

RESEARCH ARTICLE

Evaluation of a collaborative group intervention for mothers with moderate to severe perinatal mental illness and their infants in Australia

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ABSTRACT

Perinatal mental illness is a known risk to maternal–infant attachment and healthy infant development. Mothers experiencing complex mental health issues in the first year following birth are less likely to become involved in parenting programs or day stay interventions because of their mental health difficulties and perceived stigma. Currently, most perinatal day or group treatment programs only include the mother and not their infant. This paper describes “Together in Mind,” a perinatal and infant mental health day program developed by the Queensland Centre for Perinatal and Infant Mental Health, targeting mothers with moderate to severe mental illness and their infants under 12 months. The service model was a 6-week, 1 day per week psychoeducation intervention. Psychoeducational material and support were provided across each day session by an adult perinatal mental health clinician, an infant mental health clinician, and a child health nurse working in collaboration. The program was trialed across seven Hospital and Health Service sites in Queensland, Australia, during 2016–18. In total, 24 group day programs were delivered with 84 mothers and their infants. Pre and post intervention quantitative measures and a post-program qualitative survey about participant satisfaction were collected. Statistically significant improvements in all quantitative measures showed a large to medium effect size on the: Health of the Nation Outcome Scale (HoNOS) ($d = 0.82$; $p < .000$); Depression, Anxiety and Stress Scale (DASS-21) ($d = 0.5$; $p < .000$); Karitane Parenting Confidence Scale (KPCS) ($d = 0.63$; $p < .000$); Maternal Postnatal Attachment Scale (MPAS) ($d = 0.49$; $p < .000$), Ages and Stages Questionnaire: Social-Emotional (6 months) ($d = 0.83$; $p < .000$). The results indicate collaboration and early intervention contributes to strengthening the emerging development of the maternal–infant relationship within the context of complex maternal mental health issues.

KEYWORDS

child health, collaboration, group intervention, infant mental health, perinatal mental health

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1 | INTRODUCTION

Perinatal and infant mental health refers to the emotional and psychological wellbeing of women, their infants, partners, and families from preconception through pregnancy up to 2 years postpartum (Austin & Highet, 2011). This is the time of highest risk for women to develop mental health problems (Oates, 2015) with an estimated 16% of women (Buist et al., 2008; Pearlstein, Howard, Salisbury, & Zlotnick, 2009; Yelland, Sutherland, & Brown, 2010) and 10% of men (Condon, Corkindale, & Boyce, 2004; Deloitte Access Economics, 2012; Salmelo-Aro, Aunola, Saisto, Halmesmaki, & Nurmi, 2006) developing a significant perinatal mental illness in this period. There is growing evidence of the negative impacts of poor mental health outcomes on not only the perinatal mother but also her infant and family (Cornish et al., 2005; Halligan, Murray, Martins, & Cooper, 2007; Behrendt, Scharke, Herpetz-Dahlmann, Konrad, & Firk, 2019; Murray & Cooper, 1997). Seventy percent of women with postnatal depression are reported to have relationship difficulties with their infants (Miller, Pallant, & Negri, 2006) while children whose parent has a mental illness have a 40%-60% increased risk of disrupted mental wellbeing in their adolescence (Maybery, Reupert, Patrick, Goodyear, and Crase (2009). The infant's attachment to its primary caregiver, usually the mother, impacts on the child's development and plays a critical role in brain growth in the first 3 years of life (National Scientific Council on the Developing Child, 2004; Shonkoff & Phillips, 2000; Shore, 2001).

Effectively addressing perinatal conditions and infant mental health outcomes represents an interplay of several factors. Increasing evidence shows that treating the mother's mental illness alone does not improve infant development and emotional-social outcomes (Gunlicks & Weissman 2008; Murray, Cooper, & Hipwell, 2003; Nysten, Moran, Franklin, & O'Hara, 2006). Studies of mother-infant group programs addressing mild-moderate maternal mental health and the mother-infant relationship also report improved outcomes in mothers' mood, reductions in stress and anxiety, and improved interactions between the mother and the infant (Milgrom, Ericksen, McCarthy, & Gemmill, 2006; Stein et al., 2014; Toth, Rogosch, Manly, & Cicchetti, 2006). Mothers with more severe perinatal mental illness face significant barriers in accessing help at different stages of the care pathway through both individual and systemic barriers. Stigma, fear of being viewed as an inadequate mother, services not addressing their specific mental health needs coupled with service fragmentation, and previous help-seeking and treatment experiences (Bilstza, Ericksen, Buist, & Milgrom, 2010), leads to significant gaps in the continuum of care for this vulnerable population.

Key Findings and their Implications for Practice/Policy

1. Healthy infant social-emotional development occurs in the context of the parent-infant relationship. For mothers with moderate to severe mental health disorders, the emerging maternal-infant relationship is often compromised. Results from a perinatal and infant mental health day program "Together in Mind" developed for this particular vulnerable cohort indicates collaborative early intervention strengthens the emerging development of the maternal-infant relationship in the context of complex maternal mental health issues.
2. Evidence is increasingly indicating the need for collaborative service delivery in the perinatal and infant mental health field. The literature suggests that while services may work together, for example, colocation, it is not collaboration in its truest form. The "Together in Mind" intervention uniquely uses the collaboration of three key mental health and child health services in planning, implementing, delivering, and evaluating the program together thus breaking down the traditional silos that usually occur in service delivery. Results indicate benefits to both mothers and infants attending the program and clinicians delivering the intervention.
3. Perinatal and infant mental health is an emerging area of practice in Australia and internationally. Service planning and workforce development in PIMH is poorly represented in funding health priorities. Through the implementation of "Together in Mind," a significant gap in the continuum of care has been identified and addressed with new infant positions being prioritized in some regions of Queensland and a clinical workforce being introduced to and trained in PIMH with over 150 clinicians now trained in "Together in Mind." The "pebble in the pond" is having a significant ripple effect in improving health priorities in PIMH.

Improved perinatal and infant mental health outcomes are more likely if interventions focus on (1) meeting the parent's mental health needs; (2) developing secure parent-child relationships; (3) establishing safe and supportive social connections; (4) building therapeutic rapport with collaborating and integrated services (de Camps

Statement of Relevance to the field of Infant and Early Childhood Mental Health

Perinatal mothers with moderate to severe mental illness often face barriers in accessing timely and responsive services that support both their mental health and parenting experience. By addressing these issues in a collaborative early intervention model of care, the emerging development of the mother–infant relationship can be nurtured and supported in a time critical period in their infant’s brain development.

Meschino, Philipp, Israel, & Vigod, 2015; Egeland, 2009; Giallo, Cooklin, Wade, D’Esposito, & Nicholson, 2013; Myers, Cleary, Johnson, & Schmied, 2015). An example of such a program is “Together in Mind” developed as a 1 day per week, 6-week group intervention for mothers diagnosed with moderate to severe mental illness and their infants. Program implementation was made possible by funding through the National Perinatal Depression Initiative (2014–16) and the Queensland Mental Health Plan: *Connecting care to recovery* 2016–21 as part of a state-wide perinatal and infant mental health strategy.

“Together in Mind” does not replace current treatment but is designed to uniquely address participants’ mental health and the mother–infant relationship through a collaborative partnership between three related public health services. While cross referrals are common, these services work independently focusing on a specific area of expertise (1) adult perinatal mental health assessing and supporting the mother’s mental health and wellbeing; (2) child and youth mental health (infant services) working with complex families with infants aged 0–4 years; and (3) community child health nurses conducting home visiting, parenting support groups and providing strategies for new or struggling parents. The significance of this program lies in the truly collaborative model where senior level nursing staff and allied health clinicians from the three services come together to plan, deliver, learn, and support each other in an intensive model of perinatal and infant mental health. To date, a literature review has found no comparison studies targeting a similar diagnostic cohort that offers a collaborative program where clinicians work alongside each other throughout the entire program.

Clinicians work together to facilitate a perinatal and infant mental health-specific intervention program, supported by a program manual developed in consultation with the three services. The program combines Cognitive Behavior Therapy with evidence-based mental health psy-

choeducation and parenting strategies relevant to the clinician’s expertise delivered on each of the six group days. This approach aims to reduce service fragmentation and improve efficiencies, build participant trust in services, and support referral pathways. With a focus on parenting and the infant’s development, the program supports some mothers previously wary of mental health services to engage in a positive mental health setting. The program models concepts from the Circle of Security (Powell, Cooper, Hoffman, & Marvin, 2014) with clinicians creating a therapeutic alliance that acts as a safe and secure “holding environment” for mother and infant, as they explore and navigate their relationship together through the program. By facilitating the program over 5 h each day significant opportunities arise for observation and intervention as well as social interactions between participants. The relationships developed between the mothers frequently leads to ongoing connections post group participation including attending child health programs, playgroups, and establishing their own meet up groups. The sharing and linking with other mothers with similar mental health issues was described by one clinician as “where the magic happens.”

Acknowledging the impact of paternal mental health issues, an evening session for partners and other support persons is offered mid-point (between week 3 and 4) in the program. Without the mothers’ present, the aim is to develop their partner’s understanding of perinatal and infant mental health, discuss strategies to support the mother and infant, and attend to their own emotional wellbeing. This gives them the opportunity to share their experiences in a safe space with other fathers who may be experiencing similar issues.

2 | BACKGROUND

With quaternary care unavailable for perinatal mothers with a mental illness and their infants in Queensland, and recognizing a gap in the continuum of care between community and inpatient treatment in Brisbane’s northern suburbs, three separate community-based public health services – adult mental health, child and youth mental health (infant mental health), and community child health – established a working group of senior clinicians to develop a day program pilot in 2009. The program targeted mothers with more severe and complex mental health diagnosis and was conducted at a child health facility. In the pilot, the same intervention was given to all 21 subjects and evaluated using preintervention and postintervention quantitative and qualitative surveys. The pilot study found that the program improved maternal mental health and responsiveness to the infant, increased parenting

confidence and competence, supported social connections, and improved engagement with ongoing services. The sample size precluded more extensive analysis and a comparison group was not used. It was recommended that a further study be undertaken with a larger sample size (>30) to confirm the positive impacts of the program and clarify the factors that contribute to its outcomes (van der Ham, Berry, Hoehn, & Fraser, 2013).

3 | STUDY AIM

The aim of this study was to replicate the pilot study by significantly increasing the sample size and testing its suitability across a range of metropolitan and regional settings. Given the importance of the earliest relational experiences and interactions between infants and their primary caregiver and the impact on the infant's earliest healthy development, the primary objective of this preintervention and postintervention comparison was to contribute to positive clinical outcomes for maternal mental health and parenting confidence and strengthen the emerging development of the mother–infant relationship within the context of complex maternal mental health issues. Secondary objectives were to evaluate the program elements that supported acceptability by participants, partners, and clinicians delivering the program (for example, program content, duration, delivery, environment, and social support).

4 | INTERVENTION

“Together in Mind” is an intensive perinatal and infant mental health group intervention program that provides psychoeducation sessions and support for mothers who have a diagnosed moderate to severe mental illness with a nonambulatory infant under 12 months. “Together in Mind” is collaboratively facilitated by trained clinical staff from adult mental health (nursing, psychology, social work), child and youth mental health (psychology, social work, occupational therapy), and child health (nursing) services. The program draws on a biopsychosocial and trauma-informed model that acknowledges the multiple factors that impact on the life of the parent, their infant, and family. It is designed as a targeted intervention that enhances the continuum of care by providing a more intensive level of support between community mental health-care and inpatient treatment (refer to Fig. 1).

Coordinated by the Queensland Centre for Perinatal and Infant Mental Health (QCPIMH), a consultative committee from the three collaborating services, reviewed the recommendations from the 2009 study, the program model, and related manual. The updated program model and



FIGURE 1 Perinatal and infant mental health continuum of care

manual was trialed throughout this study. A total of 84 mother–infant dyads attended 24 groups facilitated by 21 clinicians from the three services. The same three clinicians attended throughout each group per site. The groups met 5 h per day, 1 day a week, for 6 weeks with a maximum of six mother–infant dyads. The program was purposely delivered in small, closed groups to build trust, safety, and supportive networks. The programs were run in community friendly environments with access for prams and other infant facilities. Catering for mothers was included and transport and other childcare support was provided where possible. Session topics (Table 1) were delivered each day under the category of perinatal mental health including adjusting to parenthood, recognizing and managing your mental illness, strategies for self-care, communication and problem solving; child health covered strategies to manage every day parenting such as sleeping, feeding, play, and development; infant mental health covered topics on secure attachment and exploration, managing emotional regulation of self and baby, and how relationships grow infant brains. Clinicians' role modeled practical strategies in managing infants and provided “hands on” support within the group setting. Sessions included didactic presentations, group discussions, videos, handouts, and mother–infant activities such as observing, playing, and singing with your baby and self-reflective journaling.

Mothers gained an understanding of infant neurodevelopment and enacted practical strategies to strengthen their sensitivity and interactions with their infant. The program required mothers to sit quietly and observe their infants for up to 5 min on —two to three occasions each day. They were guided to reflect on what they were seeing and

TABLE 1 Program content

Perinatal mental health	Child health	Infant mental health
Adjusting to parenthood	Building a relationship with your infant	A message from your infant
Understanding and managing stress	Sleep and settling your infant	Explorers and connectors
Perinatal mental health disorders	Growth, nutrition and oral health	Relationship grows brains
What am I thinking?	Development and play	Regulation and repair
Communication skills	Injury prevention and safety	What gets in the way (of the relationship)?
Problem solving	Connecting with your community	Connecting with your infant

thinking about their baby and what their baby might be experiencing and thinking in return. Mothers were asked to consider how they, and their own experiences, impact on their infant's world. Activities delivered within the program such as singing and playing with their infants were used for mothers to practice reflecting on their infant in the present and take "delight" in their child. At other times, a clinician responds to support a mother who is distressed and anxious when her baby cries and cannot be soothed. By having three clinicians in the room at one time, a clinician sits quietly with the mother assisting her to regulate her own and her baby's emotions and consider what might be happening for the baby and herself in that moment. Referring to information and strategies shared in the group such as mindfulness, breathing exercises, and understanding baby cues, the clinician helps the mother to integrate these concepts in her immediate experience.

Having mothers attend for an extended 5-h period each day, many opportunities presented for clinicians, mothers, and infants to interact. The time allowed clinicians to observe and respond to interactions when parent–infant dyads were at their most vulnerable when tired and/or stressed. Reported in both the participant and clinician qualitative surveys, positive changes were noted in the interactions between mothers and their infant such as increased comfort in reciprocal eye contact and smiling in baby observations, mothers and babies physically relaxed in their interactions, mothers improved responses to baby cues, talking to their baby, and increased playful interactions. Clinicians reported on the "growth in confidence and responsiveness to infants" with "the growth observed in the mums and bub was more than I expected would occur after 6 weeks." Another clinician reported that "we see so much in a day that would otherwise be missed. Having the three services there means that issues can be addressed then and there. It means that both mother and infant are really supported."

Recognizing the important role played by partners in supporting the mother and infant and acknowledging the prevalence of paternal mental illness, a 2-hour evening psychoeducation session was offered to partners without

their partner present by the perinatal facilitator and a male mental health clinician midpoint in the program. Topics covered perinatal and infant mental health, strategies to support your partner and infant, the important role fathers play in their child's development, self-care and recognizing their own mental health needs, and information on available resources.

5 | METHOD

5.1 | Design and setting

A single group pre and post-test evaluation design using the same intervention was used with all participant mothers. The current study was implemented in two stages. The QCPIMH coordinated a research trial in two large regional areas in northern Queensland in 2016 (Cairns and Hinterland and Townsville Hospital and Health Service [HHS]) with each site conducting three groups. Following this study, funding was made available through the Queensland Mental Health Plan: *Connecting care to recovery* 2016–21 (Queensland Health, 2016) resulting in the continuation of the previous two sites and a further five metropolitan and regional HHS implementing the program in 2017–18 (Metro North, Metro South, Sunshine Coast, Gold Coast, and West Moreton). A Service Level Agreement was signed requiring each HHS to deliver three programs in each financial year with research data collected from the first year of implementation.

Given the diagnostic criteria of the research group, it was not possible within the scope of the evaluation to use a rigorous experimental design involving randomization versus comparison or a control group. While a randomization to a treatment versus control group was not used, research reviews suggest that single group studies can provide evidence of study effectiveness when conducted in phases and report effect sizes (Beeson & Robey, 2006; Ip et al., 2013), and that there may be little difference between the results obtained from randomized control studies and observational studies (Anglemyer, Horvarth, & Bero, 2014).

5.2 | Measures

Given participants complex mental health issues and vulnerability in accessing services, careful consideration was given to the measures used in this study. Dyadic observation-based measures and a pre and post video assessment were initially trialed in the 2016 study and were discontinued because of the nonclinical (community) research setting, client capacity to manage assessments, mother discomfort at being “judged and assessed,” clinician training, and resources required. The following validated measures were chosen for ease of application while addressing the study aims of improving maternal mental health and parenting confidence, strengthening maternal–infant relationships, and the infant’s social-emotional wellbeing within safe and supportive relationships. All measures were conducted pre and post intervention.

5.3 | Maternal mental health

Clinician rated:

- Health of the Nation Outcome Scale (HoNOS) (Wing et al., 1998).

The HoNOS is a set of 12 scales, each measuring a type of problem commonly reported by consumers who present to mental health services. A completed HoNOS provides a profile of 12 severity ratings and a total score that is compared at the first rating with ratings on a subsequent occasion. A reduction in scores indicates improvement in mental health symptoms. While numerous studies on the HoNOS report good validity but variable reliability (Orrell, Yard, Handysides, & Schapira, 2018), it was included because it is a standard measure used by mental health services throughout Australia.

Maternal mental health self-report:

- Depression Anxiety and Stress Scale (Short Version) (DASS-21) (Lovibond & Lovibond, 1996).

The DASS-21 was used as the main measure for maternal mental health. The DASS-21 consists of three seven-item scales to measure depression, anxiety, and stress. Each scale measures the severity of symptoms over the previous 7 days. Scales identify normal, mild, moderate, severe, and extremely severe ranges with pre–post measures showing

movement across the ranges. The scales can be summed to produce a composite measure of general psychological distress or negative affectivity across the three areas. It has consistently demonstrated good psychometric properties for both reliability and validity across adult populations and concurrent validity with other measures of depression, anxiety, and stress (Antony et al., 1998; Henry & Crawford, 2005). It has also been shown to measure the prevalence of anxiety and stress as a comorbid factor for postnatal women in addition to depression alone (Miller et al., 2006).

Maternal self-report:

Parenting confidence

Karitane Parenting Confidence Scale (KPCS) (Črnčec, Barnett, & Matthey, 2008).

The KPCS is an Australian scale measuring parental self-efficacy in parents of infants aged 0–12 months. Parents respond to 15 items using a 4-point Likert scale to indicate how confident they feel about managing a range of parenting situations. Higher scores indicate higher confidence or self-efficacy.

- Maternal postnatal attachment

Maternal Postnatal Attachment Relationship Scales (MPAS) (Condon & Corkindale, 1998). The MPAS is a self-report questionnaire measuring the early emotional bond between mother and infant and their attachment relationship. There are 19 items across three subscales measuring “quality of attachment,” “absence of hostility,” and “pleasure in interaction.” Higher scores indicate a higher-quality relationship.

- Infant social-emotional development

Ages and Stages Questionnaire: Social-Emotional (ASQ:SE) 2 months, 6 months, and 12 months (Squires, Bricker, & Twombly, 2015). The ASQ:SE is a self-report screening tool to identify children aged 2–66 months whose social and/or emotional development requires further evaluation and intervention. Higher scores indicate higher levels of social-emotional difficulty.

As the ASQ:SE 2 months was not available in 2016, participants in that year with infants under 3 months were unable to complete the ASQ: SE. The ASQ:SE results for 2017–18 were primarily taken on the 6-month cohort because there were too few infants in the 2 month and 12-month cohorts for sufficient data results.

5.4 | Qualitative surveys

An exit survey asking mothers to rate specific statements on their experience of the program was used to report participant's subjective improvements in their emotional-social functioning, parenting confidence and knowledge, and acceptability of the program using a rating scale of: A lot; Mostly; A bit; Not at all. Numbers related to each category were summed and identified as a percentage of the overall number. Feedback comments relating to participant satisfaction with program entry, content and processes, and suggestions for improvement were included. Clinicians completed a post program survey and were asked to rate: (1) the model of care, (2) confidence and knowledge in working with mothers with a moderate to severe mental health issue and their infants, and (3) suitability of program content. Statements were rated by: Strongly Agree; Agree; Undecided; Disagree; Strongly Disagree; Not Applicable. Feedback was provided about their experience of the collaborative model and suggestions for improvements to the training program were sought. Partners were asked both scaled questions using "Strongly Agree" to "Strongly Disagree" and open questions to comment on their pre and post learning about perinatal and infant mental health and other benefits derived from attending the partner session.

5.5 | Participants

Participant mothers were referred from public and private mental health and community child health services and general practitioners within each HHS. Mothers were included in the study if they had (1) a moderate to severe mental health diagnosis, (2) an infant under the age of 12 months for which they were the primary caregiver, and (3) were over the age of 18 years. The primary criteria for group inclusion related to the mother's diagnosis with the understanding that a mother's improved mental health and wellbeing is likely to lead to improved mother-infant interactions and, therefore, infant mental health outcomes. Mother and infant were registered on the Consumer Integrated Mental Health Application (CIMHA) to ensure clinical governance. CIMHA is a state-wide register of patient records and is designed to support the statutory obligations of the Mental Health Act 2016 within Queensland. A formal assessment of the mother-infant relationship was not undertaken because of the complexity of the mother's mental health and the high level of initial anxiety and fear expressed by mothers attending a group facilitated by public health agencies. The infants and their interactions with their mothers were observed informally each

week by the infant clinician and noted as part of the clinical record. Observed interactions included mother's response to her infant's cues (feeding, eating sleeping); infant's comfort seeking behavior; comfort level with serve-n-return behaviors between mother and infant (does the infant look away, ball up fists, become distressed, arch back); expressed beliefs about their infant ("I don't think he likes me", "He's an angry baby"); mother's capacity to reflect on her own and her infant's experience and capacity to regulate own and infant's emotional states. The child health clinician observed the infant's developmental progress and issues relating to breast feeding, eating, sleeping, and so on. The research design was developed to meet the needs of a general population excluding mothers who had a primary diagnosis of substance misuse or an intellectual disability or who were not fluent in English.

The participants age, demographic profile and mental health status are summarized in Table 2. All participating mothers identified a prior history of mental illness as well as managing complex psychosocial issues currently impacting on their lives such as relationship breakdown, isolated from family supports, financial, and housing issues. In total, 105 mothers registered for the program with 94 mother-infant dyads (84%) attending between 4 and 6 days of the 6-week program. Factors for 11 mothers not starting the program include acuity of their mental illness, physical illness of themselves or their infant, or other pressing psychosocial factors. For research purposes, mothers attending with twins (two sets) were identified as two dyads. A total of 84 participant mothers completed all preintervention and postintervention measures. Two-hour evening sessions offered specifically to partners and support persons resulted in 34 attendees (40% of eligible partners).

5.6 | Research integrity

Given the complexity of illness and psychosocial stressors experienced by the participants, the diverse locations, and the number of groups facilitated, various strategies were employed to ensure research integrity. Clinicians facilitating the program attended a 2-day training program that included all research and data collection protocols as well as program content. Theoretical constructs were clearly and consistently defined throughout the training. The intervention was delivered to a closed group with the same three clinicians facilitating all 6 days of the group. Fidelity checklists identifying key messages and activities as per the program manual were completed by the clinicians at a debriefing session at the end of the group day and provided to the research coordinator. Research

TABLE 2 Participant mental health status and demographics

Principle diagnosis <i>n</i> = 94	Number of mothers and % of total mothers with the diagnosis
Schizophrenia, schizotypal, and delusional disorders	3 (3.5%)
Mood (affective) disorders. Includes: depressive disorders, bipolar affective disorder.	42 (44%)
Neurotic, stress-related, and somatoform disorders. Includes: Anxiety disorders, mixed anxiety and depressive disorders, obsessive compulsive disorder, stress-related disorders including posttraumatic stress disorder.	42 (44%)
Other: disorders of adult personality and behavior; contextual factors	7 (7.5%)
Demographics <i>n</i> = 94	
Mother's age (years) (mean and SD)	30 (14.6)
Infant age (months) (mean and SD)	4 (18.4)
No of children (mean and SD)	1.5 (18.76)
Marital status	Number of mothers and % of the total number of mothers
Single parent	16 (17%)
Married/De Facto	78 (83%)
Nationality	Number of mothers and % of the total number of mothers
Australian	72 (77%)
Eurasian	10 (10%)
European	4 (4.25%)
New Zealand	4 (4.25%)
Middle East	2 (2%)
South Africa	1 (1%)
Not stated	1 (1%)
Education level	Number of mothers and % of the total number of mothers
Years 9–12	55 (55%)
Trade certificate	25 (25%)
Undergraduate degree	5 (5%)
Postgraduate degree	16 (16%)
Annual income	Number of mothers and % of the total number of mothers
Nil	3 (3%)
Up to \$15,599	3 (3%)
\$15,600–\$31,199	8 (9%)
\$31,200–\$51,999	11 (12%)
\$52,000–\$77,900	21 (23%)
\$78,000–\$103,999	18 (19%)
\$104,000+	14 (15%)
Not stated	16 (16%)

investigators observed sample sessions and provided regular debriefing and review with clinicians.

5.7 | Procedure

Ethics approval was received from the Human Research Ethics Committee, Children's Health Queensland Hospital

and Health Service (CHQ HHS) in December 2015. Site-specific ethics approvals were obtained prior to the program commencing in selected sites.

Following referral to the mental health clinician, mothers were visited and personally invited to attend the group. This was to begin to build relationships and trust with the clinician to support their attendance. This was especially important for those mother's experiencing significant

anxiety and depression. They were provided with written detailed information about the program, group expectations, and the research project prior to giving informed consent. They were advised that consent could be withdrawn at any time without compromise to their current treatment and referral to services. Ongoing treatment and referral services were offered to mothers who chose not to participate in the research groups. On receiving consent, participants were assessed against the criteria of a moderate to severe mental health diagnosis as identified by the International Classification of Diseases, 10th Revision (ICD-10). Diagnoses primarily related to depression and anxiety arising in the postnatal period. While not directly excluded, clinicians were responsible for determining the suitability of participants where issues such as suicidality or personality disorder were identified. Clinical governance was supported by three case reviews held prior to the program commencement, at mid-point, and at discharge. These reviews were attended by clinicians facilitating the program, with an adult and an infant psychiatrist present to provide clinical oversight. All participants were registered with their related mental health service and case management responsibilities remained with the treating team. Infants were registered as a client of the Child and Youth Mental Health Service (CYMHS) for the duration of the program for clinical governance, although they did not receive mental health diagnoses.

Preintervention measures were completed on the first day of the 6-week program and postintervention measures and feedback survey on the last day. Deidentified data were collected and collated by the research coordinator and independently analyzed through CYMHS Academic Research Centre (CHQ HHS).

5.8 | Data analysis

The data were coded, deidentified, double-entered into an encrypted Excel Database, and screened for accuracy and verification. Errors were adjusted, missing entries were coded, and the database was validated for analysis through numerical summaries in R Commander. Analyses were conducted using STATA software (StataCorp., 2015). As the data for the study population were not normally distributed, the nonparametric Wilcoxon signed-rank test was the predominant statistical test used to compare pre-post program data. Differences with $\alpha < 0.05$ probability were considered statistically significant. Effect sizes were computed (Cohen's d) and classified as small ($d = 0.2$), medium ($d = 0.5$), or large ($d = \geq 0.8$) (Cohen, 1998).

6 | RESULTS

6.1 | Study participants

Analyses revealed statistically significant improvements on all measures taken at preintervention and postintervention (Table 3). Specifically, a large effect size was found for improvements in maternal mental health measured by the clinician rated HoNOS ($d = 0.82$; $p < .001$) and a medium effect found for the total score on the self-reported DASS-21 ($d = 0.5$ $p < .001$). There was also a significant reduction across all subscales with small to medium effect sizes found for depression ($d = 0.36$; $p < .001$), anxiety ($d = 0.42$; $p < .001$), and stress ($d = 0.58$; $p < .001$). Overall results are positive with a significant shift in mental health outcomes for mothers. Consistent with these results, statistically significant improvements were found in maternal-infant postnatal attachment scores ($d = 0.49$; $p < .001$), parenting confidence ($d = 0.63$; $p < .001$), and emotional-social development of the infant ($d = 0.83$; $p < .001$).

6.2 | Qualitative outcomes

An exit questionnaire was completed by 60 mothers (72%) reporting subjective improvements in their emotional and social functioning and parenting confidence. Mothers reported improvements as a "A lot" and "Mostly" in their emotional-social wellbeing (85%) and increased confidence in caring for their child (88%). All mothers (100%) identified improved enjoyment of their infant reporting increased activities (singing, reading, and play) and spending time with them. All mothers experienced the group as safe and nonjudgmental where their privacy was respected (100%). They reported meeting the group facilitators in the preassessment phase was important to encourage their attendance and reduce anxiety. Participants felt welcome along with other mothers with similar issues in a community environment that was designed for their, and their infants, specific needs. The peer support and social connectedness shared with other mothers throughout the day was reported as reducing social isolation and negativity toward their own mothering skills (100%). Engaging one on one with each of the health professionals also built trust with the various health services. Participants rated the clinicians as "very good" and knowledgeable (100%) in their area. Participants stated the program length as "just right" (85%) and would recommend the program to other mothers in similar circumstances (95%). Partners attending the session mid-way in the program completed a feedback sheet with all partners reporting an increased awareness of infant development, perinatal and infant mental

TABLE 3 Study results

Clinician administered <i>n</i> = 84						
Preintervention and postintervention						
Measure	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>z</i>	<i>p</i>
HoNOS	8.35	3.593	5.212	3.935	6.268	.001*
Self-administered <i>n</i> = 84						
Preintervention and postintervention						
Measure	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>z</i>	<i>p</i>
DASS-21	55.333	2.788	41.595	24.575	4.886	.001*
<i>Depression</i>	16.452	10.876	12.476	9.637	3.830	.0001*
<i>Anxiety</i>	15.880	12.137	11	9.248	3.919	.0001*
<i>Stress</i>	23.809	9.419	18.047	8.609	4.747	.001*
KPCS	33.361	6.844	37.120	5.2556	−5.829	.001*
MPAS	71.57	12.116	77.883	10.510	−5.566	.001*
<i>n</i> = 61						
ASQ:SE** (6 months)	38.078	21.879	23.627	19.624	4.558	.001*

**Insufficient data collected to extract 3 months and 12 months ASQ:SE outcomes.

*Denotes statistically significant change.

health impacting on themselves, their partner and their infant, and strategies and resources to support their partner in dealing with her mental health issues.

Of the 21 clinicians delivering the program, 19 submitted a post program survey on completion of delivering three groups as per the study protocol. All clinicians completing the survey agreed that the collaborative intervention model was effective for perinatal mothers with mental illness and their infants (100%). They stated that their knowledge and confidence in working with perinatal and infant mental health difficulties had improved (90%) with as many stating that their clinical practice was impacted by a greater focus on the infant in mother–infant interactions. All clinicians agreed that the collaborative experience was invaluable in building networks and understanding the role of the other services. Concerns about program sustainability related to costs and increased workloads were reported as key disadvantages of the program. They agreed that the program: provided a streamlined approach to service delivery; improved referral and inter-service communication; reduced service fragmentation and increased trust and confidence between clinicians and participants. Parents' participation in the group was also reported to have improved the provision of targeted case management and the effectiveness of referral processes for ongoing care indicated by the uptake of recommended referrals in discharge plans. At the conclusion of the program, mothers were seeking information on further groups and activities.

7 | DISCUSSION AND CONCLUSION

The aim of this study was to evaluate the outcomes of a novel mother-infant day program, “Together in Mind,”

designed to address a significant gap in the continuum of care for mothers with moderate to severe mental illness and their infants. Through the development of a group model and program manual, the intervention used the collaboration of three key mental health and child health services working together and breaking down the traditional silos that occur in service delivery. Mothers having access to specialist health clinicians for 5 h, 1 day per week for 6 weeks allowed for the development of a therapeutic alliance that supported mothers with their individual mental health, parenting confidence, and developing relationship with their infants.

Consistent with the aims, the results from this study are very promising as statistically significant improvements on preintervention to postintervention measures were observed on all clinical measures of maternal mental health symptomatology and parent–infant responsiveness. These results include reductions in self-reported anxiety, stress, and observable symptoms of psychological distress. Mothers reported enhanced parenting confidence and knowledge and increased capacity for enjoyment of their infant. In line with these results, mothers reported enhanced feelings toward the infant and improvements in the infant's social-emotional development as measured through the ASQ: SE. Exit surveys from participants, partners, and clinicians indicate high acceptability with program content and delivery. Mothers reported higher levels of trust and willingness to engage with ongoing services evidenced by their uptake of recommended referrals in their discharge plan. The high level of program retention is supported by the mother's comments that the program addressed issues of accessing support due to stigma, feelings of inadequacy, and being judged by other mothers with social bonds developed between participants.

Clinicians welcomed the collaborative model and the opportunity the program offered to build workforce capacity in perinatal and infant mental health. As research underpins our growing knowledge of the links between parenting and the infant's neurodevelopmental outcomes, this program ensures an integrated approach to a range of perinatal and infant mental health issues that require urgent attention.

This study adds to the evidence that interventions focusing on the mother's mental health, parent–infant relationships, and the development of safe and supportive social connections are likely to lead to better outcomes for the infant (Newman, Sivaratnam, & Komiti, 2015). The collaboration of three health services to deliver one integrated program for mothers and infants represents an innovative, holistic approach to improving the experience of early parenthood for mothers experiencing moderate to severe mental illness, and reducing the likelihood of intergenerational mental health problems. Based on the positive outcomes of the program, alongside a policy shift in supporting perinatal and infant mental health programs, “Together in Mind” is becoming embedded as part of service delivery across Queensland, Australia.

8 | LIMITATIONS/STRENGTHS AND FURTHER STUDY

For logistical and ethical reasons, it was not possible to conduct this study with a control group with mothers who had moderate to severe mental health issues. Similarly, limitations were placed on the selection of mother–infant relationship pre and post assessments that could be used with a highly vulnerable cohort in a noncontrolled research setting. By not gathering validated observational data, the research is unable to identify the level of change in the emerging attachment relationship between the mother and her infant, as resulting directly from group participation. Further study undertaken with a control group is highly recommended.

Given that most mothers were receiving public or private mental health treatment and/or community support services such as child health visiting, it is possible that improvements found on outcome measures may be influenced by other effects such as time, facilitator attributes, or medical interventions (for example, prescribed medication) rather than intervention specific. A randomized control trial design comparing individual treatment alone against treatment plus participation in “Together in Mind” with inclusion of formalized dyadic observation measures, would be of great value to consider for future studies. A longitudinal study would also benefit this study by measur-

ing maternal mental health and infant attachment beyond the 6 weeks of program attendance.

Without a formal cost–benefit analysis, it is difficult to assess program outcomes compared with the costs of implementation. Potential efficiencies can be identified by bringing together mother and infant with three services in one program that would otherwise be offered in isolation. This view echoes the literature that indicates that group interventions for high-risk families that specifically address the infant's mental health provide a good return on investment and that group approaches are likely to be up to eight times less costly than multisystemic or individual approaches (The Royal Australian and New Zealand College of Psychiatrists, 2010). A cost–benefit analysis of “Together in Mind” as a model for perinatal mental health service delivery would be highly valuable. Further, the development of adapted programs to meet the needs of multicultural and special needs parents is a desirable subject to further consultation and research and is planned for future development.

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CONFLICT OF INTEREST

The authors report no conflict of interest. The authors are responsible for the content and writing of the paper.

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