

Running head: TOWARDS PARENTHOOD PROGRAM

Development and Feasibility Study of a Monitored Self-Help Antenatal Intervention Program
to Enhance Emotional Health and Reduce Parenting Stress

Jeannette Milgrom^{1,2*}, Jennifer Ericksen², Bronwyn Leigh², Yolanda Romeo², Elizabeth
Loughlin², Rachael McCarthy^{2†}, Bella Saunders², Melina Ramp², Alan W. Gemmill² Jessica
Ross² & Charlene Schembri²

1. School of Behavioural Science, University of Melbourne
2. Parent-Infant Research Institute, Department of Clinical & Health Psychology, Austin
Health

*Corresponding Author

Professor Jeannette Milgrom, Clinical & Health Psychology, Heidelberg Repatriation
Hospital, PO Box 5444, Heidelberg West, Victoria 3081, Australia

Tel: +613 9496 4009, Fax: +613 9496 4148, Email: jeannette.milgrom@austin.org.au

† Posthumous publication.

Abstract

In each of the three trimesters of pregnancy, approximately 9% of pregnant women are likely to experience depression, often accompanied by co-morbid anxiety. Antenatal depression and anxiety have been associated with poor perinatal health outcomes and linked to detrimental neurodevelopment of the fetus and with later child development. In addition, antenatal depression (AND) is a major predictor of postnatal depression which is itself associated with sub-optimal parenting and poor parent-infant relationships. Thus, addressing ways of managing depression and anxiety as well as potential parenting difficulties with new babies is indicated during pregnancy. Existing antenatal interventions have not been successful in addressing all these problems. Using a rigorous process of systematic literature review and consultation with pregnant women, partners and professionals, we developed, in workbook format, a self-help antenatal support program: '*Towards Parenthood.*' We incorporated aspects of content and delivery format that specifically redress the short comings of previous programs and which targeted known risk factors associated with AND including poor partner relationships. Focus group feedback on program content was extremely positive. The feasibility of widespread implementation of this new program was evaluated in a pilot study comparing pregnant women with an EPDS >12 and those with an EPDS <12 and allocated to intervention or routine care conditions. Weekly telephone counseling (support) sessions were offered during the 9 week intervention program. Data from this pilot study are consistent with the intervention having beneficial effects on postnatal depression and anxiety (as measured by the Beck Depression Inventory and Beck Anxiety Inventory) as well as on parenting stress (as measured by the Parenting Stress Index). Those who attended telephone sessions found the program to be positive, supportive and valuable. As in other studies, there were difficulties engaging pregnant women with the intervention program and in retaining participants. Women with an EPDS >12 were statistically less likely to engage with the program. Through

focus group and participant surveys we identified a number of specific changes to the program that could maximise uptake and completion of the intervention in future.

Introduction

The deleterious effects of postnatal depression (PND) on women include feelings of despair and hopelessness, often accompanied by an impaired mother-infant relationship with long-term consequences on child cognitive, behavioural and social development (Milgrom, Westley & Gemmill, 2004; Murray & Cooper, 1997).

There is an urgent need for effective early interventions and, if possible, preventative programs. We know that approximately 10-13% of pregnant women experience depression and one half of these women will go on to develop PND^{3,4} (Milgrom et al, 2008). Antenatal depression (AND) also results in poorer self-care and obstetric outcomes (Chung et al., 2001; Dayan et al, 2006; Zuckerman et al, 1989). Antenatal stress is linked with poor infant outcomes. Potentially then, pregnancy is a critical time both to deliver preventive programs and to identify and treat current AND (possibly, this may reduce the risk of PND⁵ and help ameliorate its impact on infants).

A number of interventions have target psychosocial risk factors in pregnancy (e.g., stress, lack of social support); however, methodological quality varies widely (see Dennis & Creedy, 2004). The weight of current evidence suggests that antenatal programs aimed at reducing PND have limited impact. Even if some approaches have an effect, various study limitations may make it difficult to detect: small sample sizes, insufficient methodological rigor, not least, varying definitions of PND (Gordon⁶, Elliott⁷, Buist⁹ and recently reviewed Gagnon and Sandall CR (2007). The diversity of previous interventions renders comparison difficult. These have included psycho-education, cognitive-behavioural therapy, interpersonal therapy, non-directive counselling and problem-solving, supportive interventions, increasing social support (via telephone, home or clinic), delivered individually or in a group-format (Creedy, 2008, ^{6,7,8,9,10}). The use of psychosocial assessment in pregnancy to protect perinatal mental health has been reviewed; with inconclusive results. (Austin, Priest & Sullivan, 2008).

Similarly, a review of antenatal classes (of diverse content) found no compelling evidence of an effect (Gagnon & Sandall, 2007). Non-identification and non-treatment of existing AND among participants in interventions further complicates the picture. Finally, very few interventions have focused specifically on the parent-infant relationship.

A Cochrane review (Dennis & Creedy, 2004) concluded that promising directions include: Home 'visits' by health professionals; Individual rather than group-based interventions; Focussing on participants 'at risk' rather than the general maternal population. Notable among other programs that have shown promise (not included in Dennis & Creedy, 2004) is the 'Preparing for Parenthood' program for primiparae (Elliot et al, 2000). In this preventive intervention consisting of antenatal and postnatal sessions women in the active treatment experienced a significantly more positive mood postnatally (interestingly 'Surviving Parenthood' groups for multiparae were unsuccessful).

Based on the foregoing considerations we developed an intervention program focussed on preventing disorders such as PND via the reduction of risk factors and the strengthening of protective factors¹². The central idea behind *Towards Parenthood* is the provision of an accessible self-help program able to prevent both PND and early parenting difficulties (in depressed and non-depressed women) by supporting couples in the transition to parenthood, through tackling risk factors, managing current depression/coping and fostering access to help. Our program addresses major risk factors for PND identified in meta-analytic studies (Beck, 1996, 2001; O'Hara & Swain, 1996) including: AND and anxiety, major life events, low social support levels, history of depression, 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 antenatal risk factors for PND (Milgrom et al., 2008).

Given the serious detrimental consequences of AND/PND on the mother-child relationship we focussed also on parenting difficulties. Some known risk factors for parenting

difficulties¹⁶, overlap with risk factors for depression (e.g., lack of social support and negative life events). Others include: young age, poor education, low income, mental health problems, substance abuse, and negative cognitive style¹⁷⁻²⁰ (Harrison & Safronoff, 2002). Negative life events (e.g., physical/sexual abuse, bereavement) can render women more vulnerable to parenting difficulties including neglect²¹. Poor levels of maternal-fetal attachment have also be linked to maternal violence toward young children²².

We targeted risk factors that appear amenable to change: depression, anxiety, stressful life events, family problems, rethinking childhood experiences, relationship with partner, isolation, self-esteem, parenting skills, expectations of motherhood, and perceptions of and attachment to infant (see Table 1 for workbook content).

In addition, we were guided by a biopsychosocial model of depression¹ that we developed for understanding PND. In essence, we posit that it is the interaction between maternal risk factors, unrealistic sociocultural expectations and current trigger factors that result in a depressive experience. These are maintained by negative cognitions and behaviours and negative interactions with significant others. *Towards Parenthood* aims to reduce maintaining factors, strengthen relationships and teach coping and problem-solving for complex demands of parenting.

We aimed to maximize accessibility and potential uptake by producing a “monitored” self-help intervention, incorporating strategies from the health promotion field aimed at creating community-level behaviour change. Thus the intervention combines a self-help workbook and individual telephone support, shown to be effective in the perinatal period (Bullock et al., 1995).

The major aims of this pilot study were:

- 1) To develop the *Towards Parenthood* program to a deliverable standard
- 2) To pilot the feasibility of delivering this antenatal self-help support program

- 3) To record consumer satisfaction, barriers to using the program, and to identify shortcomings in the pilot content and delivery format.
- 4) To evaluate the effectiveness of *Towards Parenthood* in reducing depression and anxiety and in improving parent-infant relations postnatally.

Methods

PROGRAM DEVELOPMENT

Both clinicians and researchers collaborated in a systematic review of the evidence. Selection of intervention targets was based on cognitive behavioural theory, ‘clinical wisdom’ and an exhaustive empirical review of risk factors. Our theoretical and clinical understanding of perinatal depression then informed the approach to tackling these. An extensive review of existing local and international parenting support programs was conducted to identify additional targets for such a program. A ‘skeleton’ program was developed. Three consultative methods were used in the evaluation of a first-draft prototype of *Towards Parenthood*.

i) Survey

Thirty-two pregnant women who had scores of 13 or above on the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987) participated in a telephone survey.

ii) Focus Group

Six pregnant women (32-34 weeks) and six men all of whom were expecting their first or second child took part in a focus group.

iii) In-depth Interviews

Three extended, in-depth interviews (conducted face-to-face, by telephone and via email) were carried out with new and expectant parents (3 men and 3 women in total). Another set of three interviews was conducted with working professionals in the perinatal health area.

PILOT STUDY

Sample

A community sample of 200 pregnant women participated in the evaluation: 100 women scoring high on the EPDS and 100 women scoring low on the EPDS, as determined by a cut-off score of 12.5. Women were recruited from two maternity hospital antenatal clinics in Victoria (the Northern Hospital in Melbourne's outer Northern suburbs and the Royal Women's Hospital in inner Melbourne) when 26-30 weeks pregnant. Participant characteristics at baseline are shown in Table 2. An ability to understand written English was the only inclusion criterion.

Procedure

Recruitment. Participants were screened with the EPDS by trained midwives as part of the National Postnatal Depression Program (NPDP) in Australia¹ and provided with an information booklet about emotional health during pregnancy and early parenthood. To ensure both groups (women with high scores on the EPDS and women with low scores) were recruited at a similar rate, participants who scored below 13 were invited to participate if they were born on an even numbered day (e.g., March 30, June 14). All women scoring above 12 were invited to participate.

Women were randomly allocated to receive either the Towards Parenthood intervention or routine care.

Towards Parenthood Intervention. Women allocated to the *Towards Parenthood* intervention received a self-help workbook, plus one for their partner. Workbooks comprised nine weekly units – eight to be read during pregnancy and one to be read six weeks following birth (see Table 1). Women had weekly telephone support sessions of approximately half an hour with a psychologist, allowing tailored discussion and problem solving of content in each unit. Psychologists followed structured session prompts and attended supervision sessions to ensure treatment integrity.

Routine Care. Women allocated to the routine care condition were case-managed by their midwife or GP who supported the woman and/or referred her to other services as necessary. Women in this condition were sent the *Towards Parenthood* workbook upon completion of the study.

Feasibility Study Design

The study design is shown in Figure 1

Measures

The *Edinburgh Postnatal Depression Scale* (EPDS; Cox, et al., 1987) is a 10-item self-report measure developed originally to screen for depression during the postpartum. In an Australian sample, the EPDS was found to have 100% sensitivity and 89% specificity at a cut-off of 12.5 (Boyce, Stubbs, & Todd, 1993).

The *Beck Depression Inventory-II* (BDI; Beck et al., 1996) is a well-validated, 21-item clinical instrument that measures cognitive, affective and physiological symptoms of depression. It has been applied extensively in clinical settings (Beck et al., 1996).

The *Beck Anxiety Inventory* (BAI; Beck, Epstein, Brown, & Steer, 1988) is a 21-item self-report scale designed to measure the severity of anxiety symptoms and also has well-defined psychometric properties (Beck et al., 1988).

The *Parenting Stress Index* (PSI; Abidin, 1986) is a 120-item measure of parent-child relations yielding indices fo dysfunctional parenting behaviours, and behavioural/emotional problems in the child (Abidin, 1986).

The EPDS, BDI and BAI were collected at baseline (26-30 weeks gestation) and post-treatment (12-weeks postpartum). The PSI was collected post-treatment. Demographic

information was also collected at baseline. Information about birth and services used was collected post-treatment.

Consumer feedback. After the primary endpoint of the pilot (12 weeks postpartum), a subsample (36 women: 10 with high levels of depressive symptoms and 26 with low levels of depressive symptoms) were interviewed by telephone survey. Questions addressed (1) barriers to completing sessions; (2) relevance, enjoyment, and usefulness of the program; and (3) views on number of sessions, telephone calls, workbooks, and questionnaires.

Results

Program Development

The evaluation process yielded a number of refinements, which were implemented prior to piloting. The most important were: whilst booklets were well written there was too much to assimilate in one go. To make the package more manageable we separated the sessions into colour coded sections, re-formatted in a shortened, more approachable layout. There were a number of editorial refinements (e.g. larger headings, better correspondence between mother and father manuals). More encouragement for couples to share their responses to activities was incorporated to facilitate communication. A more comprehensive referral list was developed and language was made inclusive of various groups (e.g. Single parents, same sex couples etc.) Cut out tip sheets were introduced.

Suggestions not included due to resource limitations were: face-to-face consultations; individual units rather than book format; and offering the program earlier in pregnancy. Thus, the final version used here comprised nine units - eight antenatal and one postnatal. Mothers' and fathers' guidebooks were provided to each couple (only women participated in telephone sessions). Women read one unit per week and discussed the content

with a psychologist. Therapist-completed compliance record sheets detailed which sessions were completed. Session-by-session content is outlined in Table 1.

Feasibility and Barriers in the Pilot Study

Compliance with telephone sessions was low. Only 56 women attended one or more sessions (see Figure 1). Participants with low screening scores attended more (*Median* = 6.5) than participants with high screening scores (*Median* = 0.5). The number of sessions attended was negatively correlated with baseline BDI scores, $r(N = 98) = -.26, p < .05$, and BAI scores, $r(N = 99) = -.30, p < .05$. Age, education, family income, number of children, and relationship status (partnered/single) failed to predict attendance (logistic regression, $\chi^2(5, N = 76) = 5.94, p > .05$).

Consumer feedback ($n = 36$). The consumer feedback survey revealed that 90% of respondents liked the intervention and 95% found it helpful). The main reasons for non-participation in telephone sessions were being too busy (60%) and illness /medical problems (30%). Only 16% of respondents indicated that the time commitment was too much.

Therapist recorded feedback from participants. Qualitative data collected by therapists was coded and analysed. In Table 2 a session-by-session breakdown of feedback for a sub-sample of participants ($n = 11$). Women reported being informed and reassured by the program content and helpful in discussing aspects of parenting with their partner. There were positive comments about the booklet's guidance on anxieties and expectations of parenthood.

Effectiveness of the Intervention

Missing value analysis revealed that post-treatment data were missing randomly within each of the four groups. Figures 2A and 2B show the observed changes in BDI-II and BAI scores respectively.

Depression. As expected, baseline means (Table 1) for the groups with low screening scores fell below the threshold for mild depression on the BDI (i.e., <14), whereas baseline means for the groups with high screening scores ranged from mild- moderate depression (i.e., 20 – 28). BDI scores declined over the course of the study (Figure 3a), with all groups scoring below threshold for mild depression post-treatment (Table 4).

After controlling for baseline scores on the BDI (which had a significant effect, $p < .01$), there was no significant treatment effect, $F(1, 195) = .70, p > .05$, no main effect of screening group, $F(1, 195) = .24, p > .05$, or any screening-by-treatment group interaction found, $F(1, 195) = .00, p > .05$.

Anxiety. Baseline means (Table 1) for the participants with low screening scores fell within the range for mild anxiety (i.e., 8-15), whereas baseline means for the participants with high screening scores fell within the moderate anxiety range (i.e., 16-25). BAI scores declined over the course of the study (Figure 3b; Table 4), with most groups scoring in the minimal anxiety range post-treatment.

After controlling for baseline scores on the BAI (which had a significant effect, $p < .05$), there was no significant main effect of treatment found, $F(1, 191) = .34, p > .05$. However, there was a significant effect of screening group (women with high screening scores reported more anxiety at post-treatment: $F(1, 191) = 4.18, p < .05$), but no significant screening-by-treatment group interaction, $F(1, 191) = .88, p > .35$. *Parenting Stress.* The ITT analysis using imputed values showed no significant main effect of treatment group for post-treatment PSI total scores, $F(1, 196) = .30, p > .05$. However, there was a significant effect of screening group (women with high screening scores reported more parenting stress: $F(1, 196) = 22.00, p < .01$), but no significant screening-by-treatment group interaction, $F(1, 196) = .30, p > .05$.

Scores on Parent and Child Domains of the PSI are presented in Table 4. Results for the Parent and Child Domains were similar, with no significant effect of treatment group (Parent Domain: $F(1, 196) = 1.43, p > .05$; Child Domain: $F(1, 196) = .41, p > .05$). There was a significant effect of screening group (women with high screening scores reported more post-treatment stress in both the Parent Domain: $F(1, 196) = 24.22, p < .01$, and Child Domain: $F(1, 196) = 8.02, p < .01$). No significant interaction effect was found (Parent Domain: $F(1, 196) = .39, p > .05$, Child Domain: $F(1, 196) = .10, p > .05$).

Dose-response. Partial Correlations of the number of telephone sessions completed and each outcome score (controlling for baseline BDI and BAI scores) found no significant relationships ($p > .05$ in all cases).

Help seeking. Participants were asked at post-treatment whether they sought assistance to help them cope since the birth. Significantly more intervention participants with high screening scores (53.6%) sought help than routine care participants with high screening scores (20.8%), Yates' corrected $\chi^2(1, N = 52) = 4.56, p < .05$. Although the same trend was found for intervention (54.8%) and routine care (34.3%) participants with low screening scores, the difference was not significant, $\chi^2(1, N = 77) = 2.45, p > .05$. Participants most often sought help from partners, family, and friends (69.51%), GPs (45.12%), Maternal and Child Health Nurses (41.46%), and/or mental health professionals (20.73%).

Discussion

We developed this antenatal intervention as a 'minimal' intervention package intended to reach a large number of women, consisting of self-directed sessions with interactive exercises, supported by telephone contact. It was refined based on consumer focus groups and interviews. A feedback survey on the refined program involved 36 women and was overwhelmingly positive, with 90% of women who participated indicating that they liked the program and giving positive feedback when surveyed by telephone. This study established the feasibility of delivering this intervention to a wide community based sample and also identified some barriers to uptake. As in past antenatal programs, attrition was high. Some of the problems can be attributed to the research protocol itself, in that participants found the evaluation questionnaires onerous in terms of length. However, time-demands appear a major consideration and completing sessions was also a problem for reasons such as 'being too busy'. Others cited health reasons as an obstacle.

Most importantly however, it was the women with high screening scores who had the lowest rate of return of questionnaires and attendance at telephone sessions. These women were much less likely to engage with the program. Noticeably, very few women (in particular those with high screening scores) accessed additional services despite a notification letter to their GP and it is likely that more intensive networking with GPs is needed to maximise engagement. Interestingly, those intervention women with high screening scores were more likely to access help than those in Routine care.

Whilst the final sample of women with 12-week postnatal psychometric data is modest, results suggest the program may be effective at reducing anxiety and depression. Importantly, we reached women who at baseline consisted of a typical group of pregnant women (n=121) the high screening score groups demonstrating significantly higher depression scores on a gold-standard index, the Beck Depression Inventory (BDI 23 versus

10.8). These women also showed a higher prevalence of typical risk factors such as history of depression (37% versus 15.6% for women with low screening scores) and childhood abuse (19.8% versus 9.9%). They also had higher antenatal anxiety scores. Given the small numbers available for analysis, and the low rates of session attendance, these results may be encouraging. Future work must focus on maximising attendance.

The *Towards Parenthood* intervention encourages extra support-seeking during pregnancy and postnatally. Results indicate that it was effective in this regard. Women receiving the *Towards Parenthood* intervention were more likely to seek help to cope after the birth of their baby (significant for high group, non-significant trend for low group). The relatively high rate of help seeking observed among intervention participants with high screening scores is particularly encouraging given that research suggests these women may be more reluctant to seek support for mood symptoms (Small et al., 1994; Viinamaki et al, 1994; Whitton et al., 1996; Buist et al, 2005). In general, most women do not receive treatment and as a consequence endure a more severe and protracted case of depression (England et al., 1994).

Whilst with the current protocol only 56% of women actually partook in the intervention once allocated, nevertheless if offered universally this could reach substantial numbers on a *per capita* basis in both Victoria (equal to over 3,000 annually) and in Australia generally (equal to over 12,000 annually). Currently we know that 80% of women do not seek help, so that any program that increases help-seeking can potentially make a large difference.

Finally, it is important to recognise that as not all risk factors are amenable to change or elimination (e.g. negative life events and birth complications), so that some cases of depression, anxiety and parenting difficulty may not be preventable via intervention. Nevertheless, antenatal interventions may still have a beneficial impact in such cases.

Vulnerable women may still benefit in the targeted areas of social support and relationships, gain faster access to services and become more aware of how to cope with future difficulties.

Key Areas for Improvement

Based on this feasibility study, it appears that the following are needed to increase both access and uptake:

(1) Further strategies for maximising engagement (e.g., reducing time demands, including incentives, support and time-management as part of the package, and including a fuller section on accessing help and how personal barriers might block this).

(2) Pre-emptive community health networking and connections. Involve GPs and Midwives more directly in ‘holding’ women throughout the program, and in treating depression when present (e.g. involving shared-care GPs).

(3) Consolidate partner books and shorten/rearrange.

In summary, this study resulted in a refined intervention package for dealing with the challenges of parenthood including depression and anxiety that is acceptable to women and their partners. Data on a small sample of women participating in the pilot RCT reveals trends in the expected direction for improvement in anxiety and depression. We have identified possible refinements, which may increase uptake once integrated into a second-phase version of the program. This second-phase version of the *Towards Parenthood* program would need to be evaluated in a larger randomised controlled trial.

Significance

We anticipate that the Towards Parenthood program will assist in alleviating many adjustment problems that new parents present with at new baby services. It also has the potential to reduce the incidence of depression, anxiety and related disorders in the perinatal period. Those who need additional care will also be better placed to contact available services such as general practitioners or specialist mental health services.

At present, primary care and general medical specialists come into contact with many women who may be 'at risk' of depression and who would benefit from being guided through this program which includes 3 sections on coping and managing thoughts that might lead to depressive symptomatology. This program, if shown to be successful in a larger trial, could be a very cost effective and hugely accessible intervention for Australian families.

References

- Abidin, R. R. (1986). *Parenting Stress Index Manual*. VA: Pediatric Psychology press.
- Bailham, D., & Joseph, S. (2003). Post-traumatic stress following childbirth: A review of the emerging literature and directions for research and practice. *Psychology, Health and Medicine* 8, 159-168.
- Banyard, V. L., Williams, L. M. & Siegel, J. A. (2003). The impact of complex trauma and depression on parenting: An exploration of mediating risk and protective factors. *Child Maltreatment*, 8, 334-349.
- Barlow, J., Coren, E., & Stewart-Brown, S. S. B. (2003). Parent-training programmes for improving maternal psychosocial health. *Cochrane Database of Systematic Reviews*. Issue 4. Art No.: CD002020. DOI: 10.1002/14651858.CD002020.pub2.
- Barnes, D. L. (2006). Postpartum depression: Its impact on couples and marital satisfaction. *Journal of Systematic Therapies*, 25, 25-42.
- Baydar, N., Reid, M. J., & Webster-Stratton, C. (2003). The role of mental health factors and program engagement in the effectiveness of a preventive parenting program for head start mothers. *Child Development*, 74, 1433-1454.
- Beck, C. T. (1996a). A meta-analysis of predictors of postpartum depression. *Nursing Research*, 45, 297-303.
- Beck, C. T. (1996b). A meta-analysis of the relationship between postpartum depression and infant temperament. *Nursing Research*, 45, 225-230.
- 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.
- Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *BDI-II Manual*. San Antonio: The Psychological Corporation.

- Boyce, P. M., Stubbs, J. M., & Todd, A. (1993). The Edinburgh Postnatal Depression Scale: Validation for an Australian sample. *Australian and New Zealand Journal of Psychiatry*, 27, 472-476.
- Bullock, L. F., Wells, J. E., Duff, G. B., & Hornblow, A. R. (1995). Telephone support for pregnant women: Outcome in late pregnancy. *New Zealand Medical Journal*, 108, 476-478.
- Chung, T.K.H., et al., *Antepartum depressive symptomatology is associated with adverse obstetric and neonatal outcomes*. *Psychosomatic Medicine*, 2001. **63**: p. 830-834.
- Combs-Orme, T., Cain, D. S., & Wilson, E. E. (2003). Do maternal concerns at delivery predict parenting stress during infancy? *Child Abuse & Neglect*, 28, 377-392.
- 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.
- Cranley, M. S. (1981). Development of a tool for measurement of maternal attachment during pregnancy. *Nursing Research*, 30, 281-284.
- Dayan, J., Creveuill, C., Marks, M. N., Conroy, S., Herlicoviez, M., Dreyfus, M., & Tordjman, S. Prenatal depression, prenatal anxiety, and spontaneous preterm birth: A prospective cohort study among women with early and regular care. *Psychosomatic Medicine*, 2006. **68**: p. 938-946.).
- Dennis, C-L., & Creedy, D. (2004). Psychosocial and psychological interventions for preventing postpartum depression. *Cochrane Database of Systematic Reviews*. Issue 4. Art. No.:CD001134. DOI: 10.1002/14651858.CD00134.pub2.
- Evans, J., Heron, J., Francomb, H., Oke, S., Golding, J. (2001). Cohort study of depressed mood during pregnancy and after childbirth. *British Medical Journal*, 322, 257-260.

- Gagnon, A. J., & Sandall, J. (2007). Individual or group antenatal education for childbirth or parenthood, or both. *Cochrane Database of Systematic Reviews*. Issue 3. Art. No: CD002869. DOI: 10.1002/14651858.CD002869.pub2.
- Gaines, S. D., & Rice, W. R. (1990). Analysis of biological data when there are ordered expectations. *The American Naturalist*, 135, 310-317.
- Gelfand, D. M., & Teti, D. M. (1990). The effects of maternal depression on children. *Clinical Psychology Review*, 10, 329-352.
- Goodman, J. H. (2004). Paternal postpartum depression, its relationship to maternal postpartum depression, and implications for family health. *Journal of Advanced Nursing*, 45, 26-35.
- Kettinger, L. A., Nair, P., & Schuler, M. E. (2000). Exposure to environmental risk factors and parenting attitudes among substance-abusing women. *American Journal of Drug and Alcohol Abuse* 26, 1-7.
- Milgrom, J., Ericksen, J., McCarthy, R.M. & Gemmill, A.W. (2006). Stressful impact of depression on early mother-infant relations. *Stress and Health*, 22 229-238.
- Milgrom, J., Ericksen, J., Negri, L., & Gemmill, A. W. (2005a). Screening for postnatal depression in routine primary care: Properties of the Edinburgh Postnatal Depression Scale in an Australian sample. *Australian and New Zealand Journal of Psychiatry*, 39, 833-839.
- Milgrom, J., Martin, P., & Negri, L. (1999). Treating Postnatal Depression. *A Psychological Approach For Health Care Practitioners*. England: John Wiley & Sons.
- Milgrom, J., & McCloud, P. (1996). Parenting stress and postnatal depression. *Stress Medicine*, 12, 177-186.

- Milgrom, J., Negri, L. M., Gemmill, A. W., McNeil, M. & Martin, P. R. (2005b). A randomised controlled trial of psychological interventions for postnatal depression. *British Journal of Clinical Psychology*, *44*, 528-542.
- Mrazek, P. J. & Haggerty, R. J. (1994). *Reducing risks for mental disorders - Frontiers for preventive intervention research*. Washington, D. C: National Academy Press.
- Murray, L., & Cooper, P. J. (1997). *Postpartum depression and child development*. Guilford Press: New York.
- Murray, L., & Cooper, P. J. (1997). Effects of postnatal depression on infant development. *Archives of Disease in Childhood*, *77*, 99-101.
- O'Hara, M. W., & Swain, A. M. (1996). Rates and risk of postpartum depression – A meta-analysis. *International Review of Psychiatry*, *8*, 37-54.
- O'Hara, M. W., Zekoski, E. M., Phillips, L. H., & Wright, E. J. (1990). Controlled prospective study of postpartum mood disorders: Comparison of childbearing and non-childbearing women. *Journal of Abnormal Psychology*, *1*, 3-15.
- Rice, W. R., & Gaines, S. D. (1994). Extending nondirectional heterogeneity tests to evaluate simply ordered alternative hypotheses. *Proceedings of the National Academy of Sciences*, *91*, 225-226.
- The beyondblue National Postnatal Depression Program* (2005). Final Report Vols I & II. http://www.beyondblue.org.au/index.aspx?link_id=4.665&tmp=FileDownload&fid=348.
- Tsujino, J., & Higa, M. O. (2004). Factors related to maternal violence: Longitudinal research from prenatal to age four. *Journal of Prenatal Perinatal Psychology Health*, *18*, 241-253.

Zuckerman, B., et al., *Depressive symptoms during pregnancy: relationship to poor health behaviours*. American Journal of Obstetrics and Gynaecology, 1989. **160**: p. 1107-1111

Author Notes

We thank the *beyondblue* Victorian Centre of Excellence in Depression and Related Disorders for funding this project.

We thank Jan Ryan, Jane Ting and the midwifery team at the Northern Hospital and the midwives at the Royal Women's Hospital for screening and initial recruitment of women.

Footnotes

¹ The NPDP evaluated the feasibility of using a simple screening tool to identify women at risk of antenatal and postnatal depression.

Table1: Characteristics of Participants at Baseline

	Low EPDS (< 13)		High EPDS (≥ 13)	
	Intervention	Routine care	Intervention	Routine care
	<i>n</i> = 50	<i>n</i> = 50	<i>n</i> = 50	<i>n</i> = 50
Age, <i>M</i> (<i>SD</i>)	30.5 (5)	28.0 (5.1)	28.4 (5.7)	28.8 (6.1)
Range	20-40	17-38	18-41	18-41
Weeks pregnant, <i>M</i> (<i>SD</i>)	28.1 (1.8)	27.2 (2.8)	26.3 (5.3)	24.2 (7.9)
Partnered, <i>n</i> (%)	47 (94)	45 (90)	36 (72)	35 (70)
Parity, <i>n</i> (%)				
0	22 (44)	21 (42)	11 (22)	14 (28)
1	17 (34)	21 (42)	19 (38)	19 (38)
2	5 (10)	3 (6)	7 (14)	5 (10)
>2	2 (4)	1 (2)	7 (14)	8 (16)
Born in Australia, <i>n</i> (%)	40 (80)	39 (78)	33 (66)	40 (80)
Education, <i>n</i> (%)				
Did not complete high school	2 (4)	7 (14)	13 (26)	13 (26)
Completed high school	19 (38)	17 (34)	20 (40)	16 (32)
Additional qualifications	28 (56)	25 (50)	17 (34)	21 (42)
Family income (Mode \$AUD)	40-60,000	40-60,000	40-60,000	40-60,000
EPDS, <i>M</i> (<i>SD</i>)	6.7 (3.1)	6.0 (3.7)	17.2 (4.3)	17.0 (3.5)
BDI, <i>M</i> (<i>SD</i>)	8.3 (4.0) [†]	9.1 (6.1) [†]	21.0 (10.8) [†]	22.8 (11.7) [‡]
BAI, <i>M</i> (<i>SD</i>)	8.4 (5.6)	8.3 (6.6)	19.0 (12.0) [†]	19.1 (13.0) [*]

[†] *n* = 49, [‡] *n* = 48, ^{*} *n* = 47

Table 2: Intervention Targets and Strategies Used in the Towards Parenthood Workbooks

Workbook Unit	Intervention Targets and Strategies [†]	What participants liked
Unit 1. <i>Baby Love: Making Space for a New Love Relationship</i>	<ul style="list-style-type: none"> • Reflective questions adapted from Cranley's Maternal Fetal Attachment Scale (Cranley, 1981) to promote developing relationship with baby. • Psychoeducation about baby's emotional needs. • Reflective exercise on experiences within family-of-origin to facilitate awareness of its influence on mother-baby relationship. • Practical suggestions for play and bonding. 	<ul style="list-style-type: none"> • Family of origin issues • Expectations/worries/fears of motherhood • Opened discussion with partner
Unit 2. <i>We're Expecting! Helping you Prepare for Parenthood</i>	<ul style="list-style-type: none"> • Reflective exercises exploring realistic and unrealistic expectations for the birth and parenthood to foster preparation for the transition. • Psychoeducation about the variety of feelings experienced as a new parent to foster preparation. • Brainstorming exercise to encourage forethought into coping strategies. • Psychoeducation about problem-solving skills; practice activities. 	<ul style="list-style-type: none"> • Problem solving skills • Allowed reflection on transition to/responsibility of parenthood
Unit 3. <i>Lovers and Parents: managing Relationship</i>	<ul style="list-style-type: none"> • Exercises to encourage discussion with partner about roles and expectations of one another as parents. 	<ul style="list-style-type: none"> • Enhanced communication with partner • Communication tips helpful (though less relevant for

<i>Changes</i>	<ul style="list-style-type: none"> • Reflective exercise on experiences within family-of-origin to facilitate awareness of parental relationship models. • Tip sheets for improving communication, resolving conflict, and promoting intimacy and mutual support. 	single mothers)
Unit 4. <i>Coping Tips and Stress Busters</i>	<ul style="list-style-type: none"> • Reflective exercises to identify typical ways of coping and the influence of parental models. • Psychoeducation about depression and anxiety. • Information about stress management techniques (e.g., relaxation, regular exercise, etc.). • Assessment of personal life stressors and suggestions for how to deal with common problems for new parents (including contact details for community support services). 	<ul style="list-style-type: none"> • Support services list is a useful resource • Distraction and self-talk techniques useful • Model of relationship between thoughts, feelings and behaviours very useful
Unit 5. <i>Managing Stress and Depression: Start by Analysing your Behaviour</i>	<ul style="list-style-type: none"> • Psychoeducation about the connection between behaviour, thoughts and feelings. • Exercises to encourage pleasant activity scheduling. • Information about coping strategies. 	<ul style="list-style-type: none"> • Useful to identify contributors to low mood • Recognising passive, aggressive, assertive communication styles
Unit 6. <i>Managing Stress and Depression: Healthy Relationships, Healthy Self</i>	<ul style="list-style-type: none"> • Assertiveness skills training involving psychoeducation, reflective questions, and practice exercises. • Psychoeducation about self-esteem and suggestions for building self- 	<ul style="list-style-type: none"> • Discussion of self-esteem useful in trying to be role model to own children

	<p>esteem.</p> <ul style="list-style-type: none"> • Suggestions for working with grief or distress associated with relationships within family-of-origin. 	
Unit 7. <i>Managing Stress and Depression: Developing your Skills in Changing your Self-Talk</i>	<ul style="list-style-type: none"> • Psychoeducation about the relationship between thoughts and feelings. • Exercises to tune into one's thoughts. • Psychoeducation about cognitive distortions and strategies for changing unhelpful thoughts. • Activities to practice cognitive restructuring. 	<ul style="list-style-type: none"> • Related to concept of thoughts affecting feelings • Helped recognise thinking traps • Strategies for increasing positive/decreasing negative thoughts useful
Unit 8. <i>Parenting Suggestions for Managing Newborns</i>	<ul style="list-style-type: none"> • Practical advice and normalising of difficulties with sleeping, settling, feeding, and crying. • Quiz to engage with material. • Reflective questions to develop insight into feeding preferences. • Activities to practice problem solving and coping with parenting problem scenarios. 	<ul style="list-style-type: none"> • The most helpful unit as it assisted in a practical way • Parenting tip sheets good • Feeding section good/non-judgmental/did not give preference to breast feeding
Unit 9. <i>Welcome to "The Club"!</i>	<ul style="list-style-type: none"> • Questions to reflect on and integrate the birth experience and the reality of parenthood. • Reinforcement of problem solving skills training. • Activities to foster learning and getting to know baby. 	<ul style="list-style-type: none"> • Great review of strategies learnt in program • Program helped organise my thinking about my baby

	<ul style="list-style-type: none">• Play suggestions.• Psychoeducation about the experience of both positive and negative feelings toward baby and coping strategies.• Reflective questions to encourage awareness of changes to the couple relationship and suggestions for improving communication.	
--	---	--

[†] Workbooks for women and their partners covered similar material with the main difference being that the information and activities in the partner's workbook were geared towards the experience of fathers.

Table 3: Post-treatment Scores on Parenting Stress Index (PSI)

	Low Screen Score (EPDS < 13)		High Screen Score (EPDS ≥ 13)	
	Intervention <i>n</i> = 37	Routine care <i>n</i> = 33	Intervention <i>n</i> = 21	Routine care <i>n</i> = 22
Total Score, <i>M</i> (SD)	215.8 (39.3)	214.5 (36.0)	225.6 (40.7)	234.8 (48.8)
Parent domain, <i>M</i> (SD)	121.8 (28.3)	123.4 (23.8)	129.8 (30.1)	139.4 (33.1)
Child domain, <i>M</i> (SD)	94.0 (15.8)	91.1 (18.6)	96.5 (17.7)	96.1 (17.3)

Figure 1. Participant flow through the Feasibility Study.

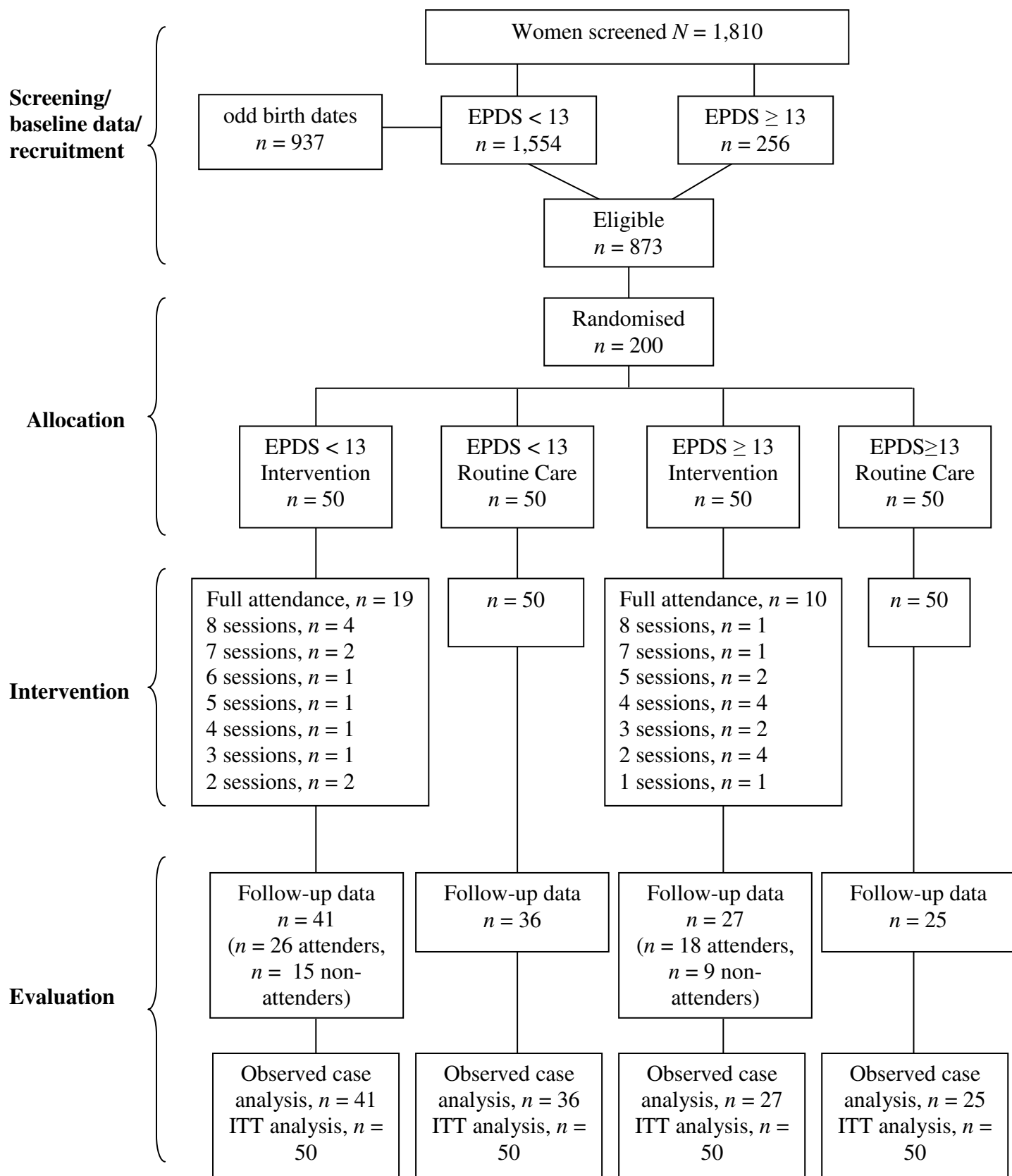
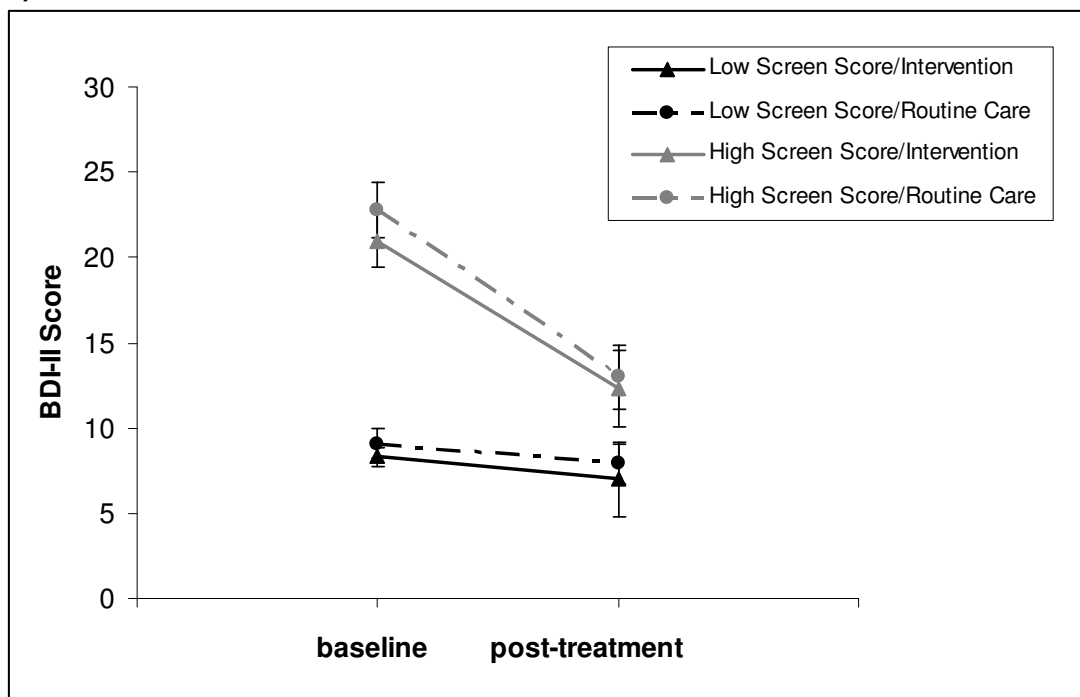


Figure 2. Changes in Depression and Anxiety Levels Following Intervention.

A) Mean scores of the BDI-II are plotted (± 1 SE) for Low Screening Score groups (black) and High Screening Score groups (Grey). Intervention is indicated by solid lines (—) and Routine Care by broken lines (---).

A)**B)**