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Activity based group therapy reduces maternal anxiety in the Neonatal Intensive Care Unit - a prospective cohort study

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ABSTRACT

Background: A large proportion of mothers in the Neonatal Intensive Care Unit (NICU) experience psychological distress, which is associated with adverse infant and parenting outcomes. Interventions addressing maternal anxiety in the NICU are scarce.

Aims: To assess the effect of activity based group therapy on maternal anxiety in the NICU when compared to a control group.

Study design: The study was a prospective phase lag cohort study. In Phase 1 the control group was recruited and assessed using the State-Trait Anxiety Inventory (STAI-S) once at recruitment and again 4 weeks later. In phase 2, mothers were invited to take part in activity-based groups of 1 h duration once a week for 4 weeks. The STAI-S was administered before and after every group session.

Subjects: Mothers of babies admitted in the NICU who consented to participate, had a working knowledge of Tamil or English and were likely to stay for 4 weeks for the treatment were included.

Outcome measures: State anxiety assessed using the STAI-S.

Results: Seventeen mothers each in the control and experimental groups completed the study. In the experimental group, there was a significant reduction in the post-test anxiety scores when compared to the pre-test in the first ($p = 0.005$), third ($p = 0.07$) and fourth ($p = 0.009$) sessions. The post-test anxiety scores of the intervention group was significantly lower than that of the control group ($p = 0.009$).

Conclusion: Activity based group therapy is effective as an intervention in reducing maternal anxiety in the NICU.

Summary: Anxiety in mothers of infants admitted in the NICU has been associated with adverse infant and parenting outcomes. This study evaluated the feasibility and effectiveness of an activity based group intervention to reduce anxiety levels in mothers in the NICU. The study was a prospective phase lag cohort study. Anxiety levels were assessed in mothers in the control group at recruitment and then 4 weeks later. In the intervention group, activity based group sessions were conducted once a week for 4 weeks. State anxiety was assessed before and after every group session. In the intervention group the anxiety levels were significantly lower in the post-test, when compared to the pre-test. Also the number of mothers suffering from moderate to severe anxiety and the anxiety scores in the post-test were significantly lower in the intervention group when compared to the control group. We conclude that activity based group sessions are effective in reducing the state anxiety in mothers in the NICU. Improving maternal psychological wellbeing may indirectly contribute to better infant outcomes.

1. Introduction

The hospitalization of a newborn in the NICU is one of the most

frightening and overwhelming experiences for parents [1]. Parents' stress, anxiety, depression, and fatigue have been shown to alter parenting behavior, perception of parental competence, parent infant

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interaction, and ultimately infant outcomes such as cognitive development, fine motor outcomes, infant temperament, emotional regulation, and health [2–5]. Psycho-education, cognitive restructuring, progressive muscle relaxation, development of mother's trauma narrative and music therapy have been used in the NICU for relieving parental stress [6]. Nontraditional approaches used in the management of stress and anxiety in mothers include writing, journaling and scrapbooking [7], art based interventions [8], and photography [9, 10].

Creative activities, a traditional therapeutic modality used in occupational therapy, incorporate the use of imagination into the production of a novel, noteworthy end product. Benefits attributed to involving in creative activities include increased motivation, enhanced learning, increased emotional resilience, increased satisfaction and self-esteem and providing opportunities for sublimation [11]. Activity based groups aim to encourage social interaction and/or develop skills [12]. Activity groups have been used in mental health settings [12], caregivers of patients with cancer [13] and in older adults [14], with the aims of developing skills and encouraging social interaction. Activity groups were found more effective than support groups. This could be because of active participation in an activity rather than passive involvement or the use of only verbal skills [12]. Further, interventions in the NICU based on cognitive behavioral therapy, while improving maternal depressive symptoms, have no significant effect on maternal anxiety symptoms [15]. The efficacy of traditional psychotherapeutic interventions may be impeded by cultural factors such as collective decision making, reasoning based on superstition and the reluctance of Indian women to express negative feelings [16–18]. Activities were chosen as a therapeutic modality in the present study, as it did not depend on literacy or prior experience; differences arising thereof may have hindered group cohesion and bonding. To our knowledge, there are no studies on activity based group therapy in this population.

Our research question was, 'Does participation in a regular activity based group reduce maternal anxiety while in the NICU, when compared to a control group, who did not receive the intervention?' We hypothesized that mothers who attended activity based group sessions once a week for 4 weeks would have a reduction in the state anxiety scores post activity when compared to pre activity scores as measured by the State-Trait Anxiety Inventory- Form Y [19]. Secondly, we hypothesized that mothers who attended activity based group sessions would have lower pre-test state anxiety levels before the last session, when compared to the post-test of the control group, implying reduced base line anxiety levels in the intervention group when compared to the control group.

2. Methodology

2.1. Research design

The study was approved by the Institutional Review Board and Ethics committee of Christian Medical College, Vellore (IRB Min no. 9726, dated 10/11/2015). Patients were recruited and written informed consent obtained from all the participants by an occupational therapy student. The study was a prospective phase lag cohort study, done in two phases. During Phase 1 (February, March 2016 and January, February 2017) the control group was recruited and the STAI-S administered once at recruitment and again 4 weeks later. Phase 2 (April to May 2016 and March, April 2017), the intervention phase was started once Phase 1 was completed. A phase lag study was used instead of random assignment into groups to reduce the possibility of exclusion bias. Since the mothers in our hospital stay in a common living area, it was felt that the effects of the intervention may influence the behavior of mothers in the control group if proper randomization was done. The STAI-S was administered before and after every activity group session in the intervention phase, which was conducted once a week for 4 weeks.

2.2. Participants

The study setting was a tertiary level 75 bedded NICU in south India. Mothers whose newborn were admitted in the NICU in our institution stayed in the hospital until the infant was discharged. Mothers of very low birth weight infants (weighing < 1500 g at birth), who were likely to stay in the hospital for 4 weeks and had a working knowledge of Tamil or English were invited to participate in the study. Out of 42 mothers who were approached in Phase 1, 25 mothers consented for assessment. In Phase 2, out of 45 mothers who were approached 35 consented for the intervention.

2.3. Instrument

The State-Trait Anxiety Inventory (Spielberger, 1983), a widely used self-reported measure of anxiety, differentiates between state anxiety, which is a situational induced feeling and trait anxiety, a relatively stable and long term level of anxiety [20]. The STAI's State and Trait scales were found internally consistent (Cronbach's $\alpha > 0.90$) when administered to age groups similar to that of this study. It has also been found sensitive to brief fluctuations of anxiety [21]. In this study, only state anxiety was assessed, since trait anxiety scores were found to be comparable in mothers of high risk and healthy infants [22]. Spielberger (1983) reported a mean state anxiety score of 36.2 (SD = 11.0) for women aged 19–39 years [19]. Scores between 40 and 59 were indicative of moderate anxiety, while scores between 60 and 80 were indicative of severe anxiety [23]. Demographic characteristics were obtained from interview and from medical records.

2.4. Intervention

An occupational therapy student led the group sessions every week along with an experienced medical social worker. The STAI was administered by the in house occupational therapist, who did not take part in the group sessions to reduce interviewer bias. Most mothers were able to complete the questionnaire without assistance. The questions were read out to mothers with limited literacy. The forms were made available in English and Tamil and were scored after identifying information was removed. The group sessions were held once a week for 1 h, at a time convenient for the mothers and participation was encouraged. Once 5–6 mothers were recruited, the group was closed to facilitate group cohesion. The activities were chosen in accordance with the cardinal principles of occupational therapy, to be interesting, useful and to have an emotional (i.e. foot print card) or material (i.e. small rattle) value. There were no incentives for participation, but the mothers were allowed to keep the product that was made. Material costs were negligible since locally available materials were used unlike in other studies [9, 24], where materials incurred considerable cost.

2.5. Sample size calculation

The sample size was calculated based on the results of the study by Mauradian et al., 2013, which looked at the effects of art based group therapy on maternal anxiety in the NICU. With an alpha error of 5% and beta of 80%, considering a STAI-S score M (SD) of 40 [10] for the control group and a score M (SD) of 28 [9] in the experimental group, the minimum required number of participants was calculated to be 10 in each group [8]. Anticipating dropouts, it was decided to recruit 15 participants in each group.

2.6. Data analysis

The data was analyzed using SPSS version 21. Demographic characteristics between the groups were compared using independent samples *t*-test and ANOVA test. Paired samples *t*-test was used to compare the scores before and after intervention. Proportion

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