

# Effect of COPE Program (Creating Opportunities for Parent Empowerment) on Maternal Stress and Parent Neonate Interaction among NICU Mothers

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## Abstract

**Aim:** The aim of this study is to evaluate the effectiveness of COPE program on Stress and Parent-Neonate Interaction among the mothers of neonates admitted in NICU at selected hospitals, Puducherry.

**Objectives:** To assess the pretest score of stress and interaction among mothers of neonates, to evaluate the effectiveness of COPE program on Stress and Parent-Neonate Interaction among mothers, to associate the post-test mean score with the selected demographic variables, to correlate the mean post-test score stress and parent-neonate interaction among the experimental and control group.

**Materials and Methods:** Quantitative approach with Experimental, pre-test post-test control group design was used for the study. Simple random sampling technique was used to select the 60 (Intervention – 30, Control – 30) mothers. The Modified PSS:NICU scale and Structured Parent Neonate Interaction Scale was used to assess the variables. The Intervention group undergone the 3 phases of COPE programme on 2<sup>nd</sup>, 4<sup>th</sup>, 6<sup>th</sup> day of admission in NICU, whereas the control group undergone the routine hospital care. The Pre and post test were conducted on the both groups.

**Results:** The result depicts that the mean post-test stress level was 20.33 in the experimental group mothers, whereas it was 77.50 in the control group mothers with the 't' value of 20.937 ( $p < 0.001$ ) which was highly significant. The mean post-test score of parent-neonate interaction among mothers was 46.33 and 12.0 in the experimental and control group and the 't' value of 33.195 ( $p < 0.001$ ) which was found to statistically significant. On correlating the mean post-test stress and parent-interaction level, the r value was found to be -0.217, shows a negative correlation.

**Conclusion:** This study shows that, the COPE program was found to be effective. Irrespective of any culture, the mother undergoing COPE program may have reduced stress by creating positive psychological and thereby improves Parent-Neonate Interaction.

**Keywords:** Stress, Parent-Neonate Interaction, Creating Opportunities for Parent Empowerment, NICU.

## INTRODUCTION

Prematurity is the leading cause of neonatal deaths and the second leading cause of death after pneumonia in children under the age of five. The rate of pre-term birth ranges from 5-18% of babies born across 184 countries, around 96.5% of them in developing countries (WHO) and India is the biggest contributor to the world's prematurity burden, with almost 3.6

million premature births accounting for 23.6% of the around 15 million global pre-term births reported each year. Of these, 13% are live pre-term births (**Indian Foundation for Premature Babies, 2013**). In developing countries, the majority of LBW infants because of intrauterine growth retardation (IUGR) are born small at term (> 37 wk of gestation) with only 6.7 per cent born prematurely. Preterm with very low

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birth weight (less than 1500g) are likely to show the greatest cognitive deficits and development delays<sup>[1]</sup>.

The birth of a preterm is a critical event in life of a family and pose many additional strains in the parenting role. The mothers of preterm neonates face a daunting task. The parenting role during the birth of the preterm influence the natural process of neonate care and mother's maternal role<sup>[2]</sup>. Stress among working women and their lack of rest during pregnancies is one of the leading cause for pre-term births.

Low-birth weight babies are more prone to suffer from Asphyxia, Respiratory distress syndrome, Hypothermia, feeding difficulty and infections which makes the babies to be shifted to NICU for few hours to weeks for the survival<sup>[3]</sup>. Neonatal Intensive Care Unit (NICU) environment, the medical care, individual circumstances<sup>[4]</sup>, and the appearance and perceived vulnerability of the infant has the potential to exacerbate stress for mothers which influences the normal transition process to parenthood<sup>[5]</sup>.

The maternal interaction includes engaging in face to face interaction, play behavior that features vocalizing, smiling, imitation in normal term infants<sup>[6]</sup>. All of these interactions activities are important for cognitive, social, emotional and physical development of the neonate<sup>[7]</sup>, Whereas, these Parent-Neonate interaction is disturbed in stressed mothers and appears to be universal across different cultures and socio-economic status group<sup>[8]</sup>.

Maternal stress can have deleterious effect on mother-neonate interaction and ability to form attachment to their baby<sup>[9]</sup>. Participating in preterm care influences the maternal feelings in positive direction. The facilitation of maternal confidence by positive parenting in the NICU is a key point in establishing long term healthy interaction and positive child outcomes<sup>[9, 10]</sup>. Positive parenting and early intervention program poses positive, significant effects on physical and mental development of the neonate<sup>[11]</sup>. Early individualized and family based intervention during neonatal hospitalization and transition to home have been shown to reduce the maternal stress and depression and increase self-esteem and to improve positive early parent-preterm interaction<sup>[12]</sup>. COPE program is one among the programs which teaches parents about normal physical, developmental and

behavioural characteristics of preterm neonates and the best ways to interact with them and facilitate their development<sup>[13]</sup>.

### COPE PROGRAM

COPE program (Creating Opportunities for Parent Empowerment) was developed in University of Rochester School of Nursing by Bernadette Melynck and her colleagues. It which helps to recognizes the critical role of parents and encourage to take an active role in their baby's care, engage in dyadic interaction with their neonate. It consists of two types of educational information. It teaches parents about normal physical, developmental and behavioural characteristics of preterm infants and the best ways to interact with them and facilitate their development<sup>[13]</sup>.

In this study, the COPE program consist of 3 phases. Phase I occurs at 2<sup>nd</sup> and 3<sup>rd</sup> day of admission in NICU, Phase II occurs at 4<sup>th</sup> and 5<sup>th</sup> day of admission in NICU and Phase III occurs at 6<sup>th</sup> and 7<sup>th</sup> day of admission in NICU.

The content of the Phases are as follows : Phase I includes Information about immature neonate physical and behavioural features, the differences between mature and immature neonates, information about NICU's environment. Phase II includes Information about infant's behaviours, its growth and development, and gives further suggestions regarding increasing the mother's participation to take care of the infant and meeting its needs. Phase III includes Supplementary information about the details of infant's states and behaviour, such as sleepiness, quiet alert state, or active alert state, and the best time to make communication, of infant's smooth transition from hospital to home and continuance of mother-infant positive interaction. During these phases, the mothers were also provided with information booklets in local language along with the video teaching and live demonstration of the Kangaroo Mother Care, Expression of Breast milk, Paladai (Katori)feeding were done to the mothers.

### MATERIALS AND METHODS

A quantitative approach with Experimental (pretest posttest control group design) study was conducted at RGGWCH, Puducherry and the data were collected during January to February of 2016. All mothers of LBW, IUGR, preterm neonates, willing to participate

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and present during period of data collection were included. The mothers with Low birth weight in the general ward, with associated risk, medically restricted, ventilator, CPAP and mothers with postpartum discomforts were excluded in this study. 60 samples were selected based on the inclusion criteria and they were randomly assigned to Intervention and Control group (intervention group n=30, control group n=30).

### TOOL DESCRIPTION

In this study section A includes the demographic data of the mothers, section B consists of obstetrical data of the mothers, section C comprises of two scale: Modified Parental Stressor Scale: NICU and Structured Parent-Neonate Interaction Scale. The demographic data includes of about about 5 items: Mother's age, Residence, education, occupation, socio-economic status. The Obstetric data includes of about 7 items: parity, gestational age, type of delivery, APGAR score within 1 minute after birth, baby weight, gender of the baby and reason for admission at NICU.

#### Modified Parental Stressor Scale: NICU

In this study the researcher modified the Parental Stressor Scale: NICU according to the need and importance of the study. The scale used by the researcher includes 3 subscales – Sights and sounds (4 items), Baby looks, behaves and treatment (14 items), Relationship and Parental Role (9 items) consisting of totally 27 items, a 5 point Likert scale ranging from no stress to extremely stressful (0 = no stress, 4 = extremely stressful).

#### Structured Parent-Neonate Interaction Scale

It is an observational Scale which measures the parent-neonate interaction between the mother and the neonates on 4 scales - Holding the baby (5 items), Emotional bonding (6 items), Breast feeding (5 items) and behavioural and state cues (4 items), consisting of totally 20 items, 4 point likert scale ranging from no interaction to very much interaction (0 = no interaction, 3 = high interaction).

The validity of the tool were got from nine experts from HOD and Professor of Obstetrics and Gynaecology Nursing and Pediatric Nursing, Obstetricians, Pediatricians. The reliability of the tool was checked by using inter-rater reliability method ( $r^2=0.87$ ) and found to be reliable.

The research conducted a pilot study for 6 mothers at RGGWCH, Puducherry and the results were analysed it was found to be feasible.

After obtaining the permission from the ethical committee, Oral and written informed consent was obtained from each mother. Among the 60 mothers, 30 were included in intervention group and 30 in control group. The categorization of mothers was done on each day of data collection by using simple random sampling technique.

The pretest was conducted to the mothers of neonates on the 2<sup>nd</sup> of admission in the NICU by using Modified Parental Stressor Scale: NICU and Structured Parent-Neonate Interaction scale. After completion of the pretest in both groups, the mothers in the intervention group were given COPE – Phase I through the Video teaching on Information about immature neonate physical and behavioural features, the differences between mature and immature neonates, information about NICU's environment and the doubts were cleared for each mother, where as in control group received only hospital routine care. On the 4<sup>th</sup> day, the COPE – Phase 2 was given through video teaching on Information about infant's behaviours, its growth and development, and gives further suggestions regarding increasing the mother's participation to take care of the infant and meeting its needs followed by demonstration of KMC, expression of breast milk and breast feeding positions and techniques was given to the intervention group. On the 6<sup>th</sup> day, the COPE – Phase 3 was given through video teaching on supplementary information about the details of infant's states and behaviour, such as sleepiness, quiet alert state, or active alert state, and the best time to make communication, of infant's smooth transition from hospital to home and continuance of mother-infant positive interaction with the distribution of information booklet and the doubt was cleared among the intervention group and observed their practices. on the 7<sup>th</sup> day, post test was conducted by using the same scales to both the intervention and control group mothers.

### RESULTS

Data were analysed by using SPSS 16 for Windows. Descriptive analysis were performed for the demographic and obstetric variables. In addition, 't' test, Karl Pearson's Correlation and Chi-square test were performed. Among the 60 study samples

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(Intervention n=30, Control n=30) the percentage and obstetric variables in the intervention and control and distribution of the samples of the demographic group is given (Table 1).

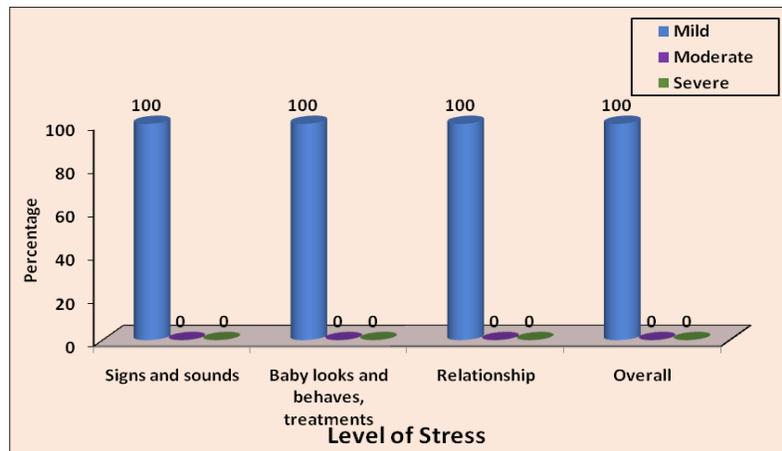
**Table 1.** Distribution of demographic and obstetric variables N = 60

Demographic variables	Experimental Group		Control Group		Chi-square value
	No.	%	No.	%	
<b>Age of mother</b>					
18 - 20	2	6.67	3	10.00	$\chi^2=1.544$ d.f=3 p = 0.672 N.S
21 - 25	14	46.67	12	40.00	
26 - 30	11	36.67	14	46.67	
>30	3	10.00	1	3.33	
<b>Education</b>					
High School	9	30.00	5	16.67	$\chi^2=0.441$ d.f=3 p = 0.932 N.S
Higher Secondary	10	33.33	16	53.33	
Diploma	4	13.33	2	6.67	
UG/PG (Graduation)	7	23.33	7	23.33	
<b>Socioeconomic status</b>					
Upper	0	0.00	0	0.00	$\chi^2=0.441$ d.f=3 p = 0.932 N.S
Upper - Middle	5	16.67	0	0.00	
Middle/Lower Middle	7	23.33	11	36.67	
Lower/Upper Lower	18	60.00	19	63.33	
Lower	0	0.00	0	0.00	
<b>Residence</b>					
Rural	19	63.33	16	53.33	$\chi^2=0.627$ d.f=2 p = 0.731 N.S
Urban	1	3.33	6	20.00	
Semi-urban	10	33.33	8	26.67	
<b>Gravida</b>					
Primi	14	46.67	13	43.33	$\chi^2=0.010$ d.f=1 p = 0.919 N.S
Multi	16	53.33	17	56.66	
<b>Gestational age at delivery</b>					
28 - 32 weeks	0	0.00	0	0.00	$\chi^2=0.032$ d.f=1 p = 0.858 N.S
32 - 36 weeks	13	43.33	10	33.33	
>36 weeks	17	56.67	20	66.67	
<b>Type of delivery</b>					
Normal	14	46.67	13	43.33	$\chi^2=0.117$ d.f=1 p = 0.732 N.S
LSCS	16	53.33	17	56.67	

N.S – Not Significant

The PSS:NICU scale, in the post test, with respect to signs and sounds, Regarding baby looks and behaves, treatments and relationship, the level of stress revealed that almost all 30(100%) had mild level of stress among mothers of neonates in the experimental group whereas in control group majority 15(50%) had moderate level of stress, 13(43.33%) had severe level of stress and only 2(6.67%) had mild level of stress among mothers of neonates (Figure 1).

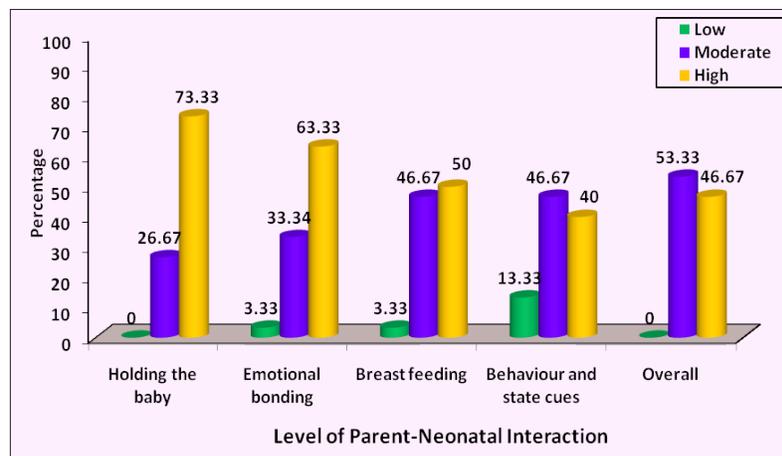
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**Fig1.** Post test level of stress in Experimental group (PSS: NICU scale)

The Parent Neonate Interaction Scale, in the post test, with respect to holding the baby, emotional bonding, breast feeding and behaviour and state cues, the level of parent-neonate interaction revealed that, majority

16(53.33%) had moderate level of interaction in the experimental group whereas in control group almost all 30(100%) had low level of interaction among mothers of neonates (Figure 2).



**Fig2.** Post test level of Parent-Neonate Interaction in Experimental group

In the experimental group, the pretest mean score of maternal stress was  $82.33 \pm 11.54$  and the post test mean score was  $20.33 \pm 3.37$  with the paired 't' value of 30.278 ( $p < 0.001$ ) whereas in the control group, the pretest mean score was  $75.10 \pm 14.01$  and the post

test mean score was  $77.50 \pm 14.56$  the paired 't' value of -2.003 which was not significant. The comparison between the post-test score of stress between the experimental and control group revealed that the unpaired 't' value of 20.937 ( $p < 0.001$ ) (Table 2).

**Table 2.** Comparison of pretest and post test level of stress within and between experimental and control group  $N = 60$  (30+30)

Stress	Pretest		Post Test		Paired 't' Value
	Mean	S.D	Mean	S.D	
Experimental Group	82.33	11.54	20.33	3.37	$t = 30.278$ $p = 0.001, S^{***}$
Control Group	75.10	14.01	77.50	14.56	$t = -2.003$ $p = 0.055, N.S$
Unpaired 't' Test	$t = 20.937$ $p = 0.001, S^{***}$				

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , S - Significant, N.S - Not Significant

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In the experimental group, the pretest mean score of parent-neonatal interaction score was  $14.30 \pm 3.84$  and the post test mean score was  $46.33 \pm 5.29$  with the paired 't' value of 27.778 ( $p < 0.001$ ) whereas in the control group, the pretest mean score was  $11.63 \pm 1.86$  and the post test mean score was  $12.00 \pm 2.03$  with the paired 't' value of -1.134 which was not significant. The comparison between the post-test score of parent-neonatal interaction between the experimental and control group revealed that the unpaired 't' value of 33.195 ( $p < 0.001$ ) (Table 3).

**Table 3.** Comparison of pretest and post test level of Parent – Neonatal Interaction within and between experimental and control group N = 60 (30+30)

Parent – Neonatal Interaction	Pretest		Post Test		Paired 't' Value
	Mean	S.D	Mean	S.D	
Experimental Group	14.30	3.84	46.33	5.29	t = 27.778 p = 0.000, S***
Control Group	11.63	1.86	12.0	2.03	t = -1.134 p = 0.266, N.S
<b>Unpaired 't' Test</b>			t = 33.195 p = 0.001, S***		

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , S – Significant

The (table 4) shows that in the experimental group, the post test mean score of stress and parent – neonatal interaction was  $20.33 \pm 3.37$  and  $46.33 \pm 5.28$ . The calculated Karl Pearson's Correlation value of  $r = -0.217$  shows a negative correlation but was not found to be statistically significant. Also in the control group, the post test mean score of stress and parent – neonatal interaction was  $77.50 \pm 14.56$  and  $12.0 \pm 2.03$ .

The calculated Karl Pearson's Correlation value of  $r = -0.022$  shows a negative correlation but was not found to be statistically significant.

The association between maternal stress and demographic variables revealed that  $\chi^2$  value was ( $P > 0.05$ ) which was not statistically significant and signifies that there was no association (Table 1).

**Table 4.** Correlation between post test level of stress and parent-neonatal interaction N = 60 (30+30)

Stress	Stress		Parent – Neonatal Interaction		'r' Value
	Mean	S.D	Mean	S.D	
Experimental Group	20.33	3.37	46.33	5.28	r = -0.217 p = 0.249, N.S
Control Group	77.50	14.56	12.0	2.03	r = -0.022 p = 0.908, N.S

N.S – Not Significant

## DISCUSSION

The main purpose of the study to evaluate the effectiveness of the COPE program on maternal stress and Parent-Neonate Interaction among NICU mothers. Findings of this study provides additional support to the previous experiential studies on COPE program and other Behavioural Intervention studies.

After participation in the COPE program, the study results revealed that pre and post test level of stress was 82.33 and 20.33 with the 't' value of 30.278 ( $p < 0.001$ ) in the experimental group, whereas in the control group, the pre and post-test mean score

was 75.10 and 77.50 with the 't' value of -2.003 which was not significant. This clearly indicates that there was significant reduction in the level of stress among mothers of neonates after the administration of COPE programme to the mothers of neonates in the experimental group. Thus the COPE programme was found to be effective in reducing the level of stress among mothers of neonates. Similarly, In the study of Melnyk et al<sup>[14]</sup>, all four phases of the COPE program were conducted in the USA shows that the maternal stress in the COPE program had significantly less than mothers in control group and the mother's participation in taking care of the preterm did not have

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statistical significance between the two groups and also reduction in the traumatic symptoms, Richard J. Shaw et al<sup>[15]</sup>, KaarensenPI<sup>[16]</sup>. Focussing on early individualized family-based interventions during neonatal hospitalization and transition to home have been shown to reduce maternal stress and depression and increase maternal self-esteem, Margarita Forcada-Guex et al<sup>[17]</sup>, the length of hospital stay was reduced in experimental group when compared to control group, Gonya et al<sup>[18]</sup>

Related to the Parent-Neonate Interaction, the study findings that pre and post test mean score of parent-neonatal interaction score was 14.30 and 46.33 with the 't' value of 27.778 ( $p < 0.001$ ) in the experimental group whereas in the control group, it was 11.63 and 12.00 with the 't' value of -1.134 which was not significant. The results highlights that there was significant difference in the parent-neonate interaction in the experimental group. This clearly shows that the COPE programme was found to be effective in increasing the level of parent-neonatal interaction among mothers of neonates in the experimental group than the mother in the control group. Similar findings was reported in the study conducted by Soheila Jafari Mianaei et al<sup>[9]</sup>, in their randomized clinical trial on 90 mothers of premature infants hospitalized in the NICUs shows intervention group had significantly less anxiety and less stress in the NICU after performing each phase of the COPE program ( $P < 0.001$ ) and COPE mothers increased interaction and infant care than the mothers in the comparison group ( $P < 0.001$ ), Leah Arnold et al<sup>[19]</sup> found the experience of first time mothers was unique and many mothers felt confused about their role. Emily D. Gerstein et al<sup>[20]</sup> proved that, maternal positive affective involvement and verbalizations in the NICU were associated with the same parenting behaviors at 24 months and shows a positive parenting.

On correlating of Maternal stress and Parent-Neonate Interaction, this study results depicts that, there is a negative correlation, a decrease in stress level enhances the interaction level and bonding among mother and neonates, Korja R et al<sup>[21]</sup> also found that maternal stress and depression are negatively related to the mother-infant interaction among 125 mothers

This study also reveals that, there was no association between demographic variables with the level of stress among mothers of neonates in the experimental

group. Hence it shows that the COPE programme can be applicable to all the mothers invariably according to their age, weeks of gestation, education, income etc, **Melnyk et al**<sup>[14]</sup> to reduce level of stress among mothers of neonates admitted in NICU.

### CONCLUSION

Analyzing the results of the present study specified that level of stress and parent-neonate interaction of mothers who had premature infants improved by presenting COPE intervention in the NICUs. During this program, mothers learnt about the differences between the physical and behavioral features of mature and immature neonates, growth and development, and behavioral and state cues and they also learnt how to interact with the neonates by meeting their needs. Therefore, the results of this study confirm the findings of previous studies regarding COPE intervention with mothers of neonates that begins early in the NICU stay and results in less parental stress in the NICU and increased parent-neonate interactions in the NICU.

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