

Professional and Non-Professional Intervention for Highly Anxious Primiparous Mothers

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Summary: Primiparous women ($n = 627$) were screened on state and trait anxiety measures in the post-partum period; sub-groups of highly anxious ($n = 89$), moderately anxious ($n = 29$), and minimally anxious ($n = 29$) mothers were derived and subsequently interviewed. The high-anxiety mothers were randomly assigned to a professional intervention, to a non-professional intervention, and to a control group, and their progress was reviewed over the following 12 months. Compliance, both in responding to progressive assessments and in accepting therapeutic intervention, was extremely high. Changes in anxiety levels for mothers not receiving an intervention were minimal over the study. In the high-anxiety sub-groups, there was a 19% reduction in state anxiety levels for those receiving a professional intervention, a 12% reduction for those receiving a non-professional intervention, and a 3% reduction in the controls. A planned contrast analysis determined that only professional intervention had a significant effect, intervention successfully lowering state anxiety levels to a value comparable with the moderately anxious mothers.

The childbearing stage has been described by many authors as a developmental crisis for women (Benedek, 1959; Raphael-Leff, 1980; Pines, 1972), and the literature (e.g. Oakley, 1980) suggests that satisfactory resolution of the crisis is by no means the rule. If the developmental crisis model is appropriate, then the high levels of anxiety commonly found in the first and third trimesters (Shereshfsky & Yarrow, 1973; Lubin *et al.*, 1975) may be necessary for emotional preparation for the stresses of childbirth and beyond. Nevertheless, high anxiety levels have been incriminated as a risk factor in late pregnancy, in labour, in the post-partum period and in bonding to the infant.

Specifically, prospective studies have demonstrated that highly anxious pregnant women have a higher incidence of pre-eclampsia, of prolonged and precipitate labour, of forceps delivery, of foetal distress and asphyxia, as well as of babies with lower Apgar levels and with congenital abnormalities (Crandon, 1979a, 1979b; Ascher, 1978). Mediating physiological mechanisms have been described (Ascher, 1978), and high ante-natal anxiety levels linked with post-natal depression in several studies (Tod, 1964; Dalton, 1971; Meares *et al.*, 1976). Single (1979) found that very high or very low levels of post-natal anxiety were associated with disturbed bonding, while Osofsky & Connors (1979) have considered how high levels of maternal anxiety may interfere with the development of maternal-child synchrony. Ainsworth *et al.* (1971) suggested that

the maternal contribution to synchrony is reflected optimally by maternal sensitivity, acceptance, co-operation, and availability, while Parker (1983) has suggested ways in which maternal anxiety may interfere with those optimal characteristics, and result in an insufficiency of care and/or over-protection of the child.

In view of such findings, we designed a naturalistic cohort study to assess the longitudinal adaptation of primiparous mothers who differed in terms of having high, moderate, and low levels of anxiety. In addition, we offered interventions which were designed to reduce anxiety to two sub-groups of the highly anxious subjects; one received professional, and the other non-professional intervention. The effectiveness of these was compared over the study period of one year.

Method

General study design: We estimated that 30 or so subjects were required in each of the five sub-groups to avoid Type II errors, and to allow for a drop-out of approximately 20% over the study. Such a cohort study, with approximately 90 high-anxiety, 30 moderate-anxiety and 30 low-anxiety subjects, would allow differences between primiparous women, contrasting sharply in terms of their levels of anxiety, to be determined over a 12-month period after having their first child. In addition, interventions in the high-risk group, the high-anxiety mothers, could be assessed by comparing the two intervention sub-groups with the high-anxiety control sub-group.

As we were interested in women with differing levels of

inherent anxiety, we screened subjects in the post-partum period, using a measure of trait anxiety. Progress during the study, however, was to be assessed principally by examining scores on a state anxiety measure, as trait scores should be resistant to current state—although this does not always hold in practice (Kendell & DiScipio, 1968).

Subjects: A consecutive series of primiparae, attending two large obstetric units in Sydney, were asked to complete the Spielberger trait and state anxiety scales (Spielberger *et al.*, 1970) on the third or fourth day post-partum. Inclusion criteria were: (a) provision of informed consent, (b) sufficient knowledge of English to complete subsequent questionnaires, (c) married or living with their partner, (d) being resident within a pre-determined geographical area of Sydney (for access by intervention team), (e) having a telephone in the house (for access), (f) the baby having no major defect and/or not having spent more than 24 hours in the intensive care nursery, and (g) the birth being a single one.

Allocation to groups: A pilot study of 94 primiparae provided reference scores for the Spielberger scales in an Australian group, the mean trait score being 33.1 (SD = 8.1). Using the data in a conservative way, we estimated that scores of 40 or more on the trait scale should result in allocation to a high-anxiety group, 32 or 33 to a moderate-anxiety group, and 25 or less to a low-anxiety group.

A consecutive series of 630 women was approached, and 627 accepted screening on the questionnaire, until adequate numbers were obtained. Those allocated to the high-anxiety group were randomly allocated to non-professional intervention, professional intervention and control sub-groups by the second author, who also randomly selected for interview, a one-in-three sample of those scoring 25 or less on the trait scale. After scoring, random allocation, and exclusion of ten subjects discovered to be non-valid by the original inclusion criteria, 166 subjects remained. Of these, 11 refused to grant an initial interview, and a further three did not complete that interview, leaving 152 in the sample.

Initial interview: A comprehensive interview of the mothers was held in their homes, with the first author interviewing all subjects within three weeks of discharge from hospital. Interview data (socio-demographic, developmental, pregnancy and post-partum, health record, etc) were collected using a semi-structured and pre-coded interview schedule, and several questionnaires were administered. These included the Costello-Comrey (1967) trait anxiety and trait depression scales, the Beck Depression Inventory (Beck *et al.*, 1961), the Eysenck Neuroticism Scale (Eysenck & Eysenck, 1964), and the Interview Schedule for Social Interaction, or ISSI (Henderson *et al.*, 1981), a measure of perceived availability and adequacy of support from intimates and the wider social network. Social class was assessed on the seven-point Congalton (1969) scale. A life event schedule, developed specifically to assess such events in the preceding 12 months for primiparous women (Barnett *et al.*, 1983), was

given and generated a total events score, a total distress score (by summing subjects' distress ratings on visual analogue scales) and a criterion score (by summing the distress ratings of the above referenced criterion group for the life events acknowledged by the subjects). The Hereford Parent Attitude scale (Hereford, 1963) was given to assess subjects' attitudes to child-rearing. The interviewer (B.B.) remained unaware of the group to which each subject was allotted, and hence of the trait anxiety score, until the interview was completed. Group allocation was then discovered by opening a sealed envelope, and intervention offered to those in the two specified high-anxiety groups. The high-anxiety controls, the moderate-anxiety, and the low-anxiety subjects were requested to complete mailed questionnaires and to attend a 12-month follow-up interview.

Subsequent assessments: Questionnaires, including Spielberger anxiety scales, were mailed to all subjects at three, six, nine and 12 months, to assess the progress of the mothers and infants. At the one-year interview, many of the initial questionnaires were repeated. These procedures were standardised for all subjects.

Interventions to the high-anxiety mothers: Non-professional intervention comprised allocation to the subject of an experienced mother, who had volunteered to assist with the study and who met our requirements for a support figure who would offer common sense advice, support, and practical help, but avoid proselytising any particular narrow model of mothering. Each such support mother was given a set of guidelines and allocated one or two study subjects. Professional intervention comprised assistance from a social worker experienced in working with mothers and children, each social worker being allocated six subjects. Guidelines for the social worker suggested attention to: the provision of support; specific anti-anxiety measures; the promotion of self-esteem and confidence; a reduction in intensity of the mother-infant interaction (if appropriate), and promotion of mother-father and father-child interaction.

All support workers, lay or professional, were given a suggested schedule of contact, which was to be more frequent in the early stages. Suggestions regarding telephone contact, both in terms of initiation and frequency, were written into the schedule, although therapists were encouraged to use their own discretion regarding appropriate strategies at any particular point. Support workers were given coded sheets, so that a contact diary was maintained for each subject.

Results

Of the 152 mothers who completed the base-line interview, 147 (97%) returned all postal questionnaires. Data analysis was restricted to this group, after we determined that this sample could not be distinguished from the remainder of those originally screened ($N = 480$) on key study variables such as age, socio-economic class, sex of the baby, and hospital of admission.

Table I summaries relevant base-line data for trial subjects allocated to the five groups. Comparisons were

TABLE I
Comparison of trial groups on relevant baseline variables

Variable	High anxiety (A)			Moderate anxiety (B)	Low anxiety (C)	Group comparisons	
	Non-professional (D)	Professional (E)	Control (F)			AvBvC	DvEvF
<i>Maternal demographic variables</i>							
Age	28.7	29.6	28.3	29.6	28.2	NS	NS
Socio-economic class	3.9	3.8	3.3	3.5	3.6	NS	NS
Australian by birth	77%	71%	68%	90%	86%	NS	NS
<i>Maternal questionnaire data</i>							
<i>Spielberger</i>							
Trait anxiety	46.4	44.1	44.8	32.4	23.0	F= 368.9***	NS
State anxiety	41.5	41.8	40.3	32.2	24.9	F= 48.7***	NS
<i>Costello-Comrey</i>							
Anxiety	30.8	31.5	28.6	22.3	12.4	F= 47.6***	NS
Depression	28.9	27.3	29.4	23.0	12.2	F= 21.9***	NS
Beck depression	8.5	7.1	6.0	4.8	2.8	F= 14.1***	NS
Neuroticism	13.8	13.4	13.4	10.1	8.0	F= 25.5***	NS
<i>Interview Schedule for social interaction</i>							
Availability of attachment	7.3	7.1	7.4	7.3	7.6	NS	NS
Adequacy of attachment	8.5	9.6	8.5	9.9	9.9	NS	NS
Availability of social integration	6.7	7.3	7.0	8.2	8.8	F= 5.2**	NS
Adequacy of social integration	12.4	12.3	12.6	13.2	13.0	NS	NS
<i>Life events</i>							
Total events	5	5	4	4	3	F= 5.1**	NS
Total distress score	23	25	20	16	11	F= 9.9***	NS
Criterion score	30	29	23	22	18	F= 5.6**	NS
Hereford parental confidence	24	23	24	25	30	F= 17.1***	NS
Confident about maternal role	50%	45%	54%	69%	79%	$\chi^2 = 9.5**$	NS
Post-natal 'blues'	87%	90%	68%	48%	41%	$\chi^2 = 22.4***$	NS
N	30	31	28	29	29		

*P < .05, **P < .01 ***P < .001

first made among the high-anxiety subjects after random allocation to group, and it can be seen that there are no significant differences between those groups, which is an issue of importance in a controlled study. When these 89 subjects were compared with the moderate anxiety and low anxiety groups, a number of significant differences were found. As expected from the study design, the groups differed on the Spielberger trait anxiety scale, and a similar difference was demonstrated on the Costello-Comrey trait anxiety measure. Similarly, the groups showed differences on measures of state anxiety (Spielberger), state depression (Beck), trait depression (Costello-Comrey), the likelihood of having experienced post-natal 'blues' for more than 24 hours, and on neuroticism scores (Table I). The more highly anxious subjects reported lower availability of social integration on the ISSI scale and less confidence about their maternal capacities, the latter being assessed by direct questioning and by the Hereford measure. The more highly anxious subjects recorded more life events in the preceding 12 months and higher distress levels associated with those life events; the subjects' own estimation of distress scores discriminated the groups more strongly than distress scores calibrated from the reference group.

Table II reports mean state and trait anxiety scores on the Spielberger measures over the 12 months of the study. Changes in anxiety levels from base-line to the 12-month

follow-up were assessed, using paired t-tests for the 147 subjects completing both assessments. On the state anxiety measure, there was a significant reduction of anxiety both in the professional intervention group (19%) and in the non-professional intervention group (12%). The 3% reduction of anxiety in the high-anxiety controls was not significant, nor were changes in the moderate-anxiety and low-anxiety groups. On the trait anxiety measure, there were significant reductions of anxiety in the two intervention groups, but not in the high-anxiety control group, while there was a significant increase in anxiety levels in the low-anxiety group.

In addition, a series of planned contrast analyses examined for changes in anxiety levels across the whole trial, using data from all test occasions. In order to control for Type I error, a family-wise error rate was employed, using the Bonferroni procedure to determine critical F values. As the drop-out rate was low, missing data were handled by recording the mean score of the subject's group on that occasion of testing for any missing anxiety score.

Firstly, a series of contrasts examined for differences between groups, averaged over all five occasions of testing. The collected high-anxiety subjects differed from the grouped moderate-anxiety and low-anxiety subjects on these contrasts, both for state (F = 143.8; Fc = 8.95) and trait (F = 77.2; Fc = 8.95) measures; all contrasts

TABLE II
Changes in anxiety levels over the 12 months

	Assessment period in months					Changes in anxiety levels from baseline to 12 month follow-up		
	N	0	3	6	9	12	Percentage change	t test
<i>Spielberger State</i>								
High anxiety group								
Non-professional intervention	30	41.5	37.0	35.2	37.3	36.4	-12%	2.27*
Professional intervention	31	41.8	39.1	36.1	34.6	33.9	-19%	4.21***
Control	31	40.3	35.5	37.6	38.8	39.1	-3%	0.65
Moderate anxiety group	29	32.2	30.7	30.5	32.3	32.5	+1%	0.17
Low anxiety group	29	24.9	24.4	24.2	26.1	25.2	+1%	0.33
<i>Spielberger Trait</i>								
High anxiety group								
Non-professional intervention	30	46.4	40.1	40.7	41.6	41.4	-11%	2.68**
Professional intervention	31	44.1	42.5	41.1	38.6	38.4	-13%	3.81***
Control	28	44.8	40.9	40.2	41.4	41.6	-7%	2.02
Moderate anxiety group	29	32.4	33.0	31.5	31.6	31.7	-2%	0.54
Low anxiety group	29	23.0	26.4	25.9	27.1	25.2	+10%	2.78**

* $P < 0.05$ ** $P < 0.025$ *** $P < 0.001$

testing for differences between the combined treatment groups and the high-anxiety controls had non-significant *F* ratios.

Trend analyses examined for interactions between groups for linear and quadratic trends over the five occasions of testing. On the state anxiety measure, a significant difference in linear trend was found between the professional intervention and the high-anxiety control groups ($F = 11.59$; $F_c = 11.0$), and between the professional intervention and the moderate-anxiety groups ($F = 13.16$; $F_c = 11.0$); the trend was for the professional intervention group scores to decrease in each case, while the comparison groups' scores tended to increase. There were no significant linear trends distinguishing between the non-professional intervention group and the high-anxiety controls, either for state ($F = 3.04$; $F_c = 11.0$) or for trait ($F = 0.29$; $F_c = 11.0$) anxiety, and differences in quadratic trends were also non-significant ($F = 0.06$ and 0.24 respectively). While there were suggestive linear trends on state anxiety for the two intervention groups to differ from the high-anxiety controls ($F = 8.69$; $F_c = 11.0$) and for the combined high-anxiety subjects to differ from the remaining subjects ($F = 8.72$; $F_c = 11.0$), these differences were not significant.

On the trait anxiety measure, there was a significant difference in linear trend between the combined high-anxiety subjects and the remaining subjects ($F = 11.71$; $F_c = 11.0$) and an even more marked difference in quadratic trend ($F = 18.24$; $F_c = 11.0$). The latter was due to a rapid drop in anxiety levels from base-line to the three-month assessment in the high-anxiety subjects and a contemporaneous increase in anxiety levels in the low-anxiety group, perhaps suggesting a regression to the mean phenomenon.

As the controlled trial established that professional intervention had had a significant effect in lowering state levels of anxiety, in comparison to lay intervention, where only a non-significant trend was apparent, we attempted to estimate whether the differential effect might reflect

differences such as contact time or interpersonal characteristics of the therapists. Data from the therapists' study diaries established that professionals made fewer visits to ($F = 6.9$, $P < .01$) and received fewer visits from ($F = 3.9$, $P < .05$) their subjects, and that fewer telephone calls were made to ($F = 19.4$, $P < .001$) and received from ($F = 5.8$, $P < 0.25$) professionals than for the non-professionals. The subjects' reports substantiated these findings, with those in the professional group reporting fewer visits ($\chi^2 = 19.6$, $P < .001$), and fewer telephone calls ($\chi^2 = 20.5$, $P < .001$), and tending to make fewer approaches to their therapist ($\chi^2 = 5.5$, NS) than those in the non-professional group. Thus, the extent of contact is unlikely to have brought about the superior result for those receiving the professional intervention. Similarly, as both groups of subjects generally rated their therapist highly (79% as against 76%), the differential effect is unlikely to reflect a non-specific therapeutic ingredient. Finally, we considered whether a differential effect in results might have emerged from the professional therapists encouraging their subjects to utilise other helping facilities to a greater degree. We assessed utilisation rates by the subjects of baby health centres, general practitioners, obstetricians, and paediatricians, such data being collected at the three-month, nine-month and twelve-month assessments, and found no significant differences between the groups on those parameters.

Discussion

Margison (1982) described a vicious cycle in highly anxious mothers of 'failed feeding, increased crying, increasing feelings of anxiety and panic about the baby', while Kumar & Robson (1983) drew the grave conclusion that 'for some women childbearing heralds the start of prolonged emotional difficulties'. The present study is then of relevance in assessing whether anxious mothers, as a high-risk group, might be assisted by two contrasting inter-

ventions. By selecting primiparous women only and specifying exclusion criteria, we sought to control several variables (e.g. significant illness or deformity in the neonate) that might have had an independent influence on outcome. We selected our sample in the early post-partum period, believing this to be the most appropriate and practical time for distinguishing the at-risk mother. We established that there is a high compliance in accepting a screening procedure at that time (with 99% of those invited completing the questionnaire) and in participating in the study (92%).

Groups of mothers, discriminated on levels of trait anxiety, were selected, and serial testing of those in groups not receiving any intervention suggested reasonable constancy on anxiety scale scores over the following 12 months; the contrast analyses established that the initial differences were maintained between the highly, moderately, and minimally anxious groups, apart from the suggestion of a slight regression to the mean phenomenon on the trait anxiety scale. The percentage change in state anxiety scores over that period was no more than 3% in those sub-groups not receiving any intervention. Rather paradoxically, when the concepts of trait and state are considered, the percentage changes in trait anxiety scores were somewhat greater, ranging from 2–10%. The noteworthy constancy in anxiety levels in those not receiving intervention suggests that we did not select subjects at a time when anxiety levels were raised ephemerally as a consequence of post-partum stressors. While our sample was a non-clinical one, and only nine acknowledged previous psychological problems, there was much to suggest that the high anxiety subjects had significant psychopathology. Their mean scores on trait (45.1) and state (41.2) Spielberger anxiety scales were not too dissimilar from those of students seeking help for emotional problems (trait 44.4; state 40.4) and of psychiatric patients with anxiety reactions (trait 48.1; state 49.0) (Spielberger *et al.*, 1970). Again, their scores on other measures of anxiety, depression and neuroticism were significantly higher than those in the other groups, while they were twice as likely as other mothers to report post-natal 'blues'.

Possible factors determining allocation to the high-anxiety group will be considered in a later paper, but in general terms, we believe that membership was determined more by constitutionally high levels of anxiety rather than by recent or current stressors. It is true that those in the high-anxiety group reported more life events during their pregnancy. They also reported a higher distress score per life event ($F = 7.0$, $P < .01$), but further

analyses, involving comparison with scores returned by a criterion group, suggested that the highly anxious subjects differed more in their tendency to perceive and to rate life events as distressing, rather than in their being exposed to more objectively judged distressing events. Such an interpretation is consistent with the finding that the high-anxiety subjects showed a consistent trend on the ISSI to nominate less availability of attachment and social integration (the latter being a significant difference) and less adequacy of attachment and social integration. Henderson *et al.* (1981) suggested that neurotic subjects are more likely to construe, as well as to perceive more negative aspects in their social network, rather than to have an excess of life events, and we would interpret a number of the differences in social support and life event stress in our study in this way.

Non-professional intervention was designed to provide each subject with a support figure who was an experienced mother herself, and who would be available to provide advice and assistance at times of perceived crisis. Subjects assigned to this group showed a rapid drop in anxiety levels in the first three months (more marked than those receiving professional intervention), but little change in anxiety scores subsequently. Over the 12-month study, their state and trait levels of anxiety decreased significantly, by 12% and 11% respectively (in comparison to 3% and 7% for the controls), but the planned contrast analyses, examining both for linear and quadratic trends, found no significant differences between the non-professional intervention and the high-anxiety control group.

Professional intervention was designed to lower anxiety in mothers by specific anti-anxiety measures and by indirect measures, such as the provision of support and guidance. In addition, the social workers attempted to pre-empt some of the interactions that appear more likely in anxious mothers. Thus, if relevant, the therapists attempted to reduce any mother-infant interactions which were too intense, to reduce over-protective behaviour, and to promote both mother-father and father-child interactions over the 12 months. Over that period, trait and state anxiety levels were reduced significantly, respectively by 13% and 19%. Such a reduction on the trait anxiety scale is of interest, and suggests confirmation of the research finding that trait scale scoring is influenced by state factors (Kendell & Di Scipio, 1968). The reduction on the state anxiety scale was impressive, not only in terms of its magnitude, but because the mean score at 12 months for this group (33.9) was very

similar to the mean score at 12 months for the moderate-anxiety group (32.5). Planned contrast analyses confirmed significant linear trends distinguishing the professional intervention group both from the 'high-anxiety' controls and from the 'moderate-anxiety' group, with those in the professional intervention group diverging from the high-anxiety controls and converging towards the moderate-anxiety subjects.

Subsidiary analyses suggested that the greater success of the professional intervention was unlikely to have been brought about by any greater contact between the professional therapists and their mothers when, in fact, the professional therapists spent less time with their subjects than did the non-professional therapists. The difference is also unlikely to reflect a non-specific therapeutic ingredient, as mothers in both groups tended to rate their individual therapist very highly, and no differential effect was found between groups. Thirdly, there was no suggestion that either intervention encouraged greater utilisation of other facilities.

Examination of mean scores shows that anxiety scores dropped rapidly over the first three months in both the non-professional intervention group and in the high-anxiety control, in comparison to the professional intervention group. This might suggest that professional intervention slowed any inherent tendency for reduction in anxiety levels, as a consequence of time or non-specific features associated with taking part in the study. This delay in reduction of anxiety may or may not be a disadvantage. Comparison of the groups over the full 12 months of the study showed a slower, but a more ongoing and a more marked reduction in anxiety in the professional group, suggesting an effect due to the more specific strategies used by the therapists. There are two important implications to such a finding. Firstly, if it can be accepted that the lay therapists principally provided support, while the professionals additionally provided specific anti-anxiety therapeutic stratagems, then 'social support' appears to be insufficient in itself. Secondly, if the lay and professional interventions had been equally successful, then there would have been considerable cost-benefit advantages in recommending the use of lay therapists. The superiority of professional intervention suggests that it would be difficult to argue for such a lay intervention. It is important, however, to keep in mind the characteristics of the sample, which might have been biased to the more socially supported in the community (especially as we excluded single and separated mothers). It is quite possible that the intervention

would have had different effects in clinical or in socially disadvantaged groups.

It is important to place our findings in perspective with other inquiries. Siegel *et al* (1980) assessed the effects of early and extended mother-baby contact in hospital, as well as of home visits by a trained para-professional, in 321 low-income women. Maternal attachment was only slightly (though significantly) affected by early and extended contact and was not affected by home visits. Neither intervention was related to reports of child abuse and neglect, or to utilisation of health care facilities. Larson (1980) carried out a controlled evaluation of the efficacy of home visits (by psychologists) designed to promote child health and development in working class families. He found, as he had predicted, that such an intervention was only effective if commenced pre-natally. Field *et al* (1980) provided a parent-training intervention for pre-term infants of teenage black mothers; improved maternal attitudes and behaviour, and more optimal growth for the child were found in comparison with a control group. While Bromwich & Parmelee (1979) reported good results for mothers and infants from a two-year intervention, most evaluations have considered brief interventions and suggested rather nebulous advantages when any positive effects have been found. Clearly, there is a need to define precise intervention strategies that may be readily incorporated into health care programmes, and to demonstrate the optimal timing and duration of those strategies, as well as the benefits that might be expected.

The principal aim of our study was to determine whether designated interventions would lower anxiety in highly anxious mothers—a secondary prevention issue. However, if our speculation is correct, that maternal anxiety may be a mediating factor influencing the maternal-infant dyad, then the study also has a primary prevention component. For that reason, we intend to follow the children for a number of years, to determine whether reduction in maternal anxiety has any significant influence on their development.

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