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Effectiveness of Interventional Package on Physiological, Neurobehavioral Parameters among Preterm

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ABSTRACT

Preterm birth is now the single most important cause of neonatal deaths and the second leading cause of death in children under 5. Quantitative study was done to assess the the effectiveness of Interventional package on physiological, neurobehavioral parameters among Preterm admitted in NICU by using True experimental design.150 preterm babies whose weight between 1500 grams – 2000 grams were selected by using non probability consecutive sampling technique and were randomly allocated to experimental arm I,II,& III (50 each).Experimental arm I was received Auditory stimulation , Experimental arm II was received Kinesthetic stimulation & Experimental arm III was received Tactile stimulation for 5 minutes (AKTS). Pretest and post-test was done by using questionnaire to obtain Demographic variables, observational tool, Bristol Breast feeding Assessment tool and Morgan's neonatal neurobehavioral examination scale. Statistical value showed that moderately significant difference between the pre and post test scores of physiological, neurobehavioral parameters among Preterm.

Keywords: *Preterm, Auditory Stimulation, Kinesthetic Stimulation, Tactile Stimulation*

1. INTRODUCTION

Big Journeys Begin with Small Steps

The term Preterm birth defined by WHO as babies born alive before 37 weeks of pregnancy completed. Globally, approximately 15 million are born preterm. The main contributor to long term health problems and neonatal death is Prematurity. It is a major obstruct to attain Millennium Development Goals Target which given its high contribution to neonatal mortality.

India contributes to one fifth of global live births and more than a quarter of neonatal deaths. Nearly 0.75 million neonates died in India 2013, the highest for any country in the world.

Nearly 85 percent of preterm babies are born between 32- and 37-weeks gestation and most of these babies do not need intensive care to survive. Solutions to improve the survival and health of vulnerable preterm and low birth weight babies exist. Essential newborn care (drying, warming, immediate and exclusive breastfeeding, hygiene and cord care) as well as basic care for feeding support, infections and breathing difficulties can mean the difference between life and death for small babies.

More effort is needed to identify women at risk of preterm labor and support them to give birth in a health facility that can offer extra care when needed, such as support for adequate feeding with breast milk, continuous skin to skin contact, maintaining temperature.

In India, 3,341,000 babies are born too soon each year and 361,600 children under five die due to direct preterm complications.

Feeding disorders affect 25% of all children. However, neonates born prematurely have a higher occurrence of feeding disorders than full term neonates. It is estimated that 30 - 40% of preterm

1.1 Statement of the Problem

A study to assess the effectiveness of Interventional package on physiological, neurobehavioral parameters among Preterm admitted in NICU in selected hospitals at Erode.

1.2 Objectives

1. To assess the level of physiological and neurobehavioral parameters among preterm before and after Interventional package in experimental and control group
2. To determine the effectiveness of Interventional package on physiological and neurobehavioral parameters among preterm in experimental and control group
3. To find out the association between the scores of physiological and neurobehavioral parameters among preterm in experimental and control group with their selected demographic variables

1.3 Hypotheses

H_1: There is significant difference in the level of physiological and neurobehavioral parameters among preterm before and after Interventional package in experimental and control group

H_2: There is significant difference in effectiveness of Interventional package on physiological and neurobehavioral parameters among preterm in experimental and control group

H_3: There is significant association between scores of physiological and neurobehavioral parameters among preterm in experimental and control group with their selected demographic variables

2. METHODOLOGY

The research approach adopted was an quantitative approach with true experimental design. The researcher was obtained a formal permission from the hospital administrative authorities, Nursing Superintendent and in charge of the NICU to conduct the study. 150 preterm babies whose weight between 1500 grams – 2000 grams were selected by using non probability consecutive sampling technique and were randomly allocated to experimental arm I, II, & III (50 each). Pretest was done by using questionnaire to obtain Demographic variables, observational tool, Bristol Breast feeding Assessment tool and Morgan's neonatal neurobehavioral on 3rd day of the delivery of the baby. Experimental arm I was received interventional package of Auditory stimulation for 5 minutes, Experimental arm II was received interventional package of Kinesthetic stimulation for 5 minutes & Experimental arm III was received interventional package of Tactile stimulation for 5 minutes (AKTS). The total duration of intervention was15 minutes, twice a day (Morning & Evening) for 10 days. Post test was done by using same questionnaire on 5th day and 10th day.

3. RESULTS AND DISCUSSION

COMPARISON OF MEAN, SD OF EXPERIMENTAL GROUP I, EXPERIMENTAL GROUP II, EXPERIMENTAL GROUP III AND CONTROL GROUP PRE AND POST TEST SCORES REGARDING PHYSIOLOGICAL PARAMETERS.

Table 1: **Showing mean, SD of experimental group I pre and post test scores regarding physiological parameters (N_1 = 5, N_2 = 5, N3 = 5, N4 = 5)**

S.No	Variables	Preterm babies	Ex.Arm I		Ex.Arm II		Ex.Arm III		Control group	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD
1	Temperature (F)	Pretest	98.64	1.161	98.4	0.34	98.12	0.96	98.6	0
		Post Test	98.6	0.07	98.6	0.05	98.28	0.72	98.6	0
		Post Test	98.4	0.26	98.6	0.04	98.64	0.08	98.64	0.08
2	Heart Rate (per min)	Pretest	149	11.83	150.4	3.84	143.4	6.54	141.6	7.79
		Post Test	152	3.63	151.2	1.30	144.6	6.14	149.8	10.10
		Post Test	150	2.07	151.4	8.5	148.2	10.77	151.6	10.7
3	Respiratory Rate (per min)	Pretest	47.6	12.28	50.4	3.5	44.8	5.76	50.4	7.79
		Post Test	53.4	9.34	48	6.04	50.6	7.79	50.2	6.94
		Post Test	58.6	14.5	47.6	6.54	51.4	7.33	52.8	6.41
4	Spo2	Pretest	93.4	0.89	93	1.58	93.6	1.67	92.4	2.5
		Post Test	96.2	2.04	94.8	1.92	96.8	2.16	92.4	2.07
		Post Test	97.4	0.89	96.8	1.09	97.8	1.30	94.6	2.6
5	Weight	Pretest	1590	134	1.58	174.3	1693	273	1734	209.7
		Post Test	1740	55.3	1.92	364	1742	215	1751	213
		Post Test	1803	67.4	1.09	391	1832	307	1806	228

Table 2: Showing comparison mean, SD, paired t value of experimental group I, II, III and control group pre and post test scores according to their physiological parameters

GROUP	PRETEST			5th Day			10th Day		
	MEAN	SD	Paired t-value	MEAN	SD	Paired t-value	MEAN	SD	Paired t-value
Experimental Group - I	2.2	0.44	-	7	0.7	1.28	9.2	1.78	2.84
Experimental Group - II	2.2	0.836	-	7.6	1.14	2.72	8.4	0.894	3.34
Experimental Group - III	2	0.7	-	6	0	1.43	8.8	1.64	2.81
Control Group - I	1.2	1.30	-	2.8	1.78	0.14	4	1.22	0.008

df – 4 (n-1) Table Value = 2.132 ($P < 0.05$ Significant)

Ccomparison of mean and standard deviation of pretest in experimental I was 2.2±0.44, post test (5th day) showed 7±0.7 and post test (10th day) 9.2 ±2.84. Ccomparison of mean and standard deviation of pretest in experimental II was 2.2±0.836, post test (5th day) showed 7.6± 1.14 and post test (10th day) 8.4 ±0.894. Ccomparison of mean and standard deviation of pretest in experimental III was 2 ±0.7, post test (5th day) showed 6±0 and post test (10th day) 8.8 ±1.64. Ccomparison of mean and standard deviation of pretest in control group was 1.2±1.3, post test (5th day) showed 2.8±1.78 and post test (10th day)4 ±1.22.

Paired 't' test calculated to analyze the difference in pre and post test scores on feeding assessment among preterm babies shows moderately significant difference and the null hypothesis is rejected. Hence it can be concluded that there is moderately significant difference between the pre and post test score of feeding assessment among preterm babies.

Table 3: Showing comparison unpaired t value of experimental group I,II,III with control group according to their physiological parameters

GROUP	5th Day			10th Day		
	MEAN	SD	Unpaired t-value	MEAN	SD	Unpaired t-value
Experimental Group - I	7	0.7	3.66	9.2	1.78	4.9
Experimental Group - II	7.6	1.14	5.16	8.4	0.894	6.6
Experimental Group - III	6	0	4	8.8	1.64	5.3
Control Group - I	2.8	1.78	-	4	1.22	-

Unpaired 't' test calculated to analyze the difference in pre and post test scores on feeding assessment among preterm babies shows moderately significant difference and the null hypothesis is rejected. Hence it can be concluded that there is moderately significant difference between the pre and post test score of feeding assessment among preterm babies.

COMPARISON OF MEAN, SD OF EXPERIMENTAL GROUP I, EXPERIMENTAL GROUP II, EXPERIMENTAL GROUP III AND CONTROL GROUP PRE AND POST TEST SCORES REGARDING NEUROBEHAVIOURAL PARAMETERS.

Table 4: Showing mean, SD of experimental group I, II, III and control group pre and post test scores according to their neurobehavioral parameters

SUBSCALE	EXPERIMENTAL ARM	MEAN	SD	Significance Paired 't' test 5TH DAY	Significance Paired 't' test 10TH DAY
TONE AND MOTOR PATTERN	Arm I – Pre test	7.2	0.8	t=2.42	t=3.67
	Arm I - Post test	15	0.7		
	Arm I - Post test	20.8	2.58		
	Arm II - Pre test	7.8	1.30	t=2.06	t=2.31
	Arm II - Post test	21.4	1.34		
	Arm II - Post test	23.4	2.58		

	Arm III - Pre test	9.4	1.67	t=2.12	t=2.32
	Arm III - Post test	22.2	2.77		
	Arm III - Post test	23.2	3.11		
	Control - Pre test	9.8	0.83	t=1.16	t=1.73
	Control - Post test	18.8	1.30		
	Control - Post test	17.6	1.14		
PRIMITIVE REFLEXES	Arm I – Pre test	7.8	**1.30**	t= 2.05	t= 2.90
	Arm I - Post test-	20.4	1.14		
	Arm I - Post test -	23.2	1.78		
	Arm II - Pre test	6.8	1.30	t= 2.38	t= 2.49
	Arm II - Post test	21	2.34		
	Arm II - Post test	24.8	2.16		
	Arm III - Pre test	10	1.58	t=1.85	t=2.83
	Arm III - Post test	22.6	2.70		
	Arm III - Post test	23.8	3.27		
	Control - Pre test	8.8	**0.83**	t= 2.33	t= 2.94
	Control - Post test	16.6	1.81		
	Control - Post test	22.8	2.58		
BEHAVIOURAL RESPONSES	Arm I – Pre test	7.8	1.30	t=2.61	t=2.73
	Arm I - Post test	20.8	1.3		
	Arm I - Post test	25.4	1.34		
	Arm II - Pre test	9	1	t=2.30	t=2.90
	Arm II - Post test	20	1.22		
	Arm II - Post test	24.8	1.30		
	Arm III - Pre test	8.4	**0.89**	t=1.56	t=2.32
	Arm III - Post test	20	1.87		
	Arm III - Post test	1.48	20.8		
	Control - Pre test	9.4	0.5	t=1.35	t=1.88
	Control - Post test	18.8	1.09		
	Control - Post test	22.2	2.28		

df – 4 (n-1) Table Value = 2.132 ($P < 0.05$ Significant)

Table 5: F ratio - PRETEST

Result Details				
Source	***SS***	***df***	***MS***	
Between-treatments	72.1333	2	36.0667	$F = 3.30887$
Within-treatments	104.8	12	8.7333	
Error	87.2	8	10.9	

The pretest F ratio value was 3.30, p value is 0.089, the result is not significant at p<0.05 regarding neurobehavioural parameters.

Table 6: F ratio - 5TH DAY POST TEST

Result Details				
Source	***SS***	***df***	***MS***	
Between-treatments	196.9333	2	98.4667	$F = 7.69271$
Within-treatments	102.8	12	8.5667	
Error	102.4	8	12.8	

The post test F ratio value was 7.69, p value is 0.013, the result is not significant at p<0.05 on 5th day of post test regarding neurobehavioural parameters.

Table 7: F ratio - 10TH DAY POST TEST

Result Details				
Source	***SS***	***df***	***MS***	
Between-treatments	29.7333	2	14.8667	$F = 0.3415$
Within-treatments	557.2	12	46.4333	
Error	348.2667	8	43.5333	

The post-test F ratio value was 0.34, p value is 0.72, the result is not significant at p<0.05 on 10th day of post-test regarding neurobehavioral parameters.

4. CONCLUSION

From the findings it can be concluded that post test score in experimental group I , II and III depicts that, in experimental group I most (100%) of them were successful, whereas in experimental group II most (100 %) of them were successful , and also in experimental group III most (100%) of them were successful on 5th and 10th day of post test . About control group mos (80%) of them were in unsuccessful on 5th day of post test , (100 %) of them were successful on 10th day of post test . It seems that interventional package were highly effective on physiologic parameters among preterm babies. The paired't' test value in experimental group I was 1.28 on 5th day and 2.38 on 10th day of post test . whereas the paired't' test value in experimental group II was 2.72 on 5th day and 3.34 on 10th day of post test and the paired't' test value in experimental group III was8.8 on 5th day and 2.81 on 10th day of post test . And in control group the paired't' test value was 1.78 5th day and 0.008 on 10th day of post test.

The unpaired't' test value in experimental group I was 3.66 on 5th day and 4.9 on 10th day of post test . whereas the unpaired't' test value in experimental group II was 8.4 on 5th day and 6.6 on 10th day of post test and the unpaired't' test value in experimental group III was 8.8 on 5th day and 5.3 on 10th day of post-test .

In experimental group I Association between post test score and demographic variables of preterm babies reveals there is a significant association between preterm babies feeding scores when compared to the sex, Gestational Age, Mode of Delivery, Birth Weight and Duration of Hospitalization regarding physiologic parameters. And in control group , Association between post test score and demographic variables of preterm babies reveals that there is no significant association regarding physiologic parameters.

The pretest F ratio value was 3.30, p value is 0.089, the result is not significant at p<0.05 regarding neurobehavioural parameters . The post test F ratio value was 7.69, p value is 0.013, the result is not significant at p<0.05 on 5th day of post test regarding neurobehavioural parameters. The post-test F ratio value was 0.34, p value is 0.72, the result is not significant at p<0.05 on 10th day of post test regarding neurobehavioural parameters.

In experimental group I and in control group, Association between post test score and demographic variables of preterm babies reveals that there is no significant association regarding neurobehavioural parameters .

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