Internal reliability was good: Cronbach's alphas for the anxiety factor ranged from .77- .78 and from .73 – .78 for the depression factor, although this increased to .78-.82 if item 10 was removed. Item-total correlations were all  $>.3$  except for item 10 [self-harm] which correlated with the total scale at .28 at 18 week's gestation. Correlations between depression and anhedonia factors ranged from .62-.67; between depression and anxiety factors .69-.70; and between anhedonia and anxiety factors .48-.54.

#### 6.4.3 Confirmatory factor analysis.

Table 4 shows the factor models tested and their fit indices. The model chi-square was significant for all models indicating a large proportion of the variance was left unexplained by each model, although this is to be expected with a large sample (Kline, 2005). Including all ten items, the current 3-factor model found in the EFA showed the best fit index values at each time point. The difference in  $\chi^2$  values of the 3-factor model compared with the next best-fitting model was significant at all time-points ( $ps < .001$ ) providing an indication that the 3-factor model best fit the data. Details of this model at time-point 3 (8 weeks postnatal) are shown in Figure 1. The 8 weeks postnatal time point is illustrated as this is likely to be when most mothers fill in the EPDS for screening purposes in practice in the UK.

Table 4

*Fit indices for comparison of modelled CFA factor structures of 10-item EPDS.*

Factor Model	Time point	$\chi^2$ <sup>(a)</sup>	df	CFI <sup>(b)</sup>	RMSEA <sup>(c)</sup>	(90% CI)	TLI <sup>(d)</sup>	PCFI <sup>(e)</sup>	AIC <sup>(f)</sup>
(i) Three factors: Anhedonia items (1 & 2), anxiety items (3, 4, 5, 6) and depression items (7, 8, 9, 10) Includes 10 items	18 weeks gestation	729.70	32***	.97	.052	.049-.055	.94	.562	795.70
	32 weeks gestation	553.67	32***	.98	.045	.042-.048	.96	.569	619.67
	8 weeks postnatal	879.50	32***	.96	.057	.054-.060	.93	.559	945.50
	8 months postnatal	762.51	32***	.97	.053	.050-.056	.95	.563	828.51
(ii) Two factors: anhedonia items (1 & 2) and general distress items (3 – 10). Includes 10 items	18 weeks gestation	1460.39	34***	.93	.072	.069-.075	.89	.576	1522.39
	32 weeks gestation	1551.73	34***	.936	.074	.071-.077	.897	.579	1613.73
	8 weeks postnatal	1700.04	34***	.922	.078	.075-.081	.874	.570	1762.04
	8 months postnatal	1645.69	34***	.929	.076	.073-.080	.885	.574	1707.69
(iii) Two factors: anxiety items (3, 4, 5) and depression items (1, 2, 6 -10) Includes 10 items	18 weeks gestation	1675.32	34***	.921	.077	.074-.080	.872	.569	1737.32
	32 weeks gestation	2130.70	34***	.912	.087	.084-.090	.858	.564	2192.70

<u>Factor Model</u>	<u>Time point</u>	<u>X<sup>2</sup><sup>(a)</sup></u>	<u>df</u>	<u>CFI<sup>(b)</sup></u>	<u>RMSEA<sup>(c)</sup></u>	<u>(90% CI)</u>	<u>TLI<sup>(d)</sup></u>	<u>PCFI<sup>(e)</sup></u>	<u>AIC<sup>(f)</sup></u>
	8 weeks postnatal	1831.60	34***	.916	.081	.078-.084	.864	.566	1893.60
	8 months postnatal	1986.39	34***	.914	.084	.081-.087	.860	.565	2048.39
(iv) One factor: items 1-10 Includes 10 items	Cox et al., (1987)								
	18 weeks gestation	2459.87	35***	.883	.092	.089-.095	.817	.562	2519.87
	32 weeks gestation	2876.04	35***	.881	.100	.097-.013	.813	.560	2936.04
	8 weeks postnatal	2798.08	35***	.871	.099	.095-.102	.797	.554	2858.08
	8 months postnatal	3042.62	35***	.867	.103	.100-.106	.791	.552	3102.62

*Note.* <sup>(a)</sup> Statistically significant chi-square value indicates a significant proportion of variance is unexplained by the model (Kline, 2005); <sup>(b)</sup> CFI values > .9 indicate good model fit (Kline, 2005); <sup>(c)</sup> RMSEA values < .05 indicate good model fit, .05-.08 reasonable model fit, > .1 poor model fit (Hu & Bentler, 1999; Kline, 2005); <sup>(d)</sup> TLI values > .9 indicate good model fit (Kline, 2005); <sup>(e)</sup> PCFI values closer to 1 indicate better model fit; <sup>(f)</sup> The model with the smallest AIC is

the one with relatively better fit (Kline, 2005). TLI and CFI are most stable with reference to the number of variables and sample size (Kenny, 2014; Cheung & Rensvold, 2002). Note: The best model fit indices for a ten-item solution are indicated in bold.

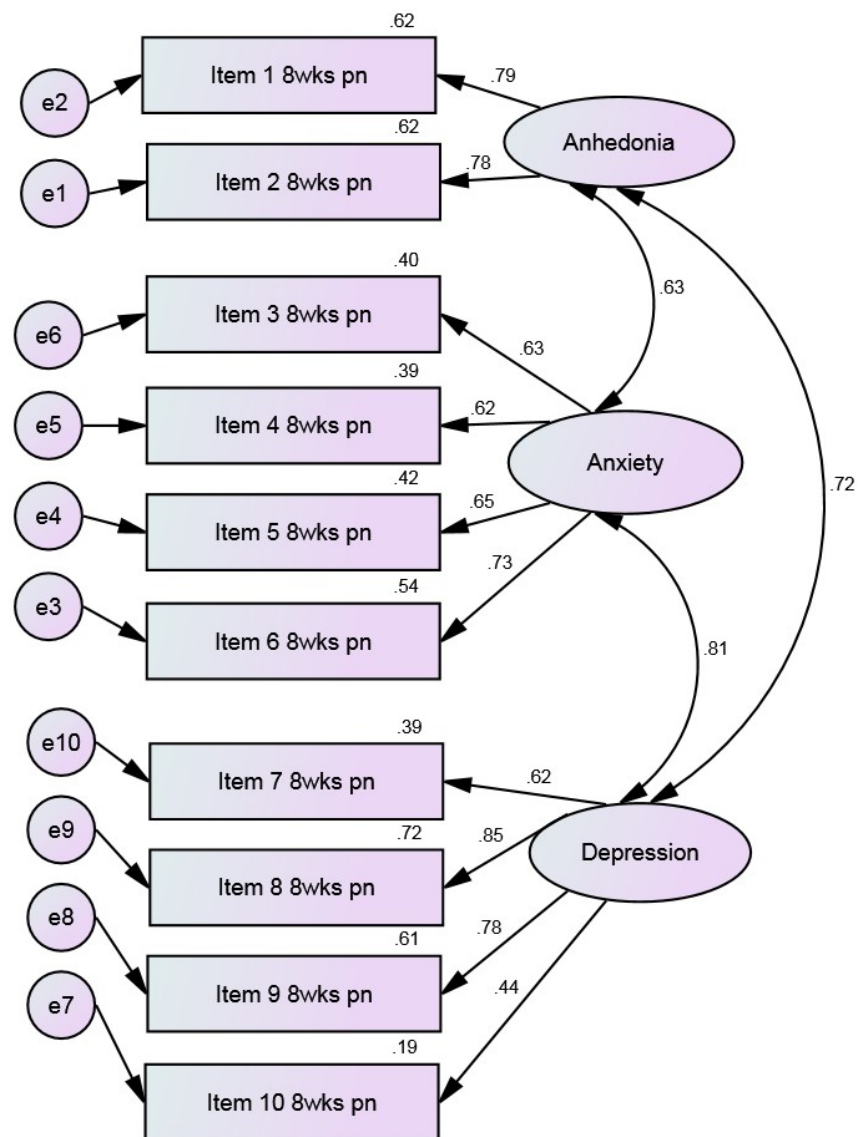


Figure 1

The current 3-factor model at time-point 3 (8 weeks postnatal). Numerical values represent standardized parameter estimates

One of the six fit indices (PCFI) suggested that the 2-factor anhedonia / general distress model best fit the data but RMSEA and TLI values were outside the range for good model fit for this model and other fit indices also were poorer. After the three factor model, the anhedonia / general distress model showed the next best fit for all other fit indices, followed by variations of the depression/anxiety model. The poorest fit of the data was given by the original unidimensional model of the EPDS.

## 6.5 Discussion

This study provides the first test of measurement invariance of the EPDS, showing that configural invariance between antenatal and postnatal groups exists in a UK population-based sample. That is, at each time point the ten items formed into the same number of factors, with the same items associated with each factor, indicating that antenatal and postnatal women conceptualise the constructs being measured by the EPDS in the same way (Cheung & Rensvold, 2002; Meredith, 1993). The EFAs and the CFAs implied that at all time-points a three-factor solution was optimal, comprising depression (items 7-10), anhedonia (items 1 and 2) and anxiety (items 3-6); and that the magnitude of factor loadings was similar across all time-points.

The factor structure in the present study was consistent with some other studies (EFA in Cunningham, Brown, & Page, 2015; Pop, Komproe, & van Son, 1992; Zhong et al., 2014) or similar (Kubota et al., 2014 ; Lee King, 2012; Reichenheim, Moraes, Oliveira, & Lobato, 2011; Tuohy & McVey, 2008). All but two of these papers had sample sizes over 400 which may suggest that as the pattern of correlations becomes more stable, items one (laugh) and two (enjoyment) separate out into a separate factor of anhedonia. The mean and median EPDS score in this sample was also comparable with studies that found the anhedonia factor. Furthermore, in our analysis the anhedonia factor explained more variance than the established anxiety factor, indicating that this factor is equally valid for future research.

The division of items into depression and anhedonia factors, explaining more variance than anxiety, could be clinically meaningful. Firstly, it may provide a more accurate assessment of the depressive symptomology of postnatal depression (Chabrol & Teissedre, 2004). Green (1998) used the term perinatal ‘dysphoria’ to describe poor perinatal wellbeing with combined depression and anxiety symptoms. Anxiety and depression are also highly comorbid in the perinatal period (Heron et al., 2004; Ross et al., 2003). Kwan et al., (2015) found that items one [laugh] and two [enjoyment] were good indicators of severity of dysphoria as it required greater dysphoria to endorse those items. Thus, consideration of responses to these two items may be useful to demonstrate the severity of combined perinatal anxiety and depression. However it must be noted that items one [laugh] and two [enjoyment] are the only positively worded items of the EPDS and this may confound the character of anhedonia with the way in which respondents answer (Goodchild, Treharne, Platts, & Booth, 2005). It has been suggested that these items may be interpreted either in the context of depression / anhedonia (as presumably the authors of the scale intended), or in the context of well-being, as the only positively worded items (Cunningham et al., 2015). Another possible explanation for the existence of the anhedonia factor is that positively worded items are known to form a separate factor to negatively worded items and can thus alter the structure of a measure artificially (Mook, Kleijn, & Van der Ploeg 1991; Tomas & Oliver, 1999). Items one [laugh] and two [enjoyment] are also both reverse-scored (i.e. a high score indicates the opposite of depression, and a reverse-transformation is applied when scoring) and it is common for reversed items to cluster together (Carlson et al., 2011; Dunbar, Ford, Hunt, & Der, 2000). After items one and two on the EPDS, the response scale and valence of items changes, which may be confusing to respondents, as has been shown on other scales with items with mixed polarities (Dunbar et al., 2000). Further research is needed to ascertain whether the anhedonia factor is substantively meaningful or due to scale construction.

If it is supposed that the anhedonia factor is meaningful, the distinction between depression and anhedonia is not yet well understood in perinatal populations. The little existing research has shown that prevalence of, and risk factors for, postnatal depressed mood and

anhedonia differ across race and ethnicity (Liu & Tronick, 2014). In the field of psychocardiology anhedonia has been related to poor cardiovascular outcomes whilst depressed mood has not (Davidson et al., 2010). Therefore careful enquiry into these two specific symptom profiles may be an important direction in perinatal research in predicting future mental and other health problems (Truijens et al., 2014). Although Bina and Harrington (2015) found that anhedonia and depression factors correlated at .84 limiting the discriminant validity of these factors individually (a cut-off of .85 is commonly used as problematic for discriminant reliability (Brown, 2015), in this study the correlations between factors were appropriate for retaining them individually. Correlations were higher between anxiety and depression than between anhedonia and depression, providing tentative evidence the concept of dysphoria. The magnitude of correlations also fits with the tripartite model of anxiety and depression in which both anxious and depressive moods can only be partially differentiated (Clark & Watson, 1991).

A few items were problematic in the analyses. In the EFA item six [things getting on top of me] consistently cross-loaded with low-loadings on both depression and anxiety factors. This is in line with previous research which has found low loadings or cross-loadings for this item on depression, anhedonia and / or anxiety factors (Bina & Harrington, 2015; Brouwers et al., 2001; Hartley, Barroso, Rey, Pettit, & Bagner, 2014; Jomeen & Martin, 2005, 2007; Odalovic, Tadic, Lakic, Nordeng, & Lupatelli, 2015; Reichenheim et al., 2011; Ross et al., 2003; Swalm, Brooks, Doherty, Nathan, & Jacques, 2010; Tuohy & McVey, 2008). When item six has been included in final factor solutions, some have included it in depression and others in anxiety factors, indicating that this item is not useful in discriminating either disorder. It could be argued that the wording of this item; 'Things have been getting on top of me' is open to interpretation and does not have face validity suggestive of either depression or anxiety.

Considering the depression items, item ten [self-harm] showed the lowest loadings (0.29 - 0.37) on any factor as may be expected for an item about self-harm but it clearly fit with depression rather than as an item on its own. Although the low loading may be statistically displeasing, our approach included all items of the EPDS in the model in order to examine the symptom structure of the scale as it is used in practice. We have included item ten as it is likely



to be a clinically useful item when a score of one or more can be used as an independent screen for women who need immediate referral (Kwan et al., 2015; Lindahl et al., 2005). Item seven [I have been so unhappy that I have had difficulty sleeping] also had consistently relatively low loadings (0.45 – 0.57 in the EFA) in line with a number of previous studies which have omitted it (Bowen et al., 2008; Hartley et al., 2014; Jomeen & Martin, 2007; Ross et al., 2003; Swalm et al., 2010; Toreki et al., 2014). Thus items eight [sad] and nine [crying] were the most indicative of the depression factor in this study.

The large population-based sample is a strength of this study but the extent to which results are applicable to specific populations cannot be determined. For example, in contrast to our results, Cunningham et al., (2015) did not find longitudinal measurement invariance in their study of the EPDS at two time points in the postpartum with their factor structures differing by severity of EPDS scores. Interestingly when EPDS scores were lower, and more comparable with this study, the factor structure was exactly the same as in this study. Our study does not allow for conclusions about the appropriateness of using total or subscale scores. Women with mental health problems may also be under-represented due to attrition in the ALSPAC sample.

The results suggest that the EPDS could continue to be used as a screen to suggest women for further psychological assessment as raw total scores may be indicative of depression, anxiety or anhedonia. In research the use of total scores is more problematic - assertions that a particular cut-off score indicates postnatal depression may either miss out or wrongly classify women with anhedonia, anxiety and / or depression. Further research testing subsequent steps of measurement invariance to enable true comparisons between antenatal and postnatal women on the EPDS is also needed before true comparisons can be made between these groups. Qualitative research with ante- and postnatal women to ensure content validity, particularly of items one [laugh], two [enjoyment], and six [things getting on top of me] would be useful, as would the use of modern measurement techniques including item response theory to provide further evidence for removal of problematic items, and to elucidate which items on the EPDS are most useful at differentiating clinical groups would be beneficial.

It could be considered a strength of the EPDS that it includes items measuring anxiety and depression in line with recent NICE guidelines (2014) that now require healthcare professionals to ask women assessment questions about anxiety. However, there are multiple other mental health problems that this measure does not address, for example, bipolar disorder and post-traumatic stress as well as disorders specific to the childbearing period which do not have a psychiatric classification, such as fear of childbirth (tokophobia), bonding disorders and maternally focussed worry disorder. If assessment of perinatal mental health continues to be carried out by way of short self-report measures, there is scope to refine this widely used scale by removing items that do not discriminate well and adding items that can assess these further mental health problems. The purpose would be to create a more inclusive measure of mental health symptoms that is still short enough to use as a brief assessment. However, there are already discrepancies between research studies, and in practice, in how the EPDS is used. For example, a wide range of cut-off scores, use of incorrect cut-off scores and validation against a questionable gold-standard for perinatal women (Matthey, 2017; Matthey & Agostini, 2016). It is therefore possible that any changes to the EPDS may result in confusion and inconsistent application of a revised measure, and the matter of criterion validity against the DSM criteria would not have been addressed.

Brief, valid instruments for assessment of postnatal mental health are needed. The EPDS appears to measure anhedonia, depression and anxiety and could be continued to be used to screen for these mental health problems. Further research is needed to investigate the validity of a separate anhedonia scale.

## 6.6 References

- Adouard, F., Glangeaud-Freudenthal, N.M., & Golse, B. (2005). Validation of the Edinburgh postnatal depression scale (EPDS) in a sample of women with high-risk pregnancies in France. *Archives of Women's Mental Health*, 8(2), 89-95. doi: 10.1007/s00737-005-0077-9

- Agampodi, S.B., & Agampodi, T.C. (2013). Antenatal depression in Anuradhapura, Sri Lanka and the factor structure of the Sinhalese version of Edinburgh Post-Partum Depression Scale among Pregnant Women. *PLoS One*, 8(7). doi:10.1371/journal.pone.0069708
- American College of Obstetricians and Gynecologists. (2015). Screening for perinatal depression. Committee Opinion No. 630. *Obstetrics and Gynecology*, 125, 1268-71. Retrieved from: <http://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Screening-for-Perinatal-Depression>
- Astbury, J., Brown, S., Lumley, J., & Small, R. (1994). Birth events, birth experiences and social differences in postnatal depression. *Australian Journal of Public Health*, 18(2), 176-184
- Bauer, A., Parsonage, M., Knapp, M., Iemmi, V., & Adelaja, B. (2014). *The Costs of Perinatal Mental Health Problems*. London, UK: Centre for Mental Health and London School of Economics. Retrieved from: [http://eprints.lse.ac.uk/59885/1/\\_lse.ac.uk\\_storage\\_LIBRARY\\_Secondary\\_libfile\\_shared\\_repository\\_Content\\_Bauer,%20M\\_Bauer\\_Costs\\_perinatal\\_%20mental\\_2014\\_Bauer\\_Costs\\_perinatal\\_mental\\_2014\\_author.pdf](http://eprints.lse.ac.uk/59885/1/_lse.ac.uk_storage_LIBRARY_Secondary_libfile_shared_repository_Content_Bauer,%20M_Bauer_Costs_perinatal_%20mental_2014_Bauer_Costs_perinatal_mental_2014_author.pdf)
- Berle, J.Ø, Aarre, T.F., Mykletun, A., Dahl, A.A., & Holsten, F. (2003). Screening for postnatal depression: Validation of the Norwegian version of the Edinburgh Postnatal Depression Scale, and assessment of risk factors for postnatal depression. *Journal of Affective Disorders*, 76, 151-156. doi: 10.1016/S0165-0327(02)00082-4
- Bina, R., & Harrington, D. (2015). The Edinburgh Postnatal Depression Scale: Screening tool for postpartum anxiety as well? Findings from a confirmatory factor analysis of the Hebrew version. *Maternal and Child Health Journal*. doi:10.1007/s10995-015-1879-7.
- Bowen, A., Bowen, R., Maslany, G., & Muhajarina, N. (2008). Anxiety in a socially-high-risk sample of pregnant women in Canada. *Canadian Journal of Psychiatry*, 53, 435-440

- Boyd, A., Golding, J., Macleod, J., Lawlor, D.A., Fraser, A., Henderson, J.,...& Davey Smith, G. (2013). Cohort Profile: the 'children of the 90s'--the index offspring of the Avon Longitudinal Study of Parents and Children. *International Journal of Epidemiology*, 42(1), 111-27. doi: 10.1093/ije/dys064.
- Brouwers, E.P.M., van Baar, A.L., & Pop, V.J.M. (2001). Does the Edinburgh Postnatal Depression Scale measure anxiety? *Journal of Psychosomatic Research*, 51, 659-663. doi: 10.1016/S0022-3999(01)00245-8
- Brown, T.A. (2015). *Confirmatory factor analysis for applied research* (2<sup>nd</sup> ed.). New York: The Guilford Press
- Carlson, M., Wilcox, R., Chou, C.P., Chang, M., Yang, F., Blanchard, J.,...& Clark, F. (2011). Psychometric properties of reverse-scored items on the CES-D in a sample of ethnically diverse older adults. *Psychological Assessment*, 23, 558-562. doi: 10.1037/a0022484.
- Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research*, 1, 245-276.
- Chabrol, H., & Teissedre, F. (2004). Relation between Edinburgh Postnatal Depression Scale scores at 2-3 days and 4-6 weeks postpartum. *Journal of Reproductive and Infant Psychology*, 22(1), 33-39. doi: 10.1080/02646830310001643067
- Cheung, G.W., & Rensvold, R.B. (2002). Evaluating Goodness-of-Fit Indexes for testing measurement invariance. *Structural Equation Modelling*, 9(2), 233-255. Retrieved from: [http://dns2.asia.edu.tw/~ysho/YSHO-English/1000%20China%20\(Independent\)/PDF/Str%20Equ%20Mod9,%20233.pdf](http://dns2.asia.edu.tw/~ysho/YSHO-English/1000%20China%20(Independent)/PDF/Str%20Equ%20Mod9,%20233.pdf)
- Clark, L.A., & Watson, D. (1991). Tripartite model of anxiety and depression: psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology*, 100(3), 316-36. Retrieved from: <https://ccbt.solutions/articles/tripartite-model-1991.pdf>
- Comrey, A.L., & Lee, H.B. (1992). *A first course in factor analysis*. Hillsdale, N.J: Erlsbaum.

- Costello, A.B., & Osborne, J.W. (2015). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research and Evaluation, 10*(7), doi:10.1.1.110.9154
- 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.
- Cunningham, N.K., Brown, P.M., & Page, A.C. (2015). Does the Edinburgh Postnatal Depression Scale measure the same constructs across time? *Archives of Women's Mental Health, 18*(6), 793-804. doi: 10.1007/s00737-014-0485-9
- Davidson, K.W., Burg, M.M., Kronish, I.M., Shimbo, D., Dettenborn, L., Mehran, R.,... & Reickmann, N. (2010). Association of anhedonia with recurrent major adverse cardiac events and mortality 1 year after acute coronary syndrome. *Archives of General Psychiatry, 67*(5), 480-488. doi: 10.1001/archgenpsychiatry.2010.36.
- Dennis, C.L., & Hodnett, E. (2007). Psychosocial and psychological interventions for treating postpartum depression. *Cochrane Database of Systematic Reviews, 2007* (4).
- Dunbar, M., Ford, G., Hunt, K., & Der, G. (2000). Question wording effects in the assessment of global self-esteem, *European Journal of Psychological Assessment, 16*(1), 13-19. doi:10.1027//1015-5759.16.1.13
- Fraser, A., Macdonald-Wallis, C., Tilling, K., Boyd, A., Golding, J., Davey Smith, G,... & Lawlor, D.A. (2013). Cohort Profile: the Avon Longitudinal Study of Parents and Children: ALSPAC mothers cohort. *International Journal of Epidemiology, 42*(1), 97-110. doi: 10.1093/ije/dys066
- Gavin, N.I., Gaynes, B.N., Lohr, K.N., Meltzer-Brody, S., Gartlehner, G., & Swinson. T. (2005). Perinatal depression: a systematic review of prevalence and incidence. *Obstetrics and Gynecology, 106*, 1071-83. doi: 10.1097/01.AOG.0000183597.31630.db

- Gibson, J., McKenzie-McHarg, K., Shakespeare, J., Price, J., & Gray, R. (2009). A systematic review of studies validating the Edinburgh Postnatal Depression Scale in antepartum and postpartum women. *Acta Psychiatrica Scandinavica*, 119, 350-364. doi: 10.1111/j.1600-0447.2009.01363.x
- Goodchild, C.E., Treharne, G.T., Platts, R.G., & Booth, D.A. (2005). Excessive negative affect and deficient positive affect in anxiety and depression: balancing the valences in the Hospital Anxiety and Depression Scale (HADS). *Health Psychology Update*, 14(2), 45-50.
- Green, J. (1998). Postnatal depression or perinatal dysphoria? Findings from a longitudinal community-based study using the Edinburgh Postnatal Depression Scale. *Journal of Reproductive and Infant Psychology*, 16, 143-155. doi:10.1080/02646839808404565
- Guedeney, N., & Fermanian, J. (1998). Validation study of the French version of the Edinburgh Postnatal Depression Scale (EPDS): new results about use and psychometric properties. *European Psychiatry*, 13(2), 83-9. doi: 10.1016/S0924-9338(98)80023-0.
- Hartley, C.M., Barroso, N., Rey, Y., Pettit, J.W., & Bagner, D.M. (2014). Factor structure and psychometric properties of English and Spanish versions of the Edinburgh Postnatal Depression Scale among Hispanic women in a primary care setting. *Journal of Clinical Psychology*, 70(12), 1240-50. doi: 10.1002/jclp.22101
- Heron, J., O'Connor, T.G., Evans, J., Golding, J., & Glover, V. (2004). The course of anxiety and depression through pregnancy and the postpartum in a community sample. *Journal of Affective Disorders*, 80 (1), 65 - 73. doi: 10.1016/j.jad.2003.08.004
- Hewitt, C., Gilbody, S., Brealey, S., Paulden, M., Palmer, S., Mann, R.,...& Richards, D. (2009). Methods to identify postnatal depression in primary care: an integrated evidence synthesis and value of information analysis. *Health Technology Assessment*, 36:1-145, 147-230. doi: 10.3310/hta13360.

- Jomeen, J., & Martin, C.R. (2005). Confirmation of an occluded anxiety component within the Edinburgh Postnatal Depression Scale (EPDS) during pregnancy. *Journal of Reproductive and Infant Psychology*, 23, 143-154.  
doi:10.1016/j.jpsychores.2005.02.018
- Jomeen, J., & Martin, C.R. (2007). Replicability and stability of the multidimensional model of the Edinburgh Postnatal Depression Scale in late pregnancy. *Journal of Psychiatric and Mental Health Nursing*, 14, 319–324. doi: 10.1111/j.1365-2850.2007.01084.x
- Kaiser, H.F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement*, 20, 141-151. doi.org/10.1177/001316446002000116
- Kline, R.B. (2005). *Principles and practices of structural equation modelling*. New York: Guilford Press.
- Kubota, C., Okada, T., Aleksic, B., Nakamura, Y., Kunimoto, S., Morikawa, M., ...& Ozaki, N. (2014). Factor structure of the Japanese version of the Edinburgh Postnatal Depression Scale in the postpartum period. *PLoS One*. 9(8):e103941. doi: 10.1371/journal.pone.0103941.
- Kwan, R., Bautista, D., Choo, R., Shirong, C., Chee, C., Mei Saw, S., ...& Chen, H. (2015). The Edinburgh Postnatal Depression Scale as a measure for antenatal dysphoria. *Journal of Reproductive and Infant Psychology*, 33(1): 28-41.  
doi:10.1080/02646838.2014.949642
- Lee King, P.A. (2012). Replicability of structural models of the Edinburgh Postnatal Depression Scale (EPDS) in a community sample of postpartum African American women with low socio-economic status. *Archives of Womens Mental Health*, 15(2), 77-86.doi: 10.1007/s00737-012-0260-8

- Lindahl, V., Pearson, J.L., & Colpe, L. (2005). Prevalence of suicidality during pregnancy and the postpartum. *Archives of Women's Mental Health*, 8, 77-87. doi: 10.1007/s00737-005-0080-1
- Liu, C.H., & Tronick, E. (2014). Prevalence and predictors of maternal postpartum depressed mood and anhedonia by race and ethnicity. *Epidemiology and Psychiatric Sciences*, 23, 201-209. doi: 10.1017/S2045796013000413
- Manian, N., Schmidt, E., Bornstein, M.H., & Martinez, P. (2013). Factor structure and clinical utility of BDI-II factor scores in postpartum women. *Journal of Affective Disorders*, 149, 259-268. doi: 10.1016/j.jad.2013.01.039
- Matthey, S. (2008). Using the Edinburgh Postnatal Depression Scale to screen for anxiety disorders. *Depression and Anxiety*, 25:926–931. doi: 10.1002/da.20415
- Matthey, S. & Agostini, F. (2016). Using the Edinburgh Postnatal Depression Scale for women and men – some cautionary thoughts. *Archives of women's mental health*. DOI 10.1007/s00737-016-0710-9
- Matthey, S., Fisher, J., & Rowe, H. (2012). Using the Edinburgh Postnatal Depression Scale to screen for anxiety disorders: Conceptual and methodological considerations. *Journal of Affective Disorders*, 146 (2), 224-30. doi: 10.1016/j.jad.2012.09.009.
- Meredith, W. (1993). Measurement invariance, factor analysis and factorial invariance. *Psychometrika*, 58, 525-543. doi:10.1007/BF02294825
- Milfont, R., & Fischer, R. (2010). Testing measurement invariance across groups: Applications in cross-cultural research. *International Journal of Psychological Research*, 3, 112-131. Retrieved from: <https://dialnet.unirioja.es/descarga/articulo/3296462.pdf>
- Milgrom, J., & Gemmill, A. (2014). Screening for perinatal depression. *Best Practice & Research Clinical Obstetrics and Gynaecology*, 28, 13-23. doi: <http://dx.doi.org/10.1016/j.bpobgyn.2013.08.014>



- Montazeri, A., Torkan, B., & Omidvari, S. (2007). The Edinburgh Postnatal Depression Scale (EPDS): translation and validation study of the Iranian version. *BMC Psychiatry*, 7(1), 11. doi: 10.1186/1471-244X-7-11
- Mook, J., Kleijn, W. C., & Van der Ploeg, H. M. (1991). Symptom-positively and -negatively worded items in two popular self-report inventories of anxiety and depression. *Psychological Reports*, 69 (2), 551-560. Retrieved from: <http://prx.sagepub.com/content/69/2/551.full.pdf>
- Murray, L., & Carothers, A.D. (1990) The validation of the Edinburgh Post-natal Depression Scale on a community sample. *British Journal of Psychiatry*. 157, 288-90. doi: 10.1192/bjp.157.2.288
- National Institute of Clinical and Health Excellence. (2014). *Antenatal and Postnatal Mental Health: Clinical management and service guidance. Updated edition. National clinical guideline number 192*. Retrieved from <https://www.nice.org.uk/guidance/cg192>
- Odalovic, M., Tadic, I., Lakic, D., Nordeng, H., & Lupatelli, A. (2015). Translation and factor analysis of structural models of Edinburgh Postnatal Depression Scale in Serbian pregnant and postpartum women – Web-based study. *Women and Birth*, 28 (3), doi:10.1016/j.wombi.2015.01.014
- Petrozzi, A., & Gagliardi, L. (2013) Anxious and depressive components of Edinburgh Postnatal Depression Scale in maternal postpartum psychological problems. *Journal of Perinatal Medicine*, 41(4), 343-8. doi: 10.1515/jpm-2012-0258
- Phillips, J., Sharpe, L., Matthey, S., & Charles, M. (2009). Maternally focussed worry. *Archives of Women's Mental Health*, 12(6), 409-18. doi: 10.1007/s00737-009-0091-4
- Preacher, K.J., & MacCallum, R.C. (2003). Repairing Tom Swift's electric factor analysis machine. *Understanding Statistics*, 2(1), 13-43. Retrieved from: [http://www.quantpsy.org/pubs/preacher\\_maccallum\\_2003.pdf](http://www.quantpsy.org/pubs/preacher_maccallum_2003.pdf)

- Pop, V.J., Komproe, I.H., & van Son, M.J. (1992). Characteristics of the Edinburgh Postnatal Depression Scale in The Netherlands. *Journal Affective Disorders*, 26(2), 105-10. DOI: 10.1016/0165-0327(92)90041-4
- Reichenheim, M. E., Moraes, C.L., Oliveira, A.S.D., & Lobato, G. (2011). Revisiting the dimensional structure of the Edinburgh Postnatal Depression Scale (EPDS): empirical evidence for a general factor. *BMC Medical Research Methodology*, 11, 93, doi: 10.1186/1471-2288-11-93
- Ross, L.E., Evans, S.E.G., Sellers, E.M., & Romach, M.K. (2003). Measurement issues in postpartum depression 1: anxiety as a feature of postpartum depression. *Archives of Women's Mental Health*, 6, 51-57. doi: 10.1007/s00737-002-0155-1
- Small, R., Lumley, J., Yelland, J., & Brown, S. (2007). The performance of the Edinburgh Postnatal Depression Scale in English speaking and non-English speaking populations in Australia. *Social Psychiatry and Psychiatric Epidemiology*, 42 (1), 70-8. doi: 10.1007/s00127-006-0134-3
- Streiner, D.L. (1994) Figuring out factors: The use and misuse of factor analysis. *Canadian Journal of Psychiatry*, 39, 135-140. Retrieved from: [https://www.researchgate.net/publication/15166264\\_Figuring\\_out\\_factors\\_The\\_use\\_and\\_misuse\\_of\\_factor\\_analysis](https://www.researchgate.net/publication/15166264_Figuring_out_factors_The_use_and_misuse_of_factor_analysis)
- Swalm, D., Brooks, J., Doherty, D., Nathan, E., & Jacques, A. (2010). Using the Edinburgh postnatal depression scale to screen for perinatal anxiety. *Archives of Women's Mental Health*, 13 (6), 515-522. doi: 10.1007/s00737-010-0170-6.
- Tabachnick, B.G., & Fidell, L.S. (2012). *Using multivariate statistics* (6th ed.). Cambridge: Pearson.

- Tomas, J. M., & Oliver, A. (1999). Rosenberg's Self-Esteem Scale: Two factors or method effects. *Structural Equation Modeling*, 6 (1), 84-98. doi: <http://dx.doi.org/10.1080/10705519909540120>
- Toreki, A., Andó, B., Dudas, R.B., Dweik, D., Janka, Z., Kozinszky, Z., & Keresztúri, A. (2014). Validation of the Edinburgh Postnatal Depression Scale as a screening tool for postpartum depression in a clinical sample in Hungary. *Midwifery*, 30 (8), 911-8. doi: 10.1016/j.midw.2014.02.008.
- Toreki, A., Andó, B., Keresztúri, A., Sikovanyecz, J., Dudas, R.B., Janka, Z.,...& Pal, A. (2013). The Edinburgh Postnatal Depression Scale: Translation and antepartum validation for a Hungarian sample. *Midwifery*, 29, 308-315. doi:10.1016/j.midw.2012.01.011
- Truijens, S.E.M., Meems, M., Kuppens, S.M.I., Broeren, M.A.C., Nabbe, K.C.A.M., Wijnen, H.A.... & Pop, V.J.M. (2014). The HAPPY study (Holistic Approach to Pregnancy and the first Postpartum Year): design of a large prospective cohort study. *BMC Pregnancy and Childbirth*, 14: 312. doi: 10.1186/1471-2393-14-312
- Tuohy, A., & McVey, C. (2008). Subscales measuring symptoms of non-specific depression, anhedonia, and anxiety in the Edinburgh Postnatal Depression Scale. *British Journal of Clinical Psychology*, 47, 153-169. doi: 10.1111/j.2044-8260.2008.tb00463.x
- Velicer, W.F., & Jackson, D.N. (1990). Component analysis versus common factor analysis: some issues in selecting an appropriate procedure. *Multivariate Behavioural Research*, 25(1), 1-28. Retrieved from: <http://www.ophi.org.uk/wp-content/uploads/Velicer-Jackson-1990.pdf>
- Vivilaki, V.G., Dafermos, V., Kogevinas, M., Bitsios, P., & Lionis, C. (2009). The Edinburgh Postnatal Depression Scale: Translation and validation for a Greek sample. *BMC Public Health*, 9, 329. doi: 10.1186/1471-2458-9-329.

Zhong, Q., Gelaye, B., Rondon, M., Sánchez, S.E., García, P.J., Sánchez, E., ... & Williams, M.A. (2014). Comparative performance of Patient Health Questionnaire-9 and Edinburgh Postnatal Depression Scale for screening antepartum depression. *Journal of Affective Disorders*, 2, 1-7. doi: 10.1016/j.jad.2014.03.028

## 7 Psychological distress in pregnancy: Pilot evaluation of the CORE-10 as an assessment tool

Coates, R., Ayers, S., de Visser, R., Thornton, A. (2016). *Psychological distress in pregnancy: Pilot evaluation of the CORE-10 as an assessment tool*. Manuscript submitted for publication.

### 7.1 Abstract

**Background:** Mental illness in pregnancy can have adverse effects on mothers and their children. Women experience diverse symptoms of mental ill health in the perinatal period, yet measures usually only assess depression or anxiety, and may therefore underestimate the prevalence of psychological distress.

**Objective:** We aimed to examine validity and reliability of the CORE-10: a short measure that had broad coverage of symptoms of distress and associated functioning, in pregnant women.

**Methods:** 366 women between 26-38 weeks pregnancy gestation completed online measures of distress (CORE-10), depression (Whooley questions), anxiety (Generalised Anxiety Disorder-2), mood (UWIST Mood Adjective Checklist, Tense Arousal Subscale) and a single item measuring worry about psychological health. We examined convergent and factorial validity and concordance rates of the measures.

**Results:** The mean score on the CORE-10 was 10.98. Previously defined scores of 11 and above indicate clinical distress. Levels of distress were high, with anxiety the most reported symptom. The CORE-10 showed good convergent validity and a two-factor structure representing 'symptoms' and 'ways of coping' best fit this sample. Internal reliability of the symptoms factor was good.

**Limitations:** Data were obtained from a self-selected online sample and may not be representative of pregnant women in the third trimester. A diagnostic interview was not used.

**Conclusions:** The CORE-10 potentially offers assessment of a broad range of symptoms of postnatal distress within the confines of a measure brief enough to be usable in clinical settings. Further validation is needed.

Keywords: Pregnancy, anxiety, depression, distress, psychometrics, validity

## 7.2 Introduction

Mental illness is experienced by 10 – 20% of women in pregnancy or the first postnatal year (Heron et al., 2004; Bauer, Parsonage, Knapp, Lemmi, & Adelaja, 2014). Perinatal mental illness has serious implications for the woman, her child(ren), wider family and society in general (Goodman, 2004; O'Donnell, Glover, Barker, & O'Connell, 2014; Orr, Reiter, Blazer, & James, 2007). In the UK, perinatal mental illness costs the National Health Service £1.2 billion and wider society £8.1 billion for every year of births in the UK (Bauer et al., 2014). Women can recover and effects can be mitigated but successful outcomes require recognition, assessment, diagnosis and treatment (O'Connor, Rossom, Henninger, Groom, & Burda, 2016). Current rates of recognition of perinatal mental health problems are low. It is estimated that 41% of cases of antenatal depression are identified (Goodman & Tyler-Viola, 2010) and less than 50% of postnatal cases (Hewitt et al., 2009; Hearn et al., 1998). There is no evidence for the rates of detection of perinatal anxiety.

Most research on screening and identification of mental illness in the perinatal period has focused on depression, although anxiety is now recognised as being of equal importance both as a disorder itself and as a predictor of depression (Heron et al., 2004; Orr et al., 2007). However there are many more less common but clinically significant mental illnesses that perinatal women experience that are not currently assessed for such as posttraumatic stress disorder (PTSD; Ayers, 2004), stress (Miller, Pallant, & Negri, 2006), obsessive compulsive disorder (Fairbrother & Abramowitz, 2007), bipolar disorder (Khan et al., 2016) and problems without psychiatric classification, such as bonding disorders (Brockington, 2004) and maternally focused worry disorder (Phillips, Sharpe, Matthey, & Charles, 2009). In most countries universal screening is not in place for any mental illness in the perinatal period (Hill, 2010). Instead expert groups compile guidance with varying degrees of recommendation for postnatal depression screening (Lancet, 2016). UK clinical guidelines suggest healthcare professionals consider asking two questions to identify depression (Whooley questions; Whooley, Avins, Miranda, & Browner, 1997) and two questions to identify anxiety (GAD-2; Kroenke, Spitzer,

Williams, Monahan, & Löwe, 2007) at the first contact in pregnancy and early in the postnatal period (NICE, 2014). Whilst the inclusion of items relating to anxiety is to be welcomed, it is likely that by only asking about depression and anxiety women with other mental health problems will be missed.

Given the diversity of perinatal symptoms, one possible solution to this problem is to screen for multiple types of distress using a measure that is still brief. The ten-item Clinical Outcomes in Routine Evaluation (CORE-10; Connell & Barkham, 2007) is a short measure of psychological distress derived from the larger CORE-OM, a well-established measure for evaluating psychological therapies in counselling and clinical psychology in the UK (Barkham, Mellor-Clark, & Stiles, 2015). The CORE-10 was devised in 2007 and since then has been used to evaluate distress in studies of CBT and psychotherapy for psychosis (Owen, Sellwood, Kan, Murray, Sarsam, & 2015; Peters et al., 2015; Schrank et al., 2014), art therapy for severe mental illness (Allan, Barford, Horwood, Stevens, & Tanti, 2015), and Increasing Access to Psychological Therapies services (Jolley et al., 2015). The CORE-10 has shown good psychometric properties and internal consistency in primary care and in depression trial participants (Barkham et al., 2013). It has not yet been tested in perinatal women.

The potential suitability of the CORE-10 for assessing perinatal mental health lies in its broad coverage of a range of symptoms of distress and associated functioning. It includes two items each to identify anxiety and depression and single items measuring the following areas: physical problems, trauma, risk, close relationships, social relationships and general functioning (see Table 2). It is anticipated that the physical item (I have had difficulty getting to sleep or staying asleep) may need modification in perinatal women due to normal disruptions to sleep in this period. To increase sensitivity four items have a low intensity (e.g. item one; I have felt tense, anxious or nervous) and six items have a high intensity (e.g. item five; I have felt panic or terror) (Connell & Barkham, 2007). A further strength is the inclusion of an item targeting suicidal intent as research shows that approximately one fifth of women with perinatal mental illness report suicidal ideation (Boots Family Trust Alliance, 2013).

Based on its brevity, good psychometric properties, and wide coverage of psychological problems this study aimed to pilot the CORE-10 in an online sample of pregnant women. The psychometric properties of the CORE-10, including convergent and factorial validity and its overlap with other measures at identifying cases needing further psychological assessment will be evaluated. We also aimed to add to the existing literature regarding the prevalence of a wide-range of specific psychological symptoms in pregnant women.

### **7.3 Methods**

#### **7.3.1 Design**

This was part of a larger study of wellbeing in pregnancy. The Wellbeing in Pregnancy (WiP) study was an online pragmatic pilot randomised-controlled trial (RCT) to evaluate the efficacy of a Wellbeing Plan for pregnant women developed by the Boots Family Trust Alliance (Boots Family Trust, Netmums, Tommy's charity, Royal College of Midwives and the Institute of Health Visiting). Measures of distress, depression, anxiety, mood and worry were completed prior to the intervention, immediately after the intervention, one-month later, and six weeks postnatally. The current study used data collected at baseline which women completed immediately before the intervention took place. Data were collected between 11<sup>th</sup> August and 19<sup>th</sup> September 2015. Ethical approval was obtained from the Research Ethics Committee at City University London.

#### **7.3.2 Participants**

The study was advertised on websites (e.g. Netmums, ASDA Baby and Toddler Club) and social media associated with the research team (e.g. Netmums, Tommy's charity, City University London, The Royal College of Midwives, the Institute of Health Visiting). Women were eligible to take part if they were 26 to 38 weeks pregnant, were aged 18 or over and had a level of English sufficient to understand and complete the Wellbeing Plan. The sample consisted of 366 women who decided to take part and completed the CORE-10 during the online recruitment and data collection period.



### 7.3.3 Measures

#### *CORE-10*

Items on the CORE-10 ask respondents how often they have experienced a symptom over the last week. Items are measured on a 5-point Likert scale ranging from 0 (not at all) to 4 (most or all of the time). Higher scores indicates higher distress. The total scale score is computed by adding all present item scores, dividing by the number of items completed, and multiplying by 10. The range is 0 – 40. Two items (item 2 ‘I have felt I have someone to turn to for support when needed’ and item 3 ‘I have felt able to cope when things go wrong’) are worded positively and thus are reverse-scored. Scores of 11 and above are considered within the clinical range of distress (Connell & Barkham, 2007). Clinical range scores of 11-14 are ‘mild’; 15-19 ‘moderate’; 20-24 ‘moderate-to-severe’; and 25 or more ‘severe’ (Connell & Barkham, 2007). Compared against a diagnosis of DSM-IV depression using the Structured Clinical Interview for DSM-III-R (SCID), a cut-off score of 13 or greater gave sensitivity and specificity values of .92 and .72 respectively (Connell & Barkham, 2007).

#### *Whooley questions*

The Whooley questions are a modified version of the PHQ-2. The questions ask if over the past month you have been bothered by i) feeling down, depressed or hopeless, and ii) having little interest or pleasure in doing things (Whooley et al., 1997). Answering ‘yes’ to either question is considered a positive test. They are intended to identify possible depression cases based on current symptoms that need further mental health assessment. Responses to the Whooley questions ranged from 0 – 2 for the purposes of correlation analysis.

#### *GAD-2*

The GAD-2 comprises the first two items of the GAD-7, a brief instrument for detecting anxiety disorders (Kroenke et al., 2007). The two items represent core anxiety symptoms (item 1: feeling nervous, anxious, or on edge and item 2: not being able to stop or control worrying) and

ask respondents how they have felt over the last two weeks from 0 (not at all) to 3 (nearly every day). Scores range from 0-6. A cut-off of three or more has shown a sensitivity of 0.86 and specificity of 0.83 to detect generalised anxiety disorder; and a sensitivity of 0.59 – 0.76 and specificity of 0.83 to detect panic disorder, social anxiety disorder and posttraumatic stress disorder in primary care patients (Kroenke et al., 2007). The scale's authors and NICE (2014) guidance for antenatal and postnatal mental health recommend using the two items as an initial brief screen, which can be followed by the other five items of the GAD-7 if scoring three or more.

#### *UWIST Mood Adjective Checklist (UMACL)*

The UMACL (Matthews, Jones, & Chamberlain, 1990) detects small changes in mood. It contains 24 mood adjectives with a four-point response scale (1-4). Participants indicate whether each adjective relates to their current mood. The UMACL has three subscales confirmed by factor analysis. The scale has good discriminant validity, is sensitive to stressors and has been used in postnatal samples. For this study only the tense arousal subscale, measuring feelings of subjective tension was included. The subscale comprises eight items including 'nervous', 'tense', 'jittery' and 'relaxed', 'composed' and 'calm'. Scores range from 8 to 32; higher scores represent a more tense state. Cronbach's alpha in this sample was .834.

#### *Worry item*

To measure worry about mental health women were asked 'Since becoming pregnant have you been worried at all about your psychological wellbeing?' with yes/no response options.

#### 7.3.4 Statistical Analysis

Using SPSS version 20, mean scores, associated standard deviations, 95% confidence intervals, medians and response category proportions of the CORE-10 were calculated. Mean scores of the CORE-10 were calculated according to age, gestation, parity, relationship status,

qualification level, ethnicity and previous self-reported mental health diagnosis. Demographic variable differences in mean scores were examined with one-way ANOVA or t-tests.

Concurrent validity of the CORE-10 was examined using Spearman's correlations for ordered and/or non-parametric data between CORE-10 and other self-report measures of anxiety and distress (GAD-2, UMACL, Whooley questions) considering (.1) small, (.3) medium and (.5) large correlations (Cohen, 1988). To compute concordance rates, scores on the CORE-10, GAD-2, Whooley questions, and worry item were dichotomised into cases needing further assessment (yes/no) based on the cut-offs given above. As a further reference category, concordance with yes/no answers to worry about mental health were computed. The worry item was used as a proxy with which to calculate criterion validity of the CORE-10 using a receiver operating characteristic (ROC) curve. The ROC curve plots the sensitivity and [1-] specificity of the CORE-10 at different cut-offs to identify worry about psychological health. The area under the curve (AUC) gives an overall estimate of the accuracy of the CORE-10 (proportion of results, both positive and negative, correctly identified).

#### *Factor analysis*

As we were using the CORE-10 in a population (pregnant women) in which it has not been used previously, we conducted confirmatory factor analysis (CFA) to establish whether the measure performs similarly to in other populations. We tested the unidimensional model of the CORE-10 proposed by the scale's authors. The maximum likelihood procedure was used to conduct the analyses. In all models, independence of error terms was specified for all variables; factors (if more than one) were allowed to correlate and each observed variable loaded on only one factor. Multiple goodness-of-fit indices were used to assess the models (Kline, 2005). These were the model Chi-square ( $\chi^2$ ) test of exact fit, the normed Chi-square (NC), the Comparative Fit Index (CFI), the Root Mean Squared Error of Approximation (RMSEA), Tucker-Lewis Index (TLI), Parsimony Normed Comparative Fit Index (PCFI), Akaike Information Criterion (AIC); optimal values for each index are given below table 5 for ease of interpretation. The model Chi-square is

sensitive to correlations and sample size (larger correlations and sample sizes produce higher Chi-square statistics), however it is reported for computation of the NC. Each fit index indicates one aspect of model fit only, thus multiple fit indices have been considered (Kline, 2005). CFAs were conducted with AMOS version 21 (Arbuckle, 2012).

As the fit indices in the CFA were not adequate for the unidimensional model, we conducted exploratory factor analysis of the 10 items using principal axis factoring. An oblique rotation (direct oblimin) was used as it was expected that factors would correlate. Eigenvalues, scree plots, and amount of variance explained were examined to determine the number of factors to be retained. Traditionally factors with eigenvalues greater than 1 are retained (Kaiser, 1960) but many consider that this is likely to result in an incorrect solution and note that the scree plot should also be examined (Velicer & Jackson, 1990; Cattell, 1966). A meaningful factor solution needs to explain at least 50% of the variance (Streiner, 1994). An item loading significantly on a factor was determined by a loading of .3 and above (Tabachnick & Fidell, 2012).

## **7.4 Results**

### **7.4.1 Participant characteristics**

A total of 600 women enrolled in the study and 366 of them completed all the measures and demographic data needed for the current analysis. Women who dropped out without completing all the measures ( $n = 234$ ) had slightly but significantly higher CORE-10 scores ( $M = 12.19$ ,  $SD = 7.15$ ) than women who remained ( $M = 10.98$ ,  $SD = 6.66$ ),  $t(566) = 2.02$ ,  $p = .044$ . Sample characteristics are shown in Table 1. Women had a mean maternal age of 30.15 years (age range 18 – 44). Most women were white, educated to at least A' level and were married or cohabiting; 22% disclosed a previous mental health diagnosis.

Table 1. Means, standard deviations, confidence intervals and median scores on the CORE-10 presented by demographic characteristics.

		<b>N (%)</b>	<b>Mean (SD)</b>	<b>95% CI</b>	<b>Median</b>
		<b>N=366</b>			
Age	Range 18-44 (M = 30.15, Mdn =30)	366 (100)			
	18-24	50 (13.7)	12.36 (7.25)	10.30-14.42	10
	25-35	255 (69.7)	10.88 (6.60)	10.06-11.69	10
	36-44	61 (16.7)	10.27 (6.34)	8.65-11.90	8
Gestation (weeks)	Range 20-39 (M = 31.30, Mdn =31)	309 (84.4)			
Parity		365 (99.7)			
	First child	169 (46.2)	10.85 (6.79)	9.82-11.88	9
	Second child	126 (34.4)	10.94 (6.43)	9.81-12.08	9.5
	Third + child	70 (19.1)	11.47 (6.79)	9.85-13.09	10
Marital status		365 (99.7)			
	Married	214 (58.47)	10.37 (6.36)	9.51-11.23	9
	Living with partner	119 (32.51)	11.24 (6.63)	10.04-12.45	10
	Separated/divorced	1 (0.27)			
	Single	11 (3.01)	15.82 (9.48)	9.45-22.19	12
	In a relationship but not living together	20 (5.46)	12.6 (6.98)	9.33-15.87	12
Qualifications		365 (99.7)			
	None	22 (6.01)	14.18 (9.22)	10.09-18.27	11

	<b>N (%)</b>	<b>Mean (SD)</b>	<b>95% CI</b>	<b>Median</b>
	<b>N=366</b>			
GCSE	47 (12.84)	9.13 (5.61)	7.48-10.77	8
A Level	39 (10.66)	11.13 (6.96)	8.88-13.39	9
City & Guilds	18 (4.92)	14.17 (5.95)	11.21-17.13	15.5
Diploma	52 (14.21)	11.21 (5.37)	9.72-12.71	11
Degree	124 (33.88)	10.55 (6.67)	9.36-11.73	9
Higher degree	63 (17.21)	10.87 (6.91)	9.13-12.61	9
Ethnicity	366 (100)			
Black	5 (1.37)	12.00 (6.63)	3.77-20.24	12
Asian	6 (1.64)	7.00 (4.47)	2.31-11.69	8.5
White British	326 (89.07)	10.92 (6.46)	10.22-11.63	9
White Other	22 (6.01)	10.64 (7.34)	7.21-14.07	8.5
Other	7 (1.91)	17.29 (10.83)	7.27-27.30	12
Previous mental health diagnosis	309 (84.42)			
Yes	82 (22.40)	13.68 (7.33)	12.07-15.29	12.5
No	227 (62.02)	9.57 (5.90)	8.78-10.34	9

#### 7.4.2 Prevalence and distribution of the CORE-10

CORE-10 scores ranged from 0 - 34, with a mean of 10.98 ( $\pm 6.66$ ). A total of 152 women (41.53%) scored 11 and above indicating a clinical level of distress (a 'case'). Using previously established categories of distress 56 women (15.30%) scored in the mild range of distress, 53 (14.48%) in the moderate range, 24 (6.56%) moderate-severe and 19 (5.19%) were severely distressed. Taking a different approach (Matthey, Valenti, Souter, & Ross-Hamid, 2013; O'Connor, Heron, Golding, Beveridge, & Glover, 2002) the top 15% of scorers were identified

by a score of 18 and above, which falls into the ‘moderate’ range of distress using the established cut-offs.

The mean and median scores on the CORE-10 split by demographic variables are presented in Table 1. There were no significant differences in CORE-10 scores by age group, parity or ethnicity ( $ps > .05$ ). There were significant differences in CORE-10 scores by relationship status, level of education and history of mental illness. Post hoc tests showed that single women had significantly higher scores than married women  $F(3, 360) = 3.05, p = .029$ . Women with no qualifications had significantly higher mean scores than women whose highest qualification was at GCSE level  $F(6, 358) = 2.29, p = .035$ ; and women who had a history of mental illness had significantly higher scores,  $t(120.96) = -4.57, p < .001$ .

Item means and response categories are given in Table 2. Eight out of ten items were significantly positively skewed as would be expected on a measure of psychological distress in a non-clinical population. Exceptions were items one (I have felt tense anxious or nervous) which broadly similar numbers of women endorsed feeling only occasionally, sometimes and often; and item seven (I have had difficulty getting to sleep or staying asleep) which a fairly even number of women reported only occasionally, sometimes and often with 16.1% having difficulty with sleep most of the time, resulting in the highest means being for these items. The next highest means were for items four (talking to people has felt too much for me) and nine (I have felt unhappy). Item six (I made plans to end my life) had the lowest mean score. However, 16 women (4.37%) had made plans to end their life occasionally, sometimes, often, or most of the time. No one endorsed the category ‘not at all’ in response to positively worded items two (I have someone to turn to for support when needed) or three (I feel able to cope when things go wrong)

#### 7.4.3 Correlations and concordance with other measures

Scores on the UMACL ranged from 8 – 31, with a mean of 19.40 ( $\pm 4.93$ ). The GAD-2 scores ranged from 0-6 with a mean of 1.72 ( $\pm 1.69$ ). Table 3 shows correlations between the measures.

All correlations were large. The CORE-10 correlated to a similar level with all measures, and most highly with the GAD-2.

Comparison of cases identified by the CORE-10, Whooley questions and GAD-2 is shown in Table 4. There were 149 Whooley cases (40.71% of the whole sample). Eighty-three women (22.68% of the whole sample) had a score of three or more (a case) on the GAD-2. Table 4 shows the overlap between cases on each measure. Using the overlap approach, the CORE-10 performed best in detecting more ‘cases’ than any other measure. On the ROC curve, the point of maximum sensitivity and specificity was indicated by a cut-off score of 10, giving 75.2% sensitivity and 67.6% specificity. The area under the curve indicated accuracy of 80.6%. For comparison, the area under the curve for the GAD-2 was 76.1%.



Table 2. CORE-10 Item content and descriptive statistics ( $N = 366$ ).

Item	Description	Mean	SD	Item-test correlation	Factor loading  EFA (factor)	Response category proportions (%)				
						0	1	2	3	4
1	I have felt tense, anxious or nervous	1.98	1.03	0.73	.654 (1)	5.7	30.1	31.4	26.0	6.8
2	<i>I have felt I have someone to turn to for support when needed</i>	0.60	0.89	0.51	.783 (2)	62.0	21.9	10.7	5.5	0
3	<i>I have felt able to cope when things go wrong</i>	0.54	0.76	0.61	.495 (2)	59.8	28.4	9.6	2.2	0
4	Talking to people has felt too much for me	1.01	1.13	0.68	.493 (1)	45.9	20.8	22.7	7.7	3.0
5	I have felt panic or terror	0.73	1.06	0.60	.725 (1)	60.4	16.4	16.4	3.8	3.0
6	I made plans to end my life	0.07	0.36	0.29	.368 (1)	95.6	3.0	0.8	0.3	0.3

Item	Description	Mean	SD	Item-test correlation	Factor loading EFA (factor)	Response category proportions (%)				
						0	1	2	3	4
7	I have had difficulty getting to sleep or staying asleep	2.12	1.29	0.52	.429 (1)	13.7	21.0	21.3	27.9	16.1
8	I have felt despairing or hopeless	0.63	1.02	0.69	.735 (1)	65.3	15.6	12.0	4.9	2.2
9	I have felt unhappy	1.13	1.05	0.72	.768 (1)	33.3	34.2	21.3	8.7	2.5
10	Unwanted images or memories have been distressing me	0.74	1.08	0.59	.611 (1)	59.3	20.2	10.4	7.4	2.7

Correlations are Spearmans's rho for non-parametric data. Response categories: 0 = Not at all; 1 = Only occasionally; 2 = Sometimes; 3 = Often; 4 = Most or all of the time. Items in italics are reverse-coded.

Table 3. Correlations between measures.

	Measure			
	CORE-10	GAD2	Whooley	UMACL Tense arousal
CORE-10	-	0.69	0.64	0.65
GAD2		-	0.52	0.65
Whooley			-	0.45

Table 4. Agreement between measures in detecting cases for further assessment on every other measure.

% detected by	If a 'case' on this measure			
	CORE-10	GAD2	Whooley	Worried about psychological health
<b>CORE-10</b>	-	87.9%	73.2%	68.5%
<b>GAD2</b>	48.0%	-	48.0%	67.6%
<b>Whooley</b>	72.2%	75.6%	-	41.6%
<b>Worried about psychological health</b>	67.1%	67.6%	74.7%	-

#### 7.4.4 Factor analysis

Table 5 indicates the fit statistics for the CFA. The unidimensional model (Model 1) as proposed by the CORE-10 authors showed good fit in terms of the CFI but TLI and RMSEA statistics were less than reasonable. To further investigate the dimensionality of the CORE-10 several CFA models were implemented and their model fit statistics compared. Following inspection of post-hoc modification indices, a number of correlated residuals were included in

the model (Model 1a: the residuals of ‘Someone to turn to for support’ were correlated with both ‘Able to cope when things go wrong’ and with ‘Panic or terror’; ‘Despairing or hopeless’ was correlated with ‘Unhappy’). The fit statistics for this model were all very good. The Chi-square test of exact fit was significant for all models indicating that a significant amount of variance was left unexplained by these models. This may be due to the sample size. The normed Chi-square index (NC;  $\chi^2/df$ ) were all  $< 5$  indicating reasonable model fit but only Model 1a met the stricter criterion of  $NC < 2$  indicating good fit and only this model showed good RMSEA with the upper bound of the confidence interval  $< .08$ .

Table 5. Fit statistics for the Confirmatory Factor Analyses for the CORE-10 in the WiP Study (N = 366)

Factor Model	$\chi^2$ <sup>(a)</sup>	<i>df</i>	<i>p</i>	NC <sup>(b)</sup>	CFI <sup>(c)</sup>	RMSEA <sup>(d)</sup>	(90% CI)	TLI <sup>(e)</sup>	PCFI <sup>(f)</sup>	AIC <sup>(g)</sup>
<b>One factor CFA</b>										
<b>Model 1</b>	129.17	35	.000	3.69	.92	.086	(.070-.102)	.89	.71	169.17
<b>Model 1a</b>	54.92	32	.007	1.72	.98	.044	(.023-.064)	.97	.70	100.92
<b>Two factor CFA</b>	87.07	34	.000	2.56	.95	.065	(.049-.083)	.94	.72	149.07

<sup>(a)</sup> Statistically significant chi-square value indicates a significant proportion of variance is unexplained by the model (Kline, 2005); <sup>(b)</sup> NC = normed chi-square ( $\chi^2/df$ ) values <5 indicate reasonable fit (Kline 2005) CFI values > .9 indicate good model fit (Kline, 2005); <sup>(c)</sup> RMSEA values < .05 indicate good model fit, .05-.08 reasonable model fit, > .1 poor model fit (Hu & Bentler, 1999; Kline, 2005); <sup>(d)</sup> TLI values > .9 indicate good model fit (Kline, 2005); <sup>(e)</sup> PCFI values closer to 1 indicate better model fit; <sup>(f)</sup> The model with the smallest AIC is the one with relatively better fit (Kline, 2005). TLI and CFI are most stable with reference to the number of variables (Kenny, 2014).

Given the poor fit of Model 1, an EFA was run using Principal Axis Factoring and an oblique Oblimin rotation. It is understood that conducting EFA after CFA cannot *validate* the factor structure of the CORE-10. The EFA was instead carried out to further *explore* the dimensions of the measure. The data set was suitable for factor analysis: the Kaiser-Meyer-Olkin Measure of Sampling Adequacy statistic was .876 indicating compact patterns of correlations (possible range 0-1 with  $\geq 0.5$  considered appropriate for factor analysis, and Bartlett's test of sphericity was significant ( $p < .001$ ) indicating there were sufficient relationships within the data to be appropriate for factor analysis (Tabachnick & Fidell, 2012). All items were significantly correlated with each other except for items two (had someone to turn to for support when needed) and seven (difficulty getting to sleep or staying asleep),  $r = .061$ . These two items also had the lowest correlations with all other items. Overall many correlations were low. Correlations ranged from .096 to .663. A strong first factor was identified (eigenvalue = 4.21) with some support for a second factor (eigenvalue = 1.13). The first factor alone accounts for 42.07% of the variance, whilst the first and second factors combined account for 53.36% of the variance. The second factor included items two and three (item loadings .783 and .495 respectively). This factor could be considered to represent 'ways of coping'. The remaining items loaded onto the first factor (loadings between .368 and .768; see Table 1) and represents 'symptoms of distress'. No items cross-loaded (loadings of items onto opposing factor ranged from .008 - .267). A CFA of this model showed an improved fit compared with the original unidimensional model, but was not as good a fit as Model 1a. The two factors correlated at  $r = .66$ . Guided by the fit indices, the amount of variance explained and the meaningfulness of factors, Model 2 was selected as the best-fitting model.

#### 7.4.5 Reliability analysis

The 'Symptoms' factor showed good internal reliability with a Cronbach's alpha of .823. This would increase to .837 if item seven was removed. Item – total correlations were all above .3 except for item 6 (I made plans to end my life) which correlated with the scale at .29. The

Spearman's correlation between items two and three (the 'ways of coping' factor) was .462 ( $p < .001$ ).

## 7.5 Discussion

This study investigated the psychometric properties of the CORE-10 in an online sample of pregnant women. Overall levels of distress were high, with anxiety the most reported symptom on the CORE-10. A two-factor model with subscales representing 'ways of coping' and 'symptoms' best fit the data. Internal reliability of the 'symptoms' factor was good. The CORE-10 showed good convergent validity and identified more cases for further mental health assessment than other measures.

There is little normative data for the CORE-10 in non-clinical samples. The mean score in the present sample (10.98) is just in the non-clinical range as may be expected in this sample, and is lower than in other samples using the CORE-10, such as participants referred to an occupational health service ( $M = 17.1$ ; Barkham et al., 2013); inpatients with psychosis before intervention ( $M = 23.05$ ; Owen et al., 2015) or young people engaging with a brief mental health intervention ( $M = 19.72$ ; O'Reilly, Illback, Peiper, O'Keeffe, & Clayton, 2015).

An alternative approach is to take the top 15% of scorers as those with clinically significant levels of distress (Matthey et al., 2013; Hanington, Heron, Stein, & Ramchandani, 2011). This would mean women with a score  $\geq 18$ , indicating that the top end of the moderate range on the CORE-10 (15-19) and above indicates a high level of distress. In terms of balancing sensitivity and specificity, the CORE-10 was more accurate than the GAD-2 at identifying women who were worried about their psychological health. Validation against a 'gold standard' clinical interview is needed to investigate the possibilities of these cut-off scores and to establish criterion validity for diagnostic disorders.



The symptom profile of women in this study provides evidence for broadening the concept of postnatal distress and how we screen for or assess it. Almost one third of the sample (32.8%) experienced feeling anxious, tense or nervous often or most or all of the time, many more than endorsed the depression symptoms with this frequency. This is in line with previous research indicating that anxiety disorders are more prevalent than rates of minor or major depression (Matthey, Barnett, Howie, & Kavanagh, 2003; Reck et al., 2008; Phillips et al., 2009). An alternative explanation is that some anxiety is common and normal in pregnancy and should not be pathologised. Furthermore, over 10% of women reported experiencing unwanted images or memories that had been distressing them often or most or all of the time, in comparison with 7.1% who reported feeling despairing or hopeless this frequently. This supports research by Marrs, Durette, Ferraro, & Cross (2009) who found that depression items were not the most endorsed symptoms when women were given a broad range of symptoms to describe their distress. In that study 10-21% of women experienced unwelcome non-specific and frightening thoughts and feelings of terror. In their factor analysis of 142 symptoms, a factor comprising morbid thoughts and psychotic-type symptoms accounted for more variance than any other factor except for mental status (characterized by problems with attention, memory and motivation).

Item seven (I have had difficulty getting to sleep or staying asleep) was highly endorsed and is likely to have inflated the mean score in this study. In late pregnancy it is unsurprising that many women have difficulty sleeping and this item may have to be adapted for use in perinatal samples. As may be expected, item six (I made plans to end my life) was endorsed the least, although more than 4% of women had thought about ending their life at least occasionally. This item is likely to be useful as a red flag to identify women at high risk who need further assessment and support, particularly as psychiatric causes account for almost one quarter of mothers dying in the first postnatal year (Knight et al., 2015). As women dying by suicide in the perinatal period are less likely to be receiving any active treatment than those not in the perinatal period it is particularly important to identify this group of at-risk women (Khalifeh,

Hunt, Appleby, & Howard, 2016). Interestingly the two items that were not endorsed in the ‘not at all’ category (having someone to turn to for support at all (item two), and feeling able to cope (item three) were both positively worded. Further research needs to establish whether the pattern of endorsement of these items and their formation of a separate factor is due to a response set, or true reflection of these constructs.

Convergent validity was good in this study, with high correlations both with measures of anxiety and depression. Correlations with the GAD-2 in this study were similar in magnitude to those found in previous studies between the CORE-10 and Beck Anxiety Inventory (BAI; .65) and between the CORE-10 and the Patient Health Questionnaire-9 (PHQ-9; .56) (Barkham et al., 2013). This is also in line with research showing strong comorbidity between anxious and depressive symptoms in pregnant and postpartum women (Ross, Gilbert Evans, Sellers, & Romach, 2003; Wenzel, Haugen, Jackson, & Brendle, 2005). The CORE-10 also demonstrated better ability than all other measures to detect cases of anxiety (GAD-2) and depression (Whooley questions). Whilst this may be expected as it includes more items than these measures, it also identified more cases of women worried about their psychological health than the GAD-2 and Whooley questions indicating that it may be appropriate to screen for symptoms other than anxiety and depression.

However, the CORE-10 and the GAD-2 did identify a similar number of women who were worried about their psychological health (68.5% vs. 67.6%). This highlights the debate concerning the use of short (i.e. two to four item) measures versus longer standardised symptom led measures. If the aim of assessment or screening in practice is to identify women who need further consultation, it is likely that practitioners will want to identify women with *any* mental health problem. It could be considered a strength of the CORE-10 that it includes symptoms of multiple mental health problems in a ten item measure. However, standardised self-report measures are unlikely to ever be able to include the whole range of possible symptoms of perinatal ill health, and time constraints would hinder use of longer measures. Furthermore, scales that use a continuous score need to be validated at every time of measurement in the

perinatal period, and for different cultures to establish appropriate cut-off scores (Matthey & Agostini, 2017). The use of short measures that ask about general distress could therefore be useful in encompassing mental health issues generally, for example the Matthey Generic Mood Question (MGMQ; Matthey et al., 2013). This question asks the respondent if they have felt stressed, anxious, unhappy, or found it difficult to cope. It showed good predictive validity in identifying anxiety disorders compared with other self-report measures and is currently being validated in ongoing studies (Matthey et al., 2013; Matthey & Agostini, 2017).

The factor structure of the CORE-10 in pregnant women needs further investigation. The errors of items on coping and support perhaps understandably correlated, showing that they share common causal factors. In fact it may be a benefit of using the CORE-10 over other brief self-report measures (e.g. the Edinburgh Postnatal Depression Scale, Cox, Holden, & Sagovsky, 1987 or the K6 or K10, Kessler et al., 2002) that the CORE-10 captures dimensions of symptoms and functioning (ability to cope and availability of help) whereas other measures only capture symptoms (McKnight & Kashdan, 2009). However, in practice, a problem with using a total score on the CORE-10 (and other measures) may be that women may have a total score that does not meet a threshold for distress because they do not endorse the items on the symptom factor and are experiencing a different set of symptoms. However they might score very highly on the coping factor indicating that they feel unable to cope and do not have anyone to turn to for help which could indicate a need for further assessment and intervention. Further research needs to assess the ability of the ‘ways of coping factor’ at distinguishing those in clinical need. It also needs to be determined whether these items load on to a separate factor and whether all the response categories were not used because they are the only positively worded items.

Based on the positive psychometric profile of the CORE-10 so far in this self-selected sample, it will now need to be validated in population samples of pregnant and postnatal women against a ‘gold standard’ clinical interview to assess its ability to distinguish psychiatric disorders. Factor analysis in population-based samples is also required to validate the structure reported in this

pilot. Further research is also needed to establish norms on the CORE-10 (and GAD-2) in pregnant and postnatal women using paper-and-pencil administration and qualitative work is needed to assess acceptability of these measures with perinatal women.

### Limitations

The generalisability of our findings is limited by the study population being self-selected.

Additionally women who are not married or cohabiting who have lower levels of education and who are of an ethnic minority are under-represented. Women with higher symptoms of distress may also be underrepresented as the women who left the study had slightly, but significantly higher scores on the CORE-10.

Our study was based on self-report instruments completed at one time point and did not include a clinical interview to validate the CORE-10. Thus, those who scored highly will not necessarily experience a clinical disorder and those with low scores might do so. Furthermore, the time-frames for each of the measures used here was different: the CORE-10 relates to the last week, Whooley questions the last month and GAD-2 the last two weeks. This may have been confusing for women to complete and/or may partly explain the higher number of Whooley cases (40.71%) as compared with GAD-2 cases (22.68%). However, differences in the way the measures are scored may also account for this difference - women only need to endorse one Whooley question in order to be a case but a score of three or more on the GAD-2 can be reached by scoring three on one question or by a combination of scores on two questions.

Further limitations arise from the nature of an internet study. Participants were likely to be highly motivated and computer literate. There is also some evidence that internet and paper-based questionnaires differ in their distributions of responses, with higher severity of symptoms reported online (Anderson, Kaldø-Sandström, Ström, & Strömgren, 2003; Buchanan, 2003). However, some research shows comparable scores between online and paper-based methods (Austin, Carlbring, Richards, & Andersson, 2006; Björnsdóttir, Enebrink, & Ghaderi, 2013).

## Conclusions

Considering the current low levels of identification of perinatal mental health problems, the CORE-10 may offer benefits in its ease of scoring making it accessible to use by workers with minimal mental health training. With further validation, use of the CORE-10 potentially offers assessment of a broad range of symptoms of postnatal distress within the confines of a measure brief enough to be usable in clinical settings.

## 7.6 References

- Allan, J., Barford, H., Horwood, F., Stevens, J., & Tanti, G. (2015). ATIC: Developing a recovery-based art therapy practice. *International Journal of Art Therapy: Inscape*, 20 (1), 14-27.
- Anderson, G., Kaldo-Sandström, V., Ström, L., & Strömgren, T. (2003). Internet administration of the hospital anxiety and depression scale in a sample of tinnitus patients. *Journal of Psychosomatic Research*, 55, 259-262.
- Anon. 2016. Editorial. Screening for perinatal depression: A missed opportunity. *The Lancet*, 387 (10018), 505.
- Austin, D.W., Carlbring, P., Richards, J.C., & Andersson, G. (2006). Internet administration of three commonly used questionnaires in panic research: equivalence to paper administration in Australian and Swedish samples of people with panic disorder. *International Journal of Testing*, 6, 25-39.
- Ayers, S. (2004) Delivery as a traumatic event: prevalence, risk factors, and treatment for postnatal posttraumatic stress disorder. *Clinical Obstetrics and Gynecology*, 47 (3), 552-567.

- Barkham, M., Mellor-Clark, J., & Stiles, W.B. (2015). A CORE approach to progress monitoring and feedback: Enhancing evidence and improving practice. *Psychotherapy*, 52 (4), 402-411
- Barkham, M., Bewick, B., Mullin, T., Gilbody, S., Connell, J., Cahill, J., Mellor-Clark, J., Richards, D., Unsworth, G., & Evans, C. (2013). The CORE-10: A short measure of psychological distress for routine use in the psychological therapies. *Counselling and Psychotherapy Research*, 13(1), 3-13
- Bauer, A., Parsonage, M., Knapp, M., Iemmi, V., & Adelaja, B. (2014). *The costs of perinatal mental health problems*. London, UK: London School of Economics and Political Science.
- Bjornsdotter, A., Enebrink, P., & Ghaderi, A. (2013). Psychometric properties of online administered parental strengths and difficulties questionnaire (SDQ), and normative data based on combined online and paper-and-pencil administration. *Child and Adolescent Psychiatry and Mental Health*, 7, 40
- Boots Family Trust, Netmums, Tommy's, Institute of Health Visiting, Royal College of Midwives 2013. *Perinatal Mental Health Experiences of Women and Health Professionals*. Retrieved from:  
[https://www.tommys.org/sites/default/files/Perinatal\\_Mental\\_Health\\_Experiences%20of%20women.pdf](https://www.tommys.org/sites/default/files/Perinatal_Mental_Health_Experiences%20of%20women.pdf)
- Brockington, I. (2004). Postpartum psychiatric disorders. *The Lancet*, 363 (9405), 303-310.
- Buchanan, T. (2003). Internet-based questionnaire assessment: appropriate use in clinical contexts. *Cognitive Behaviour Therapy*, 32, 100-1069.
- Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behaviour Research*, 1, 245-276.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum Associates.

- Connell, J., & Barkham, M. (2007). *CORE-10 User Manual, Version 1.1*. CORE System Trust & CORE Information Management Systems Ltd.
- 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.
- Fairbrother, N., & Abramowitz, J.S. (2007). New parenthood as a risk factor for the development of obsessional problems. *Behaviour Research and Therapy*, 45, 2155-2163
- Goodman, J.H. & Tyler-Viola, L. (2010). Detection, treatment and referral of perinatal depression and anxiety by obstetrical providers. *Journal of Womens Health (Larchmt)*, 19 (3), 477-490
- Goodman, J.H. (2004). Paternal postpartum depression, its relationship to maternal postpartum depression, and implications for family health. *Journal of Advanced Nursing*, 45 (1), 26-35
- Hanington, L., Heron, J., Stein, A., & Ramchandani, P. (2011). Parental depression and child outcomes – is marital conflict the missing link? *Child: Care, Health and Development*, 38, 520-529
- Hearn, G., Iliff, A., Jones, I., Kirby, A., Ormiston, P., Parr, P., Rout, J., & Wardman, L. (1998). Postnatal depression in the community. *British Journal of General Practice*, 48 (428), 1064-1066
- Heron, J., O'Connor, T.G., Evans, J., Golding, J., Glover, V., & the ALSPAC Team. (2004). The course of anxiety and depression through pregnancy and the postpartum in a community sample. *Journal of Affective Disorders*, 80, 65-73.
- Hewitt, C.E., Gilbody, S.M., Brealey, S., Paulden, M., Palmer, S., Mann, R., Green, J., Morrell, J., Barkham, M., Light, K., & Richards, D. (2009). Methods to identify postnatal depression in primary care: an integrated evidence synthesis and value of information analysis. *Health Technology Assessment*, 13 (36).

Hill, C. (2010). An evaluation of screening for postnatal depression against NSC criteria.

Retrieved from: [http://legacy.screening.nhs.uk/policydb\\_download.php?doc=140](http://legacy.screening.nhs.uk/policydb_download.php?doc=140) (accessed 10.05.16).

Jolley, S., Garrety, P., Peters, E., Fornells-Ambrojo, M., Onwumere, J., Harris, V., Braban, A., & Johns, L. 2015. Opportunities and challenges in Improving Access to Psychological Therapies for people with Severe Mental Illness (IAPT-SMI): Evaluating the first operational year of the South London and Maudsley (SLaM) demonstration site for psychosis. *Behaviour Research and Therapy*, 64, 24-30.

Kaiser, H.F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement*, 20, 141-151.

Kessler, R.C., Andrews, G., Colpe, L.J., Hiripi, E., Mroczek, D.K., Normand, S-L., Walters, E.E., & Zaslavsky, A.M., (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine*, 32, 959-976.

Khalifeh, H., Hunt, I.M., Appleby, L., & Howard, L.M. (2016). Suicide in perinatal and non-perinatal women in contact with psychiatric services: 15 year findings from a UK national inquiry. *Lancet Psychiatry*, 3(3), 233-242

Khan, S.J., Fersh, M.E., Ernst, C., Klipstein, K., Albertini, E.S., & Lusskin, S.I. (2016). Bipolar disorder in pregnancy and postpartum: Principles of management. *Current Psychiatry Reports*, 18 (2), 1-11

Knight, M., Tuffnell, D., Kenyon, S., Shakespeare, J., Gray, R., & Kurinczuk, J.J. (Eds.) on behalf of MBRRACE-UK. (2015). *Saving Lives, Improving Mothers' Care - Surveillance of maternal deaths in the UK 2011-13 and lessons learned to inform maternity care from the UK and Ireland Confidential Enquiries into Maternal Deaths and Morbidity 2009-13*. Oxford: National Perinatal Epidemiology Unit, University of Oxford.



Kline, R.B. (2005). *Principles and practices of structural equation modelling*. New York: Guilford Press.

Kroenke, K., Spitzer, R.L., Williams, J.B.W., Monahan, P.O., & Löwe, B. (2007). Anxiety disorders in primary care: Prevalence, impairment, comorbidity and detection. *Annals of Internal Medicine*, 146, 317-325.

Marrs, C.R., Durette, R.T., Ferraro, D.P., & Cross, C.L. (2009). Dimensions of postpartum psychiatric distress: Preliminary evidence for broadening clinical scope. *Journal of Affective Disorders*, 115, 100-111.

Matthews, G., Jones, D.M., & Chamberlain, A.G. (1990). Refining the measure of mood: The UWIST Mood Adjective Checklist. *British Journal of Psychology*, 81, 17-42.

Matthey, S., Barnett, B., Howie, P., & Kavanagh, D.J. (2003). Diagnosing postpartum depression in mothers and fathers: whatever happened to anxiety? *Journal of Affective Disorders*, 74, 139-147

Matthey, S., Valenti, B., Souter, K., & Ross-Hamid, C. (2013). Comparison of four self-report measures and a generic mood question to screen for anxiety during pregnancy in English-speaking women. *Journal of Affective Disorders*, 48, 347-351.

McKnight, P.E., & Kashdan, T.B. (2009). The importance of functional impairment to mental health outcomes: A case for reassessing our goals in depression treatment research. *Clinical Psychology Review*, 29, 243-259.

Miller, R.L., Pallant, J.F., & Negri, L.M. (2006). Anxiety and stress in the postpartum: Is there more to postnatal distress than depression? *BMC Psychiatry*, 6 (12). doi:10.1186/1471-244X-6-

National Institute for Health and Care Excellence, (2014). *Antenatal and Postnatal Mental Health: Clinical management and service guidance*. Updated edition. National clinical guideline number 192.

O'Connor, E., Rossom, R.C., Henninger, M., Groom, H.C., & Burda, B.U. (2016). Primary Care Screening for and Treatment of Depression in Pregnant and Postpartum Women: Evidence Report and Systematic Review for the US Preventive Services Task Force. *Journal of the American Medical Association*, 315 (4), 388-406.

O'Connor, T.G., Heron, J., Golding, J., Beveridge, M., & Glover, V. (2002). Maternal antenatal anxiety and children's behavioural/emotional problems at 4 years. *British Journal of Psychiatry*, 180, 502-508.

O'Donnell, K.J., Glover, V., Barker, E.D. & O'Connor, T.G. (2014). The persisting effect of maternal mood in pregnancy on childhood psychopathology. *Development and Psychopathology*, 26 (2), 393-403.

O'Reilly, A., Illback, R., Peiper, N., O'Keeffe, L., & Clayton, R. (2015). Youth engagement with an emerging Irish mental health early intervention programme (Jigsaw): participant characteristics and implications for service delivery. *Journal of Mental Health*, 24 (5), 283-288

Orr, S., Reiter, J., Blazer, D., & James, S. (2007). Maternal prenatal pregnancy-related anxiety and spontaneous preterm birth in Baltimore, Maryland. *Psychosomatic Medicine*, 69, 566-570.

Owen, M., Sellwood, W., Kan, S., Murray, J., & Sarsam, M. (2015). Group CBT for psychosis: A longitudinal controlled trial with inpatients. *Behaviour Research and Therapy*, 65, 76-85

Peters, E., Crombie, T., Agbedjro, D., Johns, L.C., Stahl, D., Greenwood, K., Keen, N., Onwumere, J., Hunter, E., Smith, L., & Kuipers, E. (2015). The long-term effectiveness of cognitive behavior therapy for psychosis within a routine psychological therapies service. *Frontiers in Psychology*, 6, 1658.

- Phillips, J., Sharpe, L., Matthey, S., & Charles, M. (2009). Maternally focused worry. *Archives of Women's Mental Health, 12*, 409-418
- Reck, C., Struben, K., Backenstrass, M., Stefenelli, U., Reinig, K., Fuchs, T., Sohn, C., & Mundt, C. (2008). Prevalence, onset and comorbidity of postpartum anxiety and depressive disorders. *Acta Psychiatrica Scandinavica, 118*, 459-468
- Ross, L.E., Gilbert Evans, S.E., Sellers, E.M., & Romach, M.K. (2003). Measurement issues in postpartum depression part 1: Anxiety as a feature of postpartum depression. *Archives of Women's Mental Health, 6*, 51-57.
- Schrank, B., Riches, S., Coggins, T., Rashid, T., Tylee, A., & Slade, M. (2014). WELLFOCUS PPT – modified positive psychotherapy to improve well-being in psychosis: study protocol for a pilot randomised controlled trial. *Trials, 15*, 203.
- Streiner, D.L. (1994). Figuring out factors: The use and misuse of factor analysis. *Canadian Journal of Psychiatry, 39*, 135-140.
- Tabachnick, B.G., & Fidell, L.S. (2012). *Using multivariate statistics* (6th ed.). Cambridge: Pearson.
- Velicer, W.F., & Jackson, D.N. (1990). Component analysis versus common factor analysis: some issues in selecting an appropriate procedure. *Multivariate Behaviour Research, 25* (1), 1-28.
- Wenzel, A., Haugen, E.N., Jackson, L.C., & Brendle, J.R. (2005). Anxiety symptoms and disorders at eight weeks postpartum. *Journal of Anxiety Disorders, 19*, 295-311.
- Whooley, M.A., Avins, A.L., Miranda, J., & Browner, W.S. (1997). Case-finding instruments for depression: Two questions are as good as many. *Journal of General Internal Medicine, 12*, 439-445.

## 8 General Discussion

This thesis presented five studies which were carried out with the aim of investigating the identification and assessment of perinatal mental health problems in the UK. This final chapter first provides a summary of each of the studies' findings in relation to the objectives of the thesis stated in chapter one. The key implications of the research and directions for future research are then discussed, followed by consideration of limitations of the programme of research. Finally, the reflexive statement considers my role as a researcher in the conduct of the research and the conclusion summarises the overall findings.

### 8.1 Summary of findings

#### 8.1.1 Qualitative exploration of women's conceptualisations of postnatal mental health and need for support (Chapters 3 and 4)

Two qualitative studies were carried out. The first explored women's lived experiences of postnatal distress. Interpretative phenomenological analysis generated four themes: 1) Living with an unwelcome beginning, which spoke of mothers' unexpected negative feelings about life with a new baby; 2) Relationships in the healthcare system, which highlighted the importance of both positively- and negatively-perceived events in the healthcare system and relationships with healthcare providers; 3) The shock of the new, which described mother's difficulties with adjusting to parenthood; 4) Meeting new support needs, which emphasised the need for mothers and relevant others to take action in order to move on from feeling distressed. The four themes were described within the processes of labour and birth, and establishing and maintaining breastfeeding. The study emphasised the possibility of assessing psychological processes, such as feeling overwhelmed, feeling guilty, and avoidance which were described irrespective of the type of emotional difficulties experienced.

The second qualitative study considered the symptoms of distress experienced by mothers and mothers' experiences of being assessed for mental health problems. The most frequently raised symptoms were feeling tearful, anxious, stressed, isolated and angry. Themes

identified were: 1) not identifying with postnatal depression, which described feelings of uncertainty about the type of mental ill health women were experiencing, and the lack of information about problems other than depression; 2) the need to normalise support seeking, which spoke of the stigma associated with admitting that support was needed and being able to access it; 3) the need for support irrespective of diagnosis; 4) the importance of timing of assessment and support; 5) a questionnaire is not sufficient, which spoke of a spectrum of feelings about the use of questionnaire assessment, and the need for certain conditions to be met to enable women to disclose their difficult feelings to healthcare professionals. The study highlighted the need for discussion of a broad range of symptoms of distress.

#### 8.1.2 Review findings on validated self-report measures of anxiety for perinatal women (Chapter 5)

Considering that assessment of mental health only included depression when this study was conceived (2009), a systematic review was carried out to examine which self-report measures of anxiety had been validated with pregnant and postnatal women. The questionnaires that had been validated most were measures designed for general rather than perinatal populations (General Health Questionnaire (GHQ); State-Trait Anxiety Inventory (STAI); Hospital Anxiety and Depression Scales (HADS)). Many forms of validity were reported. Criterion validity, concurrent validity, discriminant validity and factorial validity were fairly evenly represented, but overall fewer than half of the included studies used a clinical interview against which criterion validity - including sensitivity and specificity of measures - could be calculated. A number of short-form measures were identified, for example a six-item version of the STAI, the twelve-item version of the GHQ, and the Kessler-10. There was a clear lack of questionnaires designed for perinatal women. The one identified measure that was designed for pregnancy related specifically to pregnancy anxiety. There were no measures designed for the postnatal period. The review also highlighted the need to validate questionnaires in both pregnancy and the postnatal period as these periods have their own characteristics.

### 8.1.3 Validation of existing self-report measures of affective symptoms in ante- and postnatal women (Chapters 6 and 7)

In response to debate in the literature about the Edinburgh Postnatal Depression Scale (EPDS) measuring anxiety as well as depression, factor analyses of the EPDS were carried out in a large population-based sample, in pregnancy and in the first postnatal year. Exploratory and confirmatory analysis showed the EPDS comprised three factors of depression, anxiety and anhedonia. This factor structure was stable across two time points in pregnancy and two time points in the first postnatal year. The internal reliability was good but one item did not discriminate well between factors, suggesting room for adapting the measure, for example by replacing with an item measuring a different symptom of distress. This study highlighted the importance of determining whether the anhedonia factor is a cluster of (two) items measuring a separate construct from depression, or whether this factor arises because of the design of the EPDS.

The final study piloted the CORE-10, a short measure of psychological distress, in pregnant women. The most reported symptoms were feeling tense, anxious or nervous, having difficulty with sleep, feeling unhappy and feeling that talking to people was too much. Factor analysis showed that a two-factor structure with subscales of “symptoms”, and “ways of coping” best fit the data. However, it was unclear whether the positive wording of the two “ways of coping” items caused them to form a separate factor. Internal reliability for the symptoms factor was good. The CORE-10 showed good convergent validity and detected more ‘cases’ than the Whooley questions or GAD-2. This study highlighted the possible utility of using items assessing functioning and support as well as symptoms to inform mental health assessment in the perinatal period.

## 8.2 Implications of findings for thesis aims and for future research

The findings presented in chapters three to seven have implications in relation to the thesis aims and for future research. Specific implications are given in detail in those chapters. In

this section some key practical and theoretical implications and how these could be addressed in future research are discussed.

#### 8.2.1 Implications for target areas for assessment of distress

An aim of the thesis was to explore the way in which mothers conceptualise their experiences of postnatal distress with a view to informing assessment. The findings suggest a number of areas that may be useful to explore as targets for assessment. In addition to symptoms there may be specific temporal points and psychological processes that could identify women who are in need of further assessment and support in the perinatal period. These potential targets are discussed in this section.

**Key points in the transition to motherhood:** In the qualitative studies included in this dissertation, women conceptualised their postnatal distress in the context of motherhood-specific activities and roles. An assessment approach that takes into account experiences such as childbirth and breastfeeding as components of mental health and wellbeing may be worthy of further investigation. For example, midwives and health visitors will have appointments with the mother that coincide with birth experiences and establishing and maintaining breastfeeding, so temporally, this would be an appropriate time to identify and support difficulties with these key points. However, women may not feel ready to talk about their birth experience in the immediate postnatal period (with a midwife), and therefore it may be beneficial for health visitors to also consider incorporating a mother's feelings about her birth into any assessment of mental health (Meades, Pond, Ayers, and Warren, 2011). Similarly, the emotional aspects of breastfeeding (as well as practical assistance) could be raised by healthcare practitioners to promote disclosure of feelings surrounding this experience.

The role of unsatisfactory support during childbirth was a key aspect in the transition to motherhood which could invoke distress. This is in line with research showing the possible link between childbirth factors and subsequent postnatal posttraumatic stress responses (Ayers, Bond, Bertullies, & Wijma, 2016; Grekin & O'Hara, 2014), and postnatal depression (Bielinski-Blattmann et al., 2016; Filha, Ayers, Da Gama, Leal, 2016; Fisher et al., 2012). Levels of

support perceived by a woman giving birth are consistently associated with childbirth satisfaction and postnatal psychological distress (Wolman, Chalmers, Hofmeyr, & Nikodem, 1993; Hodnett, Gates, Hofmeyr, & Sakala, 2013). Furthermore, levels of social support in pregnancy can mediate the effects of negative birth experiences on development of postnatal depression, and thereby function as a protective factor (Tani & Castagna, 2016). This suggests possibilities for assessment in the ante- and postnatal period. In a systematic review, Hodnett (2002) found that four aspects were dominant in women's perceptions of their birth experience: the amount of support from caregivers; the quality of the relationship with the caregiver; involvement in decision-making and asking women whether they have concerns about their birth experience in the postnatal period and having experiences which exceed expectations. More recently Bielinski-Blattmann et al. (2016) identified three components related to birth which differentiated women experiencing depressive symptoms and women experiencing acute stress symptoms at three or four weeks postnatally. These factors were 'basic experience' factors (such as loss of feeling of safety, exhaustion and pain), coping strategies, and relationship experiences. In pregnancy, these aspects of birth experience could be addressed and preparation for dedicated birth support could be carefully assessed and encouraged. Longitudinal research evaluating the assessment of planning for birth including these aspects, subsequent birth experiences, and later postnatal distress would help to establish the value of planning the psychosocial aspects of birth as valid targets for positive birth and postnatal experiences. This could work in the way that education on preparing for parenting has been shown to be effective in preventing postnatal depression, when used as a selective intervention (Morrell et al., 2016).

Additionally, breastfeeding had a complex relationship with distress and could act in a number of different ways, including an empowering method of asserting the new motherhood role, a challenging process, and as an emotional stressor. This finding ties in with the literature below showing that there is a relationship between breastfeeding and mental health (largely postnatal depression). However, the direction of the relationship is ambiguous. It is unclear whether postnatal depression results in lower rates of breastfeeding initiation and early



cessation, or if not engaging in breastfeeding is a factor in development of depression (Pope & Mazmanian, 2016). There is some evidence that breastfeeding is a protective factor in developing postnatal depression and may lead to quicker recovery from symptoms of depression (Figueiredo, Canario & Field, 2014). However, there is far less research considering the relationship between breastfeeding and perinatal anxiety or other mental health problems. Adedinsewo et al. (2014) showed that antenatal anxiety was not statistically associated with breastfeeding practices, but mothers exclusively breastfeeding at six months postnatally (as compared with those who were not exclusively breastfeeding) had significantly lower anxiety at three months postpartum, and women who were not breastfeeding at all at 12 months postpartum also had significantly higher anxiety at three months postpartum. Conversely, Kehler et al. (2009) found that antenatal anxiety was an important predictor of early cessation of breastfeeding.

Whichever the direction of association, breastfeeding self-efficacy and mothers' negative perceptions of breastfeeding are important in this relationship between breastfeeding and postnatal depression (Pope & Mazmanian, 2016). One study has shown high breastfeeding self-efficacy to be associated with a reduced risk of developing comorbid depression and anxiety in the first eight postnatal weeks (Falah-Hassani, Shiri & Dennis, 2016).

These findings imply that further research is needed to explore the relationship between breastfeeding and other maternal mental health problems, and also that breastfeeding may be useful in the assessment context. Assessing for depression and anxiety symptoms in pregnancy could be useful in identifying women who may need additional breastfeeding support, particularly as breastfeeding is a public health priority worldwide (WHO, 2003; WHO/UNICEF, 2014). However, the encouragement of breastfeeding as a means of reducing postnatal symptoms may be contentious, as women who choose not to breastfeed may feel additional pressure to do so (Thomson, Ebisch-Burton & Flacking, 2015). Yet, assessing for difficulties establishing or maintaining breastfeeding, and the emotional effect this has on women may help to identify distress. Problems with breastfeeding were prominent in this qualitative research - despite women responding that multiple sources of help were available,

women felt that the emotional aspects and consequences of breastfeeding (or not breastfeeding) were not addressed in the perinatal period.

Including these key areas associated with the transition to motherhood in assessment also fits with the biosocial model of distress whereby not only symptoms but also areas of impaired functioning in daily life and general distress are seen as important parts of the model of mild psychological problems, and can be targeted with social interventions (Goldberg & Huxley, 1992; Suls, Krantz, and Williams, 2013).

**Symptoms:** Based on the qualitative and quantitative results from this research programme, symptoms of negative emotional states in addition to those of depression are likely to be useful in the assessment of perinatal mental health. The most frequently endorsed symptom in interviews with women who had experienced distress, and on the CORE-10 was anxiety. This is in line with research which indicates that anxiety is more prevalent than depression in the antenatal (e.g. Lee et al., 2007; Heron et al., 2004) and postnatal periods (Matthey et al., 2003; Stuart et al., 1998). It is encouraging that during this programme of research NICE (2014) has for the first time recommended assessing mothers for (generalised) anxiety. The implications of the present research for use of existing measures of distress are discussed in section 8.2.3.

A further symptom that was raised by almost half of the qualitative sample was feeling ‘stressed’. This can be operationalised as a distinctive negative emotional state of chronic arousal and impaired function which differentiates it from anxiety and depression (Lovibond & Lovibond, 1995; Rallis, Skouteris, McCabe & Milgrom, 2014). As well as using the word ‘stressed’, women in chapter four described feelings of ‘being at the end of your tether,’ ‘certain points when...I’ve had enough,’ and ‘frustrated...like everything is slipping through my fingers’. These feelings are not assessed with the current anxiety and depression questions. However, there are difficulties with the way that stress is defined and operationalised in the research on postnatal distress that will need to be addressed when measuring or assessing stress. For example, Terry, Mayocchi and Hynes (1996) reported that increased ‘stress’ during pregnancy and in the early postpartum predicted later depression and coping strategies. In their

study stress was defined by: delivery complications, difficult infant temperament, and stressful life events. Stress has also been operationalised as mood disturbance, state anxiety, and marital dissatisfaction (Rallis et al., 2014). In a recent review of studies focusing on stress as a distinctive affective state in the perinatal period, Rallis et al. (2014) only found two papers. Both of these papers provided support for perinatal distress as a state involving stress both independent of and in conjunction with depression and anxiety (Miller, Pallant & Negri, 2006; Rallis, 2008). Given these findings and the qualitative findings in this thesis, further research investigating the construct of stress and its consequences would be useful in establishing the importance of stress as a distinct affective state in perinatal women that could be a valid target for intervention.

For example, a prospective longitudinal study based on Lazarus and Folkman's (1984) theory of stress, appraisal and coping could elucidate temporal points in the transition to motherhood that result in stress responses. It could also enable understanding of the variability in women's responses to challenges such as birth and breastfeeding. The model highlights the importance of appraisal in stress responses. In primary appraisal the mother experiences or remembers an event as either benign, harmful, challenging, or threatening. Secondary appraisal occurs at the same time, whereby the mother judges how best to manage the situation. Actively coping with the situation may include strategies such as changing the situation or changing something about the self to deal with the situation, calling on supports, or problem solving. Passive coping could include ignoring the situation or blaming oneself for the situation. A benefit of using this model is the ability to include relevant contextual and interceding factors (Ayers & Olander, 2013). For example, contextual factors before birth could be the age of the woman, parity, perceived antenatal support and breastfeeding intention; interceding factors may include perceived support during birth, and breastfeeding support. Mental health would be measured at time points throughout the first postnatal year. Utilising this model including additional contextual factors could identify any pathways between stress, anxiety and depression in the perinatal period and could be used to predict intensity of mental health

problems. Such research could also aid understanding of the factors that contribute to onset, maintenance and recurrence of perinatal mental health symptoms.

If symptoms of stress are found to subsequently lead to either diagnostic levels of symptoms, or are associated with impairment in functioning, this would have implications for assessing this symptom and providing further support and/or treatment for mothers. As reported in the systematic review presented in chapter five, initial validation of the Depression, Anxiety, Stress Scales (DASS, Lovibond & Lovibond, 1995) which differentiates these three affective states has been carried out with postnatal women (Miller et al., 2006). Further validation of this measure using a diagnostic interview, and employing factor analysis would be logical next steps in pregnancy as well as the postnatal period.

A further symptom raised by many women the qualitative sample was feeling angry. This is in line with a report of over 1500 self-selected women, half of whom reported anger as a symptom of postnatal distress (Boots Family Trust Alliance et al., 2013). Furthermore, in a clinical sample of mothers, 29% had varying levels of pathological anger and 8% had severe anger (Brockington, Aucamp, & Fraser, 2006). In a non-clinical sample of mothers and fathers, 22% of mothers and 33% of fathers experienced moderate or severe anger (Parfitt & Ayers, 2012). Parental anger has been associated with depression and anxiety and can mediate the relationship between these symptoms and subsequent parent-to-child aggression (Mammen, Pilkonis, & Kolko, 2000). Furthermore, parental anger negatively influences parental perceptions of the baby, experiences of parenting, and the parent-baby relationship (Parfitt & Ayers, 2012). Brockington (2004) considers pathological anger, aversion to or hatred of a child as the predominant symptom in what he calls 'mother-infant relationship disorder'. This disorder is not recognised in psychiatric classifications, but can result in long-lasting impaired relationship between child and mother, child abuse, neglect and psychiatric disorders and learning impairments in children (Brockington, 2004). Possible self-report measures that could be investigated for assessment purposes are the State-Trait Anger Expression Inventory as used by Mammen et al. (2000) and the 'rejection and anger' scale of the Postpartum Bonding Questionnaire (Brockington et al., 2001). Postnatal anger is evident across psychiatric diagnoses

(Mammen et al., 2000) and therefore due to its exclusion as a primary presenting problem of psychiatric disorders, another possibility may be to consider the shared cognitive and behavioural processes across different mental health problems, as discussed in the next section.

**Psychological processes:** The transdiagnostic approach to psychological problems comprehensively reviewed by Harvey et al. (2004) suggests that a number of cognitive and behavioural processes are associated with multiple DSM-IV Axis I disorders. The qualitative findings in this programme of research suggested that irrespective of disorder and / or diagnosis, women encountered experiential avoidance (e.g. of breastfeeding) and avoidance of thoughts / emotions, which have been described as definite transdiagnostic processes (Harvey et al., 2004; Hayes et al., 1996). This is important because it may be the underlying cognitive or behavioural process that adversely affects the mother-child relationship through the mother being less able to perceive and respond appropriately to her baby's cues (Field, 2010). Therefore the specific process may be a valid target for assessment and intervention. This is further supported by the finding that treatment of symptoms of postnatal depression is not sufficient to improve parent-baby relationships and outcomes (Poobalan et al., 2007). Focusing on rumination as a cognitive process of depression, DeJong, Fox and Stein (2016) suggest that this may be because the processes underlying the depression (e.g. rumination) have not been treated and are then triggered when low mood or stress is encountered (DeJong, Fox, & Stein, 2016). Furthermore, Webb and Ayers (2014) found evidence of cognitive biases in perinatal women in studies of depression, anxiety and PTSD. In the assessment context, it may be that perinatal women could be assessed for vulnerability to specific cognitive or behavioural processes. Women who score positively for the maladaptive cognitive and/or behavioural processes could then receive an intervention directly addressing the process, as has been suggested in the general population (see Topper, Emmelkamp, & Ehring, 2010 for a review).

Validated measures of cognitive behavioural processes for perinatal women may thus be a relevant topic for future research.

### 8.2.2 Implications for the assessment environment

A further aim of the thesis was to examine women's views and feelings about being assessed for mental health problems. The findings in chapters three and four suggest that relationships with healthcare providers were very important to women, in labour and birth, in the immediate postnatal period in hospital, and in the postnatal period once at home. These relationships needed to be empathic, understanding, and unrushed for women to feel comfortable about discussing their distress. Very often women felt rushed, or that they did not have a satisfactory relationship with healthcare providers, such as their health visitor or GP. This finding is in line with many other studies which show the mother-healthcare professional relationship to be crucial in mothers' perceptions of their care (e.g. Dennis & Chung-Lee, 2006; Slade et al., 2010; Morrell et al., 2009). A recent survey of over 1500 postnatal women reported that perinatal mental health care from GPs tended to be inconsistent and lacking in pro-active support, with wide variation in perceived knowledge and skills at identifying problems (Khan, 2015). Concerning health visitors, Slade et al., (2010) found that women with postnatal depression were more likely to decline help from health visitors if they did not know them or felt that they were not the kind of person they could talk to. Furthermore, in that study women showed high levels of satisfaction with their health visitor when health visitors were proactive in offering support around mental health and when mothers understood the role of the health visitor as supporting their emotional wellbeing as well as the infant's health (Slade et al., 2010; Morrell et al., 2009). When health visitors are trained in psychologically informed approaches and have the time to support women using them, they can reduce and prevent postnatal depression (Brugha et al., 2011; Morrell et al., 2009). These findings together suggest the importance of how healthcare professionals communicate and develop relationships with mothers and will be important to replicate with postnatal anxiety and other mental health problems.

Mothers felt that if they had any knowledge about postnatal mental health, it concerned postnatal depression. They also perceived that healthcare professionals were not knowledgeable about other problems. In the time since the qualitative data collection, postnatal clinical practice

has developed to include assessment of perinatal anxiety (NICE, 2014), and therefore this finding may be different now. Research exploring perinatal women's perceptions of healthcare practitioners' current assessment of depression and anxiety would be useful for exploring this development. Nonetheless, there are multiple other symptoms of mental health problems that are not currently addressed, and the present findings suggest that it is important to train midwives, health visitors and other healthcare professionals who are in contact with mothers about a range of mental health problems that can occur in this period, and how to talk to women about them.

A further issue surrounds the timing of symptoms and assessment. In the present qualitative studies women found it hard to know whether their symptoms were a normal part of motherhood, or whether they should seek help for them. If symptoms were not constant this was particularly difficult. These findings reflect the need to promote awareness not only of symptoms of postnatal mental health problems, but also of the variation in patterns of symptoms over days, weeks and months, and when these can be seen as problematic. As has been suggested in the research on postnatal depression, assessing with a questionnaire measure at one time point only may overinflate the amount of women referred for further assessment whose distress was transient and subsequently naturally dissipated with time (Harvey & Pun, 2007; Matthey & Ross-Hamid, 2012; Oates, 2003). Repeating a questionnaire two weeks after the first administration may be useful in providing further contact with the woman concerned whilst ruling out referral to further services (Matthey & Ross-Hamid, 2012). Items about thoughts of self-harm, harm to the baby or suicide may be useful in identifying women in urgent need of care (Lindahl, Pearson, & Colpe, 2005). Most women in the qualitative study reported their distress as beginning within the first six weeks of birth. Although this cannot be generalised to other women or disorders, it is in line with research indicating that most cases of postnatal depression begin soon after birth (Gavin et al., 2005). As a mother will receive multiple visits from midwives and health visitors in this time frame and should see her GP at six weeks postnatally, there are multiple opportunities to discuss mental health and wellbeing, as outlined

in the update NICE guidelines (NICE, 2014). Skills and resources would need to be in place to further assess and treat women who are identified as needing further support (Oates, 2003).

### 8.2.3 Implications for use of existing measures of perinatal distress

A final aim of the thesis was to explore the validity of existing measures of perinatal distress. The present findings suggest a number of implications for the use of existing measures. First, the present research could be interpreted as providing support for the tripartite model of anxiety and depression in perinatal women, whereby the factors of the EPDS reflect positive affect (low scores on the anhedonia items), and negative affect which has been further differentiated into anxiety and depression factors in the three-factor model. However, on both the EPDS and the CORE-10, the items that were worded positively (e.g. 'I have felt able to cope when things go wrong' [CORE-10]; 'I have looked forward with enjoyment to things' [EPDS]) clustered together in the factor analyses, forming clusters of positively vs negatively worded items. This presents a question about whether the items truly reflect latent constructs (anhedonia on the EPDS; ways of coping on the CORE-10), or whether the clusters are artefacts of questionnaire design (Tomas & Oliver, 1999). Van Sonderen, Sanderman and Coyne (2013) suggest that there is no consensus that reverse wording questions eliminates response bias (the reason why reverse and positively worded questions are included in questionnaires). Instead they explicate a research scenario whereby the objective is to evaluate a unidimensional measure in which some items have been reverse worded to limit bias but in which the result is the unintended emergence of two factors. This leads to subsequent debate in the literature as to whether these constructs are meaningful, and eventually papers are published suggesting the second factor is a methodological artefact (see van Sonderen et al., 2013 for multiple examples). Furthermore, van Sonderen et al. (2013) suggest that reverse wording items is not only ineffective in eliminating acquiescence bias, but it can also lead to bias arising from inattention and confusion of the respondent.

Research to disentangle these possibilities is needed in order to be certain of what is being measured when using these questionnaires. This could be tested by rephrasing the



positively worded items to make them negatively worded in line with the remaining items on the questionnaire. If factor analysis still resulted in the two items clustering together it could be inferred that this is not due to method effects. This is important because if positive and negative affect are separate constructs apparent in perinatal women they may be valid targets for intervention, for example treatments to increase positive affect such as interpersonal psychotherapy and specific components of cognitive behavioural therapy (Cunningham et al., 2016). Conversely, if the items no longer cluster together, then this would indicate a lack of validity of the measure in its current format.

Second, there were items on both the EPDS and the CORE-10 which could be considered ambiguous and which may thus be focal points for adaptation in order to improve validity. Item six on the EPDS ('Things have been getting on top of me') did not discriminate well between anxiety and depression factors which may be due to the idiomatic wording. This could be addressed with qualitative work addressing women's qualitative interpretations of the meanings of questionnaire items (in prep). The items concerning sleep may also be problematic. On the EPDS, problems with sleeping are limited to being caused by unhappiness (item seven 'I have been so unhappy I have had difficulty sleeping'), although it may be possible that a different symptom of a mental health problem (e.g. anxiety / trauma) may be considered by some women to be the cause. Item seven on the CORE-10 'I have had difficulty getting to sleep or staying asleep' was highly endorsed which is unsurprising in late pregnancy because disruptions to sleep are common. Adapting the wording of this item may improve its capacity to indicate pathology instead of normative pregnancy behaviour. It is also possible that this item inflated total scores on the CORE-10 which may therefore have to be scaled downward, or norms could be adjusted for perinatal women. Further research which qualitatively evaluates the wording of this item with pregnant and postnatal women would be useful. Problems with including somatic items as indicators of postnatal depression led to design of measures specific to the perinatal period (e.g., the EPDS). However, Williamson et al. (2015) found that sleep items were indicative of depression in the postnatal period, with postnatal women requiring a higher score to be equivalent to a non-postnatal woman's score representing problematic sleep.

However, their conclusions derived from using a six-item insomnia scale, and further research would be needed to assess whether single items which are likely to be the only feasible option in clinical practice are able to provide differentiation of depressed and non-depressed pregnant and postnatal women. A final consideration with items on the CORE-10 is the lack of any person endorsing 'not at all' to the two positively worded items 'I have felt I have someone to turn to for support when needed' and 'I have felt able to cope when things go wrong'. Further research will need to disentangle whether this is because of method effects (e.g. because the items are positively worded and/or because of avoidance of the extreme points on a short response scale), whether this sample were better supported than other populations on which the measure has been tested, or because this item has less content validity for pregnant women.

Concerning the measures currently recommended to assess perinatal mental health, the current findings add support to the literature suggesting the Whooley questions may not identify all women with depression (NICE, 2014). In the present research, the Whooley questions detected less than half of women who were worried about their psychological health, whereas the GAD-2 and CORE-10 both detected around 70% of women worried about their psychological health. This suggests that either the current sample had higher representations of mental health problems other than depression, and/or that the Whooley questions are not sensitive at detecting depression, as they are intended to do. This supports research by Darwin, McGowan and Edozien (2015) who found that the Whooley questions missed half of the women identified by an EPDS score of  $\geq 10$  as being probably depressed. This figure worsened to nine out of ten being missed with the addition of a third question asking if women wanted help with how they were feeling. The UK National Screening Committee review also concluded that there was no evidence to support use of the Whooley Questions in detecting postnatal depression (Hewitt et al., 2009; Hill, 2010). More recently, a comparison of the Hospital Anxiety and Depression Scales (Zigmond & Snaith, 1983) and the Whooley questions found that the Whooley questions were less sensitive at identifying women with anxiety, especially for women who had sub-threshold symptom levels (King et al., 2012).

Concerning the GAD-2, the present findings showed that the GAD-2 and CORE-10 identified similar amounts of women who were worried about their mental health but the CORE-10 also identified 88% and 73% of women who were cases on the GAD-2 and Whooley respectively, in comparison with the GAD-2 identifying 48% of cases on the CORE-10 and 48% of Whooley cases. The NICE guidelines (2014) do state that the GAD-2 was chosen to assess anxiety because the evidence base for short measures of anxiety validated with perinatal women is very small. Further validation of the CORE-10 with pregnant and postnatal representative samples and using diagnostic interviews will be useful to establish its capacity to identify multiple forms of psychological distress.

### **8.3 Limitations of the research programme**

Limitations of individual studies have been discussed in some depth in chapters three to seven. This section focuses on some key methodological limitations not previously discussed. One concern is the use of the term ‘postnatal distress’ to frame the experiences of postnatal women in the qualitative studies. The definition ‘postnatal distress’ is open to interpretation and, whilst it is meant to be inclusive of all mental health problems, this may not be how it is interpreted by all women. This term was used with regard to problems highlighted in the introduction with the use of the term ‘postnatal depression’ as a broad term for postnatal mental health problems (Jones & Cantwell, 2010; CEMACH, 2007). Because ‘postnatal depression’ has been used as an umbrella term for postnatal mental health problems of different types, some women who have experienced what they view as ‘postnatal depression’ may not identify as having experienced postnatal ‘distress’ and therefore would not consider themselves eligible for the study. Furthermore, the term ‘distress’ may have been too broad for women who have a specific diagnosis of another mental health problem, for example an anxiety disorder, to identify with; this may have further excluded women. Nonetheless, the term ‘distress’ was chosen to include as many women as possible who experienced adverse mental health. It may be that as the field of perinatal mental health research progresses, alternative definitions of mental ill-

health and wellbeing become more widely used in academia, practice, and society (Alderdice et al., 2013).

A further limitation relates to the use of diagnostic interviews. Firstly, the CORE-10 was not validated with a diagnostic interview. Whilst the intention of this thesis was to explore the initial, less resource-intensive methods of validation to make a case for assessing criterion validity (using a diagnostic interview), the conclusions that can be drawn are limited. This is more so because, as far as the author is aware, this is the first time the CORE-10 has been used with pregnant women and therefore there are no comparable normative data. For example then, the finding that the CORE-10 identified more cases than the other measures in chapter seven could be explained by the CORE-10 over-identifying women with anxiety, and/or because the sample was actually high in problematic anxiety. Furthermore, it is recognised that self-report measures will generally result in higher prevalence rates than interviews (Paulson & Bazemore, 2010).

Secondly, there is a theoretical contradiction concerning the use of diagnostic interviews. As stated in the introductory chapter, some diagnostic criteria for mental health disorders may not be appropriate for perinatal women, yet validation against the criteria of diagnostic systems such as the DSM and ICD is considered the gold standard for validation of self-report measures of mental health. This means that until diagnostic criteria are made more appropriate for, or specific to, perinatal mental health problems, a measure that is validated and achieves high sensitivity, specificity and overall precise classification rates may still not identify women with many of the symptoms that have been reported in this thesis. For example, high levels of stress and anger may be problematic to mothers but would not be identified by diagnostic classifications. Whilst it is acknowledged that the disorder approach may not be optimal for classifying forms of perinatal distress, as it is currently the dominant system this programme of research has taken the position that any new assessment measures will still need to be validated against diagnostic criteria. An alternative approach in the future may be to ask women whether they need extra support or treatment and target the temporal points,

impairments and psychological processes outlined in this programme of research rather than focusing solely on symptoms of disorders.

A third issue related to the potential disconnection between diagnostic criteria and self-report measures concerns the systematic reviews of measures conducted with the purpose of informing researchers and practitioners about which measure best identifies mental health problems. The review presented in chapter five, and the NICE (2014) review which aimed to propose measures of anxiety and depression to use in practice, are both based on measures already in existence that have been validated against diagnostic criteria. The evidence base of anxiety measures validated in perinatal samples with a diagnostic interview for the NICE review was small, resulting in recommendation of a measure (GAD-2) validated in the general population, but even if the evidence base is grown substantially, it will still be based on those diagnostic criteria. Furthermore, reviews of existing measures by their nature only consider distress that has already been categorised by those questionnaires. These measures can only access distress that has already been categorised in a specific objective measure, and is unable to access real-life (experiential) accounts of distress, such as those presented in chapters three and four. Therefore, whilst the symptom profiles presented in the qualitative and quantitative work here may appear to differ, it cannot be known if women in the quantitative studies experienced symptoms other than those presented in the questionnaire items.

The use of mixed methods in this thesis raises issues around who screening is intended to help, and how the terminology used affects this. In the qualitative studies, the aim was to allow women to discuss their emotional difficulties without the constraints of psychiatric terminology (for example, we did not use specific psychiatric classifications such as ‘generalised anxiety disorder’ to recruit women). Women could take part in the study if they felt that they needed help with their emotional difficulties, irrespective of whether they had a mental health diagnosis. The women in this study were also concerned that all mothers experiencing difficulties emotionally should be offered support. Whilst we did compile a list of the symptoms women experienced (in chapter four) it was clear that women largely spoke about their problems in the context of the transition to motherhood. For example, anxiety was related to

breastfeeding or to lack of sleep, and trauma was related to birth or illness. The evidence also suggests that women experiencing postnatal mental health problems are unlikely to seek support themselves due to issues such as stigma, lack of knowledge, unrealistic expectations of motherhood and the symptoms of mental illness (Milgrom & Gemmill, 2014). Therefore as questionnaire items addressing symptoms may not overcome problems with stigma and fear around mental health service use, a screening approach using lay pragmatic terminology (e.g. emotional difficulties) may be beneficial if the aim is to identify all women who feel that they need some form of support. This suggests that assessment of mental health in the perinatal period could be undertaken in relation to the woman's individual transition to motherhood and with concern for her daily life with her baby, which may enable the woman and relevant practitioners to address those issues that the woman perceives as being problematic (Matthey et al., 2013). This approach is also in line with the movement to put women and service users at the centre of research (Alderdice, 2013). However, in reference to the criteria of the National Screening Committee, clear pathways and interventions for problems that are identified would need to be in place, and perinatal mental health services and social interventions are currently below national standards (Maternal Mental Health Alliance, 2014; Public Health England, 2015).

Conversely, the quantitative studies in this thesis utilise questionnaires that have been validated against DSM criteria (e.g. the Edinburgh Postnatal Depression Scale) or that assess psychiatric symptoms (e.g. the CORE-10). Furthermore the review (chapter 5) actively sought measures that had been validated and it explicated the importance of validation against a 'gold standard' largely taken to mean DSM criteria (Matthey & Ross-Hamid, 2011). The use of these measures implies assessment for the purposes of identifying women who need further consultation to establish the presence or absence of psychiatric disorder. Whilst the psychiatric approach has been beneficial in identifying those who need treatment, and comparison of prevalence and prognosis, it is limited in a number of ways including use of thresholds and symptoms not appropriate or relevant to perinatal women (these limitations are outlined in detail

in section 1.2.2). The findings of the qualitative work add to these limitations by suggesting that the criteria do not address some of the issues that women feel they need help with.

It is also recognised that the thesis draws on what could be considered a negative conceptualisation of mental health. Both the lay pragmatic terminology employed in the qualitative work (e.g. emotional difficulties) and the psychiatric classifications used in the quantitative studies encompass problems encountered with mental health. It has been suggested that adoption of the term 'psychological health' which suggests a continuum from health to ill-health, would promote a non-stigmatising and inclusive approach and could enhance wellbeing (Alderdice et al., 2013). This thesis has not drawn on largely positive experience that many women have of pregnancy and childbirth, which could be considered a limitation (Alderdice et al., 2013).

This programme of research did not include a measure of the mother-infant relationship or consider the fathers' mental health, yet it is recognised that any approach to improving maternal mental health assessment and subsequent child outcomes will need to involve these factors (Brockington et al., 2006; Condon, 2010; Forman et al., 2007). The findings of the qualitative research indicated that mothers experienced symptoms of anger towards their infants, and high levels of stress for example, but the quantitative parts did not address these symptoms. This is because an aim of the quantitative chapters was to validate already existing brief measures of distress, which did not include items to measure these symptoms. However it is accepted as a limitation of the design of the programme of research that the symptoms that arose in the qualitative studies were not measured in the quantitative parts. Ideally, the qualitative and the quantitative findings combined would lead to further refinement of existing self-report measures, and / or development of new measures, for example adapting quantitatively ill-performing items and adding items to represent symptoms arising from the qualitative studies. Such measures could then be tested and validated both quantitatively and qualitatively, ensuring that perinatal women are kept at the centre of the research process.

A further limitation relates to the imbalance of studies concerning either pregnancy or the first postnatal year. Whilst the thesis title concerns the assessment of perinatal mental health,

the qualitative studies only relate to postnatal distress and therefore a similar broad approach to exploring pregnant women's experiences of distress would be complementary. Conversely, the CORE-10 data relate to women in their third trimester of pregnancy and a further large sample of postnatal women will be needed to validate the measure for use at that time.

A final limitation relates to the timing of completion of self-report measures. As discussed in section 8.2.2 (*Implications for the assessment environment*), measuring affect at only one time may not show a true picture of prevalence of symptoms, as the score may identify women who are having a bad day, or few days, women who are permanently unhappy or who are temporarily ill (Oates, 2003). In the present research, CORE-10 data were analysed at one point in time only, and EPDS data had at least three months between administrations. For at least some of the women at each time point and on each measure, symptoms may naturally dissipate in the ensuing weeks, indicating that repeat administration of self-report questionnaires two weeks apart may give a more accurate picture of prevalence and identify more specifically those women who do need to be referred for further assessment (Harvey & Pun, 2007; Matthey & Ross-Hamid, 2012).

Whilst these limitations exist, the methods employed in this programme of research have highlighted some key issues in the assessment of perinatal mental health. The combination of in-depth interviews and factor analyses using a large population-based sample has elucidated uncertainty around what the EPDS measures, about women's dissatisfaction with its administration outside of a supportive and trusting relationship, and about the inadequacy of only assessing for depression. This points to the need for future adaptation or development of self-report measures and the symptoms they include, and for attention to be paid to the environment in which they are used. A large sample of pregnant women enabled the use of factor analysis of a short measure of distress (CORE-10) potentially suitable for use with pregnant women after further validation. The systematic review has been useful for researchers looking for a validated measure of perinatal anxiety to use in future research.



#### 8.4 Reflexive account

It is recognized that my position as researcher has influenced the research process, from the inception of studies through to data collection, analysis and write-up. To phrase it differently, I take the position that meaning is made rather than found (Mauthner et al., 1998). It is also acknowledged that reflexivity is an ongoing process and that there are limits to the extent to which I can be aware of the influences that my intentions, emotions and personality have had on my research, both in the past and the present (Mauthner & Doucet, 2003). However there are some issues that I am able to raise in relation to my part in the research process.

First, when I started the programme of research, my previous experience of postnatal distress related to my MSc empirical project which concerned birth trauma (Meades, Pond, Ayers and Warren, 2010). Therefore I considered it important to ask women about their birth experience to provide a more holistic picture of their experience of being a mother, starting right at the beginning of that period of their life. It is possible, therefore, that I was listening to women's experiences through a birth trauma 'filter'. I had a deeper knowledge of PTSD than I did of OCD or bipolar disorder for example. Nonetheless, PTSD following childbirth is now recognised as a clinically meaningful problem and the research findings are consistent with the literature concerning experiences of traumatic birth. I also was very forthright in stating that I was a student, and an academic student, not a student-therapist as I did not want participants to feel that I was more knowledgeable than them, or assessing, judging or trying to fix their situation in any way. This was to fulfil the functions of building rapport and enabling participants to feel comfortable to say whatever they wanted.

During the period of interviewing women for the qualitative study I was pregnant with my first child. Despite giving the participants this information before the interview took place, and therefore giving them the option to not take part, this may have affected the findings through the researcher-participant relationship. Whilst this relationship may sometimes be conceptualised by the participant viewing the researcher as a subject-knowledge expert, I was keen for this not to happen and felt that the woman should be the expert on her own mental health. This may also have been influenced by a feminist standpoint, reacting against the male-

dominated field of psychiatric classification (e.g. Tomes, 1994). The result may have been that some of the women interviewed who had experienced postnatal distress took on the role of the expert, not only about their distress, but concerning motherhood: they had been through labour and childbirth and had experience of looking after an infant, and I was the student who would experience these transitions in a few months. My inexperience and my effort to emphasise women's voices may have resulted in not fully accounting for my own subjectivity in the interviews for example by not probing specific areas further. However, as it was my first pregnancy, this may have encouraged the women to explain motherhood and its challenges in a very thorough way, in order to prepare me. If I had already had children there may have been aspects of motherhood that were implicitly acknowledged and taken for granted, for example that I might have known what it was like to try to breastfeed. If women had asked me whether I breastfed I would have had to respond, and this may have affected how women spoke about their experiences. As it was, I did not have strong feelings about methods of infant feeding at the time of data collection and I was surprised by the prominence of breastfeeding in accounts of distress.

By the time I came to transcribe the interviews I had returned from maternity leave and had my own experiences of childbirth, and early parenting embedded in my consciousness. Unexpectedly, I found myself to be a passionate advocate of supporting women to breastfeed and was again struck by the frequency of and intensity given to experiences of breastfeeding women's accounts. However, care was taken to ensure researcher bias was kept to a minimum, by frequent meetings with my two supervisors, checking inter-rater reliability and discussing ambiguities to reach a consensus about coding. A list of the themes and subthemes that arose was also sent to participants for feedback, although no alterations were suggested. I was also encouraged to keep in mind different experiences of breastfeeding that occur. Whilst the majority of women who experienced difficulties with breastfeeding wanted to breastfeed and felt they did not have enough support to enable them to do so, one spoke about needing permission to not breastfeed. I also recognise that my own socio-economic and demographic characteristics are similar to those of the sample and it is likely that a demographically different

sample (e.g. of younger mothers / in a different geographical area) would result in different experiences of breastfeeding.

In addition to my surprise at the prominence of breastfeeding in experiences of distress, I was also struck by the difficulty that women had with describing how their distress impaired them and affected their daily functioning. The impression I received was that distress was all-encompassing and because of this, separating out the effects was not possible. It may be that interviews with close others, such as the mother's partner/husband, mother or close friend would have been able to elucidate the impacts of distress. Perhaps at the time of the interviews, despite my academic knowledge, I was unable to fully grasp the overwhelming nature of looking after a new baby, and how it must have been difficult to describe whether daily life with a baby was impacted, when that experience itself was new and difficult.

## **8.5 Conclusion**

In conclusion, this thesis has contributed to our knowledge about perinatal mental health assessment in a number of ways. The thesis addressed a number of gaps in the literature by qualitatively and quantitatively considering a broad range of symptoms of mental health problems experienced in pregnancy and the postnatal period. First, qualitative explorations of postnatal distress revealed that women experience many symptoms including but extending beyond depression. Awareness needs to be raised amongst healthcare professionals and future mothers of these potential problems, and research should focus on ways of assessing multiple mental health problems. Second, based on the ways that women contextualised their distress, key points in the transition to motherhood such as labour and childbirth, and establishing breastfeeding were often perceived as causing or triggering distress and may provide a framework within which distress can be talked about and assessed. Third, cognitive and behavioural processes such as avoidance and anger may be valid areas for assessing mental health problems. Fourth, there is a lack of measures of anxiety that have been validated in perinatal women, and this has been confirmed recently by NICE (2014). Therefore it will be important to build the evidence base of validated measures which can then be compared in their

ability to identify anxiety. Fifth, this research has shown that the most popular measure of postnatal depression, the EPDS, has a stable structure in pregnancy and the postnatal period, representing anxiety, depression and anhedonia. However, the need to ascertain whether questionnaire design is responsible for clustering of items and redundancy of response categories on both the EPDS and the CORE-10 has been highlighted. Adaptation of individual items on both the CORE-10 and EPDS may improve their validity. Finally, a short measure of psychological distress, the CORE-10 was trialled and performed well in initial tests of validity in pregnant women. Overall, this programme of research highlights the importance of moving toward a more holistic approach to perinatal mental health assessment.

## 9 References

- Abbott, R., Dunn, V.J., Robling, S.A., & Paykel, E.S. (2004) Long-term outcome of off spring after maternal severe puerperal disorder. *Acta Psychiatrica Scandinavica*, 110, 365–7. DOI: 10.1111/j.1600-0447.2004.00406.x
- Aboulafia, M. (2012). George Herbert Mead. In E.N. Zalta (Ed.). *The Stanford Encyclopedia of Philosophy* (Summer 2012 Ed.). Retrieved from <http://plato.stanford.edu/entries/mead/>
- Adedinsewo, D. A., Fleming, A. S., Steiner, M., Meaney, M. J., & Girard, A. W. (2014). Maternal anxiety and breastfeeding findings from the MAVAN (Maternal Adversity, Vulnerability and Neurodevelopment) study. *Journal of Human Lactation*, 30(1), 102-109. doi: 10.1177/0890334413504244
- Agius, A., Borg Xuereb, R., Carrick-Sen, D., Sultana, R., & Rankin, J. (2016). The co-existence of depression, anxiety and post-traumatic stress symptoms in the perinatal period: A systematic review. *Midwifery*, 36, 70-79, DOI: <http://dx.doi.org/10.1016/j.midw.2016.02.013>
- Alcorn, K.A., O'Donovan, A., Patricka, J.C., Creedy, D., & Devilly, G.J. (2010). A prospective longitudinal study of the prevalence of post-traumatic stress disorder resulting from childbirth events. *Psychological Medicine*, 40(11): 1849-1859
- Alderdice, F. (2013). Life is short and the art long: It depends on how you measure it. *Journal of Reproductive and Infant Psychology*, 31 (5), 11.2013, 429-430.
- Alderdice, F, Ayers, S., Darwin, Z., Green, J., Jomeen, J., Kenyon, S., ... Walsh, J. (2013) Measuring psychological health in the perinatal period : Workshop consensus statement. *Journal of Reproductive and Infant Psychology*, 31 (5), 11.2013, 431-438. DOI: 10.1080/02646838.2013.835039

- American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5)*. USA: American Psychiatric Association.
- Andersen, L. B., Melvaer, L. B., Videbech, P., Lamont, R. F., & Joergensen, J. S. (2012). Risk factors for developing post-traumatic stress disorder following childbirth: a systematic review. *Acta Obstetrica et Gynecologica Scandinavica*, 91(11), 1261-72.
- Armstrong, S.J., & Small, R.E. (2010). The paradox of screening: Rural women's views on screening for postnatal depression. *BMC Public Health*, 10 (744). doi:10.1186/1471-2458-10-744
- Arroll, B., Smith, F. G., Kerse, N., Fishman, T., & Gunn, J. (2005). Effect of the addition of a "help" question to two screening questions on specificity for diagnosis of depression in general practice: diagnostic validity study. *British Medical Journal*, 331(7521), 884. doi: 10.1136/bmj.38607.464537.7C
- Ashley, J.M., Harper, B.D., Arms-Chavez, C.J., & LoBello, S.G. (2016) Estimated prevalence of antenatal depression in the US population. *Archives of Women's Mental Health*, 19(2): 395-400. doi: 10.1007/s00737-015-0593-1
- Ayers, S., Bond, R., Bertullies, S., & Wijma, K. (2016). The aetiology of post-traumatic stress following childbirth: a meta-analysis and theoretical framework. *Psychological Medicine*, 46(06), 1121-1134. doi: 10.1017/S0033291715002706
- Ayers, S., & Olander, E. (2013). What are we measuring and why? Using theory to guide perinatal research and measurement. *Journal of Reproductive and Infant Psychology*, 31 (5), 439-448. doi: : 10.1080/02646838.2013.834041
- Ballard, C. G., Davis, R., Handy, S., & Mohan, R. N. (1993). Postpartum anxiety in mothers and fathers. *European Journal of Psychiatry*, 7, 117–121.
- Bauer, A., Parsonage, M., Knapp, M., Iemmi, V., & Adelaja, B. (2014). *The costs of perinatal mental health problems*. Centre for Mental Health and London School of Economics.

Retrieved from

[http://eprints.lse.ac.uk/59885/1/\\_lse.ac.uk\\_storage\\_LIBRARY\\_Secondary\\_libfile\\_shared\\_repository\\_Content\\_Bauer,%20M\\_Bauer\\_Costs\\_perinatal\\_%20mental\\_2014\\_Bauer\\_Costs\\_perinatal\\_mental\\_2014\\_author.pdf](http://eprints.lse.ac.uk/59885/1/_lse.ac.uk_storage_LIBRARY_Secondary_libfile_shared_repository_Content_Bauer,%20M_Bauer_Costs_perinatal_%20mental_2014_Bauer_Costs_perinatal_mental_2014_author.pdf)

Beck, C.T., & Gable, R.K..(2000). Postpartum depression screening scale: development and psychometric testing. *Nursing Research*, 49(5), 272-82.

Beck, C.T., Gable, R.K., Sakala, C., & Declercq, E.R. (2011). Posttraumatic stress disorder in new mothers: results from a two-stage U.S. national survey. *Birth*, 38(3), 216-27

Bennett, H.A., Einarson, A., Taddio, A., Koren, G., & Einarson, T.R. (2004). Prevalence of depression during pregnancy: Systematic review. *Obstetrics and Gynecology*, 103(4), 698-709

Berkman, N.D., Lohr, K.N., Ansari, M., McDonagh, M., Balk, E. Whitlock, E.,...Chang, S. (2013). *Grading the strength of a body of evidence when assessing health care interventions for the Effective Health Care Program of the Agency for Healthcare Research and Quality: An update. AHRQ Publication No. 13 (14)-EHC130-EF*. Rockville, MD: Agency for Healthcare Research and Quality. Retrieved from [www.effectivehealthcare.ahrq.gov/reports/final.cfm](http://www.effectivehealthcare.ahrq.gov/reports/final.cfm).

Bielinski-Blattmann, D., Gurber, S., Lavalley, K., Grob, A., Surbek, D., & Stadlmayr, W. (2016). Labour experience and postpartum stress and depression: A quantitative and qualitative examination. *Journal of Reproductive and Infant Psychology*, 34 (2), 162-174. DOI: <http://dx.doi.org/10.1080/02646838.2015.1131252>

Boots Family Trust, Netmums, Tommy's, Institute of Health Visiting, Royal College of Midwives (2013). *Perinatal Mental Health Experiences of Women and Health Professionals*. Retrieved from

[https://www.tommys.org/sites/default/files/Perinatal\\_Mental\\_Health\\_Experiences%20of%20women.pdf](https://www.tommys.org/sites/default/files/Perinatal_Mental_Health_Experiences%20of%20women.pdf)

- Bosanquet, K., Bailey, D., Gilbody, S., Harden, M., Manea, L., Nutbrown, S., & McMillan, D. (2015) Diagnostic accuracy of the Whooley questions for the identification of depression: A diagnostic meta-analysis. *BMJ Open*, 5(12). Article number e008913. doi: 10.1136/bmjopen-2015-008913.
- Boyd, R.C., Le, H.N., & Somberg, R. (2005) Review of screening instruments for postpartum depression. *Archives of Women's Mental Health*, 8(3), 141-53. DOI: 10.1007/s00737-005-0096-6
- Brand, S.R., & Brennan, P.A. (2009). Impact of antenatal and postpartum maternal mental illness: How are the children? *Clinical Obstetrics and Gynecology*, 52 (3), 441-455. doi: 10.1097/GRF.0b013e3181b52930
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77-101. <http://dx.doi.org/10.1191/1478088706qp063oa>
- Brockington I. (2004). Postpartum psychiatric disorders. *The Lancet*, 363(9405): 303-10. DOI: 10.1016/S0140-6736(03)15390-1
- Brockington, I.F., Aucamp, H.M., & Fraser, C. (2006). Severe disorders of the mother-infant relationship: definitions and frequency. *Archives of Women's Mental Health*, 9 (5), 243-251. DOI: 10.1007/s00737-006-0133-0
- Brockington, I. F., Oates, J., George, S., Turner, D., Vostanis, P., Sullivan, M., ... Murdoch, C. (2001). A screening questionnaire for mother-infant bonding disorders. *Archives of Women's Mental Health*, 3(4), 133-140. DOI: 10.1007/s007370170010
- Brouwers, E.P.M., van Baar, A.L., & Pop, V.J.M. (2001). Does the Edinburgh Postnatal Depression Scale measure anxiety? *Journal of Psychosomatic Research*, 51, 659-663.



- Brown, T. A., Chorpita, B. F., & Barlow, D. H. (1998). Structural relationships among dimensions of the DSM-IV anxiety and mood disorders and dimensions of negative affect, positive affect, and autonomic arousal. *Journal of Abnormal Psychology, 107*, 179–192.
- Brugha, T.S., Morrell, C.J., Slade, P., & Walters, S.J. (2011). Universal prevention of depression in women postnatally: cluster randomized trial evidence in primary care. *Psychological Medicine, 41* (4):739-48. doi: 10.1017/S0033291710001467
- Bryman, A. (2006). Paradigm peace and the implications for quality. *International Journal of Social Research Methodology, 9*, 2, 111-126. DOI:10.1080/13645570600595280
- Burke Johnson, R., Onwuegbuzie, A., & Turner, L. (2007) Toward a definition of mixed methods research, *Journal of Mixed Methods Research, 1*, 112-133. doi: 10.1177/1558689806298224
- Byatt, N., Biebel, K., Friedman, L., Debordes-Jackson, G., Ziedonis, D., & Pbert, L. (2013). Patient's views on depression care in obstetric settings: how do they compare to the views of perinatal health care professionals? *General Hospital Psychiatry, 35*, 598-604. DOI: <http://dx.doi.org/10.1016/j.genhosppsych.2013.07.011>
- Byatt, N., Moore Simas, T.A., Lundquist, R.S., Johnson, J.V., & Ziedonis, D.M. (2012). Strategies for improving perinatal depression treatment in North American outpatient obstetric settings. *Journal of Psychosomatic Obstetrics and Gynecology, 33*(4), 143-161. doi: 10.3109/0167482X.2012.728649.
- Chew-Graham, C. A., Sharp, D., Chamberlain, E., Folkes, L., & Turner, K. M. (2009). Disclosure of symptoms of postnatal depression, the perspectives of health professionals and women: a qualitative study. *BMC family practice, 10*(1), 7. doi: 10.1186/1471-2296-10-7.

- Choi, P., Henshaw, C., Baker, S., & Tree, J. (2005). Supermum, superwife, supereverything: performing femininity in the transition to motherhood. *Journal of Reproductive and Infant Psychology*, 23(2), 167-180. DOI: <http://dx.doi.org/10.1080/02646830500129487>
- Chorpita, B. F., Albano, A. M., & Barlow, D. H. (1998). The structure of negative emotions in a clinical sample of children and adolescents. *Journal of abnormal psychology*, 107(1), 74. <http://dx.doi.org/10.1037/0021-843X.107.1.74>
- Clark, L. A., & Watson, D. (1991). Tripartite model of anxiety and depression: psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology*, 100(3), 316.
- Coates, R., Ayers, S., de Visser, R. (2014). Women's experiences of postnatal distress: a qualitative study. *BMC Pregnancy and Childbirth*, 14, 359, doi:10.1186/1471-2393-14-359.
- Condon, J.T. (2010). Women's mental health: A "wish-list" for the DSM-V. *Archives of Women's Mental Health*, 13 (1), 5-10. doi:10.1007/s00737-009-0114-1
- Connell, J., & Barkham, M. (2007). *CORE-10 user manual, version 1.1*. CORE System Trust & CORE Information Management Systems Ltd
- Cox, J.L., Holden, .JM., & Sagovsky, R. (1987). Detection of postnatal depression. Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry*. 150, 782-6. DOI: 10.1192/bjp.150.6.782
- Cresswell, J.W. (2011). Controversies in mixed methods research. In Denzin, N.K. & Lincoln, Y.S. (Eds.), *The Sage Handbook of Qualitative Research* (4<sup>th</sup> ed.) (pp.269-284).Thousand Oaks, C.A.: Sage.
- Cunningham, N.K., Brown,P.M., & Page, A.C. (2016). The structure of negative emotional states in a postpartum inpatient sample. *Journal of Affective Disorders*, 192, 11-21. DOI 10.1016/j.jad.2015.12.0040165-0327/&

- Cuthbert, B., & Insel, T. (2010). Classification issues in women's mental health: clinical utility and etiological mechanisms. *Archives of Women's Mental Health*, 13, 57-59
- Darwin, Z., McGowan, L., & Edozien, L.C. (2015) Identification of women at risk of depression in pregnancy: using women's accounts to understand the poor specificity of the Whooley and Arroll case finding questions in clinical practice. *Archives of Women's Mental Health*, 19, 41-49. doi: 10.1007/s00737-015-0508-1.
- DeJong, H., Fox, E., & Stein, A. (2016). Rumination and postnatal depression: A systematic review and a cognitive model. *Behaviour research and therapy*, 82, 38-49. doi: 10.1016/j.brat.2016.05.003
- Dennis, C.-L., & Chung-Lee, L. 2006. Postpartum depression help-seeking barriers and maternal treatment preferences: A qualitative systematic review. *Birth*, 33(4), 323-331. doi: 10.1111/j.1523-536X.2006.00130.x
- Dennis, C.L., & Hodnett, E. 2007. Psychosocial and psychological interventions for treating postpartum depression. *Cochrane Database of Systematic Review*, 17(4). DOI: 10.1002/14651858.CD006116.pub2
- Department of Health. (2009). *The Healthy Child Programme – Pregnancy and the first five years*. Department of Health. Retrieved from <https://www.gov.uk/government/publications/healthy-child-programme-pregnancy-and-the-first-5-years-of-life>
- diFlorio, A., & Meltzer-Brody, S. (2015). Is postpartum depression a distinct disorder? *Current Psychiatry Reports*, 17: 76. doi: 10.1007/s11920-015-0617-6
- Ding, X-X., Wuc, Y-L., Xu, S-J., Zhua, R-P., Jia, X-M., Zhang, S-F., ...Tao. F-B. (2014). Maternal anxiety during pregnancy and adverse birth outcomes: A systematic review and meta-analysis of prospective cohort studies. *Journal of Affective Disorders*, 159, 103–110. doi: 10.1016/j.jad.2014.02.027

- Dures, E., Rumsey, N., Morris, M., & Gleeson, K. (2011). Mixed methods in health psychology: Theoretical and practical considerations of the third paradigm, *Journal of Health Psychology, 16*, 332-341. doi: 10.1177/1359105310377537
- El Den, S., O'Reilly, C.L., & Chen, T.F. (2015). A systematic review on the acceptability of perinatal depression screening. *Journal of Affective Disorders, 188*, 284-303. doi: 10.1016/j.jad.2015.06.015
- Falah-Hassani, K., Shiri, R., & Dennis, C.-L. (2016). Prevalence and risk factors for comorbid postpartum depressive symptomology and anxiety. *Journal of Affective Disorders, 198*, 142-147. DOI: <http://dx.doi.org/10.1016/j.jad.2016.03.010>
- Field, T. (2010). Postpartum depression effects on early interactions, parenting, and safety practices: A review. *Infant Behaviour and Development, 33* (1), 1-6. doi:10.1016/j.infbeh.2009.10.005
- Field, T.A, Diego, M., Hernandez-Reif, M., Figueiredo, B., Deeds, O., Ascencio, A., ... Kuhn, C. (2010). Comorbid depression and anxiety effects on pregnancy and neonatal outcome. *Infant Behavior and Development, 33*, 23-29. doi: 10.1016/j.infbeh.2009.10.004
- Field, T., Diego, M., & Hernandez-Reif, M. (2006). Prenatal depression effects on the fetus and newborn: a review. *Infant Behaviour and Development, 29*, 445-455. doi: 10.1016/j.infbeh.2006.03.003
- Figueiredo, B., Canário, C., & Field, T. (2014). Breastfeeding is negatively affected by prenatal depression and reduces postpartum depression. *Psychological Medicine, 44* (5), 927-936. doi:10.1017/S003291713001530
- Filha, M. M. T., Ayers, S., da Gama, S. G. N., & do Carmo Leal, M. (2016). Factors associated with postpartum depressive symptomatology in Brazil: The Birth in Brazil National

Research Study, 2011/2012. *Journal of affective disorders*, 194, 159-167. doi:  
10.1016/j.jad.2016.01.020

Finlay, L. (2006) 'Rigour', 'Ethical Integrity' or 'Artistry'? Reflexively reviewing criteria for evaluating qualitative research, *British Journal of Occupational Therapy*, 6 (7), 319-326. DOI: 10.1177/030802260606900704

Fisher, J., Mello, M. C. D., Patel, V., Rahman, A., Tran, T., Holton, S., & Holmes, W. (2012). Prevalence and determinants of common perinatal mental disorders in women in low- and lower-middle-income countries: a systematic review. *Bulletin of the World Health Organization*, 90(2), 139-149. doi: 10.2471/BLT.11.091850

Forman, D. R., O'Hara, M. W., Stuart, S., Gorman, L. L., Larsen, K. E., & Coy, K. C. (2007). Effective treatment for postpartum depression is not sufficient to improve the developing mother-child relationship. *Development and psychopathology*, 19(02), 585-602. DOI: 10.1017/S0954579407070289

Frost, N., Nolas, S. M., Brooks-Gordon, B., Esin, C., Holt, A., Mehdizadeh, L., & Shinebourne, P. (2010). Pluralism in qualitative research: The impact of different researchers and qualitative approaches on the analysis of qualitative data. *Qualitative research*, 10(4), 441-460.

Gale, S., Harlow, B.L. (2003). Postpartum mood disorders: a review of clinical and epidemiological factors. *Journal of Psychosomatic Obstetrics and Gynaecology*, 24(4), 257-66.

Gavin, N.I., Gaynes, B.N., Lohr, K.N., Meltzer-Brody, S., Gartlehner, G., & Swinson, T. (2005). Perinatal depression: a systematic review of prevalence and incidence. *Obstetrics and Gynecology*, 106, 1071-83. DOI:  
10.1097/01.AOG.0000183597.31630.db

- Gaynes, B.N., Gavin, N., Meltzer-Brody, S., Lohr, K.N., Swinson, T., Gartlehner, G.,...& Miller, W.C. (2005). Perinatal depression: prevalence, screening accuracy, and screening outcomes. *Evidence Report / Technology Assessment Summary*, 119: 1-8
- Gibb, B. E., Coles, M. E., & Heimberg, R. G. (2005). Differentiating symptoms of social anxiety and depression in adults with social anxiety disorder. *Journal of Behavior Therapy and Experimental Psychiatry*, 36, 99–109. doi:10.1016/j.jbtep.2004.08.002
- Gjerdingen, D., Crow, S., McGovern, P., Miner, M., & Center, B. (2009). Postpartum depression screening at well-child visits: validity of a 2-question screen and the PHQ-9. *The Annals of Family Medicine*, 7(1), 63-70. doi: 10.1370/afm.933
- Glasheen, C., Richardson, G.A., & Fabio, A. 2010. A systematic review of the effects of postnatal maternal anxiety on children. *Archives of Women's Mental Health*, 13, 61-74. doi: 10.1007/s00737-009-0109-y
- Goldberg, D. (2010). Should our major classifications of mental disorders be revised? *British Journal of Psychiatry*, 196, 255-256. doi:10.1192/bjp.bp.109.072405
- Goldberg, D. P., & Huxley, P. (1992). *Common Mental Disorders: A Bio-Social Model*. New York, NY, US: Tavistock/Routledge.
- Grace, S.L., Evindar, A., & Stewart, D.E. (2003). The effect of postpartum depression on child cognitive development and behaviour: A review and critical analysis of the literature. *Archives of Women's Mental Health*, 6, 263-274. DOI: 10.107/s00737-003-0024-6
- Green, J.M. (1998). Postnatal depression or perinatal dysphoria? Findings from a longitudinal community-based study using the Edinburgh Postnatal Depression Scale. *Journal of Reproductive and Infant Psychology*, 16, 143-155.
- Grekin, R., & O'Hara, M. W. (2014). Prevalence and risk factors of postpartum posttraumatic stress disorder: a meta-analysis. *Clinical Psychology Review*, 34(5), 389-401. doi: 10.1016/j.cpr.2014.05.003

- Green, S.M., Haber, E., Frey, B.N., & McCabe, R.E. (2015). Cognitive-behavioural group treatment for perinatal anxiety: a pilot study. *Archives of Women's Mental Health*, 18, 631-638. doi: 10.1007/s00737-015-0498-z
- Grigoriadis, S., de Camps Meschino, D., Barrons, E., Bradley, L., Eady, A., Fishell, A., ... Ross, L.E. (2011). Mood and anxiety disorders in a sample of Canadian perinatal women referred for psychiatric care. *Archives of Women's Mental Health*, 14(4), 325-33. doi: 10.1007/s00737-011-0223-5.
- Hansard, HC Debate. (29 January 2016). Retrieved from <http://www.parliament.uk/business/publications/written-questions-answers-statements/written-question/Commons/2016-01-26/24144/>
- Harvey, A. G., Watkins, E., Mansell, W., & Shafran, S. (2004). *Cognitive behavioural processes across psychological disorders: A transdiagnostic approach to research and treatment*. USA: Oxford University Press.
- Harvey, S. T., & Pun, P. K. (2007). Analysis of positive Edinburgh depression scale referrals to a consultation liaison psychiatry service in a two-year period. *International Journal of Mental Health Nursing*, 16(3), 161-167. DOI: 10.1111/j.1447-0349.2007.00463.x
- Hastings, B.M. (2002) Social constructionism and the legacy of James' pragmatism. *Theory and Psychology*, 12(5), 714-720. doi: 10.1177/0959354302012005902
- Hay, D.F., Pawlby, S., Waters, C.S., & Sharp, S. (2008). Antepartum and postpartum exposure to maternal depression: Different effects on different adolescent outcomes. *Journal of Child Psychology and Psychiatry*. 49(10), 1079-1088. Doi: 10.1111/j.1469-7610.2008.01959.x
- Hayes, S.C., Wilson, K.G., Strosahl, K., Gifford, E.V., & Follette, V.M. (1996). Experiential avoidance and behavioural disorders: a functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology*, 64, 1152-68.

- Hendrick, V., Altshuler, L., Strouse, T., Grosser, S. (2000). Postpartum and nonpostpartum depression: differences in presentation and response to pharmacologic treatment. *Depression and Anxiety*, 11, 66–72
- Heron, J., O'Connor, T.G., Evans, J., Golding, J., Glover, V., & ALSPAC Team. 2004. The course of anxiety and depression through pregnancy and the postpartum in a community sample. *Journal of Affective Disorders*, 80, 65-73. DOI: 10.1016/j.jad.2003.08.004
- Hewitt, C., Gilbody, S., Brealey, S., Paulden, M., Palmer, S., Mann, R.,...& Richards, D. (2009) Methods to identify postnatal depression in primary care: an integrated evidence synthesis and value of information analysis. *Health Technology Assessment*, 13(36): 1-230. doi: 10.3310/hta13360
- Hill, C. (2010). *An evaluation of screening for postnatal depression against NSC criteria*. (Public Health England Report). Retrieved from [legacy.screening.nhs.uk/policydb\\_download.php?doc=140](http://legacy.screening.nhs.uk/policydb_download.php?doc=140)
- Hipwell, A.E., Goossens, F.A., Melhuish, E.C., & Kumar, R. (2000). Severe maternal psychopathology and infant-mother attachment. *Development and Psychopathology*, 12, 157–75.
- Hodnett, E. D. (2002). Pain and women's satisfaction with the experience of childbirth: a systematic review. *American Journal of Obstetrics and Gynecology*, 186(5), S160-S172.
- Hodnett, E. D., Gates, S., Hofmeyr, G. J., & Sakala, C. (2013). Continuous support for women during childbirth. *Cochrane Database of Systematic Reviews*, 7, CD003766. DOI: 10.1002/14651858.CD003766.pub5
- Hoertel, N., Lopez, S., Peyre, H., & Blanco, C. (2015). Are symptom features of depression during pregnancy, the postpartum period and outside the peripartum period distinct?



Results from a nationally representative sample using item response theory (IRT).

*Depression and Anxiety*, 32(2). DOI: 10.1002/da.22334

Hofberg, K.R., & Brockington, I. (2000). Tokophobia: an unreasoning dread of childbirth. A series of 26 cases. *British Journal of Psychiatry*, 176, 83-85.

Hookway, C. Pragmatism. In E.N. Zalta (Ed.). (2010). *The Stanford Encyclopedia of Philosophy* (Spring 2010 ed.), Retrieved from

<http://plato.stanford.edu/archives/spr2010/entries/pragmatism/>

Howitt, D. (2010). *Introduction to Qualitative Methods in Psychology* (2<sup>nd</sup> ed.), Essex, UK: Pearson Education Limited.

Ingram, R. E. (1990). Self-focused attention in clinical disorders: review and a conceptual model. *Psychological bulletin*, 107(2), 156-176

Jacques, H.A.K., & Mash, E.J. (2004) A test of the tripartite model of anxiety and depression in elementary and high school boys and girls. *Journal of Abnormal Child Psychology*, 32(1), 13-25. DOI: 10.1023/B:JACP.0000007577.38802.18

Joiner, T. E., Brown, J., & Metalsky, G. (2003). A test of the tripartite model's prediction of anhedonia's specificity to depression: Patients with major depression versus patients with schizophrenia. *Psychiatry Research*, 119, 243–250

Jomeen, J., Glover, L., Jones, C., Garg, D., & Marshall C. (2013). Assessing women's perinatal mental health: exploring the experiences of health visitors. *Journal of Reproductive and Infant Psychology*, 31(5), 479-48. doi: 10.1080/02646838.2013.835038

Jomeen, J., & Martin, C.R.. (2004). Is the Hospital Anxiety and Depression Scale (HADS) a reliable screening tool in early pregnancy? *Psychology and Health*, 19, 787-800.

- Jones, I., & Cantwell, R. (2010). The classification of perinatal mood disorders—suggestions for DSMV and ICD11. *Archives of Women's Mental Health*, 13(1), 33-36. DOI: <http://dx.doi.org/10.1007/s00737-009-0122-1>
- Jones, H.W., & Venis, J.A. (2001). Identification and classification of postpartum psychiatric disorders. *Journal of Psychosocial Nursing and Mental Health Services*. 39: 23–30
- Kehler, H. L., Chaput, K. H., & Tough, S. C. (2009). Risk factors for cessation of breastfeeding prior to six months postpartum among a community sample of women in Calgary, Alberta. *Canadian Journal of Public Health/Revue Canadienne de Sante'e Publique*, 376-380
- Kessler, R.C., McGonagle, K.A., Zhao, S., Nelson, C.B., Hughes, M., Eshleman, S.,... Kendler, K.S.(1994). Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. *Archives of General Psychiatry*, 51, 8-19
- Khan, L. (2015). *Falling through the gaps: Perinatal mental health and general practice*. Centre for Maternal Health. Retrieved from <http://www.rcgp.org.uk/clinical-and-research/toolkits/~media/0DF1836E7D6B46788519F79E0ACF6EB2.ashx>
- King, L., Pestell, S., Farrar, S., North, N., & Brunt, C. (2013). Screening for antenatal psychological distress. *British Journal of Midwifery*, 20(6). DOI: <http://dx.doi.org/10.12968/bjom.2012.20.6.396>
- Kingston, D., Austin, M. P., Heaman, M., McDonald, S., Lasiuk, G., Sword, W., ... Biringer, A. (2015a). Barriers and facilitators of mental health screening in pregnancy. *Journal of Affective Disorders*, 186, 350-357. doi: 10.1016/j.jad.2015.06.029
- Kingston, D. E., Biringer, A., McDonald, S. W., Heaman, M. I., Lasiuk, G. C., Hegadoren, K. M., ... Jarema, K. M. (2015b). Preferences for Mental Health Screening Among Pregnant Women: A Cross-Sectional Study. *American Journal of Preventive Medicine*, 49(4). doi: 10.1016/j.amepre.2015.03.026

- Kingston, D. E., Biringir, A., Toosi, A., Heaman, M. I., Lasiuk, G. C., McDonald, S. W., ... Austin, M. P. (2015c). Disclosure during prenatal mental health screening. *Journal of Affective Disorders, 186*, 90-94. doi: 10.1016/j.jad.2015.07.003
- Klier, C.M. (2006). Mother-infant bonding disorders in patients with postnatal depression: The Postpartum Bonding Questionnaire in clinical practice. *Archives of Women's Mental Health, 9*(5): 289-91. DOI: 10.1007/s00737-006-0150-z
- Kroenke, K. (2001). Studying symptoms: Sampling and measurement issues. *Annals of Internal Medicine, 134*(90), 844-853. doi:10.7326/0003-4819-134-9\_Part\_2-200105011-00008
- Kroenke, K., Spitzer, R. L., & Williams, J. B. (2003). The Patient Health Questionnaire-2: validity of a two-item depression screener. *Medical Care, 41*(11), 1284-1292. DOI: 10.1097/01.MLR.0000093487.78664.3C
- Kroenke, K., Spitzer, R. L., Williams, J. B., Monahan, P. O., & Löwe, B. (2007). Anxiety disorders in primary care: prevalence, impairment, comorbidity, and detection. *Annals of internal medicine, 146*(5), 317-325. Retrieved from <https://sites.oxy.edu/clint/physio/article/anxietydisordersinprimarycare.pdf>
- Kvalevaag, A.L., Ramchandani, P.G., Hove, O., Assmus, J., Eberhard-Gran, M., & Biringir, E. (2013). Paternal mental health and socioemotional and behavioural development in their children. *Pediatrics, 131*(2). doi: 10.1542/peds.2012-0804
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, NY: Springer.
- Lee, A. M., Lam, S. K., Lau, S. M. S. M., Chong, C. S. Y., Chui, H. W., & Fong, D. Y. T. (2007). Prevalence, course, and risk factors for antenatal anxiety and depression. *Obstetrics & Gynecology, 110*(5), 1102-1112. DOI: 10.1097/01.AOG.0000287065.59491.70
- Lewis, G. (Ed). (2007). *The Confidential Enquiry into Maternal and Child Health (CEMACH). Saving Mothers' Lives: Reviewing maternal deaths to make motherhood safer – 2003-*

2005. *The seventh report on confidential enquiries into maternal deaths in the United Kingdom*. London: CEMACH. Retrieved from <http://www.publichealth.hscni.net/sites/default/files/Saving%20Mothers'%20Lives%202003-05%20.pdf>

- Lincoln, Y.S., Lynham, S.A., & Guba, E.G. (2011). Paradigmatic controversies, contradictions and emerging confluences, revisited. In N.K. Denzin & Y.S. Lincoln (Eds.), *The Sage Handbook of Qualitative Research* (4<sup>th</sup> ed.) (pp.163-188), Thousand Oaks, C.A.: Sage.
- Lindahl, V., Pearson, J. L., & Colpe, L. (2005). Prevalence of suicidality during pregnancy and the postpartum. *Archives of Women's Mental Health*, 8(2), 77-87. DOI: 10.1007/s00737-005-0080-1
- Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour research and therapy*, 33(3), 335-343. doi:10.1016/0005-7967(94)00075-U
- Lyons, A. (1999). Shaping health psychology: Qualitative research, evaluation and representation. In Murray, M. & Chamberlain, K. (Eds.), *Qualitative Health Psychology: Theories and Methods* (pp.241-267). London: Sage.
- Madigan, S., Moran, G., Schuengel, C., Pederson, D. R., & Otten, R. (2007). Unresolved maternal attachment representations, disrupted maternal behavior and disorganized attachment in infancy: links to toddler behavior problems. *Journal of Child Psychology and Psychiatry*, 48, 1042–1050. doi: 10.1111/j.1469-7610.2007.01805.x
- Mammen, O. K., Pilkonis, P. A., & Kolko, D. J. (2000). Anger and parent-to-child aggression in mood and anxiety disorders. *Comprehensive psychiatry*, 41(6), 461-468. DOI: 10.1053/comp.2000.16567

- Mann, R., Adamson, J., & Gilbody, S. M. (2012). Diagnostic accuracy of case-finding questions to identify perinatal depression. *Canadian Medical Association Journal*, 184(8), E424-E430. doi: 10.1503/cmaj.111213
- Martin, J.L., McLean, G., Cantwell, R., & Smith, D.J. (2016) Admission to psychiatric hospital in the early and late postpartum periods: Scottish national linkage study. *BMJ Open*, 6(1). doi: 10.1136/bmjopen-2015-008758
- Maternal Mental Health Alliance. (2014). *UK Specialist community perinatal mental health teams (current provision)*. Retrieved from:  
[http://everyonesbusiness.org.uk/?page\\_id=349](http://everyonesbusiness.org.uk/?page_id=349)
- Matthey S. (2010). Are we overpathologising motherhood? *Journal of Affective Disorders*, 120(1-3), 263-6. doi: 10.1016/j.jad.2009.05.004
- Matthey, S. (2008). Using the Edinburgh Postnatal Depression Scale to screen for anxiety disorders. *Depression and Anxiety*, 25(11), 926-931. DOI: 10.1002/da.20415
- Matthey, S., Barnett, B., Howie, P., & Kavanagh, D.J. (2003). Diagnosing postpartum depression in mothers and fathers: Whatever happened to anxiety? *Journal of Affective Disorders*, 74, 139-147.
- Matthey, S., & Ross-Hamid, C. (2011). The validity of DSM symptoms for depression and anxiety disorders during pregnancy. *Journal of Affective Disorders*, 133(3):546-52. doi: 10.1016/j.jad.2011.05.004.
- Matthey, S., Valenti, B., Souter, K., & Ross-Hamid, C. (2013). Comparison of four self-report measures and a generic mood question to screen for anxiety during pregnancy in English-speaking women. *Journal of Affective Disorders*, 148(2-3), 347-51. doi: 10.1016/j.jad.2012.12.022
- Mauri, M., Oppo, A., Montagnani, M.S., Borri, C., Banti, S., Camilleri, V., ... Cassano, G.B. (2010). Beyond "postpartum depressions": Specific anxiety diagnoses during pregnancy

predict different outcomes: Results from PND-ReScU . *Journal of Affective Disorders*, 127, 177-184. doi: 10.1016/j.jad.2010.05.015

Mauthner, N. S., & Doucet, A. (2003). Reflexive accounts and accounts of reflexivity in qualitative data analysis. *Sociology*, 37(3), 413-431. Retrieved from <http://www.andreadoucet.com/wp-content/uploads/2011/02/Mauthner-Doucet-Reflexive-Accounts.pdf>

Mauthner, N.S., Parry, O., & Backett-Milburn, K. (1998). The data are out there, or are they? Implications for archiving and revisiting qualitative data. *Sociology*, 32, 733-745. doi: 10.1177/0038038598032004006

Meades, R., Pond, C., Ayers, S., & Warren, F. (2011). Postnatal debriefing: Have we thrown the baby out with the bathwater? *Behaviour Research and Therapy*, 49(5), 367-372.

Merrill, L., Mittal, L., Nicolero, J., Caiozzo, C., Maciejewski, P. K., & Miller, L. J. (2015). Screening for bipolar disorder during pregnancy. *Archives of Women's Mental Health*, 18(4), 579-583. doi: 10.1007/s00737-015-0527-y

Milgrom, J., Gemmill, A.W., Bilszta, J.L., Hayes, B., Barnett, B., Brooks, ... Buist, A. (2008). Antenatal risk factors for postnatal depression: A large prospective study. *Journal of Affective Disorders*, 108(1-2): 147-157. DOI: 10.1016/j.jad.2007.10.014

Miller, R. L., Pallant, J. F., & Negri, L. M. (2006). Anxiety and stress in the postpartum: is there more to postnatal distress than depression?. *BMC psychiatry*, 6(1). DOI: 10.1186/1471-244X-6-12

Mineka, S., Watson, D., & Clark, L. A. (1998). Comorbidity of anxiety and unipolar mood disorders. *Annual Review of Psychology*, 49, 377-412. DOI: 10.1146/annurev.psych.49.1.377

- Moran-Ellis, J., Alexander, V. D., Cronin, A., Dickinson, M., Fielding, J., Sleney, J., & Thomas, H. (2006). Triangulation and integration: processes, claims and implications. *Qualitative Research*, 6(1), 45-59. doi: 10.1177/1468794106058870
- Morrell, C. J., Slade, P., Warner, R., Paley, G., Dixon, S., Walters, S. J., ... Nicholl, J. (2009). Clinical effectiveness of health visitor training in psychologically informed approaches for depression in postnatal women: pragmatic cluster randomised trial in primary care. *BMJ*, 338, a3045. doi: 10.1136/bmj.a3045
- Morrell, C.J., Sutcliffe, P., Booth, A., Stevens, J., Scope, A., Stevenson, M.,...Stewart-Brown, S. (2016). A systematic review, evidence synthesis and meta-analysis of quantitative and qualitative studies evaluating the clinical effectiveness, the cost-effectiveness, safety and acceptability of interventions to prevent postnatal depression. *Health Technology Assessment*, 20 (37). DOI: <http://dx.doi.org/10.3310/hta20370>
- Munk-Olsen, T., Munk Laursen, T., Pedersen, C.B., Mors, O., & Mortensen, P.B. (2006). New Parents and Mental Disorders: A Population-Based Register Study. *Journal of the American Medical Association*, 296(21). DOI: 10.1001/jama.296.21.2582
- Muzik, M., Klier, C.M., Rosenblum, K.L., Holzinger, A., Umek, W., & Katschnig, H. (2000). Are commonly used self-report inventories suitable for screening postpartum depression and anxiety disorders? *Acta Psychiatrica Scandinavica*. 102, 71-73.
- Myers, E., Aubuchon-Endsley, N., Bastian, L.A., Gierisch, A.R., Kemper, A.R., Swamy, G.K.... Sanders, G.D. (2013). Efficacy and safety of screening for postpartum depression. *Comparative effectiveness review*, 106, *Agency for Healthcare Research and Quality*, Rockville, MD.
- National Institute for Health and Clinical Excellence. (2007). *Antenatal and postnatal mental health. NICE Guideline CG45*. London: National Institute for Health and Clinical

Excellence. Retrieved from

<https://www.nice.org.uk/guidance/cg45?unlid=101829663620151372047?print=true>

National Institute for Health and Care Excellence. (2014). *Antenatal and Postnatal Mental Health: Clinical management and service guidance. Updated edition. NICE guideline (CG192)*. London: National Institute for Health and Care Excellence. Retrieved from <https://www.nice.org.uk/guidance/cg192>

National Institute for Health and Care Excellence. (2016) *Antenatal and postnatal mental health NICE unclassified quality standard (QS115)*. London: National Institute for Health and Care Excellence. Retrieved from <https://www.nice.org.uk/guidance/qs115/chapter/Using-the-quality-standard>

National Institute of Mental Health. (2008). *The National Institute of Mental Health strategic plan. National Institute of Mental Health (NIH Publication 08-6368)*. Retrieved from <http://www.nimh.nih.gov/about/strategic-planning-reports/index.shtml>

Navarro, P., Ascaso, C., Garcia-Esteve, L, Aquado, J., Torres, A., & Martin-Santos, R., (2007). Postnatal psychiatric morbidity: A validation study of the GHQ-12 and the EPDS as screening tools. *General Hospital Psychiatry*, 29, 1-7. DOI: 10.1016/j.genhosppsy.2006.10.004

Newham, J.J., & Martin, C.R. (2013). Measuring fluctuations in maternal well-being and mood across pregnancy. *Journal of Reproductive and Infant Psychology*, 31(5), 531-540. DOI: 10.1080/02646838.2013.834040

Nicolson, P. (1986). Developing a feminist approach to depression following childbirth. In S. Wilkinson (Ed.), *Feminist social psychology: Developing theory and practice*. Philadelphia, PA/ Milton Keynes, UK: Open University Press.



- Oates, M. (2003). Postnatal depression and screening: too broad a sweep? *British Journal of General Practice*, 53(493), 596-597. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1314671/>
- O'Cathain, A., Murphy, E., & Nicholl, J. (2008). The quality of mixed methods studies in health services research, *Journal of Health Services Research and Policy*, 13, 92-98. doi: 10.1258/jhsrp.2007.007074
- O'Connor, T.G, Heron, J., Golding, J., Beveridge, M., & Glover, V. (2002). Maternal antenatal anxiety and children's behavioral/emotional problems at 4 years. *British Journal of Psychiatry*, 180, 502- 508
- O'Connor, T.G., Heron, J., Golding, J., Glover, V., & the ALSPAC Study Team. (2003). Maternal anxiety and behavioural/emotional problems in children: A test of a programming hypothesis. *Journal of Child Psychology and Psychiatry*, 44(7), 1025-1036
- O'Hara, M. W., & McCabe, J. E. (2013). Postpartum depression: current status and future directions. *Annual Review of Clinical Psychology*, 9, 379-407. doi: 10.1146/annurev-clinpsy-050212-185612
- O'Hara, M. W., Rehm, L. P., & Campbell, S. B. (1982). Predicting depressive symptomatology: a. Cognitive behavioral models and postpartum depression. *Journal of Abnormal Psychology*, 88, 450-453.
- Olfson, M., Broadhead, W.E., Weissman, M.M., Leon, A.C., Farber, L., Hoven, C.W., & Kathol, R.G. (1996). Subthreshold psychiatric symptoms in a primary care group practice. *Archives of General Psychiatry*, 53(10), 880–886.
- Parfitt, Y., & Ayers, S. (2012). Postnatal mental health and parenting: The importance of parental anger. *Infant Mental Health Journal*, 33(4), 400-410. doi: 10.1002/imhj.21318

- Patton, M.Q. (2002) *Qualitative Research and Evaluation Methods* (3<sup>rd</sup> ed.). Thousand Oaks, C.A.: Sage.
- Paulson, J.F., & Bazemore, S.D. (2010) Prenatal and postpartum depression in fathers and its association with maternal depression: a meta-analysis. *JAMA (The Journal of the American Medical Association)*, 303, 1961–1969. doi:10.1001/jama.2010.605
- Petrozzi, A., & Gagliardi, L. (2013). Anxious and depressive components of Edinburgh Postnatal Depression Scale in maternal postpartum psychological problems. *Journal of Perinatal Medicine*, 41(4), 343-8. doi: 10.1515/jpm-2012-0258
- Pfeiffer, R.S. (2003). An introduction to classic American pragmatism. *Philosophy Now*. Retrieved from [http://philosophynow.org/issues/43/An\\_Introduction\\_to\\_Classic\\_American\\_Pragmatism](http://philosophynow.org/issues/43/An_Introduction_to_Classic_American_Pragmatism)
- Phillips, J., Sharpe, L., Matthey, S., & Charles, M. (2009). Maternally focussed worry. *Archives of Women's Mental Health*, 12, 409-418. DOI: 10.1007/s00737-009-0091-4
- Poobalan, A.S., Aucott, L.S., Ross, L., Smith, W.C., Helms, P.J., & Williams, J.H. (2007). Effects of treating postnatal depression on mother-infant interaction and child-development: Systematic review. *British Journal of Psychiatry*, 191, 378-86. DOI: 10.1192/bjp.bp.106.032789
- Pope, C. J., & Mazmanian, D. (2016). Breastfeeding and Postpartum Depression: An Overview and Methodological Recommendations for Future Research. *Depression Research and Treatment*. Article ID 4765310. DOI: <http://dx.doi.org/10.1155/2016/4765310>
- Public Health England. (2013) *NHS population screening explained*. Retrieved from <https://www.gov.uk/guidance/nhs-population-screening-explained>

Public Health England. (2015) *Evidence review criteria: National screening programmes*.

Retrieved from <https://www.gov.uk/government/publications/evidence-review-criteria-national-screening-programmes>

Rallis, S. (2008). *Postpartum distress across the first postpartum year*. (Unpublished Master's Thesis) RMIT University, Melbourne, Australia.

Rallis, S., Skouteris, H., McCabe, M., & Milgrom, J. (2014). The transition to motherhood: Towards a broader understanding of perinatal distress. *Women and Birth*, 27(1), 68-71. DOI: 10.1016/j.wombi.2013.12.004

Reichert, J. & Zielke, B. (2008) Editorial: Theories that matter. On Some Pragmatic Aspects of Social Constructionism. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 9(1), Retrieved from <http://nbn-resolving.de/urn:nbn:de:0114-fqs0801D5Ed8>.

Reilly, N., Harris, S., Loxton, D., Chojenta, C., Forder, P., & Austin, M.-P. (2014). The impact of routine assessment of past or current mental health on help-seeking in the perinatal period. *Women and Birth*, 27. doi: 10.1016/j.wombi.2014.07.003

Robertson, E., Grace, S., Wallington, T., & Stewart, D.E. (2004). Antenatal risk factors for postpartum depression: a synthesis of recent literature. *General Hospital Psychiatry*, 26(4), 289-95. DOI: 10.1016/j.genhosppsych.2004.02.006

Ross, L.E., Evans, S.E.G., Sellers, E.M., & Romach, M.K. (2003). Measurement issues in postpartum depression 1: anxiety as a feature of postpartum depression. *Archives of Women's Mental Health*, 6(1), 51-57. DOI: 10.1007/s00737-002-0155-1

Ross, L.E., & McLean, L.M. (2006). Anxiety disorders during pregnancy and the postpartum period: A systematic review. *Journal of Clinical Psychiatry*, 67(8), 1285-1298.

- Rowe, H.J., Fisher, J.R.W., & Loh, W.M. (2008). The Edinburgh Postnatal Depression Scale detects but does not distinguish anxiety disorders from depression in mothers of infants. *Archives of Women's Mental Health*, 11, 103–108. DOI: 10.1007/s00737-008-0003-z
- Roy-Byrne, P., Katon, W., Broadhead, W. E., Lepine, J. P., Richards, J., Brantley, P. J., ... Liebowitz, M. (1994). Subsyndromal ("mixed") anxiety-depression in primary care. *Journal of General Internal Medicine*, 9(9), 507-512. DOI: 10.1007/BF02599221
- Rucci, P., Gherardi, S., Tansella, M., Piccinelli, M., Berardi, D., Bisoffi, G., & Corsino, M.A. (2003). Subthreshold psychiatric disorders in primary care: Prevalence and associated characteristics. *Journal of Affective Disorders*, 76(1-3), 171-181.
- Sandelowski, M. (2000) Combining qualitative and quantitative sampling, data collection, and analysis techniques in mixed-methods studies. *Research in Nursing and Health*, 23, 246-255.
- Sanger, C., Iles, J.E., Andrew, C.S., & Ramchandani, P.G. (2015). Associations between postnatal maternal depression and psychological outcomes in adolescent offspring: a systematic review. *Archives of Women's Mental Health*, 18, 147-162. doi: 10.1007/s00737-014-0463-2
- Schaper, A.M., Rooney, B.L., Kay, N.R., & Silva, P.D. (1994). Use of the Edinburgh Postnatal Depression Scale to identify postpartum depression in a clinical setting. *Journal of Reproductive Medicine*, 39(8), 620-624.
- Schwandt, T. A. (1997). *Qualitative Inquiry: A Dictionary of Terms*, Thousand Oaks, C.A: Sage.
- Schwartz, S.M., Trask, P.C., Shanmugham, K., & Oswald Townsend, C. (2004). Conducting psychological research in medical settings: Challenges, limitations and recommendations for effectiveness research. *Professional Psychology: Research and Practice*, 35(5), 500-508. DOI: 10.1037/0735-7028.35.5.500

- Scope, A., Booth, A., & Sutcliffe, P. (2012). Women's perceptions and experiences of group cognitive behaviour therapy and other group interventions for postnatal depression: a qualitative synthesis. *Journal of Advanced Nursing*, 68(9), 1909-19. doi: 10.1111/j.1365-2648.2012.05954.x
- Sharma, V., & Mazmanian, D. (2014). The DSM-5 peripartum specifier: prospects and pitfalls. *Archives of Women's Mental Health*, 17(2), 171-3. doi: 10.1007/s00737-013-0406-3.
- Simpson, W., Glazer, M., Michalski, N., Steiner, M., & Frey, B.N. (2014). Comparative efficacy of the generalized anxiety disorder 7-item scale and the Edinburgh Postnatal Depression Scale as screening tools for generalized anxiety disorder in pregnancy and the postpartum period. *Canadian Journal of Psychiatry*, 59(8), 434-40
- Skouteris, H., Wertheim, E.H., Rallis, S., Milgrom, J., & Paxton, S.J. (2009). Depression and anxiety through pregnancy and the early postpartum: An examination of prospective relationships. *Journal of Affective Disorders*, 113 (3), 303-308. doi: 10.1016/j.jad.2008.06.002
- Slade, P., Morrell, C. J., Rigby, A., Ricci, K., Spittlehouse, J., & Brugha, T. S. (2010). Postnatal women's experiences of management of depressive symptoms: a qualitative study. *British Journal of General Practice*, 60(580). doi: 10.3399/bjgp10X532611
- Smith, J.A. (1999). Towards a relational self: social engagement during pregnancy and psychological preparation for motherhood, *British Journal of Social Psychology*, 38, 409-426. DOI: 10.1348/014466699164248
- Smith, J.A., Flowers, P., Larkin, M. (2009). *Interpretative Phenomenological Analysis: Theory, method and research*. London: Sage.
- Smith, J.A., Jarman, M., & Osorn, M. (1999). Doing Interpretative Phenomenological Analysis. In Murray, M. & Chamberlain, K. (Eds), *Qualitative Health Psychology: Theories and Methods*, London: Sage.

- Spielberger, C.D., Gorsuch, R.L., & Lushene, R.E. (1970). *Manual for the State-Trait Anxiety Inventory (STAI)*. Palo Alto, CA: Consulting Psychologists Press.
- Spies, G., Stein, D. J., Roos, A., Faure, S. C., Mostert, J., Seedat, S., & Vythilingum, B. (2009). Validity of the Kessler 10 (K-10) in detecting DSM-IV defined mood and anxiety disorders among pregnant women. *Archives of women's mental health*, 12(2), 69-74. doi: 10.1007/s00737-009-0050-0
- Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of internal medicine*, 166(10), 1092-1097. DOI: 10.1001/archinte.166.10.1092
- Starks, H., & Trinidad, S. B. (2007). Choose your method: A comparison of phenomenology, discourse analysis, and grounded theory. *Qualitative health research*, 17(10), 1372-1380. DOI: 10.1177/1049732307307031
- Stein, A., Pearson, R.M., Goodman, S.H., Rapa, E., Rahman, A., McCallum, M.,... Pariante, C. (2014). Effects of perinatal mental disorders on the fetus and child. *The Lancet*, 384, 1800-19. doi: 10.1016/S0140-6736(14)61277-0
- Stuart, S., Couser, G., Schilder, K., O'Hara, M., & Gorman, L. (1998). Postpartum anxiety and depression: Onset and comorbidity in a community sample. *Journal of Nervous and Mental Disease*, 186, 420-424.
- Suls, J., Krantz, D.S., & Williams, G.C. (2013). Three strategies for bridging different levels of analysis and embracing the biopsychosocial model. *Health Psychology*, 32(5): 597-601. doi: 10.1037/a0031197
- Sutter-Dallay AL, Giaconne-Marcasche V, Glatigny-Dallay E., & Verdoux, H. (2004) Women with anxiety disorders during pregnancy are at increased risk of intense postnatal depressive symptoms: a prospective survey of the MATQUID cohort. *European Psychiatry*, 19, 459–463. DOI: 10.1016/j.eurpsy.2004.09.025

- Tani, F., & Castagna, V. (2016). Maternal social support, quality of birth experience, and postpartum depression in primiparous women. *The Journal of Maternal-Fetal & Neonatal Medicine*. DOI:10.1080/14767058.2016.1182980
- Teddlie, C. & Tashakkori, A. (2003) Major issues and controversies in the use of mixed methods in the social and behavioural sciences. In Tashakkori, A. & Teddlie, C. (Eds.), *Handbook of Mixed Methods in social and behavioural research* (pp. 3-50). Thousand Oaks, CA: Sage.
- Terry, D. J., Mayocchi, L., & Hynes, G. J. (1996). Depressive symptomatology in new mothers: A stress and coping perspective. *Journal of Abnormal Psychology*, 105(2), 220.
- Thomas, N., Komiti, A., & Judd, F. (2014). Pilot early intervention antenatal group program for pregnant women with anxiety and depression. *Archives of Women's Mental Health*, 17(6), 503-9. doi: 10.1007/s00737-014-0447-2
- Thombs, B.D., Arthurs, E., Coronado-Montoya, S., Roseman, M., Delisle, V.C., & Leavens, A. (2014). Depression screening and outcomes in pregnancy or postpartum: A systematic review. *Journal of Psychosomatic Research*, 76, 433-446. doi: 10.1016/j.jpsychores.2014.01.006
- Thomson, G., Ebisch-Burton, K., & Flacking, R. (2015). Shame if you do - shame if you don't: women's experiences of infant feeding. *Maternal & Child Nutrition*, 11, 36-46. DOI: 10.1111/mcn.12148
- Tomas, J. M., & Oliver, A. (1999). Rosenberg's self-esteem scale: Two factors or method effects. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 84-98. DOI: <http://dx.doi.org/10.1080/10705519909540120>
- Tomes N. (1994). Feminist Histories of Psychiatry, in Micale M. S., & Porter R., (Eds), *Discovering the History of Psychiatry* (pp. 348–83). New York: Oxford University Press.

- Topper, M., Emmelkamp, P.M.G., & Ehring, T. (2010). Improving prevention of depression and anxiety disorders: Repetitive negative thinking as a promising target. *Applied and Preventive Psychology, 14*, 57-71. doi: 10.1016/j.appsy.2012.03.001
- van den Bergh, B.R. H., Mennes, M., Oosterlaan, J., Stevens, V., Stiers, P., Marcoen, A., & Lagae, L. (2005). High antenatal maternal anxiety is related to impulsivity during performance on cognitive tasks in 14- and 15- year olds. *Neuroscience and Biobehavioral Reviews, 29*, 259-269. doi:10.1016/j.neubiorev.2004.10.010
- Van Sonderen, E., Sanderman, R., & Coyne, J. C. (2013). Ineffectiveness of reverse wording of questionnaire items: Let's learn from cows in the rain. *PloS one, 8*(7). DOI: <http://dx.doi.org/10.1371/journal.pone.0068967>
- Watson, D. (2005). Rethinking the mood and anxiety disorders: a quantitative hierarchical model for DSM-V. *Journal of Abnormal Psychology, 114*(4), 522. DOI:10.1037/0021-843X.114.4.522
- Watson, D., Clark, L., Weber, K., & Assenheimer, J. (1995) Testing a tripartite model: II. Exploring the symptom structure of anxiety and depression in student, adult and patient samples. *Journal of Abnormal Psychology, 104*(1), 15-25
- Webb, R., & Ayers, S. (2014). Cognitive biases in processing infant emotion by women with depression, anxiety and post-traumatic stress disorder in pregnancy or after birth: A systematic review. *Cognition and Emotion, 29* (7). DOI:10.1080/02699931.2014.977849
- Wenzel, A., Haugen, E.N., Jackson, L.C., & Brendle, J.R., 2005. Anxiety symptoms and disorders at eight weeks postpartum. *Journal of Anxiety Disorders, 19*, 295-311. DOI: 10.1016/j.janxdis.2004.04.001
- West, D. (1996). *An introduction to continental philosophy*, Cambridge, U.K: Polity Press.



- Whiffen, V.E., & Johnson, S.M. (1998). An Attachment Theory Framework for the Treatment of Childbearing Depression. *Clinical Psychology: Science and Practice*, 5 (4), 478–493. DOI: 10.1111/j.1468-2850.1998.tb00168.x
- Whooley, M.A., Avins, A.L., Miranda, J., & Browner, W.S. (1997). Case-finding instruments for depression: Two questions are as good as many. *Journal of General Internal Medicine*, 12(7), 439-445.
- WHO (2003). *Global Strategy for Infant and Young Child Feeding*. World Health Organization: Geneva. Retrieved from <http://www.who.int/nutrition/publications/infantfeeding/9241562218/en/>
- WHO/UNICEF (2014). *Global Nutrition Targets 2025: breastfeeding policy brief*. World Health Organization / UNICEF. Retrieved from [http://www.who.int/nutrition/publications/globaltargets2025\\_policybrief\\_breastfeeding/en/](http://www.who.int/nutrition/publications/globaltargets2025_policybrief_breastfeeding/en/)
- Williamson, J. A., O'Hara, M. W., Stuart, S., Hart, K. J., & Watson, D. (2015). Assessment of postpartum depressive symptoms the importance of somatic symptoms and irritability. *Assessment*, 22(3), 309-318. doi: 10.1177/1073191114544357
- Willig, C. (2008). *Introducing qualitative research in psychology*, Berkshire, U.K.: Open University Press
- Willig, C. (1999). Beyond appearances: A critical realist approach to social constructionism. In Nightingale, D.J. and Cromby, J. (Eds.). *Social Constructionist Psychology: A critical analysis of theory and practice* (pp37-51). Milton Keynes: Open University Press.
- Wisner, K. L., Sit, D. K., McShea, M. C., Rizzo, D. M., Zoretich, R. A., Hughes, C. L., ... Confer, A. L. (2013). Onset timing, thoughts of self-harm, and diagnoses in postpartum women with screen-positive depression findings. *JAMA Psychiatry*, 70(5), 490-498. doi: 10.1001/jamapsychiatry.2013.87

- Wolman, W. L., Chalmers, B., Hofmeyr, G. J., & Nikodem, V. C. (1993). Postpartum depression and companionship in the clinical birth environment: a randomized, controlled study. *American Journal of Obstetrics and Gynecology*, 168(5), 1388-1393.
- Woolhouse, H., Brown, S., Krastev, A., Perlen, S., & Gunn, J. (2009). Seeking help for anxiety and depression after childbirth: Results of the maternal health study. *Archives of Women's Mental Health*, 12, 75-83
- Zhong, Q.-Y., Gelaye, B., Zaslavsky, A.M., Fann, J.R., Rondon, M.B., Sanchez, S.E., & Williams, M.A. (2015). Diagnostic validity of the generalized anxiety disorder -7 (GAD-7) among pregnant women. *PLoS ONE*, 10(4).  
<http://dx.doi.org/10.1371/journal.pone.0125096>
- Zigmond, A.S., & Snaith, R.P. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica*, 67(6), 361-370