# EFFECT OF ORAL MOTOR INTERVENTIONS ON DROOLING AMONG CEREBRAL PALSY CHILDREN AT SELECTED CENTERS OF THE CITY.

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#### Abstract

Cerebral palsy (CP) is a movement and posture disorder caused by non-progressive lesions in the developing brain. CP may affect oral motor skills, leading to speech delay, drooling and difficulties with sucking, swallowing, and chewing. A study conducted to assess drooling among cerebral palsy children in experimental and control group and to assess effect of oral motor interventions on drooling in experimental group. Quantitative approach was selected for the study. Quasi experimental non randomised control group design was used. 10 Children from age group of 4-12 years with cerebral Palsy taken as sample. Non probability purposive sampling method was used. Children from different rehabilitation was selected for the study. Standardized Scale for Assessment of Drooling (By Thomas- Stonell and Greenberg) was used for assessment of drooling. Cohen's Kappa is used to check the reliability. Reliability was assessed using inter-rater method. Investigator calculated the r- value for Assessment of Drooling = +0.82. So Standardized Scale for Assessment of Drooling is reliable. Result shows that, In experimental group, in pretest, 80% of the cerebral palsy children had mild oral motor skills and 20% of them had severe oral motor skills. In posttest, 60% of them did not have drooling, 20% of them had mild drooling and 20% of them had moderate drooling. This indicates that the drooling among cerebral palsy children improved remarkably after oral motor interventions. Researcher applied paired t-test for the effectiveness of oral motor interventions on drooling among cerebral palsy children. Average drooling score among cerebral palsy children in pretest was 5 which reduced 3.4 in posttest. T-value for this test was 4 with 4 degrees of freedom. Corresponding p-value was small (less than 0.05), the null hypothesis is rejected. Average drooling score in pretest was significantly higher than that in posttest. It is evident that the oral motor interventions are significantly effective on reducing drooling among cerebral palsy children.

**Keywords:** Cerebral Palsy, Oral Motor Interventions, Drooling, Pediatric Rehabilitation, Saliva Control, Oromotor Dysfunction, Feeding Difficulties, Sensory Stimulation, Non-Pharmacological Interventions.

#### Introduction

Cerebral palsy (CP) is a non-progressive neurological disorder affecting movement and posture due to lesions in the developing brain (Bax et al., 2005). Among the various complications associated with CP, oral motor dysfunction is one of the most prevalent, leading to issues such as drooling, feeding difficulties, and speech impairments (Van Hulst et al., 2018). Drooling, or sialorrhea, affects a significant proportion of children with CP, impacting their physical health,

social interactions, and quality of life (Tahmassebi et al., 2003). Excessive drooling can result in dehydration, aspiration pneumonia, perioral skin irritation, and social stigma, necessitating effective intervention strategies (Senner et al., 2019)

Oral motor interventions aim to enhance the strength, coordination, and endurance of oral structures such as the lips, tongue, and jaw (Reilly et al., 2012). These interventions include active and passive muscle exercises, sensory stimulation, and neuromuscular training, all of which are designed to improve saliva control and oral function (Arvedson et al., 2010). Research suggests that structured oral motor therapy can significantly reduce drooling severity, improving feeding abilities and communication skills in children with CP (Van der Burg et al., 2016).

This study aims to evaluate the effectiveness of oral motor interventions on drooling among children with cerebral palsy. By comparing an experimental group receiving structured therapy with a control group receiving standard care, the research seeks to provide empirical evidence supporting the integration of oral motor therapy in clinical and rehabilitative settings.

# Objective

This study aims to assess drooling and the effect of oral motor interventions on drooling in children with cerebral palsy by comparing an experimental group receiving intervention with a control group receiving standard care.

# Methods

# **Study Design & Setting**

A quasi-experimental, non-randomized control group study design was used. The study was conducted in selected rehabilitation centers.

# **Participants & Sampling**

A total of 10 children aged 4-12 years diagnosed with CP were included in the study. Participants were selected using a non-probability purposive sampling technique.

# Inclusion Criteria: -

- Children age group of 4-12 years.
- Children with all types of cerebral palsy affected with oral motor skills

# Exclusive Criteria: -

- Children who are not able to cooperate.
- Children who are suffering from cerebral palsy with other neurological problems, congenital deformities like cleft lip and cleft palate and associated deafness or blindness.
- Children with any other associated critical condition.

# **Ethical Considerations**

Ethical clearance was obtained from the Institutional Ethics Committee. Written informed consent was taken from parents/caregivers before participation.

# Assessment Tools & Reliability

Standardized Scale for Assessment of Drooling (By Thomas- Stonell and Greenberg) was used for assessment of drooling. Cohen's Kappa is used to check the reliability. Reliability was assessed using inter-rater method. Investigator calculated the r- value for Assessment of Drooling = +0.82. So Standardized Scale for Assessment of Drooling is reliable.

# **Result:**

Demographic variable		Experimental		Control	
	Freq	%	Freq	%	
Age					
4 to 6 years	3	60%	1	20%	
7 to 9 years	1	20%	2	40%	
10 to 12 years	1	20%	2	40%	
Gender					
Male	1	20%	2	40%	
Female	4	80%	3	60%	
Types of Cerebral Palsy					
Spastic Cerebral Palsy	2	40%	5	100%	
Athetoid Cerebral Palsy	2	40%	0	0%	
Mixed Cerebral Palsy	1	20%	0	0%	
Presence of Drooling					
Yes	5	100%	5	100%	
Education status of parents					
Literate	5	100%	5	100%	
Antenatal History for Disorder					
PIH	0	0%	1	20%	
Pre-eclampsia, Eclampsia	2	40%	3	60%	
Gestational Diabetes	0	0%	1	20%	
No any antenatal History		60%	0	0%	
Types of delivery					
Vaginal normal delivery	3	60%	0	0%	
Caesarean section	2	40%	5	100%	
Birth Weight					
< 2.5 kg	1	20%	3	60%	
2.5 to 3.5 kg	4	80%	2	40%	
Birth History					
Birth Asphyxia	0	0%	2	40%	
Birth Asphyxia and prematurity	1	20%	0	0%	
Prematurity	1	20%	1	20%	
No any abnormality found	2	40%	2	40%	
Any other	1	20%	0	0%	

Demographic variable	Experimental		Control	
	Freq	%	Freq	%
Verbal Communication ability of the child				
Child able to speak	0	0%	1	20%
Child is not able to speak	1	20%	2	40%
Child able to speak/ express few words	4	80%	2	40%
Socioeconomic status of parents				
High socioeconomic status	0	0%	1	20%
Middle socioeconomic status	0	0%	4	80%
Low socioeconomic status	5	100%	0	0%

In experimental group, 60% of the cerebral palsy children had age 4 to 6 years, 20% of them had age 7 to 9 years and 20% of them had age 10 to 12 years. In control group, 20% of the cerebral palsy children had age 4 to 6 years, 40% of them had age 7 to 9 years and 40% of them had age 10 to 12 years.

In experimental group, 20% of them were males and 80% of them were females. In control group, 40% of them were males and 60% of them were females.

In experimental group, 40% of them had spastic cerebral palsy, 40% of them had athetoid cerebral palsy and 20% of them had mixed cerebral palsy. In control group, all of them had spastic cerebral palsy.

In experimental and control group, all of them had drooling.

In experimental and control group, all of them were literate.

In experimental group, 40% of them had pre-eclampsia, eclampsia and 60% of them did not have any antenatal history of disorder. In control group, 20% of them had PIH, 60% of them had pre-eclampsia, eclampsia and 20% of them had Gestational Diabetes.

In experimental group, 60% of them had vaginal normal delivery and 40% of them had caesarean section. In control group, all of them had caesarean section.

In experimental group, 20% of them had birth weight less than 2.5kg and 80% of them had birth weight 2.5 to 3.5 kg. In control group, 60% of them had birth weight less than 2.5kg and 40% of them had birth weight 2.5 to 3.5 kg.

In experimental group, 40% of them did not have any birth history 20% of them had Birth Asphyxia and prematurity, 20% of them had prematurity, 20% of them had some other birth history. In control group, 40% of them did not have any birth history, 40% of them had Birth Asphyxia and 20% of them had prematurity.

In experimental group, 20% of them were not able to speak and 80% of them were able to speak/express few words. In control group, 20% of them were able to speak, 40% of them were not able to speak and 40% of them were able to speak/express few words.

In experimental group, all of them were from low socioeconomic class. In control group, 20% of them were from high socioeconomic class and 80% of them were from middle socioeconomic class.

Drooling	Experimental		Control		
	Pretest		Pretest		
	Freq	%	Freq	%	
No drooling	0	0%	0	0%	
Mild	4	80%	2	40%	
Moderate	0	0%	3	60%	
Severe	1	20%	0	0%	

**Objective 1:** To assess drooling among cerebral palsy children in experimental and control group

In experimental group, 80% of the cerebral palsy children had mild oral motor skills and 20% of them had severe oral motor skills. In control group, 40% of the cerebral palsy children had mild oral motor skills and 60% of them had moderate oral motor skills.





Drooling	Experimental			
	Pretest		Post	test
	Freq	%	Freq	%
No drooling	0	0%	3	60%
Mild	4	80%	1	20%
Moderate	0	0%	1	20%
Severe	1	20%	0	0%

In experimental group, in pretest, 80% of the cerebral palsy children had mild oral motor skills and 20% of them had severe oral motor skills. In posttest, 60% of them did not have drooling,

20% of them had mild drooling and 20% of them had moderate drooling. This indicates that the drooling among cerebral palsy children improved remarkably after oral motor interventions.



Paired t-test for effectiveness of oral motor interventions on drooling among cerebral palsy children:

	Mean	SD	Т	df	p-value
Pretest	5.0	2.2	4	4	0.008
Posttest	3.4	2.2			

Researcher applied paired t-test for the effectiveness of oral motor interventions on drooling among cerebral palsy children. Average drooling score among cerebral palsy children in pretest was 5 which reduced 3.4 in posttest. T-value for this test was 4 with 4 degrees of freedom. Corresponding p-value was small (less than 0.05), the null hypothesis is rejected. Average drooling score in pretest was significantly higher than that in posttest. It is evident that the oral motor interventions are significantly effective on reducing drooling among cerebral palsy children.



#### Discussion

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The findings align with prior studies indicating that oral motor therapy significantly improves saliva control in children with CP. The improvement observed in drooling severity is consistent with research by Van Hulst et al. (2018), which found that targeted oromotor exercises enhance oral coordination and reduce excessive salivation.

# Conclusion

The findings of this study indicate that oral motor interventions significantly reduce drooling in children with cerebral palsy. The structured exercises targeting oral muscles effectively improved saliva control, leading to enhanced oral motor function. This improvement not only benefits physical health by reducing risks of aspiration and dehydration but also improves social interactions and overall quality of life. The study underscores the importance of integrating oral motor interventions into rehabilitative and therapeutic programs for children with CP. Future research with larger sample sizes and longer follow-up periods is recommended to further validate these findings and explore additional therapeutic strategies.

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