# An evaluation of mindfulness-based childbirth and parenting courses for pregnant women and prospective fathers/partners within the UK NHS (MBCP-4-NHS)☆

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## ARTICLE INFO

## ABSTRACT

An evaluation of mindfulness-based childbirth and parenting courses for pregnant women and prospective fathers/partners within the UK NHS (MBCP-4-NHS).

*Objective*: To explore the usefulness within the National Health Service (NHS) of a brief (four week, ten hour) course based upon the Mindfulness Based Childbirth and Parenting (MBCP) programme (Duncan and Bardacke, 2010) described here as MBCP-4-NHS.

*Background*: The National Maternity Review (2016) and report of The Independent Mental Health Taskforce to the NHS (2016a, 2016b) in England highlight the need for significant investment into perinatal mental health services, with the Government pledging funding to improve such services through a range of measures. Whilst the field of mindfulness during the perinatal period is in need of well controlled trials and studies exploring the mechanisms of action (Hall et al., 2016) the limited research to date supports the potential for mindfulness based interventions in pregnancy and the need for further scientific study in this area (Dhillon et al., 2017; Shi and Macbeth, 2017). Particularly because it may broaden women's repertoire of coping strategies with the potential to improve the developmental trajectory of both parents and infants (Dunn et al., 2012; Duncan and Bardacke, 2010; Vieten and Astin, 2008). However, most of the studies to date have involved lengthy courses of around 8–9 weeks (24 h) duration, which may not be feasible or economical within a UK NHS setting and therefore, would be unlikely to be adopted as routine practice.

*Design*: An initial pilot study to discover if MBCP-4-NHS is acceptable and feasible within NHS maternity services, comparing maternal and paternal pre and post intervention self-report measures of mental health to begin to explore the effectiveness of this intervention.

*Setting*: NHS antenatal education classes held in children's centres for expectant parents across Oxfordshire.

*Participants*: All expectant parents receiving Oxfordshire maternity services between October 2014 and January 2015 were invited to self-refer into the intervention, of which 155 individuals (86 women and 69 men) took part.

*Intervention*: 'MBCP-4-NHS' – A brief (four week, ten hour) course developed from the nine week Mindfulness Based Childbirth and Parenting (MBCP) intervention.

*Measures*: Self-report measures of mental health including low mood/depression, mindfulness, stress, anxiety, pregnancy related distress and experiences.

*Findings*: The results showed a significant increase in both maternal and paternal mental health with women demonstrating a significant improvement in symptoms of stress, anxiety, depression, pregnancy-related distress, labour worry and positive and negative pregnancy experiences; and men improving significantly in symptoms of anxiety, depression and showing a trend for improvement in self-reported symptoms of perceived stress.

*Conclusions*: This is a promising antenatal intervention that can be feasibly implemented within NHS which might have the potential to impact upon parental mental health and, therefore, possibly also the health of next generation. However, caution is needed interpreting these findings given that this study did not include an active control group.

*Implications for practice*: This research provides a clear rationale and justification for a large randomised control trial of this intervention within the NHS, which should include a more diverse population, across multiple centres and should explore both the potential health benefits for parents and infants/children as well as potential economic costs/benefits.

## Introduction

It is well documented that perinatal depression and stress represent significant health issues, with approximately 1 in 5 women experiencing depression, anxiety, or other emotional difficulties during pregnancy, birth and the postnatal period (DoH, 2007, 2011 Davé, 2010, IMHT, 2016). Studies suggest the prevalence of prenatal anxiety and depression ranges from 13% to 21% and the postpartum prevalence ranging from 11% to 17% (Fairbrother et al., 2015). These issues have serious detrimental effects with perinatal psychiatric disorder being a leading cause of maternal mortality for the last two decades, contributing to 15% of all maternal deaths in pregnancy, and the first six months postpartum (Lewis, 2011), largely as a result of deaths by suicide. Furthermore, parental mental health problems during the perinatal period have the potential to interfere with mother-child interactions (Stein et al., 2012) and child emotional, behavioural and cognitive outcomes (Luoma et al., 2001; O'Connor, Heron and Glover, 2002; Ramchandani et al., 2008). For example, research suggests that if a mother is in the top 15% for symptoms of anxiety or depression while pregnant, her child has double the risk of a probable mental disorder by the age of thirteen (Talge et al., 2007). Why is unclear, it could be due to environmental, genetic, factors, or both, or may be mediated by many other factors. However, questions around which type of parental intervention might improve child and parent outcomes, whether an intervention should be delivered as a treatment or prevention, and through which mechanisms of action these interventions might work has formed the basis for many studies over the last three decades. For postpartum depression alone interventions investigated have included those based upon Interpersonal and Cognitive-Behavioural models (Werner et al., 2015).

Importantly, it is not only diagnosable mental illness in mothers which is associated with poorer outcomes for children, but also a range of objective stressors and subjective stresses (including symptoms at subclinical levels Glover, 2014). Reducing perinatal distress is a vital public health goal and recent Department of Health reports have continued to call for evidence-based interventions, targeting families at risk of mental health difficulties as well as offering improvements in antenatal education (McMillan et al., 2009; Marmot, 2010; DoH, 2010, 2011). Improving life chances for children and families through robust mental health is also crucial to addressing health and social inequalities in the UK (Marmot, 2010). The question remains, however, of how best to do this without increasing stigmatisation and whilst also promoting social inclusion. A universal, population-based, antenatal education programme addressing the needs of all, whilst teaching skills that decrease vulnerability to stress, anxiety and depression would seem optimal. If such an intervention was also able to offer these skills to both expectant mothers and prospective fathers/partners this would also provide the whole family with the best possible chance of optimal mental health. A systemic inclusive community/public health approach also seems potentially more powerful and synergistic than an intervention targeting only one individual or dyad. Indeed, an evaluation of mindfulness classes for staff in maternity services in the UK NHS services in Oxford recently indicated a positive impact not only on personal factors but also in the organisational domain (Warriner et al., 2016).

Research continues to evolve demonstrating that the practice of mindfulness can generate improvements in a wide range of psychological and physiological health conditions (Woolhouse et al., 2014; Surawy et al., 2015; Liu et al., 2013; Dunn et al., 2012; Duncan and Bardacke, 2010; Dimidjian and Goodman, 2009; Grossman et al., 2004; Khoury et al., 2013). Although it is important to note that many of the studies in the field remain exploratory, have methodological weaknesses and/or do not include active control conditions (Dimidjian and Segal., 2015), a recent systematic review and meta-analysis of mindfulness-based interventions concluded that mindfulness meditation improves pain, depression symptoms and quality of life (Hilton et al., 2017). Indeed Mindfulness-Based Cognitive Therapy (MBCT) has been shown through high-quality Randomised Controlled Trials (RCT's) to significantly reduce the recurrence of depression (Hofman et al., 2010; Kuyken et al., 2016) and now forms part of the UK National Institute of Clinical Excellence (NICE) guidelines for the prevention of depression (NICE, 2009). In addition, an RCT exploring the Mindfulness-Based Stress Reduction Programme (MBSR) for patients with chronic pain, chronic illness and stress concluded that the programme was not only associated with improvements in several patient-centred outcomes, including pain and psychological symptoms over a 1-year period, it also led to reductions in health service utilisation (primary care and emergency department services) up to 18-months later (McCubbin et al., 2014). Similarly MBCT was also shown to reduce Canadian non-mental health care service utilisation 1-year post-therapy compared controls (Kurdyak et al., 2014).

Since mindfulness based programmes have been shown to be helpful for pain and depression at other points in the life-cycle and have the potential to reduce use of health services the potential for these interventions during the perinatal period has begun to be explored (Dimidjian et al., 2015; Woolhouse et al., 2014; Guardino et al., 2013; Dunn et al., 2012; Duncan and Bardacke, 2010). Duncan and Bardacke (2010) observed a decrease in pregnancy anxiety and an increase in mindfulness and positive affect following a nine-week Mindfulness-Based Childbirth & Parenting (MBCP) course but this was not a controlled study. Nor was a study by Dunn et al. (2012) which found that 75% of participants in a mindfulness treatment group experienced a decrease in stress symptoms, and 67% showed positive change in levels of stress and self-compassion at three-month follow-up. Similarly, in a non-randomised study Dimidjian et al. (2015) found that their perinatal mindfulness intervention showed promise as an acceptable, feasible, and clinically beneficial brief psychosocial prevention option for pregnant women with histories of depression.

Woolhouse et al. (2014) designed and conducted a study of in two parts (1) a non-randomised trial targeting women at risk of mental health problems (a selected population; $n = 20$) and (2) a randomised controlled trial (RCT) of a universal population ($n = 32$) receiving either a 6-week mindfulness-based programme or care as usual. Significant improvements were noted for depression, anxiety and mindfulness scores for the selected population in the non-randomised study, and significant improvements were noted in anxiety and mindfulness scores in the randomised trial with a non-clinical population. In one of the first randomised controlled pilot trials of a mindfulness meditation intervention during pregnancy Guardino and colleagues (2013) found some evidence that mindfulness training during pregnancy may effectively reduce pregnancy related anxiety and worry.

More recently a systematic review and meta-analysis of mindfulness-based interventions in pregnancy found that mindfulness-based interventions may be beneficial for outcomes such as anxiety, depression, perceived stress and levels of mindfulness (Dhillon et al., 2017). Similarly a systematic review of the effectiveness of mindfulness-based interventions (MBIs) on maternal perinatal mental health outcomes offered preliminary evidence for the effectiveness of MBIs in reducing perinatal anxiety. The review suggested that as MBIs are a non-pharmacological approach to maternal distress likely to be acceptable to women in pregnancy they could therefore be integrated into existing programs of pregnancy care (Shi and Macbeth, 2017).

Of these interventions, MBCP teaches both the skill of mindfulness meditation as well as traditional antenatal education regarding the process and physiology of childbirth, positions for labour etc. and moves beyond the birth into parenting (Duncan and Bardacke, 2010). Furthermore, it includes all of the original components of the traditional MBSR programme and involves fathers/birth partners as equal participants, although the impact on paternal mental health was not explored in this paper (Duncan and Bardacke, 2010). The Mindfulness Based Childbirth and Parenting (MBCP) approach is informed by revised Stress and Coping Theory (Folkman, 1997) and mindfulness theory (Brown et al., 2007; Wallace and Shapiro, 2006; Kabat-Zinn, 2003). Mindfulness allows for an appraisal process involving greater flexibility and accuracy of perception in the moment, as well as greater acceptance of and less mental reactivity to whatever is taking place on a somatic, cognitive, affective or behavioural level (Duncan and Shaddix 2015). This capacity for being fully present when applied during childbirth supports the process of labour, both psychologically and physiologically (Bardacke, 2012). Mindfulness practice also increases positive affect (Bränström and Duncan, 2014) which serves as a restorative resource to support adaptive coping with stress (Folkman and Moskowitz, 2000). Mindfulness applied in the moment-to-moment process of parenting could also support interpersonal, present-centred, non-judgmental awareness and compassion (Duncan et al., 2009), thereby promoting healthy parent-child attachment (Duncan and Shaddix, 2015).

Crucially, MBCP has also been investigated in a brief 18-h form known as Mind-in-Labor (MIL) (Duncan et al., 2014) with a RCT ($n = 30$) comparing MIL program participants with those who had attended a standard childbirth preparation class without a mind-body focus (Duncan et al., 2017). Compared to the controls, "MIL participants showed greater childbirth self-efficacy and mindful body awareness (but no changes in dispositional mindfulness), lower post-course depression symptoms that were maintained through postpartum follow-up, and a trend toward a lower rate of opioid analgesia use in labor" (Duncan et al., 2017). For the reasons outlined above and with the financial constraints of the UK NHS in mind, including the fact that many traditional NHS antenatal education programmes are only a few hours long, (Barlow et al., 2009; McMillan et al., 2009) it was decided that a brief MBCP based-programme was the most suitable mindfulness-based programme for investigation within the NHS services.

In summary, several studies have suggested that the acquisition of mindfulness skills appears to have a positive impact on the mental health and well-being of pregnant women and perhaps also their families. In ad-

dition, although these skills are applicable to pregnancy, childbirth and parenting, perhaps more importantly they are transferrable skills for life, that can be applied at a systemic level for communities and public health which may reduce health service utilisation and promote social inclusion. This pilot study explores whether a brief mindfulness-based childbirth and parenting programme can be feasibly implemented within NHS maternity services as well as some potential maternal and paternal outcomes which, if shown to be promising in this pilot, could later be more fully evaluated in terms of effectiveness and efficacy through a larger controlled trial study.

## Methods

### Participants

Study participants were self-referrals to face-to-face Mindfulness-Based Childbirth and Parenting (MBCP) courses from Oxfordshire maternity services. 155 individuals (86 women and 69 men) took part in the MBCP courses between October 2014 and January 2015. Of these, 100 participants (64 women and 36 men) completed the pre-course questionnaires and 55 participants (36 women and 19 men) completed both pre and post course questionnaires.

### Procedure

Posters advertising the MBCP course were displayed in the maternity department and community midwife clinics around Oxfordshire. A series of courses were conducted from October 2014 to January 2015, taught by two members of the Oxford University Hospitals MBCP trained midwives team who adhere to the UK guidelines for teaching mindfulness-based courses (UK Mindfulness-Based Teacher Trainer Network, 2011). Pregnant women were invited to attend the courses and to bring with them their birth partner (often the expectant father) or otherwise to bring along a course partner, such as a friend. Individuals consented to participate in the course evaluation and study prior to the start of their course (study participation was optional and not necessary to take the MBCP courses, see below). Data was collected via questionnaires distributed to participants before the course and immediately after the course.

### Consent

When potential participants enquired about the MBCP course they were provided with study information. Ten days prior to the course commencing, registered participants were sent further course information along with the pre-course questionnaire and consent form. Those participants who were interested in taking part in the study provided informed consent at this point. Explicit consent was sought for the use of anonymised narrative quotes in published work. The study was reviewed by London – Chelsea Research Ethics Committee, REC reference 15/LO/1697.

### Intervention

The adapted MBCP-4-NHS course consisted of 4, weekly 2.5 h evening sessions (10 h), combining traditional antenatal teaching with mindfulness based skills and was based on the 'Mind in Labor' MBCP based course developed by Nancy Bardacke (Duncan et al., 2014). MBCP-4-NHS included formal and informal mindfulness meditations (such as the body scan, mindfulness of the breath, mindfulness of daily activities, inter-connectedness with the baby), practiced both during the classes and at home, with a recommendation that participants should engage in daily home practice. These mindfulness meditation practices

were interwoven with antenatal-education taught with a mindful attitude of non-striving, kindness/compassion, beginners-mind, patience, trust, non-judging, acknowledging or accepting and letting go.

*Measures*

The following measures were taken up to two weeks before and two weeks after the course:

1. *Edinburgh Postnatal Depression Scale:* (EPDS: Cox et al., 1987). This 10-question self-rating scale has been proven to be an efficient and effective way of identifying patients at risk for perinatal depression. While this test was specifically designed for women who are pregnant or have just had a baby, it has also been shown to be an effective measure for general depression in the larger population. It is quick to complete, approximately 5 min, and cut-offs of 9/10 indicate possible depression, 12/13 likely depression. Cronbach's $\alpha$ = 0.900 for mothers and 0.811 for fathers.
2. *Five Factor Mindfulness Questionnaire (FFMQ):* The *FFMQ* is used as a pre- and post-measure of mindfulness disposition. It measures five facets of mindfulness as it is currently conceptualised, observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience and has been shown to be a reliable, acceptable model fit (Bohlmeijer et al., 2011). The FFMQ-SF ranges from 24 (low) to 120 (high) with each question scored from 1 to 5. Cronbach's $\alpha$ = 0.856 for mothers and 0.863 for fathers.
3. *The Perceived Stress Scale*: (PSS: Cohen et al., 1983) This is the most widely used psychological instrument for measuring the perception of stress. It is a measure of the degree to which situations in one's life are appraised as stressful. The questions are of a general nature and hence are relatively free of content specific to any sub-population group. The questions in the PSS ask about feelings and thoughts during the last month and respondents are asked to rate on a scale of 0–40 how often they felt a certain way. Cronbach's $\alpha$ = 0.913 for mothers and 0.904 for fathers.
4. *The Generalised Anxiety Disorder Scale:* (GAD-7: Spitzer et al., 2006) is a rating scale designed specifically for assessing symptom severity of generalised anxiety disorder. Scores range from 0 to 21. Cut-offs are 5, 10 and 15 for mild, moderate and severe anxiety respectively. Cronbach's $\alpha$ = 0.897 for mothers and 0.849 for fathers.
5. *Tilbury Pregnancy Distress Scale:* (TPDS: Pop et al., 2011) This is a 16-item self-rating scale of pregnancy specific psychological functioning for the previous 7 days and ranges from 0 to 48. It includes a perceived partner involvement subscale (range 0–12). Cronbach's $\alpha$ = 0.826 for mothers and 0.737 for fathers.
6. *Oxford Worries about Labour Scale* (OWLS: Redshaw et al., 2009). This is a 10 item multi-dimensional self-report measure of mothers' worries and concerns about labour and birth. It assesses three dimensions of women's worries: labour pain and distress, pre-labour uncertainty and interventions. The scale has a range of 10–40 with 10 being the highest level of worry. Cronbach's $\alpha$ = 0.797 for mothers (fathers not measured).
7. *Pregnancy Experience Scale* (PES-brief: DiPietro et al., 2008). The PES evaluates maternal appraisal of positive and negative stressors during pregnancy; the PES-Brief consists of the top 10 items endorsed as pregnancy hassles and 10 pregnancy uplifts. Frequency scores are calculated by counting the number of endorsed questions for positive and negative frequency scores; previous mean scores are 6.5–7.5 for hassles and 9.5 for uplifts. Intensity scores are calculated by summing the scores for hassles or uplifts and dividing them by the frequency score; previous mean scores are 1.4 for hassles and 2.4 for uplifts. Cronbach's $\alpha$ for the positive subscale (uplifts) = 0.672 and the negative subscale (hassles) = 0.850, for mothers (fathers not measured).

Pregnant women were asked to complete the measures in full, whereas expectant fathers were asked to complete all measures except the final item of the TPDS (pertaining to weight gain from being pregnant), and the OWLS and the PES, which both relate to being pregnant and are therefore not relevant to fathers-to-be.

*Data analysis*

The questionnaire data was analysed using SPSS to generate descriptive statistics. SPSS is among the most widely used programs for statistical analysis in social science. Paired *t*-tests were conducted to evaluate any change in outcomes pre- to post-course.

**Results**

*Data checks*

The data was checked for outliers and issues with score distribution. Shapiro Wilk's tests indicated significantly non-normal scores for the sample of mothers for the frequency of pre-course uplifts, $W(34) = 0.255$, $p = .000$, and hassles, $W(34) = 0.220$, $p = .000$. Interpreting these results in conjunction with histograms, the analyses using the PES was conducted using bootstrapped testing. Missing data was marked as missing in SPSS and not included in analysis. Where questionnaires were missing they were not included, and identified in the tables by the 'n' number.

*Sample characteristics*

Data from one-hundred participants was taken from October 2014 to January 2016 over eight MBCP courses ($n$ = 13, 15, 14, 16, 10, 12, 12 and 8, respectively); 64% of the sample were expectant mothers and all course partners to attend were expectant fathers. Fifty-five participants completed both pre and post-course measures, consisting of thirty-six mothers and nineteen fathers, although one expectant mother did not complete the post-course TPDS and two mothers did not complete the post-course OWLS or the PES.

*Prospective mothers: Pre-course sample of all prospective mothers who completed a pre-course questionnaire ($n$ = 64)*

In terms of trimester, 57.1% ($n$ = 36) of women were in their third trimester and 42.9% ($n$ = 28) were in their second trimester (1 missing data). No participants started the course during the first trimester.

The age range of mothers-to-be was 23–42 years and the mean age was 34 years.

Of the women attending, 73.4% were expecting their first baby ($n$ = 47) and 26.6% ($n$ = 17) had given birth previously.

The majority of the sample was married, with 71.7% ($n$ = 43), 23.3% ($n$ = 14) cohabiting, 3.3% ($n$ = 2) living separately to their partner, 1.7% ($n$ = 1) divorced or separated and 3.1% ($n$ = 2) single. The average relationship length of those currently in relationships ($n$ = 95, both men and women) was 8 years, with a range of 11 months-20 years.

Most women had completed higher education with 86.4% ($n$ = 51) of mothers having degrees or postgraduate degrees. A majority owned their homes, with 57.4% ($n$ = 35) of mothers as homeowners; 36.1% ($n$ = 22) renting and the remainder either living with parents, with their partner or in their workplace ($n$ = 4). Most women were employed with 63.9% ($n$ = 39) employed full-time, 23% ($n$ = 14) employed part-time, 4.9% ($n$ = 3) students, and 8.2% ($n$ = 5) unemployed.

No mothers stated that they smoked; 13.4% ($n$ = 8) of mothers reported drinking alcohol (1 reported 'moderate' and 7 reported 'little' amounts).

*Prospective fathers: Pre-course sample of all prospective fathers who completed a pre-course questionnaire ($n$ = 36).*

In terms of trimester, 50% ($n$ = 18) of fathers stated that their partner was in her third trimester and 50% ($n$ = 18) in her second trimester.

The age range of fathers-to-be was 27–51 years and the mean was 35 years. In terms of relationship status, 72.2% ($n$ = 26) of fathers were married, 25% ($n$ = 9) were cohabiting with their partners and 2.8%

($n = 1$) living separately to their partner; 11.1% ($n = 4$) of expectant fathers already had children.

Most fathers had completed higher education with 80% ($n = 28$) of fathers reporting that they had degrees or postgraduate degrees. A majority owned their homes, with 60% ($n = 21$) of fathers being homeowners, 37.1% ($n = 13$) renting and 2.9% ($n = 1$) living in their workplace ('other'). Only 5.7% ($n = 2$) fathers were students with the remaining 94.3% ($n = 33$) employed full-time.

One father stated that they smoked; 80.4% ($n = 26$) drank alcohol (18 'little' and 8 'moderate') amounts.

*Study sample (prospective mothers (n = 36) and fathers (n = 19) completing both pre and post course questionnaires)*

Study sample characteristics are outlined in the below tables. The sample has been split into two so that women and men are examined separately as they are not independent of each other. All expectant partners were male and no prospective mothers or fathers reported smoking.

| Mothers-to-be participant characteristics n = 36 | % | n |
|---|---|---|
| Age (range 29–41 years) | Mean: 35 years | |
| Relationship status (1 living separately, 2 missing data) | | |
|     Married | 64.7 | 22 |
|     Cohabiting | 32.4 | 11 |
| Relationship length (range 1–20 years) | Mean: 9 years | |
| Educated to degree or postgraduate level | 90.3 | 28 |
| Currently employed (3 missing data) | | 29 |
|     Full-time | 60.6 | 20 |
|     Part-time | 27.3 | 9 |
| Accommodation (1 living in workplace, 3 missing data) | | |
|     Homeowner | 57.6 | 19 |
|     Renting | 39.4 | 13 |
| Previously given birth (3 missing data) | 36.1 | 13 |
|     Emergency Caesarean | 8.3 | 1 |
|     Vaginal | 41.7 | 5 |
|     Ventouse | 5.2 | 2 |
|     Elective Caesarean | 16.7 | 2 |
| Trimester (1 missing data) | | |
|     Second | 45.7 | 16 |
|     Third | 54.3 | 19 |
| Currently drinking alcohol (3 missing data) amount: little | 15.6 | 5 |

| Fathers-to-be participant characteristics n = 19 | % | n |
|---|---|---|
| Age (range 30–51 years) | Mean: 36 years | |
| Relationship status | | |
|     Currently married | 57.9 | 11 |
|     Currently cohabiting | 42.1 | 8 |
| Relationship length (range 2–21 years) | Mean 8.5 years | |
| Educated to degree or postgraduate level | 72.7 | 14 |
| Currently employed full-time (1 student) | 94.7 | 18 |
| Accommodation (1 living in workplace, 1 missing data) | | |
|     Homeowner | 57.9 | 11 |
|     Renting | 36.8 | 7 |
| Has children | 19.1 | 4 |
| Trimester | | |
|     Second | 57.9 | 11 |
|     Third | 42.1 | 8 |
| Currently drinking alcohol (1 missing data) Amount: 8 little, 6 moderate | 77.7 | 14 |

| Measure | Mothers | | | Fathers | | | Norms |
|---|---|---|---|---|---|---|---|
| | N | Mean | SD | n | Mean | SD | |
| PSS stress | 64 | 18.27 | 6.97 | 36 | 15.22 | 6.77 | 11.9–14.7 |
| GAD-7 anxiety | 63 | 7.17 | 5.37 | 36 | 4.58 | 3.75 | 2.7–3.8 |
| EPDS pregnancy depression | 64 | 8.58 | 5.54 | 36 | 4.94 | 3.88 | 7.6 |
| TPDS pregnancy distress | 64 | 17.47 | 7.91 | 36 | 12.36 | 6.25 | 10.67 |
| OWLS labour worry | 62 | 25.61 | 6.21 | – | – | – | 25.15 |
| PES positive frequency | 60 | 8.33 | 2.02 | – | – | – | 6.5–7.5 |
| PES negative frequency | 60 | 7.58 | 2.55 | – | – | – | 9.5 |
| PES positive intensity | 60 | 2.16 | 0.82 | – | – | – | 2.4 |
| PES negative intensity | 60 | 1.67 | 0.44 | – | – | – | 1.4 |
| FFMQ mindfulness | 63 | 76.78 | 11.21 | 36 | 82.28 | 11.91 | 74–75 |

*Baseline mood of pre-course questionnaire completers (n = 64 mothers and n = 36 fathers)*

Baseline scores indicated a pre course sample of prospective mothers who were highly stressed, anxious and distressed with a moderate level of depressive symptoms. The mothers reported a typical amount of labour worry and high level of positive pregnancy experiences and low negative pregnancy experiences. The score for mindfulness is similar to previous research with a similar sample of pregnant women (Duncan and Bardacke 2010; Woolhouse et al., 2014).

The pre course sample of men appeared healthier with a lower (but still higher than normal) level of stress and low levels of anxiety, depression and distress. The male sample also had a higher reported level of dispositional mindfulness than average (Gambrel and Piercy 2015).

*Baseline mood of pre and post course questionnaire completers: prospective mothers (n = 36) and fathers (n = 19) who completed both pre-course and post-course questionnaires.*

All baseline scores of all measures for those prospective mothers ($n = 36$) and fathers ($n = 19$) who completed both pre-course and post-course questionnaires were analysed as a sub-sample in order to see how these compared to the sample as a whole.

Comparing expectant mothers who completed and did not complete the post-course measures, non-completers ($n = 28$) had a significantly more recent date of birth (1982) than completers ($n = 35$, 1980), $t(45.77) = 2.12$, $p < .05$ (equal variances not assumed). Study completers also had significantly higher anxiety scores at baseline (non = completers: $m = 5.37, sd = 5.51$, completers: $m = 8.53, sd = 4.90$), $t(61) = -2.40$, $p < .05$ (bootstrapped 95% CIs: $-5.87, -0.57$).

| Measure | Mothers | | | Fathers | | | Norms |
|---|---|---|---|---|---|---|---|
| | n | Mean | SD | n | Mean | SD | |
| PSS stress | 36 | 19.19 | 7.03 | 19 | 14.58 | 5.72 | 11.9–14.7 |
| GAD-7 anxiety | 36 | 8.53 | 4.90 | 19 | 4.42 | 3.37 | 2.7–3.8 |
| EPDS pregnancy depression | 36 | 9.36 | 5.22 | 19 | 4.74 | 3.40 | 7.6 |
| TPDS pregnancy distress | 36 | 18.47 | 8.25 | 19 | 13.21 | 6.84 | 10.67 |
| OWLS labour worry | 35 | 26.71 | 5.51 | – | – | – | 25.15 |
| PES positive frequency | 34 | 8.03 | 2.25 | – | – | – | 6.5–7.5 |
| PES negative frequency | 34 | 7.74 | 2.54 | – | – | – | 9.5 |
| PES positive intensity | 34 | 2.02 | 0.49 | – | – | – | 2.4 |
| PES negative intensity | 34 | 1.70 | 0.42 | – | – | – | 1.4 |
| FFMQ mindfulness | 35 | 75.26 | 11.66 | 19 | 82.79 | 10.90 | 74–75 |

The mothers in the pre-post course completers sample had high scores for stress and distress. Anxiety and depression scores were moderate. Labour worry was comparable to study norms. Pregnancy experience uplift scores were higher and hassles scores lower than previously found but intensity of experiences was comparable to previous samples (Chan, 2014).

The fathers in the study sample had low scores for anxiety, depression and distress and their stress score were within population norms. Their mean score for mindfulness, was higher than the female sample and higher than previous research (Gambrel and Piercy 2015).

There were no significant differences between men who completed or did not complete the post-course measures.

*Prospective mothers (n−36): change in mood pre to post course for questionnaire completers*

Paired *t*-tests showed that all scores improved and were statistically significant for prospective mothers, except for positive pregnancy experience (uplifts) intensity. See table and Appendix A graphs.

| Measure | n | Pre-course mean | SD | Post-course mean | SD | 95% CIs | t(df) | p | Hedge's g ES |
|---|---|---|---|---|---|---|---|---|---|
| PSS | 36 | 19.19 | 7.03 | 15.06 | 5.86 | 2.14, 6.14 | 4.20(35) | **<.001** | 0.63 |
| GAD7 | 36 | 8.53 | 4.90 | 5.08 | 4.18 | 1.72, 5.17 | 4.05(35) | **<.001** | 0.75 |
| EPDS | 36 | 9.36 | 5.22 | 6.28 | 4.10 | 1.58, 4.58 | 4.17(35) | **.000** | 0.65 |
| TPDS | 35 | 18.20 | 8.21 | 13.17 | 7.71 | 2.19, 7.87 | 3.59(34) | **.001** | 0.62 |
| OWLS | 33 | 27.09 | 5.41 | 29.39 | 5.67 | −4.52, −0.08 | −2.11(32) | **.042** | −0.41 |
| *Uplifts frequency | 32 | 8.16 | 2.26 | 8.84 | 1.80 | −1.25, −0.19 | −2.47(31) | **.020** | −0.33 |
| *Uplifts intensity | 32 | 2.06 | 0.48 | 2.18 | 0.40 | −0.23, 0.01 | −1.80(31) | .086 | −0.25 |
| *Hassles frequency | 32 | 7.69 | 2.61 | 6.56 | 2.73 | 0.38, 1.87 | 2.86(31) | **.013** | 0.42 |
| *Hassles intensity | 32 | 1.71 | 0.43 | 1.46 | 0.42 | 0.12, 0.37 | 3.90(31) | **.003** | 0.57 |
| FFMQ | 35 | 75.26 | 11.66 | 83.80 | 11.47 | −12.8, −4.29 | −4.08(34) | **<0.001** | −0.73 |

Significant changes in bold. 0.2 indicates approximate small ES.
*analyses showing bootstrapped (based on 1000 samples) confidence intervals and *p* values owing to non-normal distribution
NB The OWLS measure is reverse scored.

Of note, perceived stress mean score post-course is near population norms, where the pre-course score was high; anxiety score has reduced to the 'mild' cut-off; depression scores no longer almost meet the cut-off for potential depression (10). See individual outcome graphs Appendix A.

*Prospective fathers (n = 19): change in mood pre to post course for questionnaire completers*

Paired *t*-tests showed that anxiety and depression symptoms improved significantly pre to post-course, with a trend for perceived stress to also improve. Mindfulness increased pre to post-course. Pregnancy-related distress did not change significantly pre to post course. See table and Appendix B graphs.

| Measure | n | Pre-course mean | SD | Post-course mean | SD | 95% CIs | t(df) | p | Hedge's g ES |
|---|---|---|---|---|---|---|---|---|---|
| PSS | 19 | 14.58 | 5.72 | 12.21 | 5.75 | −0.08, 4.82 | 2.03(18) | .057 | 0.40 |
| GAD7 | 19 | 4.42 | 3.37 | 3.26 | 2.81 | 0.25, 2.07 | 2.67(18) | **.016** | 0.37 |
| EPDS | 19 | 4.74 | 3.40 | 3.32 | 2.81 | 0.17, 2.67 | 2.39(18) | **.028** | 0.45 |
| TPDS | 19 | 13.21 | 6.84 | 11.79 | 6.63 | −0.36, 3.21 | 1.67(18) | .112 | 0.21 |
| FFMQ | 19 | 82.79 | 10.90 | 89.11 | 10.17 | −10.62, −2.01 | −3.08(18) | **.006** | −0.59 |

Significant changes in bold. 0.2 indicates approximate small ES.

## Discussion

The aim of this pilot study was to explore the feasibility of implementing a brief Mindfulness-Based Childbirth and Parenting (MBCP) course into UK NHS services (MBCP-4-NHS) and to explore the potential of a few outcome measures for a larger RCT. Previous research has started to evaluate MBCP courses for mood improvements during and after pregnancy, but thus far this research has been limited to the USA, sample sizes are small, general and pregnancy related measures have not always both been included and partners/father outcomes have not been included in the data. This study included a larger sample size, from NHS maternity services users in Oxfordshire, UK, and included partners all of whom were the father of the baby. The results showed that pregnant women improved significantly post MBCP-4-NHS in terms of self-reported symptoms of perceived stress, anxiety, depression, pregnancy-related distress, labour worry and positive and negative pregnancy

experiences (the frequency of these experiences and the intensity of positive experiences). Partners (fathers) improved significantly post MBCP-4-NHS in self-reported symptoms of anxiety, depression and showed a trend for improvement in self-reported symptoms of perceived stress but this was not significant. Pregnancy-related distress did not improve pre to post-course in men. Mindfulness significantly increased for both men and women.

The expectant women and their partners demonstrated differing scores at baseline, with women averaging high stress and distress and moderate anxiety and depression but partners showing a mild to average anxiety and depression. It is therefore interesting that both samples showed significant improvements after the course, given that the men had less scope/need for improvement. That partners also improved in terms of symptoms of anxiety and depression is an important finding, especially given that research investigating interventions for perinatal mental health for men is lacking (Pilkington et al., 2015). It is also promising that attendance rates are good for partners taking these courses 83.3% (Women 87.3%)

There are a number of limitations to this pilot study. First, there is no control comparison so any improvement could be due to reversion to the mean or placebo effects. Second, although 155 participants took the courses and 100 signed up to the research, only 55 completed both pre and post-course questionnaires. The sample size is still relatively small and some analyses may be underpowered. There was some bias in the completion of post-intervention measures, with those who completed post-intervention tending to have higher levels of anxiety at baseline and being older. It is unclear as yet why this difference occurred and might be related to perceived lack of benefit from the course, or due to less perceived need for the skills being taught, as well as other cultural and social factors. In future, it may be helpful to exam any association between attendance and likelihood of providing follow-up data and whether outcome data from those who dropped out looks different from those who completed the course. Third, the measures used were all self-report measures and therefore subjective and more open to bias than clinical observations might be. Fourth, the sociodemographic data means that the results are from a self-selected population from one county in one country only and therefore, difficult to generalise to other populations who may less educated and in less stable relationships, amongst other potentially distinguishing factors. Previous studies examining the attendees of mindfulness-based interventions tend to find similar demographics, which is an interesting finding. This might be interpreted as indicating that this is the kind of population to whom mindfulness courses appeal,

however, it is also important to consider that other populations have been less able to access this type of intervention. This significant question particularly requires further investigation. That study completers had higher scores for anxiety at baseline than non-completers suggests that participants were also self-selecting to continue to take part in the research for more information or therapeutic benefit.

Finally this study did not explore fidelity to the interventions or postnatal use of the skills taught through the course. A qualitative follow-up study of parents' experiences of mindfulness one year after attending a MBCP programme (Sedgfield et al., 2018) supports the assumptions of the MBCP programme, that mindfulness practice in the antenatal period can endure as a life skill into parenting and benefit parental emotion regulation and the parent-infant relationship (Duncan and Bardacke, 2010), which is known to benefit child development (McMillan et al., 2009).

A small interview follow-on study has explored some of these themes (Larke et al., 2018) and a further randomised controlled trial on the outcomes of an on-line mindfulness in pregnancy course is due to be published (Krusche et al., 2018).

Although there are limitations, this study suggests that brief MBCP courses within the UK NHS system are feasible and have the potential to improve mood in prospective parents. The inclusion of a slightly larger sample size, partner/father outcomes as well as both general and pregnancy-related measures is a strength of this study, as these have not always been present in previous studies. This research is particularly important given the rates and potential impact of perinatal depression, anxiety and other emotional difficulties during the perinatal period. There remains is a lack of feasible, useful interventions at this stage of life, particularly for both expectant mothers and their partners / expectant fathers who experience depression and anxiety postpartum but are often unsupported. There are also few antenatal education programmes which are skills based and which encompass the whole family, and potentially whole communities. It is, therefore, encouraging that prospective parents are opting to attend these courses together. This study remains a small pilot with limited ability to draw conclusions, however, alongside the other evidence in this field, it does provide justification for an investigation of the benefits of a full scale RCT of MBCP-4-NHS vs. standard NHS antenatal education of a similar duration. It would also be useful to explore the benefits of MBCP-4-NHS in comparison to longer courses of 8 or 9-weeks duration as seen with traditional mindfulness-based interventions.

### Implications for future work

More research of this brief 4-week MBCP course using a larger sample with a control group is needed. In addition, research to investigate whether similar benefits are seen with different populations would be beneficial especially with individuals who may be more susceptible to low mood, have less access to mindfulness-based courses and represent a more diverse population. However, the results provide justification for a larger scaled controlled trial of MBCP-4-NHS within the UK NHS.
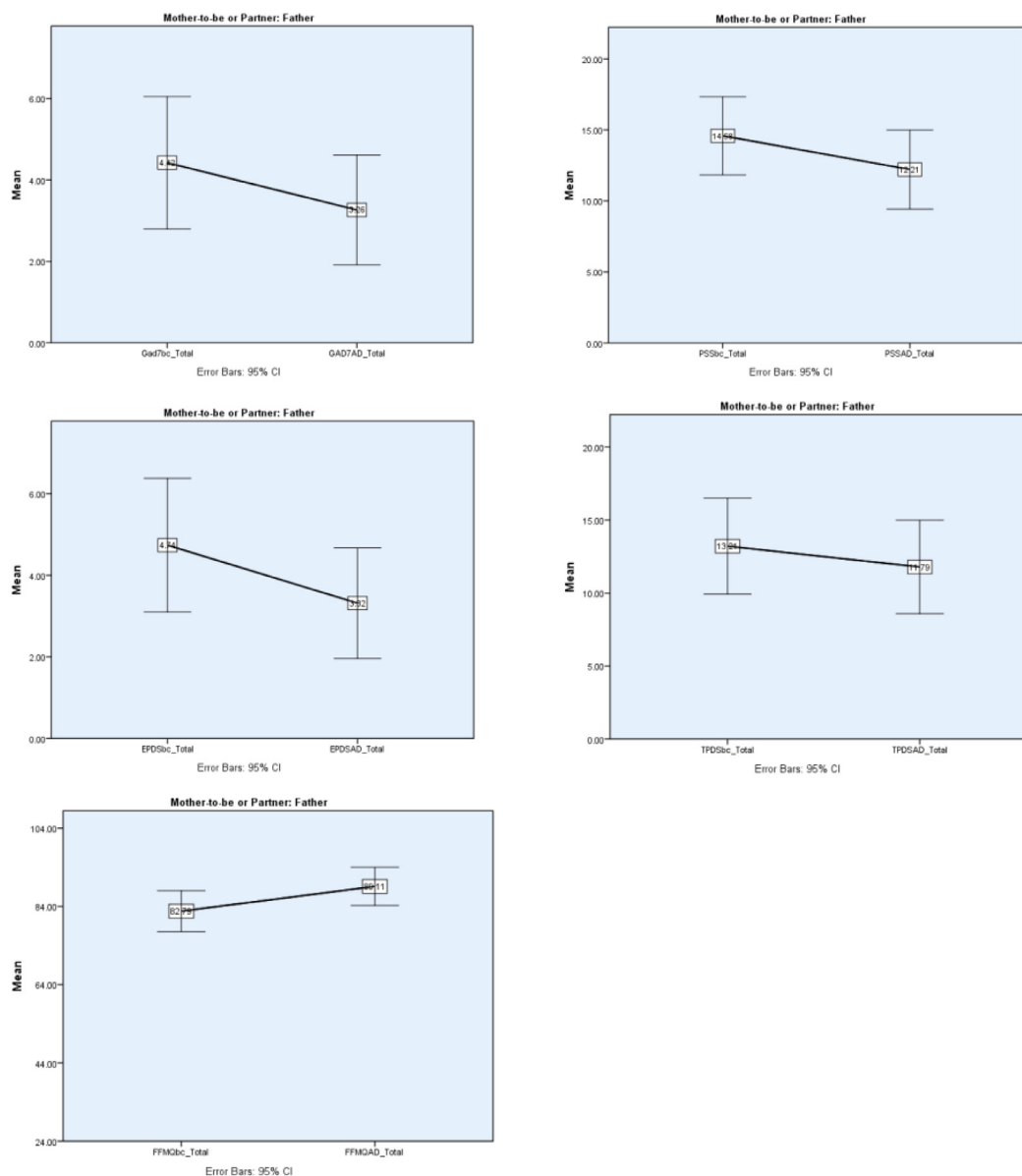
### Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.midw.2018.05.004.

**Appendix A. Prospective mothers (n−36): change in mood pre to post course for questionnaire completers**



Error Bars: 95% CI
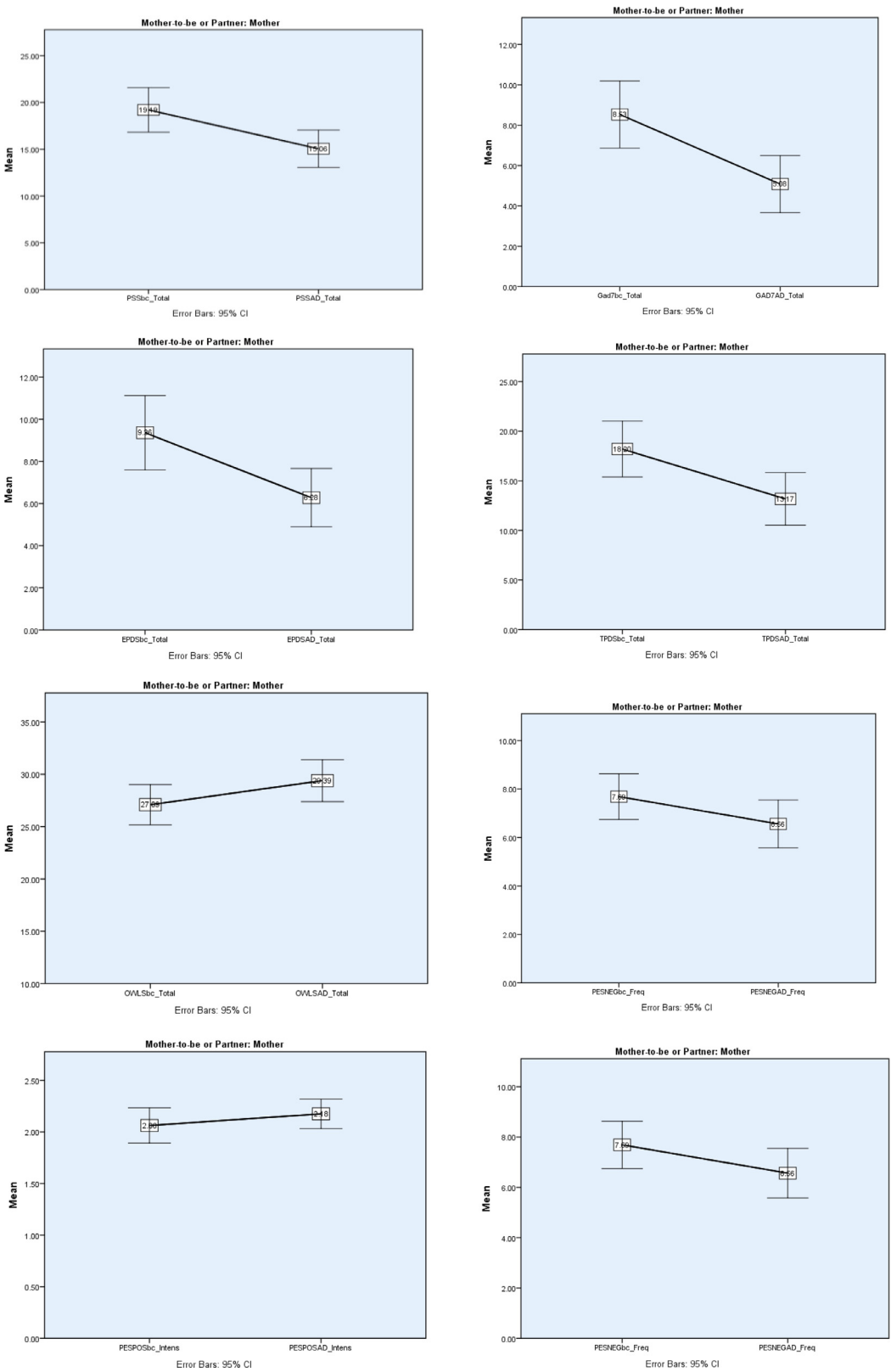
## Appendix B. Prospective fathers ($n = 19$): change in mood pre to post course for questionnaire completers



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