

EFFECTIVENESS OF EARLY INTERVENTION PROGRAM AMONG INFANTS BORN EARLY TERM



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Abstract-

BACKGROUND AND AIM: Compared to full-term newborns, early term babies are far more likely to have neurological problems. Early babies should benefit from initiatives that motivate parents to enhance the environment they provide for their children. It is unclear which intervention elements are connected to better parental outcomes, and many parent-centered therapies don't monitor parental change. Compared to full-term babies, preterm infants are more prone to experience neurodevelopmental issues such as cerebral palsy, mental retardation, vision and hearing impairment, and cerebral palsy. The study's goal was to evaluate the value of early intervention programs among infants born early term using the Hammersmith scale.

METHODS: SUBJECTS: Early term Infants. **STUDY DESIGN:** Experimental study. **SAMPLING TECHNIQUE:** Convenient sampling technique. **SAMPLE SIZE:** 30. **INCLUSION CRITERIA:** Age: 37-38 weeks, Gender: Male and female, Low birth weight. **EXCLUSION CRITERIA:** Cortical blindness, Hydrocephalus, Congenital abnormalities, Retinopathy. **PROCEDURE:** Based on inclusion and exclusion criteria, a total of 30 children will be chosen for the study. The parents will be informed about the study, and their written informed consent will be obtained. 30 children were divided into 2 groups i.e. experimental group (Group A) (n=15) will be given an early intervention program which includes auditory, visual, vestibular and tactile stimulation and control group (Group B) (n=15) will be given an early intervention program which includes positioning, cognitive, communication, kangaroo mother method. The outcome is measured using the Hammersmith scale. This intervention program improves the physical function of an early-term baby. The post-test values are evaluated and tabulated. **RESULT:** A statistically significant difference was found between Groups A and B and within each group was found by statistical analysis of the quantitative data. The experimental group's post-test mean value was 46.60, whereas the control group was 31.13. As a result, there is a significant statistical difference between Groups A and B.

CONCLUSION: The study concluded that auditory, visual, vestibular and tactile stimulation are effective among early term infants.

Keywords: Early intervention, early term infants, Hammersmith neonatal neurological examination scale, gestational age.

1. INTRODUCTION :

It has long been believed that full-term infants delivered between 37 and 41 weeks of gestation are a low-risk, uniform population. Recent evidence from research based on delivery mode suggests that term neonates are not more morbid than early-term caesarean section newborns (37-38 weeks), which have been linked with higher morbidity. ⁽¹⁾ The ideal result for the mother, the child, or both is a late preterm birth or an early term birth due to issues that could get worse if the pregnancy is permitted to go on. Placenta previa, preeclampsia, and multiple births are examples of conditions that can be classified as placental, maternal, fetal, or a combination of all four. There are some problems associated with early delivery that are common to all conditions, such as child prematurity-related morbidities like breathing difficulties and intraventricular hemorrhage, and also maternal birth-related morbidities like unsuccessful induction and caesarean birth. Early term delivery may be advised, nevertheless, if continuing the pregnancy has higher risks such as bleeding, uterine rupture, and still birth ⁽²⁾.

Early term birth is associated with a greater need for hospital care in the initial postnatal period. This study's objective was to assess the morbidity and costs of healthcare for preterm infants in the initial three years of life. ⁽³⁾ A number of risk factors, such as complications of pregnancy (hypertension, diabetes), medical procedures (provider-initiated deliveries, assisted reproduction), parental sociodemographic and way of life traits, and environmental factors are common to countries with the highest early term birth rates and increased early term birth rates ⁽⁴⁾. Early parenting stress from early term birth has been linked to a higher risk of behavioral issues later in life, according to several studies. However, there are few research and contradictory findings ⁽⁵⁾.

For four decades, people have worked hard to illustrate that early intervention for poor children, and more recently, children with developmental impairments, can result in significant improvements in cognitive, academic, and social outcomes. The long-term morbidity of the babies is a serious public health issue. Because multiple systems of organs are not fully developed to support life outside the uterus, the biological chance for preterm complications is increased. ⁽⁶⁾

Preterm infants are more likely to experience neurological problems, compared to full-term infants. Preterm infants project to develop should be improved through interventions that assist parents in enhancing the environment they provide for their children. Numerous parent-involved programs lack measures of parental change, and it is unclear which interventional elements are linked to better parental outcomes. The purpose of this study was to identify the critical components of intervention strategies and determine each component's direct effects on families and their preterm children. ⁽⁷⁾

Early mature babies have a higher risk of suffering cognitive and motor disability compared to babies born at term. In the healthcare setting, early developmental therapies have been given with the goal of improving the status and physical results for these newborns. The long-term advantages of these programs are still unknown ⁽⁸⁾. Early intervention programs are made to stop or lessen developmental delays as well as to improve participants' therapeutic efficacy. Children that are naturally or socially vulnerable are likely to get early intervention, as do those who have known developmental delays. Based on the most recent research, there is growing agreement that early interventions can have only modestly positive benefits ⁽⁹⁾.

Infants born early term have a greater risk of impaired neurodevelopment. The major objective is to create an early treatment program for extremely preterm infants that families can use constantly at home and to measure the effects of related parental stimulation on the development of cognitive and motor skills ⁽¹⁰⁾. The three primary causes of newborn, infant, and child morbidity, mortality, and neurological deficits and disabilities globally are preterm birth, low birth weight, and congenital anomalies ⁽¹¹⁾. Early-term infants are more probable to miss positive milestones than negative ones, and the parents may experience more stress. A type of early intervention known as the Mother Infant Interaction Program aims to strengthen the relationship between parents and babies as well as the growth of young children. Parents who received treatment reported feeling less anxious and more capable, secure,

and confident in their capacity to care about their preterm-born child than they otherwise would have. This was because of the information, advice, help, and emotional support given throughout the intervention. The group of control parents stated that they felt less emotionally involved and supported than the intervention parents and showed greater concern for their child's development. The developmental milestones of each child were closely monitored by the parents. (12).

For infants and kids with exceptional challenges, improving cognition and ability to learn is one of early intervention's main objectives⁽¹³⁾. Children who are born prematurely are more likely to have motor deficits, and these abnormalities frequently last until puberty. There isn't much data on how PT affects preterm infants' development of motor skills. There have been a variety of interventions created to encourage growth in these newborns, but few studies have shown that early intervention has a meaningful impact on motor performance⁽¹⁴⁾. Even among newborns born between 34 and 36 weeks of pregnancy, immaturity is linked to long-term neurological effects, with risks rising as gestation shortens⁽¹⁵⁾. Early term babies are births that occur between 37 0/7 and 38 6/7 weeks of gestation and are now recognized as having a greater risk of bad results than new-born between 39 and 41 gestational weeks⁽¹⁶⁾.

2. METHOD

2.1 Participants and selection criteria:

The study was conducted as a convenient sampling method, randomly selected based on inclusion and exclusion criteria. Subjects of both gender Infant with age 37-38 weeks and low birth weight.

The study eliminated infants with retinopathy, hydrocephalus, congenital abnormalities, and cortical blindness. The study setup was Saveetha physiotherapy OPD, Saveetha medical college, and hospital, Thandalam, Chennai. The informed consent was given to the patient before the treatment began and explained about the procedure.

2.2 Procedure:

Based on inclusion and exclusion criteria, subjects from SAVEETHA MEDICAL COLLEGE AND HOSPITAL have been screened. For the study, 30 samples were collected as a group. They receive an early intervention program that incorporates kangaroo mother method, positioning, visual, vestibular, tactile, and cognitive stimulation. The parents were given a written explanation of the study's methodology, and their written informed consent was obtained. 30 children were divided into 2 groups.

EXPERIMENTAL GROUP (GROUP A): Group A(n=15) will be given early intervention program which includes auditory, visual, vestibular and tactile stimulation for 4 weeks.

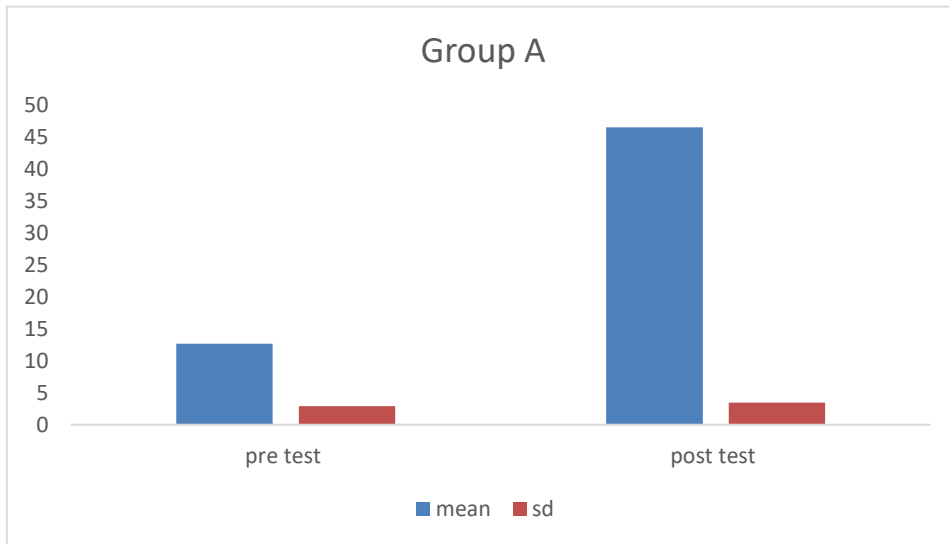
CONTROL GROUP (GROUP B): Group B(n=15) will be given early intervention program which includes positioning, cognitive, communication, kangaroo mother method for 4 weeks.

The outcome is measured using hammersmith scale. This intervention program improves the physical function of early-term infants.

3. STATISTICAL ANALYSIS

Table-1 shows Pre- test values and post- test values for hammersmith neonatal neurological examination scale of group A

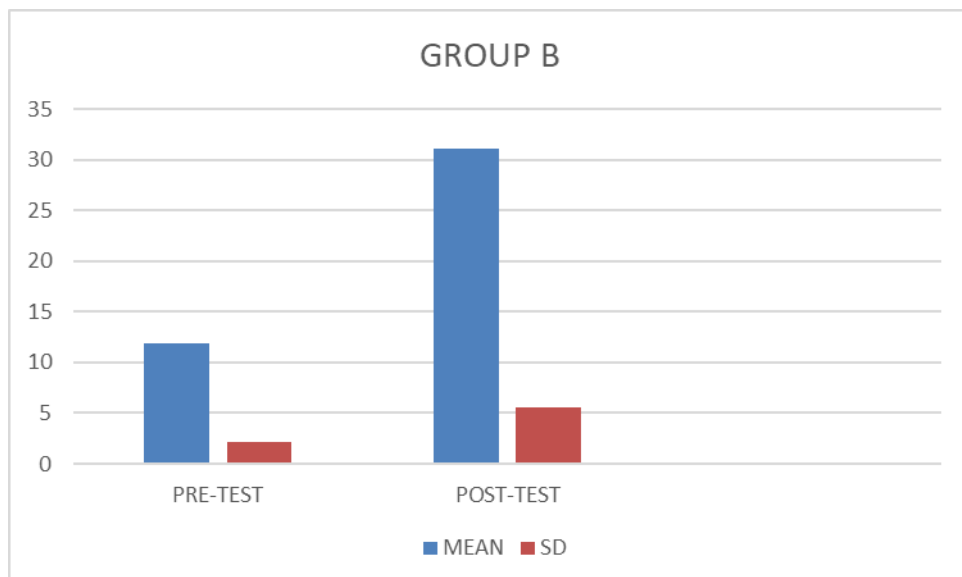
| GROUP A | | MEAN | SD | P VALUE | T VALUE |
|----------------------|-----------|-------|------|---------|---------|
| (Experimental group) | PRE-TEST | 12.67 | 2.92 | <0.0001 | 23.8 |
| | POST TEST | 46.60 | 3.46 | | |



Graph 1 - Pre -test and post- test values for hammersmith neonatal neurological examination scale for group A

Table-2 shows pre and post values of hammersmith neonatal neurological examination scale for group B

| GROUP B (Control group) | | MEAN | SD | P VALUE | T VALUE |
|----------------------------|-----------|-------|------|---------|---------|
| | PRE-TEST | 11.87 | 2.10 | <0.0001 | 14.34 |
| | POST-TEST | 31.13 | 5.59 | | |

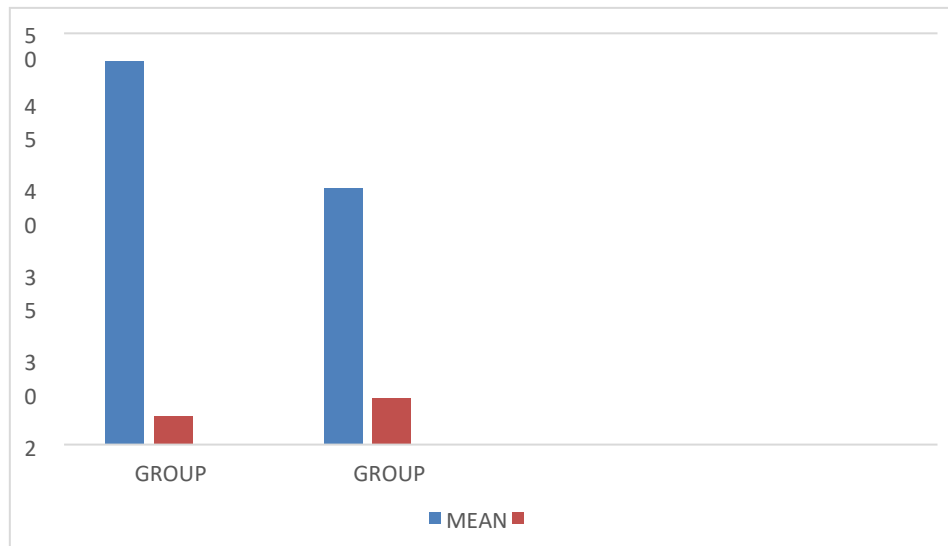


Graph 2 – Pre-test and post -values of hammersmith neonatal neurological examination scale for group B

Table-3 shows Post test - mean value and SD value of Group A and Group B

| | MEAN | SD |
|---------|-------|------|
| GROUP A | 46.60 | 3.46 |
| GROUP B | 31.13 | 5.59 |

Graph 3 - Post Test-Mean Value and SD value of Group A and Group B



4. RESULT:

statistical analysis of quantitative data indicated statistically significant differences between groups A and B. The group A post-test mean value on the Hammersmith neonatal neurological examination scale was 46.60 ± 3.46 , whereas group B was 31.13 ± 5.59 . This demonstrates that group B is lower than Group A. Group A (Experimental group) was given auditory, visual, vestibular and tactile stimulation, whereas Group B (Control group) was given early intervention program which includes positioning, cognitive, communication, kangaroo mother method. Thus, this statistical analysis shows that intervention given to group A is more effective than the intervention given to group B.

5. DISCUSSION:

According to Kaaresen PI and colleagues' (2006) study, parents of preterm infants who take part in this early intervention program have less parenting stress than parents of newborns. We're looking into whether this will result in long-term advantages right now. Orton J in 2009 this study finds that child developmental therapies have a good short-term influence on the intellectual development of preterm children. Early interventions produced positive and clinically significant impacts on various prosocial behaviors of mothers of preterm infants, according to Benzies KM (2013)'s study. Spittle A, (2015) Preterm infants program have a positive response on the development of both the brain and the body during infancy, including cognitive benefits. Grote, N. K., (2010) Preterm birth, low birth weight, and congenital abnormalities are the main causes of neonatal, baby, and child illness, mortality, and neurological impairments and disabilities worldwide. According to Kyn NM, (2013), this study's qualitative analysis of the MITP's influences showed that the intervention had a favorable outcome and seemed to be a significant educational and supportive endeavor. As a result, parental stress is reduced and parental confidence is raised. Petrini JR, (2009) this study finds that risks increase as gestation shortens, even in infants born at 34 to 36 weeks of gestation, when immaturity is connected to long-term neurological consequences. According to MA Lobo, (2013)'s study, knowing grounded cognition and the supporting evidence is essential because it can assist physical therapists and other prevention providers focus on preventing subsequent years delays, seek their efforts at behaviors that are essential in growth, and reaffirm the importance of physical therapy in early treatment, where the focus is on getting kids ready for school. According to the study's initial findings by EC Cameron., 2005, Infants born prematurely with VLBW at four months may experience less motor delay if they participate in the neonatal and early PT program studied in this experiment. Shapiro-Mendoza C reports that the study discovered that babies born preterm in the late stages and early term are more probable to require services under the EI program and may profit from much more regular screening for developmental disorders or disability.

6. LIMITATION AND RECOMMENDATIONS:**LIMITATIONS:**

- This study was done in a short time with smaller number of subjects.
- The study consisted of smaller sample size.

RECOMMENDATION

- To make the study more valid, long term study with large sample size is recommended.
- Regular follow up to be done.

7. CONCLUSION:

The study's findings showed that early term babies are more likely to require services from the Early Intervention program and could benefit from far more regular testing for developmental problems or disabilities. The article comes to the conclusion that early term newborns respond well to touch, vestibular, auditory, and visual stimuli. Because involvement in EI program services is a strong proxy for concern about developmental deficiencies, this study raises the potential that gestational age at delivery may have independent long-term impacts on development. From the perspective of an obstetrician, tactile stimulation is the gentle and brief rubbing of a baby with the goal of activating sensory receptors through touch stimulus. Making decisions regarding developmental screening, creating MA EI programs, and other areas are all significantly impacted by this study.

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