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# A PILOT STUDY TO ASSESS THE EFFECTIVENESS OF SNOEZELEN AND PLAY THERAPY ON BEHAVIOUR AND BIOPHYSIOLOGICAL CHANGES AMONG CHILDREN WITH CEREBRAL PALSY

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## ABSTRACT

A pilot study was conducted to analyse the effectiveness of snoezelen and play therapy on behavior among cerebral palsy children. The Experimental crossover design was used. The data was analysed from twelve children between the age group of 3- 11 years. . Simple random sampling technique was used. Six of them received initially play therapy than snoezelen, six of them received initially snoezelen than play therapy. Behavior assessment scale for Indian children with cerebral palsy was used to assess the basic and post intervention score. The study demonstrated that both play therapy and snoezelen have a positive effect. Play therapy and snoezelen was highly significant than snoezelen and play therapy. The result revealed a reduction in maladaptive behavior across all behavior domain, Adaptive behavior also showed significant differences . Both this therapies can be effectively provided to the children with cerebral palsy.

**KEYWORDS:** Cerebral palsy, Snoezelen, Play therapy, Behavioural assessment scale.

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# INTRODUCTION

Cerebral palsy is formerly known as cerebral paralysis,[1] It is the most common physical disability in early childhood.[2] A variety of prenatal, perinatal and postnatal factors contribute to the development of cerebral palsy.[3] These children have various associated disabilities. About 50-75% of them have mental retardation and 30-50% of them were present with behavior problems.[4] Population based studies from around the world report prevalence estimates of cerebral palsy ranging from 1.5-4 per 1000 live births. Around 8000-10,000 babies and infants diagnosed every year with cerebral palsy[5]. In India there are 25 lack people with cerebral palsy. In Kerala 2 lack children are affected with cerebral palsy[6]. Often children with cerebral palsy miss essential milestones due to their physical, emotional, and cognitive limitations. Cerebral palsy is not a disease. It is a condition caused by developmental differences and with adequate care it can be managed effectively, Maladaptive behavior will most frequently happen with cerebral palsy. Brassard conducted a study on behavior difficulties of adolescents with cerebral palsy. The result confirms that 36.9% of them have behavior difficulties and 61.9% of them have peer problems.[7] Play is an essential activity for all children. The children with cerebral palsy is more limited in their physical activity. It may not be easy for them to engage in spontaneous play. So playing is a most valuable area of their therapy[8].A study was conducted on the effectiveness of play therapy over conventional physiotherapy. The result shows that play therapy along with conventional physiotherapy was found to be effective in improving hand function.[9] Behaviors are sensory driven. One another treatment available to this population is the provision of sensory stimulation by means of snoezelen. This stimulation invokes environmental manipulation to effect internal change in the child, decreasing the maladaptive behavior, reducing stress and producing more adaptive behavior. Snoezelen is a combination of two Dutch words for(doze and smell).Snoezelen room offers a relaxed atmosphere with pleasant surroundings, soothing sounds, captivating aromas, tactile experiences massage and vibrations, vibrosonic sensation and gentle movement.[10] Children with cerebral palsy may display an abnormal degree of sensory processing, either increased or decreased. Sensory dysfunction can also cause over sensitiveness or under sensitiveness that lead to mental and physical distraction, and they may present with problems in hearing, seeing, smelling and balance since the snoezelen has provides all this stimulation.[11] The present study focuses on effect of play therapy and snoezelen on behavior among children with the cerebral palsy.

### *Objectives*

To assess the behavior of children with cerebral palsy in a selected special care unit by using a standardized behavioral assessment scale.

To assess the effectiveness of snoezelen on behavior among children with cerebral palsy in a selected special care unit.

To assess the effectiveness of play therapy on behavior among children with cerebral palsy in a selected special care unit.

To compare the effectiveness of play therapy followed with snoezelen on behavior among children with cerebral palsy.

To compare the effectiveness of snoezelen followed with play therapy on behavior among children with cerebral palsy.

To find the difference in biophysiological parameters (heart rate, $Sp0_2$) before, during and after play therapy

To find the difference in biophysiological parameters (heart rate,$SpO_2$) before, during, and after snoezelen.

### *Hypotheses*

- H1. There will be a greater decrease in number and duration of maladaptive behavior when the children are in the snoezelen as compared to the play therapy
- H2.There will be a greater increase in the number and duration of adaptive behavior when the children are in the snoezelen as compared to play therapy.

# MATERIALS AND METHODS

### *Research design*

Experimental cross over design. (Same treatment approach was tested between the two groups.)

| | | |
|---|---|---|
| **GROUPI** | **PLAY THERAPY** | **SNOEZELEN** |
| **GROUPII** | **SNOEZELEN** | **PLAY THERAPY** |

### *Setting*

Pilot study was conducted in selected special care unit, Coimbatore.

### *Population*

Cerebral palsy children between the age group of 3- 11 years.

### *Sample and sample size*

Totally 12 children were selected randomly in which six of them received play therapy before snoezelen and the remaining six of them received initially snoezelen than play therapy.

### *Sampling technique*

Simple random sampling technique in which lottery method was used to select the samples.

***Inclusion criteria***
Inmates of spastic and athetoid type of cerebral palsy with the age group of 3-11years were included. Both male and female children diagnosed with cerebral palsy were included in the study.

***Exclusion criteria***
Cerebral palsy with visual problems, hydrocephalus, ataxic, mixed type and day scholars were excluded from the study.

***Method of data collection***
Direct observation with standardaized behavior assessment scale for Indian children with cerebral palsy. Adaptive behavior assessment scale and Maladaptive behavior assessment scale, Pulse oxymetry was used to assess the heart rate and $SpO_2$.

***Procedures*** *The study was approved by the Institutional Human ethics committee of saveethauniversity Chennai.007/10/2013/IEC/SU dated 15. October 2013.Informed concern is obtained from the Institutional administrator and board of director.*The samples were selected byusing lottery method, Experimental cross over design was used, First six of them received play therapy and snoezelen the second six received snoezelen and play therapy. Before starting the session three days orientation was given to the children to familiarize the situation. The session lasts for 30-45 minutes. Each week two sessions of therapy were given for eight weeks, totally 16 consecutive sessions was conducted. Pre assessment of behavioral problems of cerebral palsy children was taken before they start the snoezelen. After snoezelen post assessment was taken and eight weeks resting period was given. This post assessment score was considered as pre assessment score for the play therapy. After the 16 sessions post assessment was taken, Similarly play therapy verses snoezelen was also conducted, and the effectiveness was compared. Heart rate and $SpO_2$ was assessed before, during, and after both the therapies.

***Data collection tool***
***Tool I***
Consists of personal information, age, sex, weight, height,intelligent quotient, type of cerebral palsy, mental age and biophysiological parameters.

***Tool II***
A Standardaized behavioral assessment scale for Indian children with cerebral palsy was used. The scale contains 75 items , in which 16 violent and destructive behavior, 4 temper tandrums,7 misbehave with others, 10 self-injurious behavior,8 repetitive behavior, 8 odd behavior, 3 hyperactivity,6 antisocial behavior, 6 rebellious behaviour,9antisocial behavior and 4 fears. The total score was150

***Tool III***
A standardied adaptive behavior assessment scale for Indian children with cerebral palsy was used, which includes 15 motor development,30 activities of daily living (eating, toileting ,brushing, bathing, dressing, grooming),15 language skill, 15 reading-writing skill,15 domestic skill,10 pre-vocational. The total score was 300.

## RESULT AND DISCUSSIONS

The study consisted of a cross over design of children with cerebral palsy from 3-11years of age ,the mean age of, group I and group II was( 7.33 ± 2.73) and (7.55 ± 2.07) and I.Q of both the group was (51.83 ± 6.53) and (48.50 ± 9.71). In this study both the groups 50% of them were male and 50% of them were female. In cerebral palsy subtype (group I) 83.3% of them were under spastic type and 16.75% of them were athetoid type. In (group II) 66% of them were spastic and the remaining 33.3%were athetoid type.

**Table I**
***Independent sample t'test for equality of Means***

| Group | | Mean | SD | Mean difference | t value | P Value | |
|---|---|---|---|---|---|---|---|
| $SpO_2$ before play | Group I | 92.33 | 1.506 | .000 | .000 | 1.000 | |
| | Group II | 92.33 | 2.944 | .000 | .000 | 1.000 | NS |
| $SpO_2$ during play | Group I | 97.00 | 1.095 | 2.000 | 2.070 | .065 | |
| | Group II | 95.00 | 2.098 | 2.000 | 2.070 | .075 | NS |
| $SpO_2$ after play | Group I | 95.67 | 1.506 | 1.667 | 1.387 | .196 | |
| | Group II | 94.00 | 2.530 | 1.667 | 1.387 | .202 | NS |
| $SpO_2$ before snoezelen | Group I | 88.67 | 88.67 | -1.000 | .443 | .667 | |
| | GroupII | 89.67 | 89.67 | -1.000 | .443 | .667 | NS |
| $SpO_2$ during snoezelen | Group I | 95.67 | 95.67 | .667 | .309 | .763 | |
| | GroupII | 95.00 | 95.00 | .667 | .309 | .763 | NS |
| $SpO_2$ after snoezelen | Group I | 94.33 | 94.33 | 1.667 | .928 | .375 | |
| | Group II | 92.67 | 92.67 | 1.667 | .928 | .375 | NS |

***Table I reveal that $SpO_2$ is increased during play therapy and snoezelen and it is maintained after both the therapy but statistically not found any significant difference, since the sample size was small.***

**Table II**

***Independent sample test for equality of means***

| Group | | Mean | SD | Std Error mean | Mean difference | t value | P value | |
|---|---|---|---|---|---|---|---|---|
| HR before play | Group I | 84.33 | 12.09 | 4.937 | -6.333 | -.924 | .337 | NS |
| | Group II | 90.67 | 11.63 | 4.752 | -6.333 | -.924 | .337 | |
| HR during play | GroupI | 85.33 | 12.87 | 5.258 | -.3.333 | -.574 | .578 | NS |
| | GroupII | 88.33 | 6.02 | 2.459 | -.3.333 | -.574 | .578 | |
| HR after play | Group I | 82.00 | 11.93 | 4.872 | -7.333 | -.1.181 | .265 | NS |
| | GroupII | 89.33 | 9.43 | 3.853 | -7.333 | -.1.181 | .266 | |
| HR before snoezelen | GroupI | 93.00 | 8.74 | 3.568 | 1.500 | .299 | .771 | NS |
| | GroupII | 91.50 | 8.66 | 3.538 | 1.500 | .299 | .771 | |
| HR during snoezelen | GroupI | 88.67 | 10.17 | 4.153 | 1.000 | .173 | .866 | NS |
| | Group II | 87.67 | 9.83 | 4.014 | 1.000 | .173 | .866 | |
| HR after snoezelen | Group I | 90.33 | 8.23 | 3.363 | 2.333 | .449 | .663 | NS |
| | GroupII | 88.00 | 9.71 | 3.967 | 2.333 | .449 | .663 | |

***Table II revealed that heart rate was increased during play therapy and maintained after play, but duringsnoezelen heart rate was decreased and maintained after snoezelen. But statistically not found any significant difference.***

**Table III**

***Wilcoxon signed rank test for play therapy and snoezelen adaptive behavior score of cerebral palsy children***

| Adaptive behavior of cerebral palsy children | Mean | SD | Z | P value | Inference |
|---|---|---|---|---|---|
| Pre play therapy | 57.33 | 30.06 | | | |
| Post play therapy | 90.83 | 36.24 | .028 | 0.05 | S* |
| Pre snoezelen | 90.83 | 36.24 | | | |
| Post snoezelen | 143.83 | 34.21 | .028 | 0.05 | S* |
| Pre play therapy | 57.33 | 30.06 | | | |
| Post snoezelen | 143.83 | 34.21 | .026 | 0.05 | S* |

***Table III revealed that, there is a difference between both play therapy and snoezelen. Both the therapies were found to be significant. There was a difference between the pre and post adaptive behavior of cerebral palsy children after each therapy.***

**Table IV**

***Wilcoxon signed rank test for play therapy and snoezelen maladaptive behaviour score of cerebral palsy children***

| Maladaptive behavior of cerebral palsy children | Mean | SD | Z | P value | Inference |
|---|---|---|---|---|---|
| Pre play therapy | 96.16 | 12.59 | | | |
| Post play therapy | 80.00 | 12.66 | .027 | <0.05 | S* |
| Pre snoezelen | 80.00 | 12.66 | | | |
| Post snoezelen | 57.33 | 5.60 | .027 | <0.05 | S* |
| Pre play therapy | 96.16 | 12.59 | | | |
| Post snoezelen | 57.33 | 5.60 | .028 | <0.05 | S* |

***The finding showed that there is a significant difference between pre play therapy and post snoezelen at <0.05 level.***

**Table V**

***Wilcoxon signed rank test for snoezelen and play therapy on adaptive behavior score of cerebral palsy children***

| Adaptive behaviour of cerebral palsy children | Mean | SD | Z | P | Inference |
|---|---|---|---|---|---|
| Pre snoezelen | 72.50 | 29.74 | | | |
| Post snoezelen | 106.33 | 42.72 | .028 | <0.05 | S* |
| Pre play therapy | 106.33 | 42.72 | | | |
| Post play therapy | 133.17 | 44.45 | .027 | <0.05 | S* |
| Pre snoezelen | 72.50 | 29.74 | | | |
| Post play therapy | 133.17 | 44.45 | .027 | <0.05 | S* |

***There is a ignificant difference between the pre snoezelen and post play therapy at < 0.05 level in increasing adaptive behavior of cerebral palsy children.***

**Table VI**

***Wilcoxon signed rank test for snoezelen and play therapy on maladaptive behavior score of cerebral palsy children***

| Maladaptive behaviour of Cerebral palsy children | Mean | SD | Z | P | Inference |
|---|---|---|---|---|---|
| Pre snoezelen | 94.50 | 13.26 | | | |
| Post snoezelen | 62.0 | 9.98 | .027 | < 0.05 | S* |
| Pre play therapy | 62.0 | 9.98 | | | |
| Post play therapy | 52.83 | 10.83 | .028 | <0.05 | S* |
| Pre snoezelen | 94.50 | 13.26 | | | |
| Post play therapy | 52.83 | 10.83 | .028 | <0.05 | S* |

***There is a significant difference between the pre snoezelen and post play therapy in reduction of maladaptive behavior at <0.05 level.***

**Table VII**

***'t' test for comparing the difference between group I and group II adaptive behavior of cerebral palsy children***

| Comparision of adaptive behavior | Mean | SD | T | P | Inference |
|---|---|---|---|---|---|
| Group I Pre play therapy | 57.33 | 30.06 | | | |
| Post snoezelen | 143.83 | 34.21 | 4.671 | < 0.01 | S* |
| GroupII Pre snoezelen | 72.50 | 29.74 | | | |
| Post play therapy | 133.17 | 44.45 | 5.97 | <0.01 | S* |

***Finding showed that play therapy and snoezelen was more significant in increasing adaptive behaviour of children with cerebral palsy when comparing to snoezelen and play therapy at <0.01 level.***

**Table VIII**

***'t' test for comparing the difference between group I and group II maladaptive behaviour of cerebral palsy children***

| Comparision of maladaptive behavior | Mean | SD | t | P | Inference |
|---|---|---|---|---|---|
| Group I | | | | | |
| Pre play therapy | 96.16 | 12.59 | | | |
| Post snoezelen | 57.33 | 5.069 | 18.707 | <0.01 | S* |
| Group II | | | | | |
| Pre snoezelen | 94.50 | 13.26 | | | |
| Post play therapy. | 52.83 | 10.83 | 17.453 | <0.01 | S* |

***There is a significant difference in pre and post therapy score, in which play therapy and snoezelen is statically more significant than snoezelen and play therapy.***

## DISCUSSION

This pilot study demonstrates both play therapy and snoezelen have positive effect on behaviour. When we compared to group I and group II. play therapy and snoezelen was more significant than snoezelen and play therapy. In the study reduction of maladaptive behaviour was higher when compared with adaptive behaviour. Improvement in adaptive behavior was also observed but not like maladaptive behaviour. Maladaptive behaviour was highly significant among (GroupI t =18.7) when compared with Group II( t=17.45) < 0.01 level. There is a difference between play threrapy and snoezelen than snoezelen and play therapy on behaviour of cerebral palsy children. $SpO_2$ was increased during snoezelen and play therapy but heart rate was increased during play and decreased during snoezelen and maintained after each therapy.

## CONCLUSION

Cerebral palsy children have higher rates of behavior problems, and are often accompanied by disturbances of sensation, perception and communication. Snoezelen stimulates all the senses and have significant effect on reduction of maladaptive behavior and improving adaptive behavior .It can be implemented in daily care activities.

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***Conflict of interest***

The investigator did not find any conflicts of interest during the time of study.

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