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1) EFFECT OF MUSIC THERAPY ON SELECTED PHYSIOLOGICAL PARAMETERS AMONG THE PREMATURE BABIESIN

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ABSTRACT

Background: NICU environment can be stressful to these little ones. Premature and low birth weight infants respond to their new surroundings with increased levels of agitation, which can cause fluctuations in both the heart rate and blood pressure, oxygen saturation andfeeding. Exposure to music therapy has been proven to calm the infant and helps reverse the stress response. A number of studies reveal that babies who experience music therapy are more content, feed better and experience shorter length of stay in the hospital less crying, maintain physiological parameters and an increase in weight gain. **Objectives of the Study:** To assess the selected physiological parameters of the premature babies before music therapy 2) To assess the effectiveness of music therapy on selected physiological parameters of the premature babies. **3)** To correlate the findings with selected demographical variables **Material and Method:** In order to achieve the desired objective of the study a Quantitative research approach was adopted for this study and the pre test post test quasi experimental research design for the study. This study was proposed to be conducted in Bharati hospital sangli with non probability purposive sampling method The reliability of the tool correlation and split half technique was used and the 'r' value is more than 0.7 hence the tool found to be reliable. The pilot study was conducted from 25 jan to 28 March on 20 premature babies control 10 and experimental 10 samples were selected from Bharati hospital sangli and Amanapure hospital Miraj. Music therapy was given with head phones with recommoned decibel level that is 50 to 70 DB. before starting the music physiological parameters were assessed as a pre test, Music was given for 10 minutes and stopped then after 5 minutes the post test parameters were observed. Total for one baby 6

sessions were given on alternative days. so one baby was included in a study for 12 days. **Result**: overall there is significant difference seen in control and experimental group for physiological parameters with music therapy. In Heart rate the mean difference is 6.03 in control group and 28.06 is in experimental group. calculated t value is 18.12 which is more than t table value (1.734) and p is 0 which is less than 0.001. Hence There is sufficient evidence at the alpha level of significance to support the claim that there is reduction in HR in experiment group then control group. 2) In respiratory rate the mean difference is 1.4 in control group and 8.49 is in experimental group. calculated t value is 13.62 which is more than t table value (1.734) and p is 0 which is less than 0.001. Hence There is sufficient evidence at the alpha level of significance to support the claim that there is reduction in RR in experiment group then control group. 3) In oxygen saturation the mean difference is 2.2 in control group and 6.03 is in experimental group. calculated t value is 13.32 which is more than t table value (1.734) and p is 0 which is less than 0.001. Hence There is sufficient evidence at the alpha level of significance to support the claim that there is increment in SPO2 in experiment group then control group. 4) In oral intake the mean difference is 7.3 in control group and 12.9 is in experimental group. calculated t value is 3.3 which is more than t table value (1.734) and p is 0 which is 0.001. Hence There is sufficient evidence at the alpha level of significance to support the claim that there is increment in oral intake in experiment group then control group.5) In weight the mean difference is 0.032in control group and 0.036 is in experimental group. calculated t value is 0.1 is less than t table value (1.734) and p is 0.918 which is more than 0.001. Hence there is no significant difference is seen in experimental and control group, The effect of music on the physiological response of the neonates before and after the intervention was calculated using ANOVA. The calculated p values are less than 0.05 except for weight (0.167) Hence it is inferred that music was effective in improving the physiological responses of the preterm neonates. Except weight hence the null hypothesis is rejected.

KEYWORDS: Premature babies, Music therapy, Behavioral parameters.

INTRODUCTION

India is the biggest contributor to the world's prematurity burden, with almost 3.6 million premature birth each year before 37 weeks of gestation. Infants who are born too early or who are recovering from traumatic births or surgery right after birth are moved to the NICU in order to help them grow and thrive.[11] The NICU is an amazing place where Loud

machinery, medical rounds coming with group of people, alarms on ventilators, Lamps, tubes to eat and breathe, pumps and the hiss of oxygen, this NICU environment can be stressful to these little ones. Premature and low birth weight infants respond to their new surroundings with increased levels of agitation, which can cause fluctuations in both the heart rate and blood pressure, oxygen saturation and feeding.

Hearing is possible as early as 24 weeks of gestation. Loud noises and abrupt peaks in sound levels from sources such as ventilators, monitor alarms, and even cabinet doors can affect an infant's blood oxygen levels, impair cerebral blood flow, and alter the sleep-wake cycles which are necessary for development, maturation and weight gain.The neonatal intensive care unit (NICU) serves premature infants with low birth weight. Prematurity is defined as less than 37 weeks gestation, and low birth-weight(LBW)indicates the infant weighs less than 2500 grams (5 lbs., 8 oz). Many risks and complications are frequently associated with premature births, such as asthma, respiratory distress/lung immaturity, and organ immaturity correlate with LBW infants cerebral palsy, cognitive functioning below the normal level, poor academic achievement and behavioral problems. Some health impairments may even lead to an increased predisposition to early mortality Unlike full-term infants, very premature babies come into the world lacking the neurologic ability to coordinate a suck/swallow/breathe response "The longer it takes them to learn this essential skill, the further behind in the growth process they fall.".[1]

As per the academic of pediatrics Over the past 2 decades, number of studies have documented the Effects of the NICU Environment on Stress Responses of Preterm Infants. Excessive stimulation, excessive noise, light and handling of preterm infants leads to increased stress responses, disturbances in sleep and increased risk of cochlear damage that may lead to hearing loss.[2]

More recently, the use of structured stimuli (e.g., music therapy) has been encouraged as a means of reducing environmental stress.[8]

Results of studies of music therapy with premature infants, suggest that music therapy can reduce pain, stress, and stimulus deprivation during illness.

Exposure to music therapy has been proven to calm the infant and helps reverse the stress response. A number of studies reveal that babies who experience music therapy are more

content, feed better and experience shorter length of stay in the hospital less crying, maintain physiological parameters and an increase in weight gain.[12]

Soothing music with a flowing, lyrical melody, simple harmony, soft tone colour and easy rhythm (About 60 to 80 beats per minute) can help to stimulate the relaxation response. Music can stimulate the release of endorphins from the brain, reduce blood levels of ACTH and increase phenylthylamine secretion. Neural impulses triggered by soothing music can trigger autonomic nervous system reactions to produce relaxation in muscle tone, brain wave frequency, galvanic skin response, Pilomotor reflexes and pupillary reflexes. Music also facilitates emotional homeostasis.[13]

During the early 1950s, studies showed beneficial effects of music in surgical patients, such as increased cardiac output and decreased heart rate (HR), respiratory rate, and blood pressure (BP).[18] The study of the effects of music on preterm infants has been championed by the American Music Therapy Association, which was founded in 1998 through the merging of the National Association for Music Therapy (founded in 1950)[19] and the American Association for Music Therapy (founded in 1971).[20]

STATEMENT OF THE STUDY

"A study to assess the effectiveness of music therapy on selected physiological parameters of the premature babies in selected neonatal intensive care units of sangli city".

OBJECTIVES OF THE STUDY

- To assess the selected physiological parameters of the premature babies before music therapy
- To assess the effectiveness of music therapy on selected physiological parameters of the premature babies.
- To correlate the findings with selected demographical variables

HYPOTHESIS

- **Ho**- Music therapy will not have any significant difference on the selected physiological parameters of premature babies.
- $\mathbf{H_1}$ - Music therapy will have significant difference on the selected physiological parameters of premature babies.

MATERIAL AND METHODS

RESEARCH APPROACH- In order to achieve the desired objective of the study a Quantitative research approach was adopted for this study. **RESEARCH DESIG-** Keeping in view the objectives of the study the researcher selected the pre test post test quasi experimental research design for the study. **INDEPENDENT VARIABLE** independent variable is music intervention. **DEPENDENT VARIABLE** In this study, the dependent variable is selected physiological parameters **SETTING** This study was proposed to be conducted in Bharati hospital, sangli. Bharati Hospital and Amanapure childrens Hospital Miraj. **SAMPLE AND SAMPLING TECHNIQUE** premature babies selected for data collection were those who fulfilled the criteria laid down for the selection of the sample and were available during the period of the data collection. They were selected by non probability purposive sampling method. **RELIBILITY** The reliability of the tool correlation and split half technique was used and the r value is more than 0.7 hence the tool found to be reliable **PILOT STUDY** The pilot study was conducted from 25 jan to 28 March on 20 premature babies control 10 and experimental 10 samples were selected from Bharati hospital sangli and Amanapure hospital Miraj**. METHOD** The data was collected through observation table .the subjects were selected based on inclusion criteria with non probability purposive sampling technique (20 samples) in each group 10 samples. it is informed to the Audiometrologist for hearing assessment prior to the study and if the hearing test is valid then only the subjects were added in the study. Before the study physiological parameters were observed and then Music therapy was given with head phones with recommoned decibel level that is 50 to 70 DB. Music was given for 10 minutes and stopped then after 5 minutes the post test parameters were observed. Total for one baby 6 sessions were given on alternative days. so one baby was included in a study for 12 days. and for analysis mean, SD, t test and ANNOVA test is used. After the pilot study, tool was found feasible and gave better insight to the investigator **DATA ANALYSIS** The data collected, tabulated and computed with the use of analysis with mean, SD, t test and ANNOVA test.

ANALYSIS OF THE DATA AND RESULT

THE ANALYZED DATA IS PRESENTED UNDER THE FOLLOWING HEADINGS

- **SECTION I**

A) frequency and percentage distribution of Demographical variables.

a) Frequency distribution based Gender.

b) Frequency distribution based on Gestational week

c) Frequency distribution based on type of delivery

d) Frequency distribution based on birth weight

- **SECTION II**

A) Comparison of pre/post mean score of Physiological parameters in control and experimental group.

B) Comparison of post mean score between control and experimental group.

- **SECTION III**

A) ANOVA showing effect of music between control and experimental Group

SECTION I

A) frequency and percentage distribution of Demographical variables

Table no 1 -frequency and percentage distribution of Demographical variables

SR.NO	DEMOGRAPHIC VARIABLES		EXPERIMENTAL GROUP		CONTROL GROUP	
			frequency	percentage	frequency	percentage
1	GENDER	Male	4	40%	5	50%
		Female	6	60%	5	50%
2	WEIGHT	1 kg to 1.5 kg	5	50%	4	40%
		1.5kg to 2 kg	5	50%	6	60%
3	GESTATIONAL AGE	28wks to 32 wks	4	40%	5	50%
		32 to 36 wks	6	60%	5	50%
4	TYPE OF DELIVERY	Normal	6	60%	4	40%
		Lscs	4	40%	6	60%

Table no 1 show the frequency and percentage distribution of Demographical variables in the gender the maximum number that is 60% were females and in weight in both the group 60% were from 1.5 to 2 kg in control group and in gestational week maximum were from the 32 to 36 wks that is 60% where in type of delivery maximum were from normal delivery that is 60% from conrol group and 60% were from Lscs in experimental group.

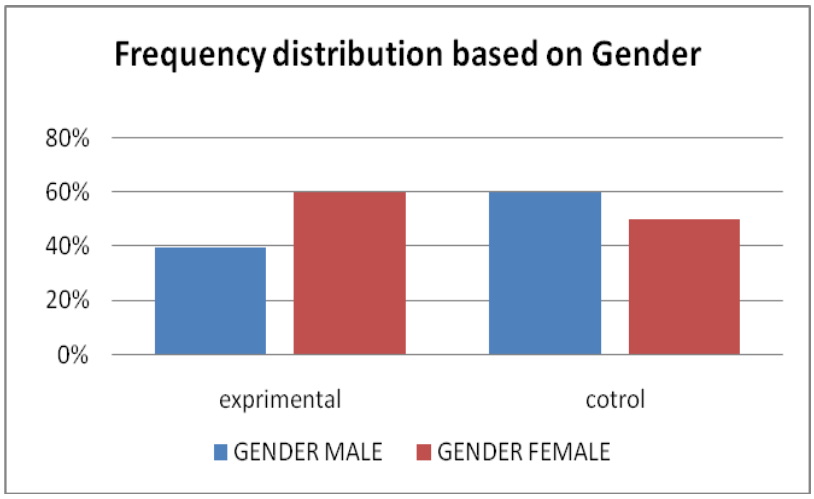

Figure NO -1 - Frequency distribution based on Gender

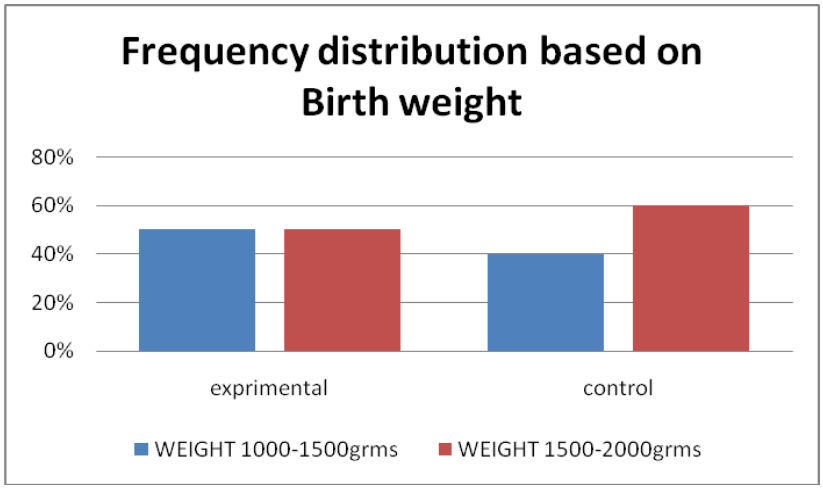

Figure NO -2 - Frequency distribution based on Birth weight

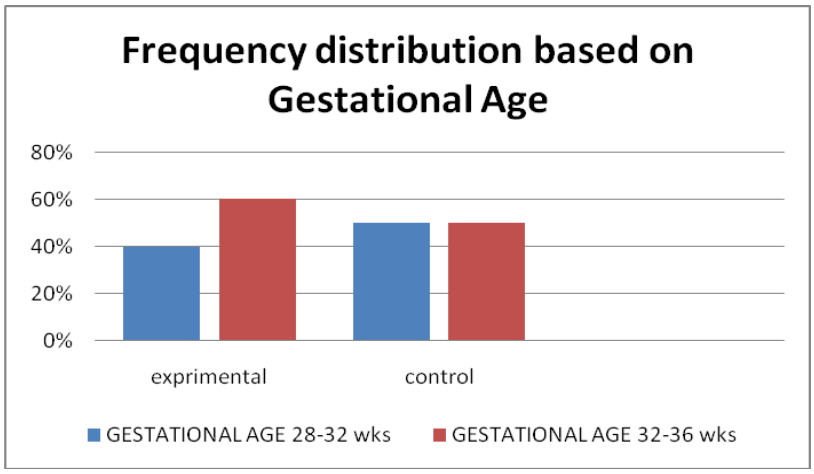

Figure NO -3 - Frequency distribution based on Gestational Age

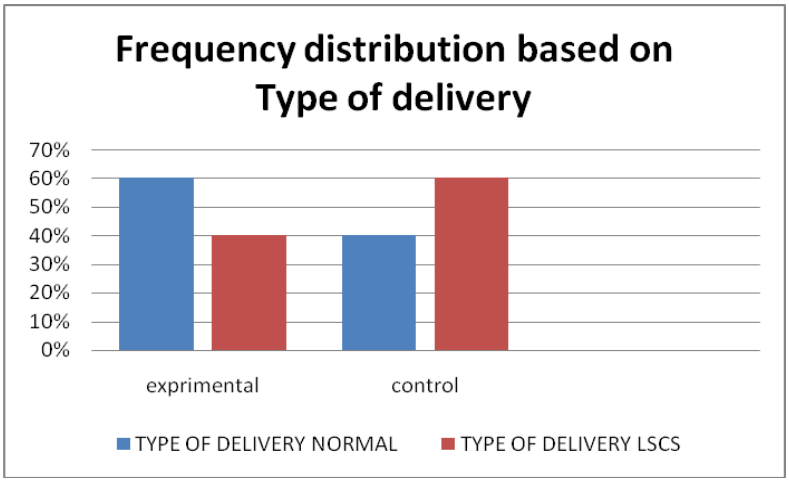

Figure NO -4 - Frequency distribution based on Type of delivery

SECTION –II

A) Comparison of pre/post mean score of physiological parameters in control and experimental group.

b) Comparison of post mean score between control and experimental group

Table no. 2 – Comparison of pre/post mean score of Heart rate in control and experimental group

Group		Mean	SD	t value	P value
control	pre	151.33	7.05	6.74	1
	post	157.36	11.23		
Experiment	pre	151.98	8.58	16.64	0.0001
	post	123.9167	9.64		

Table t value (1.833) and P(0.001).

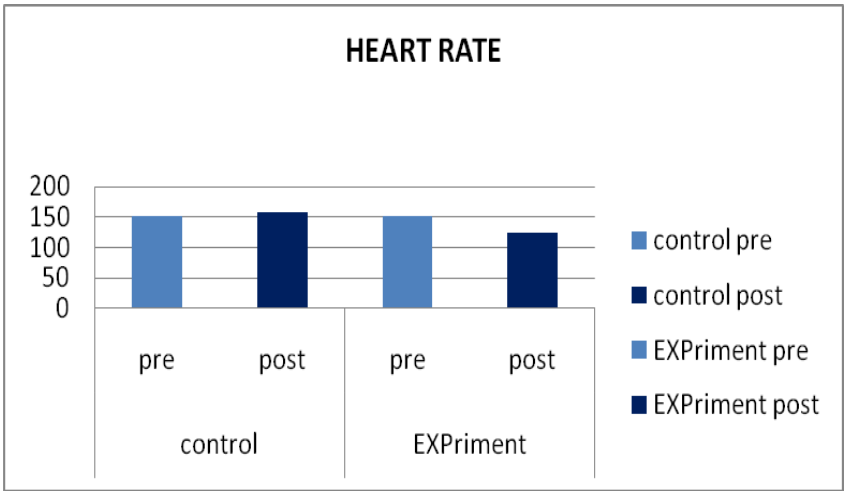

Figure NO -5 Comparison of pre/post mean score of Hear rate in control and experimental group.

Table no 2 and figure no 5 shows that there is significant difference is seen in control and experimental group.T value in control group is 7.09 and in the experimental group is 12.9 which is more than the t table value. and the p value in control group is 1 which is more than 0.001 indicates no significant difference where the p value in the experimental group is 0.001 which shows that there is significant difference in experimental group.

Table no. 3 Comparison of pre/post mean score of Respiratory Rate in control and experimental group.

Group		Mean	SD	t value	P Value
control	pre	50.1	5.10	2.07	0.966
	post	51.5	7.68		
Experiment	pre	48.09	2.33	19.49	0
	post	39.6	4.17		

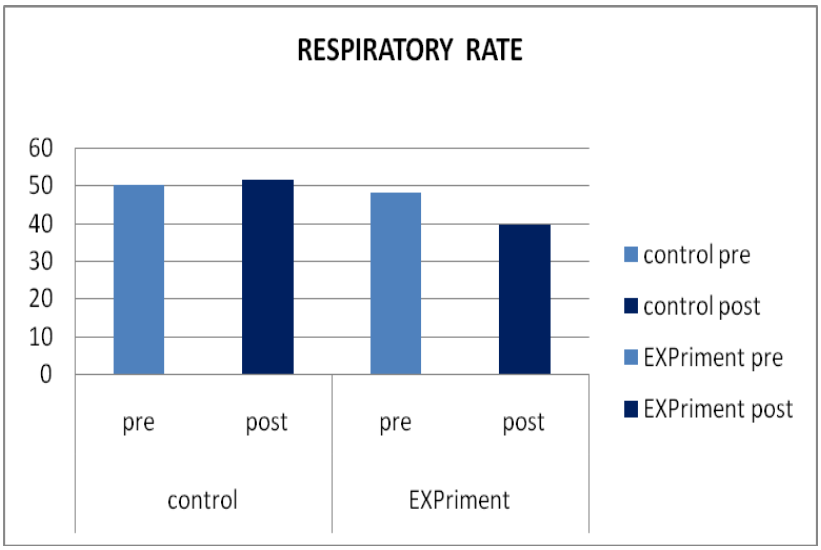

Figure NO. 6 – Comparison of pre/post mean score of Respiratory Rate control and experimental group.

Table no 3 and figure no 6 shows that there is significant difference is seen in control and experimental group.T value in control group is 2.07 which is more than the t table value and in the experimental group it is 19.49 which is more than the t table value. and the p value in control group is 0.966 which is more than 0.001 indicates no significant difference between pre and post test where the p value in the experimental group is 0 which is < 0.001 shows highly significant difference in experimental group for Respiratory Rate.

Table no. 4 –Comparison of pre/post mean score of Oxygen Saturation in control and experimental group

Group		Mean	SD	t value	P value
Control	pre	92.56	1.69	5.63	1
	post	90.36	3.52		
Experiment	pre	92.55	2.33	12.5	0
	post	98.85	1.83		

T table value (1.833), p value (0.001).

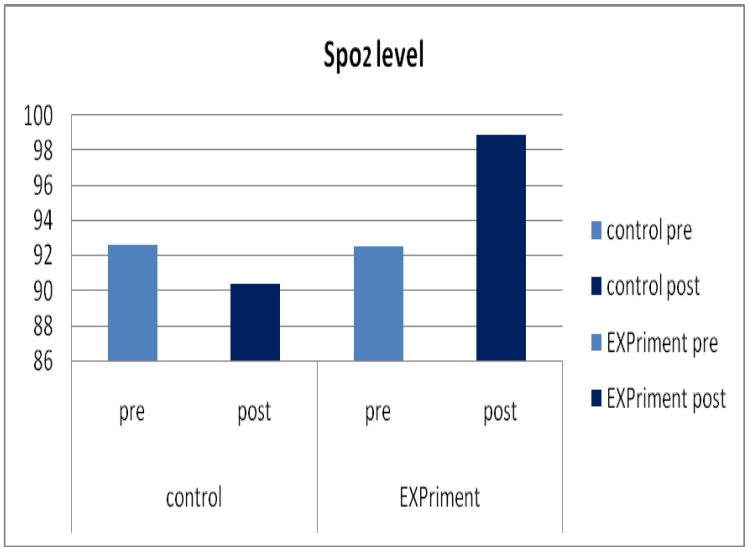

Figure NO. 7 –Comparison of pre/post mean score of Oxygen Saturation control and experimental group.

Table no 4 and figure no 7 shows t value in control group is 5.63 which is more than the t table value and the p value is 1 which is more than 0.001 indicates no significant difference between pre and post test in the control group. In experimental group t calculated t value is 12.63 which is more than the t table value. and the p value in is 0 which is more than 0.001 indicates highly significant difference between pre and post test for SPO2 level.

Table no. 5– Comparison of pre/post mean score of weight in control and experimental group

Group		Mean	SD	t value	P value
Control	pre	1.51	0.18	0.91	0.388
	post	1.478	0.13		
Experiment	pre	1.499	0.24	2.49	0.035
	post	1.463	0.22		

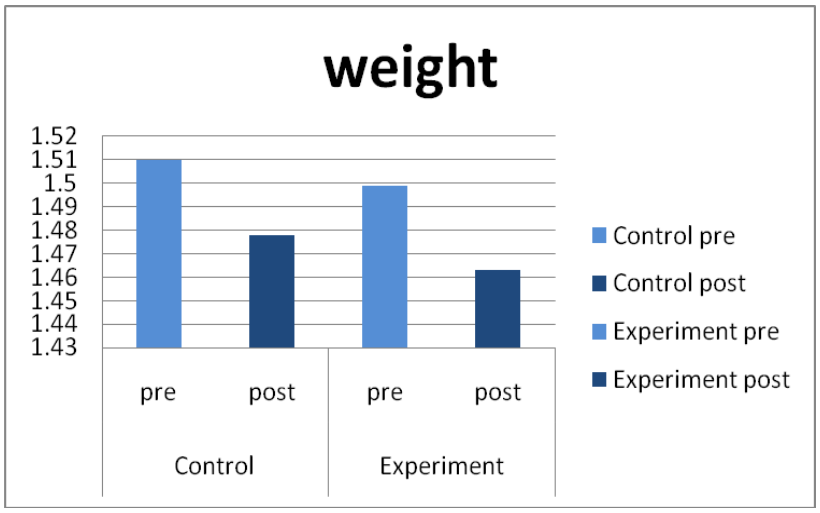

Figure NO. 8 – Comparison of pre/post mean score of weight in control and experimental group

Table no 5 and figure no 8 shows t value in control group is 0.91 which is more than the t table value and the p value is 0.388 which is more than 0.001 indicates no significant difference between pre and post test in the control group. In experimental group t calculated t value is 2.49 which is more than the t table value. and the p value in is 0.035 which is more than 0.001 indicates no significant difference between pre and post test in experimental group for weight.

Table no. 7– Comparison of pre/post mean score of oral intake in control and experimental group

Group		Mean	SD	t value	P value
Control	pre	8.4	2.63	5.09	0
	post	15.7	5.88		
Experiment	pre	8.9	2.92	12.06	0
	post	21.8	3.67		

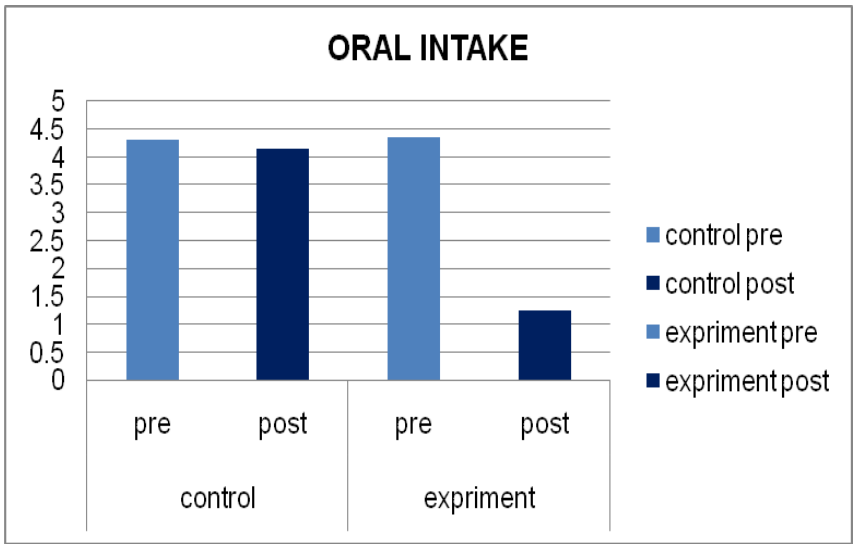

Figure NO. 9 – Comparison of pre/post mean score of oral intake in control and experimental group

Table no 8 and figure no 9 shows t value in control group is 5.09 which is more than the t table value and the p value is 0 which is < 0.001 indicates there is significant difference between pre and post test in the control group. In experimental group t calculated t value is 12.06 which is more than the t table value. and the p value in is 0 which is < 0.001 which shows highly significant difference between pre and post test for oral intake.

B) – Comparison of post mean score between control and experimental group

Table no. 9 – Comparison of post score between control and experimental group

Sr.No	Parameters	Group	Mean difference	t-value between control and experiment (Difference = μ (expriment) - μ (control)	p-value	Result
1	HR	control	6.03333	18.12	0	Highly significant.
		expriment	28.0633			
2	RR	control	1.4	13.62	0	Highly significant.
		expriment	8.49			
3	SPo2	control	2.2	13.32	0	Highly significant.
		expriment	6.3			
4	Oral intake	control	7.3	3.3	0.001	significant.
		expriment	12.9			
5	wt	control	0.032	0.1	0.918	Not significant
		expriment	0.036			

Table t value (1.734) and P(0.001).

1) In Heart rate the mean difference is 6.03 in control group and 28.06 is in experimental group. calculated t value is 18.12 which is more than t table value (1.734) and p is 0 which is

less than 0.001. Hence There is sufficient evidence at the alpha level of significance to support the claim that there is reduction in HR in experiment group then control group.

2) In respiratory rate the mean difference is 1.4 in control group and 8.49 is in experimental group. calculated t value is 13.62 which is more than t table value (1.734) and p is 0 which is less than 0.001. Hence There is sufficient evidence at the alpha level of significance to support the claim that there is reduction in RR in experiment group then control group.

3) In oxygen saturation the mean difference is 2.2 in control group and 6.03 is in experimental group. calculated t value is 13.32 which is more than t table value (1.734) and p is 0 which is less than 0.001. Hence There is sufficient evidence at the alpha level of significance to support the claim that there is increment in SPO2 in experiment group then control group.

4) In oral intake the mean difference is 7.3 in control group and 12.9 is in experimental group. calculated t value is 3.3 which is more than t table value (1.734) and p is 0 which is 0.001. Hence There is sufficient evidence at the alpha level of significance to support the claim that there is increment in oral intake in experiment group then control group.

5) In weight the mean difference is 0.032in control group and 0.036 is in experimental group. calculated t value is 0.1 is less than t table value (1.734) and p is 0.918 which is more than 0.001. Hence there is no significant difference is seen in experimental and control group.

SECTION III

A) ANOVA showing the effect of music between control and experimental group.

Table no. 10 – ANOVA showing effect of music between control and experimental group

	F-value between control and exp	p-value	Result
HR	511.99	0	We see that p-value for groups is 0 < .05 indicates difference between groups of control and experiments are **statistically significant** for Heart Rate.
RR	145.74	0	We see that p-value for groups is 0 < .05 indicates difference between groups of control and experiments are **statistically significant** for RRate.
SPo2	202.05	0	We see that p-value for groups is 0 < .05 indicates difference between groups of control and experiments are **statistically significant** for SPO2
Oral intake	26.65	0	We see that p-value for groups is 0 < .05 indicates difference between groups of control and experiments **are statistically significant** for oral intake
wt	1.94	0.167	We see that p-value for groups is 0 > .05 indicates difference between groups of control and experiments are **not statistically significant** for wt

The effect of music on the physiological response of the neonates before and after the intervention was calculated using ANOVA. The calculated p values are less than 0.05 except for weight (0.167) Hence it is inferred that music was effective in improving the physiological responses of the preterm neonates. Except weight hence the null hypothesis is rejected.

CONCLUSION

Premature infants may face a number of health challenges, including, low birth weight, breathing problems because of underdeveloped lungs, underdeveloped organs or organ systems, greater risk for life-threatening infections, greater risk for a serious lung condition, known as respiratory distress syndrome, greater risk for cerebral palsy (CP) and greater risk for learning and developmental disabilities. Healing with sound has become increasingly popular and well documented as an effective holistic treatment. Music is credited to have numerous qualities and capabilities and it has been shown even to enhance the growth of plants. Studies have shown that soft and soothing music to individual babies enhances their physiologic stabilit. Babies like and enjoy gentle and classical or gentle instrumental music. Music causes autonomic stability, reduces stress and quietens the baby, increase oxygen saturation and reduce heart rate Respiratory rate and oral intake but on weight it has not shoen the effect on weight gain as the sample size was less in Pilot phase.

The present pilot study, in short, gave the investigator a new experience, a chance to widen the knowledge and conduct final study which will help to understand the effect of intervention on preterm neonates in maintaining the physiological responses to achieve and restore the life.

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