Research report

Towards parenthood: An antenatal intervention to reduce depression, anxiety and parenting difficulties

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ABSTRACT

Background: There have been few antenatal interventions aimed at preparing women for the transition to parenthood and previous attempts to intervene antenatally to prevent postnatal depression and anxiety have had limited impact.
Methods: We evaluated the effectiveness of an antenatal intervention which targeted risk factors for poor postnatal adjustment, with the dual aim of reducing both postnatal symptoms of depression/anxiety and parenting difficulties (a nine-unit self-guided workbook with weekly telephone support). Based on an initial feasibility study ($n = 200$) which confirmed a low level of help-seeking among distressed women during pregnancy, an additional community networking component was developed aimed at increasing social support and access to health professionals to facilitate treatment of current antenatal depression/anxiety, if present. In the evaluation of a second version of the intervention, pregnant women ($n = 143$) were randomly allocated to receive either the intervention or routine care.
Results: Following the antenatal intervention there were significantly fewer cases scoring above threshold for mild-to-severe depression/anxiety symptoms postnatally compared to routine care, along with a trend towards reduced parenting stress. The community networking component appeared helpful and women with higher baseline depression scores showed higher levels of help-seeking in both intervention and routine care groups.
Limitations: It was not possible to evaluate the efficacy of individual program components separately.
Conclusions: The findings provide support for the effectiveness of the *Towards Parenthood* intervention both as a preparation for parenthood program and in reducing symptoms of postnatal depression/anxiety.

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1. Introduction

Throughout pregnancy approximately 9% of expectant mothers are depressed at any one time (according to the best meta-analytic estimates: Gavin et al., 2005). Similarly, among newly-delivered mothers 12.9% will be depressed at 3 months postpartum (Gavin et al., 2005). The impact on women's lives is profound. Depression and associated feelings of despair and hopelessness are frequently accompanied by co-morbid anxiety and consequences include poor partner relationships (Hickey et al., 2005). Furthermore, antenatal depression (AND) and anxiety have been associated not only with poor self-care and poor obstetric outcomes (Chung et al., 2001; Dayan et al., 2006; Zuckerman et al., 1989) but also with suboptimal infant outcomes (Talge et al., 2007). Postnatal depression (PND) in turn is often accompanied by an impaired mother–infant relationship linked to poor child cognitive, behavioural and social development (Milgrom et al., 2006, 2004; Murray et al., 2003). The development and validation of effective early interventions and, if possible, preventative programs are therefore highly desirable.

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The weight of current evidence suggests that antenatal programs developed to date, have limited impact at preventing postnatal depression and anxiety. Psycho-education, cognitive–behavioural therapy, interpersonal therapy, non-directive counselling and problem-solving, supportive interventions and increased social support (via telephone, home or clinic), have all been evaluated, delivered either individually or in group-format (Austin et al., 2008; Brugha et al., 2000; Buist et al., 1998; Dennis and Creedy, 2004; Elliott et al., 2000; Hayes et al., 2001, 2004; Munoz et al., 2007; Stamp et al., 1995; Webster et al., 2003; Zlotnick et al., 2001). However, methodological quality varies widely (see Dennis and Creedy, 2004) and small sample sizes, varying definitions of PND, different target populations (universal versus high risk) and the diversity of previous approaches make comparison difficult. Similarly, a review of antenatal classes (of varied content) found no compelling evidence of a consistent intervention effect (Gagnon and Sandall, 2007). However, some individual programs appear promising. For example, a single intervention session added to antenatal classes that focused on psychosocial issues related to becoming a parent has shown some promise (but only for women with low self-esteem: Matthey et al., 2004). Non-identification and non-treatment of existing AND in some studies further complicates interpretation of results and evidence is also scant for the effectiveness of treatment interventions for existing AND (Dennis et al., 2007). However, programs with a focus on active treatment of existing difficulties, and those delivered on an individual basis may show the most promise. Notably, very few interventions have focused specifically on strengthening the mother–infant relationship.

We aimed to develop an effective depression, anxiety and parenting preparation program that could be offered to all new mothers and have wide population coverage by:

i) maximizing the potential for population uptake by developing the program as an accessible self-help workbook with regular individual telephone support from a psychologist or postgraduate psychology trainee (telephone-based support has been shown to be effective in the perinatal period: Bullock et al., 1995),

ii) focusing directly on the reduction of risk factors for PND, anxiety and parenting dysfunction and on the strengthening of protective factor for these problems. In addition, as partner relationships are themselves a risk factor, we aimed to include a component supporting the couple in the transition to parenthood, inclusive of partners' issues,

iii) facilitating treatment of current depression and/or anxiety where present and fostering access to help and continuity of care,

iv) providing problem-solving skills for coping with future parenting and emotional health difficulties should they arise. This program was anticipated to be helpful not only for PND, but also for women who experience parenthood as stressful, who do not necessarily have significant symptoms of depression and anxiety (Miller et al., 2009).

In short, the approach aims at reducing the impact of risk factors, strengthening relationships and providing problem-solving skills for future emotional health and for the complex demands of parenting.

The core element of this approach is the targeting of known risk factors, in order to ameliorate both the symptoms of PND and vulnerability to early parenting dysfunction. The major risk factors for PND identified in meta-analytic studies (Beck, 1996, 2001; O'Hara and Swain, 1996) include: previous history of depression and/or anxiety, major negative life events, low social support, existing antenatal depression, poor partner support and low self-esteem. A recent study using data from 40,333 women also confirmed AND, antenatal anxiety, poor partner support and previous depression history as specific antenatal risk factors for PND (Milgrom et al., 2008).

Some major risk factors for parenting difficulties (Gottlieb and Pancer, 1988) overlap with major risk factors for depression (e.g., lack of social support and negative life events) as well as with other factors described in the literature including: young age, poor education, low income, other mental health problems, substance and sexual abuse, and negative cognitive style (Bailham and Joseph, 2003; Baydar et al., 2003; Buist, 1998; Combs-Orme et al., 2004; Harrison and Sofronoff, 2002; Kettinger et al., 2000; Milgrom and Beatrice, 2003). Some of these experiences can render women more vulnerable to parenting difficulties including, at the extreme, child neglect (Banyard et al., 2003). Poor levels of maternal–fetal attachment have also been linked to abuse of young children (Tsujino and Higa, 2004).

From this list we targeted issues related to risk factors that appeared amenable to change: existing depression, anxiety, reviewing stressful life events and providing problem-solving, cognitive and behavioural strategies, rethinking childhood experiences in the context of parenting, earlier family relationships, communication with partner, isolation and lack of practical support, self-esteem, parenting skills, expectations of motherhood, and perceptions of and attachment to infant.

In this paper we report the systematic process of program development and evaluation we undertook and report on the outcomes of our major aims:

1) To conduct a feasibility study of a first version program.
2) To produce a second version program in accord with feedback on consumer satisfaction, barriers to uptake and shortcomings in the content and format of the first version.
3) To evaluate, in a randomised controlled trial (RCT), the effectiveness of the second version *Towards Parenthood* program in reducing postnatal levels of clinical depression and anxiety and in minimising potential early parenting difficulties.

2. Methods

2.1. Program development and feasibility study

2.1.1. Formative development

Seven clinical psychologists collaborated in selecting potential intervention targets based on empirical review of known risk factors for PND and parenting difficulties. Local and international parenting support programs were searched for additional targets. A prototype program was developed drawing on cognitive behavioural theory and clinical experience to target risk factors. Mothers' and fathers' workbooks were produced, each with nine units — eight antenatal and one postnatal. Couples read one unit per week. Only women participated in telephone sessions with a

psychologist or trainee psychologist. Three consultative methods were then used to further refine the first version: a survey of 32 pregnant women who scored above threshold on the Edinburgh Postnatal Depression Scale (Cox et al., 1987); a focus group with expectant parents (six men and six women); and in depth interviews both with expectant parents (three men, three women) and three health professionals.

This phase exposed a number of problems and appropriate refinements were made prior to the feasibility study. Briefly, the most important adjustments were: material was separated session-by-session into colour-coded sections, and re-formatted in a shortened, more user-friendly layout with cut-out tip sheets. Editorial refinements included better correspondence between mother and father manuals. To facilitate communication, more direct encouragement for couples to share their responses to the material was incorporated by including "pause and share" reminders throughout the workbook. A more comprehensive referral list was developed and language was made inclusive of various groups (e.g. single parents, same sex couples etc.).

2.1.2. Feasibility study

The purpose of the feasibility study was to identify barriers to help-seeking and engagement, to assess acceptability to participants, to gather consumer feedback and to observe trends in postnatal levels of psychological distress. One hundred women with screening scores on the EPDS ≥ 13 and 100 women scoring <13 were recruited at antenatal clinics (at the Northern Hospital and the Royal Women's Hospital, Melbourne Australia) when 26–30 weeks pregnant. Women were allocated randomly, to either the first version intervention program or to routine care. An ability to understand written English was the only inclusion criterion. Telephone counsellors (psychologists or trainees) completed compliance record sheets and kept clinical notes detailing session attendance.

In this first version, attendance at telephone sessions was low — only 56/100 women in the intervention attended one or more sessions, and of these only 46 attended five or more sessions. Session attendance was negatively correlated with baseline BDI-II scores, $r(N = 98) = -.26, p < .05$, and BAI scores, $r(N = 99) = -.30, p < .05$. Age, education, income, number of children, and relationship status (partnered/single) failed to predict attendance (logistic regression, $\chi^2 = 5.94, p > .05$).

More intervention participants with high screening scores (53.6%) sought help than routine care participants with high screening scores (20.8%), (Yates' corrected $\chi^2 = 4.56, p < .05$). No consistent trends were detected in outcome levels of depression, anxiety or parenting stress ($p > 0.05$ in all cases). Given the low compliance it was difficult to draw conclusions about effectiveness. In a feedback survey of intervention women ($n = 36$) 90% reported that they "liked" the intervention content and 95% reported it as "helpful". The program was redesigned to include a number of features. A community networking component was designed to strengthen and encourage help-seeking by establishing communication between women's health professionals and encouraging use of community supports. A second major change involved the separate self-help workbooks for women and partners. The consensus among participants was that partners did not engage with these and the program content was therefore re-packaged as a single workbook with couples and partners content integrated.

A full report on this formative development and feasibility study phase of the work is available at www.piri.com.au.

2.2. Randomised controlled trial

A randomised controlled trial (RCT) was conducted to evaluate the second version of the program. The RCT was approved by the Human Research Ethics Committees of Northern Health, Eastern Health and Austin Health. The trial was registered with the Australian Clinical Trials Registry (ACTRN012606000263594). The evaluation of effectiveness centred on addressing the following hypotheses: in the early postpartum period compared to women in routine care, women in the *Towards Parenthood* intervention will report

1) less depression,
2) less anxiety,
3) less parenting dysfunction,
4) less general stress.

In addition, we wanted to re-assess participants' levels of engagement with the second version of the program, in light of changes made as a result of the feasibility study, so session attendance was an important secondary outcome.

2.2.1. Design

The design of the RCT is shown in the CONSORT (Moher et al., 2010) diagram in Fig. 1.

2.2.2. Participants

The study design called for a sample with good representations of women both with and without symptoms of depression, anxiety and stress. Following informed consent, women were recruited from the Northern Hospital and from the Angliss Hospital (Melbourne, Australia) when 20–32 weeks pregnant. Participants were screened with the Edinburgh Postnatal Depression Scale (EPDS: Cox et al., 1987) and the Risk Assessment Checklist (Murphy, 2009) by midwives. Women who scored ≥ 13 on the EPDS and/or RAC were all invited to participate. To ensure a similar pace of recruitment between those with high (≥ 13) or low (<13) screening scores, women with low screening scores were approached only if they had even numbered birthdates (e.g., January 2nd, January 4th etc.). Exclusion criteria were: 1) inability to understand written English, 2) presence of psychotic symptoms, 3) extreme levels of distress requiring crisis management, or 4) stage of pregnancy >32 weeks gestation.

Two hundred and fifty-four women were offered participation. Of these, 143 women were randomised: 43 women with high screening scores and 100 women with low screening scores. Pre-randomisation attrition was due to: exclusion criteria being met (42%), baseline questionnaires incomplete (18%), too busy (19%), woman considered the program unnecessary (8%), other reasons (e.g., accessed other supports/services etc., 13%).

2.2.3. Community networking

We provided each participant with a community networking pamphlet highlighting the importance of establishing support networks and listing contacts for relevant services, to encourage
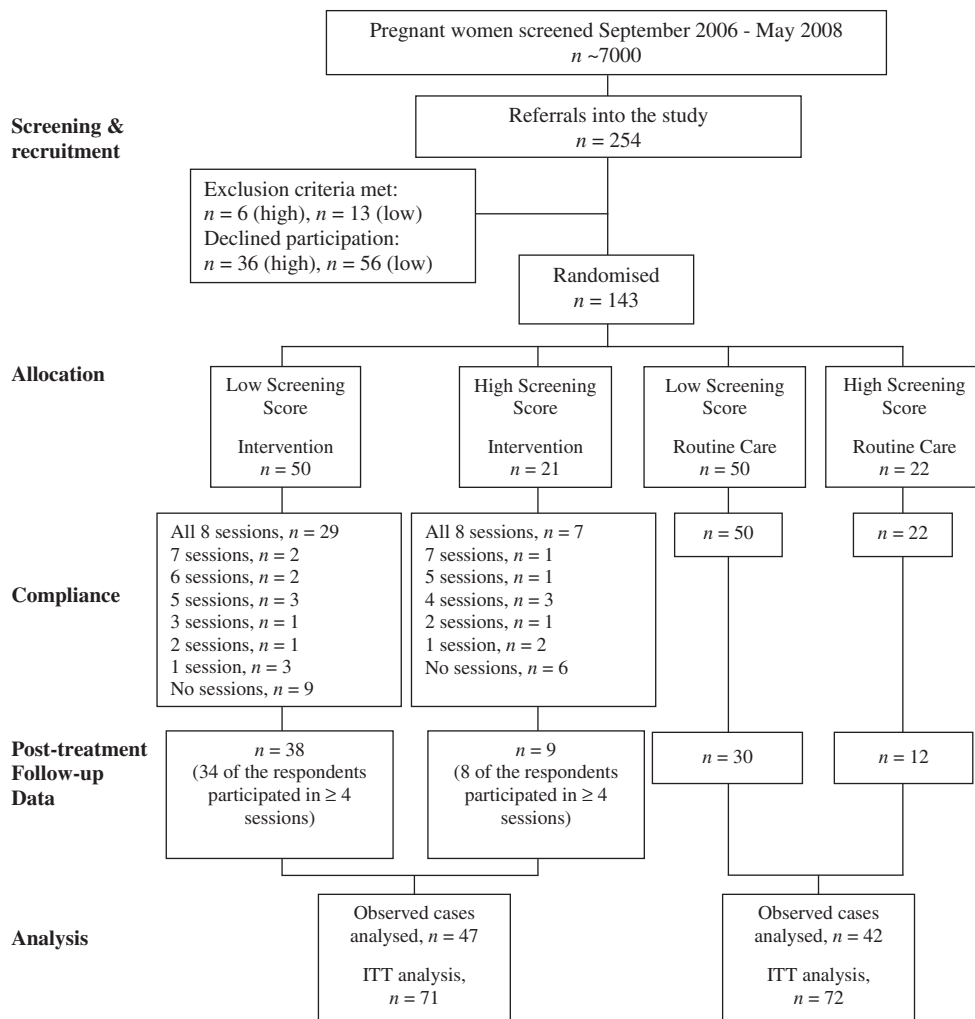
Fig. 1. CONSORT diagram showing participant flow through the randomised controlled trial of the second version *Towards Parenthood* program.

and enable help-seeking. This included both professional services (e.g. GPs, midwives, social workers, psychology services) and non-clinical community supports (e.g., playgroups, mother's groups). We also provided each participant with an information booklet about emotional health during pregnancy and early parenthood developed by *beyondblue*, Australia's national depression initiative (booklet available at www. beyondblue.org.au). In addition, each participant's GP and other appropriate health professionals (e.g., Obstetrician) were contacted by letter and/or phone and provided with contact details for all other health professionals in contact with the woman to encourage collaborative case management. GPs were advised of their patient's screening score (this was clearly explained on participants' consent forms) and received an 'Antenatal and Postnatal Depression Management Guide' developed by *beyondblue* (available at www.beyondblue.org.au).

2.2.4. Towards Parenthood intervention

The second version program workbook is published as Milgrom et al. (2009). Women allocated to this condition received the *Towards Parenthood* intervention in addition to community networking. The second version intervention consisted of a self-help workbook comprising nine units — eight to be read during pregnancy and one to be read following the birth (see Table 1). Women read the necessary material each week and then discussed the content with a psychologist or trainee psychologist in a weekly telephone support session. Units 2 and 3 were delivered together, so that telephone support comprised eight sessions. Unit 2 was written specifically for fathers/partners; women read Unit 1 followed the next week by Unit 3. The postnatal unit was completed six weeks following the birth. Telephone calls lasted approximately half an hour and allowed for tailored discussion and problem-solving around the unit content. Telephone calls were made by the therapist at a regular pre-arranged time each week. Participants were asked to notify the therapist by phone if they were not going to be available for the session and sessions were rescheduled. On occasions where contact with participants was lost, therapists left up to three messages for the participant to reschedule the session and a letter was sent to the participant's home address. Psychologists delivering the intervention followed structured session prompts and kept detailed notes. To ensure treatment

Table 1
Towards Parenthood workbook content.

Workbook unit
Unit 1. Toward motherhood
Nurturing the developing mother–baby relationship and reflecting on experiences within the family-of-origin to facilitate awareness of its influence on the mother–baby relationship.
Unit 2. Toward fatherhood
Nurturing the developing father–baby relationship, reflecting on family-of-origin experiences, raising awareness of upcoming changes/challenges and the importance of mobilising supports.
Unit 3. We're expecting! Preparing for parenthood
Facilitating realistic expectations of upcoming changes and problem-solving skills training.
Unit 4. Caring for yourself is caring for your baby
Focusing on self-care, stress busters and self-esteem.
Unit 5. From lovers to parents: managing relationship changes
Navigating changing roles by encouraging open communication, assertiveness, intimacy, and reflection on family-of-origin experiences.
Unit 6. Keeping some balance in your life
Behavioural strategies for coping with depression and anxiety.
Unit 7. Healthy thinking, healthy self
Cognitive strategies for coping with depression and anxiety.
Unit 8. Caring for your newborn baby
Developing realistic expectations about caring for a newborn.
Unit 9. Welcome to "The Club"!
Postnatal session to reflect on and integrate the birth experience and the reality of parenthood and to reinforce previously discussed coping strategies.

integrity, postgraduate trainees were supervised by senior clinicians and a project manager (CS) supervised overall adherence to the study protocol.

2.2.5. Routine care

Women allocated to routine care were case-managed by their midwife and/or GP as occurs routinely. Community networking was implemented as in the intervention condition. Women in routine care were sent the *Towards Parenthood* workbook post-study.

2.2.6. Randomisation

Women were allocated to either intervention or routine care via a coded, double-blinded, variable-length permuted block randomised treatment allocation schedule produced by an independent person prior to commencement. The schedule was stratified for screening score (high or low), to ensure a balanced representation across treatments, and was administered by a hospital administrator blind to coding.

2.2.7. Measures

Women were screened for possible symptoms of depression and parenting dysfunction and then completed further questionnaires at baseline (20–32 weeks gestation, pre-randomisation) and post-treatment (12 weeks postpartum).

The *Edinburgh Postnatal Depression Scale* (EPDS: Cox et al., 1987) is a 10-item self-report measure developed to screen for depression during the postpartum, but also has well-established validity for use in pregnancy. In an Australian sample, the EPDS was found to have 100% sensitivity and 89% specificity at a cut-off of 12.5 (Boyce et al., 1993). High scores

(usually at a cut-off of ≥ 13) are taken to indicate a high probability of existing depression.

The *Risk Assessment Checklist* (Murphy, 2009) is an 11-item scale measuring risk factors for parenting difficulties and reflects factors known to put women at risk of both parenting and mood disorders. As with the EPDS, scores ≥ 13 on the RAC are considered 'high scores' and may indicate a high risk for subsequent difficulties. The RAC has a clear four-factor structure (Social Disconnection, Socioeconomic Status, Psychological Functioning and Psychological Vulnerability), good internal consistency and concurrent validity with published scales, and acceptable test–retest reliability (Murphy, 2009).

The *Beck Depression Inventory-II* (BDI: Beck et al., 1996) is a widely used, well-validated, 21-item clinical instrument that measures cognitive, affective and physiological symptoms of depression. It has well-validated psychometric properties (Beck et al., 1996). A score of ≥ 14 indicates presence of depression (14–19 mild, 20–28 moderate, 29–63 severe). The BDI-II was the central clinical measure of depressive symptomatology in this study.

The *Depression Anxiety Stress Scales short form* (DASS: Lovibond and Lovibond, 1995) is a well-validated 21-item measure of depression, anxiety and stress (7 items per scale). A score of ≥ 8 on the anxiety scale or ≥ 15 on the stress scale indicate levels of anxiety or stress respectively outside of the normative range. These two scales were the main measures of anxiety and stress symptoms in participants in this trial.

The *Parenting Stress Index* (PSI: Abidin, 1995) comprises 101 items measuring parent–child relationship functioning, level of dysfunctional parenting behaviour and child behaviour problems. Responses to items are totaled to produce seven 'Child Domain' and six 'Parent Domain' subscales, which are totaled to yield overall scores for each domain. Domain scores are summed to yield a total PSI score — scores ≥ 260 reflect clinical levels of parenting dysfunction.

The EPDS, RAC and demographics were collected at baseline. The BDI-II and DASS short form were collected at baseline and post-treatment (12-weeks postpartum). The PSI and help-seeking information were collected post-treatment. If women were partnered, the DASS was also sent to partners at baseline and post-treatment.

2.2.8. Power calculations and data analyses

In line with CONSORT standards for the conduct of RCTs (Moher et al., 2010) data were analysed on an intention-to-treat (ITT) basis, each analysis being executed twice, once using observed data only, and once after imputing missing values using maximum likelihood methods (Expectation Maximisation). Where necessary, data were square-root or log transformed before analysis. Untransformed values are reported here, for ease of interpretation.

Key outcomes (depression, anxiety and parenting dysfunction) were examined using Analysis of Covariance (ANCOVA) controlling for baseline scores. Effect sizes were expressed as Cohen's *d* (Cohen, 1988). Alpha was set at .05. Computations were executed in SPSS 16.0.

We calculated the minimum sample size to detect a clinically meaningful difference in parenting dysfunction as significant at the 0.05 level, with a power of 0.8. Based on previous data (PSI $= 282.46$, $SD = 41.25$: Milgrom et al., 2006), a difference (δ) of 33 points would take PSI scores

into the normative range (i.e., ≤250). The sample size required per condition is: $n = 15.7(41.25/33)^2 = 24.53$. Assuming 40% attrition, the adjusted number per treatment condition is: $n^* = n/(1-0.4)^2 = 68.13$, which rounds to 70. Similar calculations for the BDI yielded $n = 24.3$, making 70 women per group sufficient for both main outcome measures.

3. Results

Fig. 1 shows the flow of participants through the RCT. Seventy-one women were randomised to the intervention and 72 to routine care. Table 2 shows the characteristics of both groups at baseline. As is appropriate in a RCT (Moher et al., 2010), no between-group tests of significance were conducted on baseline variables. Whilst the groups appeared reasonably balanced, the frequency of post-high school education was approximately 1.4 times higher in the intervention group, a potentially important imbalance. However, a multiple regression found no evidence that treatment outcome was linked to either of the socioeconomic indicators in this sample. Neither income nor education level was associated with postnatal BDI-II or PSI scores.

3.1. Compliance

Eight telephone sessions were scheduled (covering nine workbook units). Of women with low screening scores, 72% participated in at least half (≥4) of the sessions and 58% participated in all (8) sessions. Of intervention women with high screening scores, 57% participated in at least half of the sessions and 33% participated in all eight. Many women indicated that whilst they had not participated in every session, they still read and completed the workbook activities.

No significant relationships were found between the number of sessions attended and baseline depression (BDI-II: $r = -.15$, $p = .22$), anxiety ($r = -.08$, $p = .51$), or stress scores ($r = -.21$, $p = .08$). To allow logistic regression, session attendance was collapsed to a binary coding indicating completion of either ≤3 or ≥4 telephone sessions. Age, education (completed high school/did not complete high school), income, number of children, and relationship status (partnered/single) did not predict session attendance ($\chi^2 = 2.94$, $p = .71$).

3.2. Effectiveness of the intervention

Post-treatment data were missing completely at random (Little's MCAR test, $\chi^2 = 57.93$, $p = .44$).

3.2.1. Depression, anxiety and stress

Fig. 2A, B and C shows the change in depression, anxiety and stress scores for intervention and routine care participants, from baseline to post-treatment. An ANCOVA using observed cases revealed that, after controlling for baseline depression (BDI-II) scores, participants in the intervention reported significantly lower levels of depression (BDI-II) post-treatment than participants in routine care ($F_{1, 86} = 7.82$, $p < .01$. Cohen's $d = 0.6$). Significant treatment effects favouring the intervention group were also found on subscales of the DASS for anxiety, ($F_{1, 86} = 7.35$, $p < .01$. Cohen's $d = 0.58$), and stress, ($F_{1, 86} = 7.73$, $p < .01$. Cohen's $d = 0.59$), after controlling for baseline values. These results remained significant in ITT analyses following imputation of missing values. Results on the depression subscale of the DASS paralleled those for the BDI-II (data not shown).

3.2.2. Parenting dysfunction

T-tests of post-treatment PSI scores using only observed cases indicated that intervention participants scored significantly lower than participants in routine care on both the parent domain of the PSI ($t = 1.98$, $p = .05$. Cohen's $d = 0.45$) and the PSI total score ($t = 2.06$, $p < .05$. Cohen's $d = 0.46$). Mean scores on the subscales of the PSI parent domain are shown in Fig. 3. No significant differences were found for the child domain of the PSI. When ITT analyses were conducted, the differences between the groups on the parent domain of the PSI and the PSI total became non-significant.

Numbers were too small for a sub-group analysis, but among participants with high screening scores, those in the intervention had, on average, lower PSI scores post-treatment than those in routine care, with their mean scores falling below the threshold for dysfunction.

3.3. Frequencies of above threshold cases

Using established cut-offs, Table 3 shows the proportion of cases above threshold for depression (BDI-II≥14 cut-off for mild depression), anxiety (DASS Anxiety Scale≥8 cut-off for mild anxiety), stress (DASS Stress Scale≥15 cut-off for mild stress), and parenting dysfunction (PSI≥260 cut-off for significant parenting stress) at baseline and post-treatment. Post-treatment, significantly more participants in routine care scored above threshold than participants in the intervention for: depression, (Yates' corrected $\chi^2 = 6.35$, $p < .05$), anxiety (Yates' corrected $\chi^2 = 5.16$, $p < .05$), stress (Yates' corrected $\chi^2 = 4.48$, $p < .05$), and for parenting dysfunction (Yates' corrected $\chi^2 = 5.51$, $p < .05$). Even when we apply the conservative assumption that all missing cases scored above threshold, differences between the intervention and routine care groups remain significant for depression, anxiety, stress, and parenting dysfunction ($p < .05$ in all cases).

Table 2
Characteristics of Participants at Baseline.

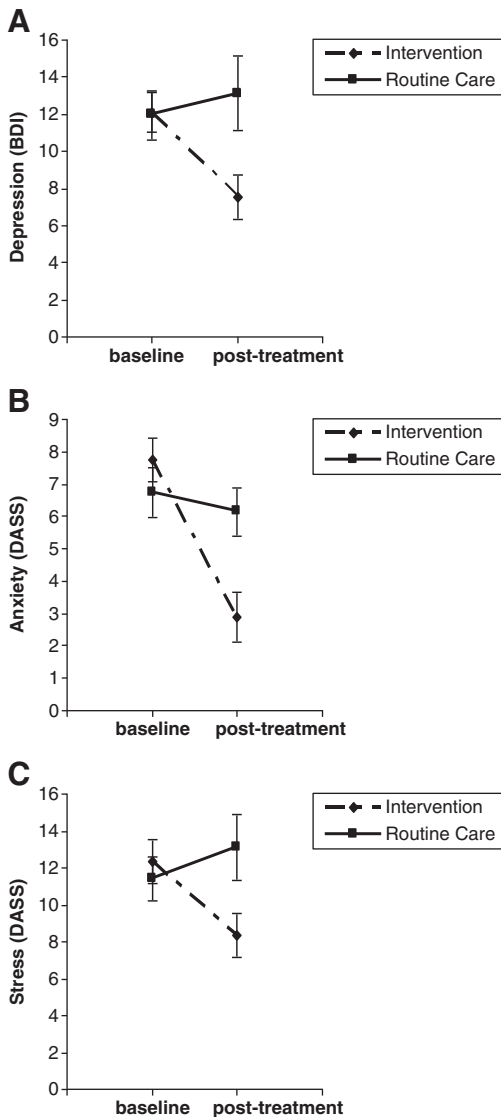|	Intervention	Routine care
Age, M (SD)	31.96 (5.58)	32.63 (5.93)
Range	20–42	19–44
Weeks pregnant, M (SD)	24.73 (3.71)	25.10 (3.63)
Partnered, (%)	88.7	83.3
Parity, (%)		
0	38.0	31.9
1	35.2	33.3
>1	26.8	34.8
Born in Australia, (%)	78.9	90.3
Education, n (%)		
Did not complete high school	11 (15.5)	15 (20.8)
Completed high school only	22 (31.0)	29 (40.3)
Additional qualifications	38 (53.5)	28 (38.9)
Modal income bracket ($AUD)	40,001–60,000	40,001–60,000
EPDS, M (SD)	8.96 (5.76)	8.75 (5.93)
RAC M (SD)	5.85 (4.86)	6.69 (4.95)

Fig. 2. Change from baseline to post-treatment for the intervention (dotted lines) and routine care (solid lines) groups. Mean values are plotted ± 1SE. A) Beck Depression Inventory-II (BDI-II). B) Anxiety subscale of the Depression, Anxiety and Stress Scale (DASS). C) Stress subscale of the Depression, Anxiety and Stress Scale (DASS).

3.4. Partners and the couple relationship

Post-treatment, mean DASS depression scores for partners were 2 ($SD=3.15$) in the intervention group and 6 (9.2) in routine care. Anxiety scores averaged 1.4 (2.8) in intervention and 4.5 (6.4) in routine care. Stress scores showed a similar pattern with a mean of 6.9 (7.6) following intervention versus 11.9 (9.2) in routine care. . However, as many partners failed to complete questionnaires and 14% of women were single, a relatively small number of partners completed questionnaires at both time points (intervention: $n=16$, routine care: $n=8$). No significant differences were found between the groups in depression ($F_{1, 21}=1.82$, $p=.19$) or anxiety ($F_{1, 21}=2.46$, $p=.13$), although a marginally non-significant difference was found between the groups in stress ($F_{1, 21}=4.10$, $p=.056$). A

possible trend for women in the intervention to report less dysfunction in their relationship with their partner than women in routine care (see Fig. 2 'Spouse' subscale of the PSI) was found to be marginally non-significant ($t=1.56$, one-tailed $p=.051$).

3.5. Help-seeking

In a logistic regression, levels of depressive symptoms (BDI-II) at baseline were found to be associated with help-seeking in the early postpartum ($\chi^2=9.23$, $p<.01$). Participants with higher scores on the BDI-II were more likely to have sought assistance from someone to help them cope after the birth of their baby (e.g., from their GP, Maternal & Child Health Nurse, counsellor, early parenting centre, etc.). Among women with high screening scores there were no significant differences in help-seeking between those in the intervention condition and those in routine care (Yates' corrected $\chi^2=.77$, $p=.38$). Help-seeking rates among women with high screening scores appeared to have improved substantially over the first version feasibility study with 69.2% of intervention women seeking help (compared to 53.6% in feasibility study) and 47.6% of routine care participants seeking help (versus 20.8% in feasibility study).

4. Discussion

Parenthood is a major life transition and a substantial number of new parents have difficulty navigating this period of change. The prevalence of depression in the perinatal period highlights that many women experience significant mental health difficulties; in addition, adjustment and parenting difficulties at this time are not uncommon. Because of the uncertainty involved in attempting to define, in advance, which individuals might benefit most, we developed an inclusive intervention aimed at protecting and enhancing the emotional well being and coping skills of all women and their partners in the transition to parenthood. This study established the feasibility of delivering a prototype intervention of this kind to a wide community-based sample; identified necessary key improvements to the first version; and demonstrated the clinical effectiveness of a fully developed program in a RCT. In doing this, study samples were stratified to ensure good representations of both women with high psychosocial risk factor profiles, and of those without these characteristics. High attrition and non-compliance, identified as major problems in the feasibility study, were improved to a large extent in the fully developed program. Equally important, the disproportionately low rate of attendance at telephone sessions by women with high screening scores was not observed in the fully developed program. A limitation of our study design was that the workbook content was always delivered in conjunction with telephone support. It was therefore not possible to assess the separate contribution of these two components to the effectiveness of the intervention. A second difficulty was the poor engagement of men in the first version. Despite the repackaging of content and encouragement for couples to share reactions to the material together, the poor return of questionnaires from men in the RCT suggests that their engagement remained poor as has been observed in couple's counselling processes generally (Englar-Carlson and Shepard,
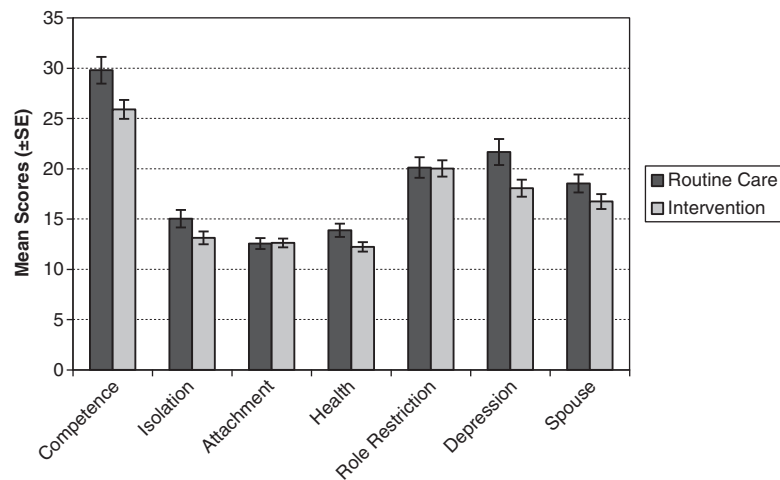
Fig. 3. Mean scores ($\pm$ 1SE) for intervention and routine care groups on each of the subscales in the PSI parent domain.

2005) and in service uptake in the perinatal period in particular (Matthey et al., 2009.

The effectiveness of the intervention program was demonstrated in the RCT, with significant advantages indicated for intervention participants on depression, stress and anxiety outcomes. Although a trend towards reduced parenting dysfunction was found in the observed-case analysis, this did not remain significant in the intention-to-treat analysis. Most previous attempts at preventing the occurrence of PND have shown limited promise (Dennis and Creedy, 2004). Our findings compare favourably to psychosocial interventions reviewed by Dennis and Creedy (2004). Fifteen intervention studies were reviewed including antenatal and postnatal classes, professional and lay home visits, pre- and postnatal care, and postnatal care delivered earlier than standard. Overall, the interventions were not effective in preventing PND (though home visits by a health professional showed some promise as did interventions provided on an individual basis).

Of the few comparable RCTs in this area, some have reported a possible reduction in incidence of PND, but significant treatment effects on overall levels of depressive symptomatology have been harder to confirm (e.g. Ma Asunción et al., 2010). However, a

recent review of depression prevention in low-SES women (though not restricted to perinatal women) lends support to the promise of preventative interventions for depression in vulnerable women generally (van der Waerden et al., 2011). It is possible that our intervention, beginning antenatally, exerted part of its effect through reducing the incidence of new cases of PND as well as by ameliorating new and pre-existing symptoms. This may have been due both to the coping skills taught in the intervention supported by telephone contact and to appropriate treatment uptake with a health professional where needed. If so, this would be a somewhat novel and useful property. Establishing the efficacy of each individual program component could be one focus of future work with a larger cohort.

Of particular importance was the inclusion of a parenting component in our program. A sizeable proportion of parents experience significant stress in the parenting role (Combs-Orme et al., 2004). This is particularly the case following depression. As well as an immediate effect on well being, PND also affects mother–infant interactions (Milgrom et al., 1999; Teti et al., 1990; Leigh and Milgrom, 2008) with negative long-term implications for child cognitive, behavioural and social development (Milgrom et al., 2004; Murray and Cooper, 1997), as well as for partners (Goodman and Goodman, 2004) and for couple relationships (Milgrom and McCloud, 1996). We included a parenting component in line with conclusions from a previous review of parent-training programs for improving psychosocial health of mothers (Barlow et al., 2003). Twenty-six studies (all group-based interventions) met quality criteria for that review. These comprised eight behavioural interventions, six cognitive–behavioural interventions, four multi-modal interventions, six humanistic interventions, and two rational-emotive interventions. Parenting programs improved depression, anxiety/stress, self-esteem, and marital adjustment in the short-term. However, there was little evidence of the role such programs might play in prevention (i.e. they were not offered antenatally).

Gagnon and Sandall (2007) reviewed educational efforts delivered antenatally, but not specifically focused on parenting. These included individual or group education to prepare for childbirth/parenthood. Nine studies were reviewed, addressing fetal attachment (two studies), labour, baby care, counselling and neuromuscular exercise (one study),

Table 3
Frequency of cases of above threshold depression, anxiety, stress and parenting dysfunction.

	Baseline		Post-treatment	
	Intervention	Routine care	Intervention	Routine care
	$n = 71$	$n = 72$	$n = 47$ [a]	$n = 42$ [a]
Depression (BDI-II $\geq$ 14)	21 (29.6%)	24 (33.3%)	6 (12.8%)	16 (38.1%)
Anxiety (DASS anxiety $\geq$ 8)	29 (40.8%)	23 (31.9%)	3 (6.4%)	11 (26.2%)
Stress (DASS stress $\geq$ 15)	25 (35.2%)	21 (29.2%)	5 (10.6%)	13 (31.0%)
Parenting dysfunction (PSI $\geq$ 260)	–	–	3 (6.7%)	11 (28.2%)

[a] Parenting dysfunction: $n = 45$ (intervention), $n = 39$ (routine care).

child development (one study), early parenthood (one study), pregnancy education, peer support and health behaviour (one study), vaginal birth following caesarean (one study), and two studies specifically targeted fathers. Most effect sizes were small to moderate and methodological rigor was unclear. Results were inconclusive.

The implications of these existing systematic reviews are significant — it appears that parenting programs, compared to antenatal education, do improve maternal mental health in the short-term. Our results may add to this by suggesting the advantages of beginning parenting intervention antenatally.

It appears that our program's focus on targeting risk factors for both postnatal depression and for parenting difficulties, together with increasing access to health professionals and facilitating treatment for existing symptoms of antenatal depression, may have succeeded in bringing together some of the most efficacious elements from the diversity of existing approaches.

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