

Mealtime interaction between mothers and their young ones with cerebral palsy

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2 Abstract

3 15 The aim of this study was to investigate the 5 mealt ime interaction between mothers and their
4 young children with cerebral palsy (CP). Three 3 groups of participants were included in the study.
5 The mothers of thirteen young 33 children with CP, the mothers of seventeen children with CP and
6 associated ID and the mothers of seventeen 3 typically developing children in the age group of 2.6
7 to 3.6 years participated in the study. A questionnaire pertaining to mother initiated and child
8 initiated communication during mealt ime was developed, validated and administered on the
9 participants. The responses were documented, scored and statistically analyzed. The results
10 revealed that the mealt ime interaction initiated by the mother was significantly different across
11 groups, wherein the mothers of the group of typically developing children interacted more often
12 to their children 3 when compared to the mothers of children with CP. The mealt ime interaction
13 initiated by the 19 mothers of children with both CP and ID was the least. Further, 10 there was no
14 significant difference found in the child initiated communication across the groups. It was found
15 that the typically developing children initiated communication using speech and children with
16 CP and CP with ID used the nonverbal mode primarily. It can be concluded that mothers of
17 children with CP interact less and are less responsive to their child's communication attempts
18 during mealt ime. The study throws light on the importance of facilitating mother child
19 interaction during mealt ime in feeding therapy sessions, which is a good platform for improving
20 their overall feeding and communication abilities.

21 Key-words: *Mealt ime interaction, mother initiated communication, child initiated*
22 *communication.*

5 1 Mealtime interaction between mothers and their young ones with cerebral palsy

2 Background

3 Interaction makes language learning easier. It is a known fact that children learn language when
4 parents/caregivers interact with them during different situations at different times. These
5 situations include the routine day to day activities, which provide a good platform for them to
6 learn language. One such regularly occurring situation is the mealtime routine which is a social
7 activity and involves parent-child interaction. For example, the child could express his need for
8 food or choice of food, deny food or express the fact that he is full and does not require any more
9 food and many other related utterances. Mealtime creates opportunities for language learning,
10 cognitive development and mother-child bonding. When there is communication between
11 parents/caregivers and their children during mealtime, an emotional attachment is formed, which
12 is essential for a healthy social functioning (Ainsworth & Bell, 1974; Satter, 1987; Barnard,
13 Hammond, Booth, Bee, Mitchell, & Spieker, 1989). According to Meyer, Coll, Lester, Boukydis,
14 McDonough and Oh (1994), the 10 behaviors of both parent/caregiver and the child during feeding,
15 contributes significantly to the overall success of the feeding interaction as well as feeding
16 performance.

17 In most children, the communication acts during feeding and the entire process of feeding occurs
18 normally, enabling them to take in food with ease and fulfilling their food/hunger related
19 requirements, making the meal time an enjoyable and comfortable activity. However, in some
20 children, especially those with communication disorders, such as cerebral palsy, intellectual
21 disability, autism spectrum disorders, this is affected. They exhibit problems in verbal
22 communication as well as feeding (Benfer, Weir, Bell, Ware, Davies, & Boyd, 2013; Nadon,

1 Feldman, Dunn, & Gisel, 2011; Rezaei, Rashedi, Gharib, & Lotfi, 2011). Minor feeding
2 problems have been reported in typically developing children too, during their early childhood,
3 ranging from 25% to 35% (Colin & Dana, 2002). These problems could have a direct impact on
4 the type and pattern of interaction between the parent and the child, specifically during mealtime.

5 One such commonly occurring developmental disability leading to both verbal communication
6 and feeding is cerebral palsy. ⁷ Cerebral palsy (CP) is a group of permanent disorders of the
7 development of movement and posture causing activity limitation, that are attributed to non-
8 progressive disturbances that occurred in the developing infant or fetal brain. The motor
9 disorders of CP are often accompanied by disturbances of sensation, perception, cognition,
10 communication and behavior, epilepsy and by secondary musculoskeletal problems (Rosenbaum,
11 Paneth, Leviton, Goldstein, Bax, Damiano, Dan, & Jacobsson, 2007). It is one of the most
12 common conditions leading to developmental disability in children and is frequently associated
13 with a variety of feeding problems.

14 Research findings indicate that children with CP have ²¹ poor oral suction, poor intake, nasal
15 regurgitation, choking, aspiration, gagging, weak suck, excessive air intake, vomiting, difficulty
16 in swallowing, self-feeding and spoon feeding, later introduction of solid food, and improper
17 feeding positions (Clarren, Anderson, & Wolf, 1987; Reilly, Skuse, & Poblete, 1996; ¹⁷ Sullivan,
18 Lambert, Rose, Ford-Adams, Johnson, & Griffiths, 2000; ¹⁷ Gangil, Patwari, Aneja, Ahuja &
19 Anand, 2001; Wilson & Hustad, 2009; Benfer, Weir, & Boyd, 2012; Diwan & Diwan, 2013;
20 Benfer, et al., 2013). They also exhibit lengthy feeding times (Diwan & Diwan, 2013; Gangil et
21 al., 2001; Sullivan et al., 2007). As a consequence to the feeding problems, children with CP
22 have health related problems, growth failure and their nutritional status is affected. These
23 problems may affect the interaction between the parent and the child during meal time. Brizee,

1 Sophos, and McLaughlin (1990) suggested that feeding problems can lead to problems in parent-
2 child interaction.

3 In addition to these findings on feeding problems, it has also been reported that children with CP
4 experience a delay in developing language and learning to speak (Bishop, 1987; Largo, Graf,
5 Kundu, Hunziker, & Molinari, 1990; Luoma, Herrgård, Martikainen, & Ahonen, 1998). Children
6 with CP rarely initiate exchanges in conversation with familiar adults, taking a largely
7 respondent role, while adults introduce topics and start most conversations (Jolleff, McConachie,
8 Winyard, & Jones, 1992; Light, Collier, Parnes, 1985a; Light, Collier, Parnes, 1985b; Pennington,
9 1999; Pennington & McConachie, 1999). They also take fewer turns in conversation than do
10 their adult partners and often fail to reply unless obliged to do so (Light et al., 1985a). In
11 addition, they produce many yes/no answers and seldom ask questions (Basil, 1992, Light et al.,
12 1985b; Pennington, 1999; Pennington & McConachie, 1999). In other words, many children with
13 CP are hindered in their development of narrative skills and functional communication (Basil,
14 1992, Jolleff et al., 1992, Light et al., 1985a, Light et al., 1985b, Pennington, 1999; Pennington
15 & McConachie, 1999; Pennington, Goldbart, & Marshall, 2004). Problems in communication,
16 especially poor speech production, may be a direct result of the motor impairment due to a
17 disturbed neuromuscular control of speech mechanism, i.e. dysarthria (Crary, 1995; Pennington,
18 1999; Pennington & McConachie, 2001a; Pennington & McConachie, 2001b; Pirila et al.,
19 2004; Strand, 1995).

20 Further children with CP may be at risk for receiving less frequent responsive linguistic input
21 from caregivers that facilitates communication and language development (Chen, Klein, &
22 Haney, 2007). Attempts of communication that a child with CP makes are often misinterpreted
23 or not acknowledged at all. Kennes, Rosenbaum, Hanna et al., (2002) reported that the more

1 severe the condition, the lesser are the child's abilities to speak and to be understood by family
2 members. Eventually the child may lose the intent to communicate due to a lack of reciprocity.
3 Since the child has limited speech and language in addition to the other problems, this can also
4 influence the quality of the interaction between the parent and the child especially during meal
5 time. Humphrey and Freud (1991) reported in his study that infants with motor problem,
6 particularly with CP tend to take more time to respond while feeding and also use alternative
7 means to communicate.

8 A study by Preeja and Manjula (2008) in the Indian context, aimed at describing the factors in
9 intentional communication, between the mother and the non speaking child with CP, in a play
10 time activity. Amongst the factors analyzed, instruction (action) and information were the most
11 predominant communication functions observed in mother and child respectively. The results
12 revealed a communication asymmetry in the use of various communicative functions between
13 mothers and their non speaking children with CP. Mothers were dominant communication
14 partners, while children were passive communication partner as revealed from the frequency of
15 occurrence of various communicative functions. Mahoney, Fors, and Wood (1990) reported that
16 mothers of these children have a tendency to increase the frequency of commands.

17 Another study aimed at examining parenting representations and feeding interactions of fifty
18 eight mothers and their children aged between 16months to 52months with mild to severe CP.
19 Correlation and regression analysis examined relation between representations (compliance with
20 parental requests, achievement, secure base, enmeshment, worry about child's future and
21 emotional pain), demographic characteristics, diagnostic severity and developmental status. The
22 results revealed that mothers with more compliance related concerns showed less sensitivity,
23 acceptance and delight during feeding. Mothers experiencing more emotional pain displayed

1 more hostility. Mothers who reported worries about their children displayed sensitivity and
2 delight. The findings of the study indicated that mother's representation of mother-child
3 relationship was related to their behavior with their child with CP, independent of the child's
4 skills and abilities (Sayre, Pianta, Marvin, & Saft, 2001).

5 A study of mealtime interaction between 20 young children with CP and their mothers was
6 carried out by Veness and Reily (2008), which aimed at describing the characteristics of
7 mealtime interaction and determining whether feeding impairment and other characteristics were
8 related to interaction patterns. The results revealed that the interactions were maternally
9 dominated. Language delay was also related to the interaction patterns. The study emphasized on
10 considering mealtime interactions between children with CP and their mothers as an integral part
11 of intervention.

12 Ferm, Ahlsen, and Bjorck-Akesson (2012) investigated the pattern of interaction between a
13 child aged 6 years 6 months with severe physical impairment affecting major mobility and hand
14 function, and caregiver (focus dyad) and a child of the same age without impairment and
15 caregiver (comparison dyad). Results revealed that interactions between the focus dyad was based
16 on the mealtime goals to be achieved while that of the comparison dyad was based on advanced
17 communicative goals such as talking about personal experience. The limitation of the study was
18 the possibility of the knowledge about the activity being video recorded having influenced the
19 caregiver interaction.

20 The results of the study done by Adams (2009) in Bangladesh revealed that 89% of mothers of
21 children with cerebral palsy reported mealtime being stressful, 78.4% reported mealtime to be
22 more than 30 minutes and 67% reported mealtime to be shorter at times. Results based on verbal

1 interaction revealed that 84% of the caregivers used positive verbal encouragements either never
2 or occasionally in the initial observed mealtime. Negative verbal interactions were recorded in
3 80% of the cases and 87% negative physical behaviors were recorded.

4 A systematic and in depth review of the existing literature revealed that children with CP
5 exhibit feeding and communication problems. These difficulties tend to interrupt the overall
6 interaction and consequently the relationship between the parents and the children. Mealtime
7 interaction is essential in order to make the mealtime, an enjoyable and satisfactory process.
8 However, this is reported to have been affected in children with CP. Though such studies are
9 limited, most of the studies that have investigated the mealtime interaction have reported that the
10 interactions were maternally dominated, with the child with CP making limited attempts to
11 communicate. In the Indian context also, such studies are limited. Cultural variations in the
12 feeding and communication patterns could influence the mealtime interactions seen in different
13 parts of the world. Some studies carried out in the Indian context, however, focused on the
14 mother-child interaction during play time.

15 Intellectual disability (ID) is most commonly associated with CP. The prevalence of intellectual
16 impairment in this population varies from 20% to 70% (Beckung & Hagberg, 2002; Pelligrino,
17 2007; Sigurdardottir, Indredavik, Eiriksdottir, Einarottir, Gudmundsson, & Vik, 2010). Singhi
18 Ray and Suri (2002) in a study in India also reported ID in 72.5% of the affected children with
19 CP. Research indicates that children with ID also have feeding and communication problems
20 (Linscheid, 1983; Rezaei, et al., 2011). Calis, Veugelers, Sheppard, Tibboel, Evenhuis, &
21 Penning (2008) reported in their study a prevalence of dysphagia of 99%, ⁵ in a representative
22 sample of children with severe generalized cerebral palsy and intellectual disability. The existing
23 studies that have investigated the mealtime interaction patterns in children with CP have

1 excluded participants with associated ID. Such studies investigating the mealtime interactions in
2 children with CP with associated ID are limited.

3 Studies investigating the meal time interaction between children with CP and their
4 parents/caregivers are essential, since these would provide an insight into the nature of
5 communication, if any, that happens between the dyad. Such studies would further help in
6 making the parents sensitive to their child's communicative attempts and respond in appropriate
7 ways to their child which in turn would help in strengthening the parent-child bonding. Further,
8 studies on feeding problems and the interaction between the parent and child dyad, throw light
9 on the need to increase caregiver awareness and responsiveness to their child's feeding problem.
10 The information obtained could also be used in providing guidance about the need for better
11 communication during feeding. In order to support the communication between the
12 parents/caregivers and their children with CP, such studies on caregiver-child interactions are
13 important. In this context the present study was planned. An attempt was made to investigate the
14 mealtime interaction in children with only CP and those with CP associated ID. The aim of this
15 study was to investigate the mealtime interaction between mothers and their young children with
16 cerebral palsy (CP). A control group consisting of age matched typically developing children
17 was also included. The specific objectives of the study were to investigate and compare the meal
18 time interactions of

- 19 a) the mothers and their children with CP with the interactions of mothers and their typically
20 developing children
- 21 b) the mothers and their children with CP and associated ID with the interaction of mothers
22 and their typically developing children

1 c) the mothers and children with CP with the interaction of mothers and their children with
2 cerebral palsy and associated ID.

3 **Method**

4 The study was undertaken in the following phases:

5 Phase I: Construction of the questionnaire and its validation.

6 Initially the preliminary version of the questionnaire for the assessment of mother and child
7 initiated communication during meal times was developed. This was prepared by collating
8 information from the literature (Veness & Reilly, 2008; Adams, 2009). In the initial phase of the
9 development, the questionnaire consisted of twelve questions. These were divided across two
10 sections; Mother initiated communication and child initiated communication. The section that
11 related to mother initiated communication consisted of eight questions and the section on child
12 initiated communication consisted of five. Mother initiated communication included questions
13 that focused on understanding the nature of interaction exhibited by the mother, the
14 reinforcement given to the child, the inclusion of the child in the routine mealtime interaction
15 with other members of the family etc. The child initiated communication included questions that
16 focused on the mealtime goals that were to be achieved, such as expressing hunger, indicating
17 like/dislike towards a specific food, expression of requirement of some more food or feeling of
18 fullness etc. Also the mode of expression of the child to indicate the above such as crying,
19 pointing, usage of gestures, vocalizations, speech, spitting food, refusal to open mouth, running
20 away from the meal, etc. was elicited.

21 A rating scale was also prepared to rate the responses obtained from the mother in order
22 to obtain an objective score. Each question was accompanied with a response choice in the form

1 of 'Yes' or 'No'. Few questions consisted of the response choice of "specify" if answered as
2 "Yes" in order to elicit details regarding the nature of the interaction. A response of "yes" was
3 marked as a score of 1 and "no" as a score of 0. An achievement of a greater score on the
4 questionnaire indicated that the mothers were sensitive to the activity of interaction during
5 mealtime and the children were interacting with their mothers to satisfy mealtime needs.

6 The content validity of the preliminary version of the questionnaire developed was
7 assessed by obtaining the feedback from three experienced ³ Speech-language pathologists. They
8 were asked to judge the appropriateness of the items included and the rating scale used. The
9 feedback was collected ³¹ using a 3 point rating scale ranging from the contents are not very valid
10 (score 0) to all the contents are valid (score 2). After the content validity assessment, one
11 question was added to the section on mother initiated communication and an existing question,
12 not applicable was removed.

13 A pilot study was carried out in which this questionnaire was administered on five
14 mothers of ²⁷ typically developing children and five mothers of the children with CP. Their
15 responses were documented. One question each was deleted from the section relating to mother
16 initiated communication and child initiated communication since it was not directly related to the
17 objective of the study. Further, the sequence of the questions in the section on child initiated
18 communication was also changed.

19 After the content validity check and the pilot study, the number of questions (items)
20 under the sections of mother initiated and child initiated communication were seven and five
21 respectively. The final version of the questionnaire on the meal time interaction has been
22 provided in the Appendix.

4
1 Phase II: Administration of the questionnaire on the participants

4
2 **Participants:** The mothers of thirty young children in the age group of 2.6 to 3.6 years with CP
11
3 participated in the study. Amongst them, thirteen were mothers of children diagnosed with CP
4 and seventeen were mothers of children diagnosed as CP associated with ID. This constituted the
5 clinical group. The children with CP were identified from among those who reported to the
6 therapy centre. The diagnosis of 'Delay in speech and language associated with cerebral palsy'
7 was made by a qualified team of professionals including speech-language pathologist,
8 pediatrician, physiotherapist and a clinical psychologist. Children with other associated problems
9 except ID were excluded. The degree of ID varied from mild to severe. All the children had been
10 attending speech-language therapy and physiotherapy for approximately a year. All the children
11 selected had their receptive age greater than one year based on the findings of Three-
12 Dimensional Language Acquisition Test (Geetha Herlekar, 1986).

4
13 Participants belonging to low, middle and high socio-economic statuses were included which
14 was ascertained using the NIMH socioeconomic status scale developed by Venkatesan (2009).
15 The scale has sections such as occupation and education of the parents, annual family income,
16 property, and percapita income to assess the socioeconomic status of the participants.

12
17 Mothers of seventeen typically developing children matched for age, gender, and socioeconomic
9
18 status were selected and they comprised the control group. Children with no history of
19 neurological, oromotor, communicative, cognitive, or sensorimotor, and academic impairment
20 were included. This was ensured using the 'WHO Ten-question disability screening checklist'
21 (Singhi, Kumar, Malhi & Kumar, 2007).

9
1 All ethical standards were met for participant selection and their participation. Prior to testing, an
2 oral consent was obtained from the mothers of the participants after explaining the purpose of the
3 study.

4 **Procedure:** The participants were selected based on the criteria mentioned above. A rapport was
5 established with the mother. Only those mothers/caregivers who were directly involved in
6 feeding the children were interviewed. Information regarding the mealtime interaction between
7 the mothers and their children was gathered using the final version of the questionnaire through a
8 telephonic interview. As the questionnaire was based on the responses given by the mothers, an
9 interaction between the experimenter and children was not deemed essential. In addition,
10 information regarding the duration of mealtime was also gathered. The children were divided
11 into two groups based on the mealtime duration, viz. greater than 30 minutes and less than 30
12 minutes. This was based on the review study by Arvedson (2013) who reported that mealtime
13 duration of more than 30 minutes on a regular basis, signaled the presence of a
14 feeding/swallowing problem.

15 To assess the reliability, the questionnaire was administered again on 10% of the participant
16 sample selected randomly from the clinical and control group after one week of their initial
17 responses.

18

19 **Scoring and analysis:** The responses obtained from each participant in the three groups were
20 scored based on the rating scale and a total score was obtained for each participant. The total
21 scores obtained were subjected to statistical analysis via SPSS version 21 software. Descriptive
22 statistics was used to compute the mean, median and standard deviation. Chi square test was
23 used to determine the association between the groups and the response to each question

1 contained in the questionnaire. One-way MANOVA was used to compare the scores obtained
2 across sections of mother and child initiated communication. Cronbach's alpha test was
3 administered to assess the test-retest reliability. The results obtained have been described in the
4 following section.

5

6 **Results**

7 The responses were elicited from forty seven mothers, using the final version of the
8 questionnaire developed, amongst which 17 belonged to the group of typically developing
9 children and 17 were from the group of children with CP associated with ID, while 13 were
10 mothers of the group of children with CP. The test-retest reliability was determined for 10% of
11 the samples from the three groups using Cronbach's alpha. The alpha values for all the three
12 groups were found to range between 0.93 to 0.95, which indicated significantly high test-retest
13 reliability. The results have been presented under three different sections below:

14

15 I. Comparison across the three groups based on mean scores:

16 a) Mother initiated communication

17 Descriptive statistics was computed for the section on mother initiated communication and
18 the mean scores and standard deviation obtained across the groups have been depicted in
19 table 1.

20 From the table 1, it can be observed that the mean values obtained by the mothers of the
21 group of typically developing children were the highest, followed by the mothers of the
22 group of children with CP.

23

1 Table 1: Mean scores and standard deviation (SD) obtained across groups for mother
2 initiated communication.

Sl. No.	Groups	Mean	SD
1	CP group	4.46	1.45
2	CP with ID group	2.94	1.75
3	Typically developing group	4.82	1.63

3 The mothers of the group of children with both CP and ID obtained the lowest mean
4 value compared to the other two groups. The results of one way MANOVA revealed that there
5 was a significant difference between the groups [F (2) =6.28, p<0.005].

6 b) Child initiated communication

7 In a similar manner, the descriptive statistics was computed for the section on child initiated
8 communication and the mean scores and standard deviation obtained across the groups have
9 been depicted in table 2.

10 Table 2: Mean scores and standard deviation (SD) obtained across groups for child initiated
11 communication.

Sl. No.	Groups	Mean	SD
1	CP group	4.62	0.77
2	CP with ID group	4.18	1.01
3	Typically developing group	4.65	0.99

12 From the table 2, it can be observed that similar findings were obtained as in the previous
13 section, with the group of typically developing children scoring the highest and the group of
14 children with CP and ID scoring the lowest. However, one way MANOVA revealed no
15 significant difference across groups [F (2) =1.27, p=0.29].

16

1 II. Comparison across the three groups based on the frequency of responses on each item in the
2 questionnaire:

3 a) Mother initiated communication: The number of positive responses obtained from the
4 mothers/caregivers on each of the item in the section on mother initiated communication
5 from all the three groups were totaled and converted into percentage. This has been depicted
6 in table 3. The table also shows the results of the chi-square test, which was done to check for
7 any significant differences in the responses of the group.

8 Table 3: *Percentage of positive responses for each item of the section on mother initiated*
9 *communication in the three groups and the results of chi square test.*

Item no.	Positive responses (%)			X ² (2)	p value
	Typically developing group	CP group	CP with ID group		
1	71	92	65	3.16	0.21
2	65	85	82	2.12	0.35
3	88	85	41	10.78	0.005*
4	76	46	41	4.90	0.09
5	65	15	18	11.17	0.004*
6	71	69	29	7.24	0.027*
7	47	54	18	4.95	0.08

10 ** indicates significant difference (p<0.05)

11 From the table 3, it can be observed that within the typically developing group, all the items
12 yielded a positive response from more than 60% of the mothers except item 7 for which only
13 47% of them responded positively. Within the group with CP, all the items except, 4, 5 and 7,
14 yielded a positive response from more than 60% of the mothers. In the group with CP and

1 associated ID, only the item no. 1 and 2 yielded a positive response from more than 60% of the
 2 mothers/caregivers. When the percentage of positive responses was compared across the three
 3 groups for all the items on mother initiated communication, it was seen that only item no. 1 and 2
 4 yielded positive response from more than 60% of mothers of all the three groups. When these
 5 scores were compared statistically using the chi square test across the three groups, it was seen
 6 that the responses obtained from the items 3, 5 and 6 on the acts of praise, forceful feeding, and
 7 bribing the child differed significantly ($p < 0.05$).

8 **b) Child initiated communication:** The number of positive responses obtained from the
 9 mothers/caregivers on each of the item in this section on child initiated communication from
 10 all the three groups were totaled and converted into percentage. This has been depicted in
 11 table 4. The table also shows the results of the chi-square test, which was done to check for
 12 any significant differences in the responses of the group.

13 *Table 4: Percentage of positive responses for each item of the section on child initiated*
 14 *communication in the three groups and the results of chi square test.*

Item no.	Positive responses obtained (%)			X ² (2)	p value
	Typically developing group	CP group	CP with ID group		
1	100	100	94	1.80	0.41
2	94	100	100	1.80	0.41
3	94	85	71	3.37	0.19
4	94	100	88	1.72	0.42

15
 16 From the table 4, it can be observed that when the percentage of positive responses was
 17 compared across the three groups for all the items on child initiated communication, more than

1 90% of the mothers of typically developing children responded positively to a majority of the
2 questions. For the items 1 and 2, the mothers of all the three groups responded positively.
3 However for items 3 and 4, lesser percentage of mothers in the CP with ID group responded
4 positively compared to the mothers in the CP group. When these scores were compared
5 statistically using the chi square test, it was seen that there was no significant difference on all
6 the four items across the three groups.

7

8 III. Comparison across the three groups based on the mode of response on each item in the
9 section on child initiated communication:

10 The responses provided by the mothers in response to the items in the section on child
11 initiated communication were analyzed and the same has been depicted in table 5. On
12 comparison of the mode of response between the three groups on the item 1, it was seen that
13 majority (94%) of the typically developing children verbally indicated either through speech or
14 through vocalization that they were hungry. However in the CP group, 61% of the children
15 indicated verbally (mostly through vocalizations) and 54% indicated through a cry. The rest of
16 them either pointed or pulled their mothers/caregivers to the kitchen. In the group with CP and
17 ID, most children (70%) indicated hunger by crying. Further there was a significant difference
18 across the three groups on response choice 1.1 and 1.4. The response options 1.2 and 1.3 were
19 demonstrated only by children in the CP and CP with ID group.

20 On comparison of the mode of response between the three groups on the item 2, it was
21 seen that 65% of the typically developing children verbally indicated, either through speech or
22 through vocalization, that they disliked the food provided, though some of them (35%) also spat
23 out the food.

- 1 Table 5: Number of children with their response choice for each item in the three groups and the
- 2 results obtained on the chi square test.

Item no.	Response choice	No. of children			X ² (2)	p value
		Typically developing group	CP group	CP with ID group		
1.1	Crying	5.88	53.8	70.5	15.50	0.00*
1.2	Pointing	0	23.07	5.88	5.28	0.07
1.3	Pulling you to kitchen	0	15.38	11.76	2.60	0.27
1.4	Verbally(including vocalizations)	94.11	61.5	23.52	17.62	0.00*
2.1	Spitting the food	35.2	46.15	47.05	0.58	0.75
2.2	Does not open mouth	5.88	38.46	23.52	4.75	0.09
2.3	Runs away from food	-	-	-	-	-
2.4	Crying	0	7.69	23.52	5.11	0.08
2.5	Other (verbalizing/vocalizations)	64.70	46.15	35.29	3.00	0.22
3.1	Crying	0	7.69	29.14	7.02	0.03*
3.2	Gestures	0	30.76	23.52	5.74	0.06
3.3	Speech	82.35	23.07	5.88	22.80	0.00*
3.4	Other (vocalization)	11.76	23.07	23.52	0.94	0.63
4.1	Gestures	17.64	53.84	17.64	6.16	0.04*
4.2	Speech	76.92	30.76	5.88	10.98	0.00*
4.3	Shows signs of gagging	5.88	0	17.64	3.18	0.20
4.4	Storing food in mouth	5.88	7.69	23.52	2.79	0.25
4.5	Others (vocalizing)	17.64	23.07	23.52	0.21	0.90

- 3 '* ' indicates significant difference.

- 4 Equal percentage (46%) of children in the CP group verbally indicated or pushed the food
- 5 out of the mouth. Also 38% of them preferred not to open their mouth indicating dislike.

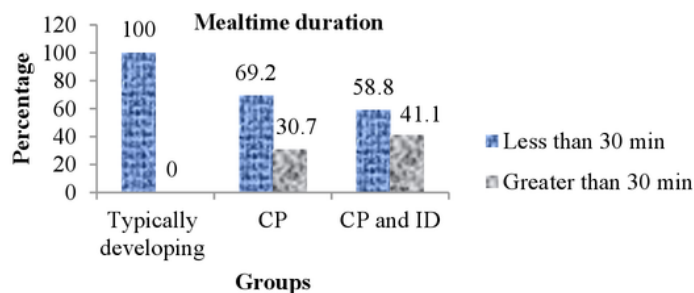
1 However in the CP with ID group, all four response choices were exhibited, with the response
2 option of 2.1 being more prevalent. It was also seen that none of the children ran away from
3 food. ⁴ However there was no significant difference across the three groups on all the response
4 options.

5 On comparison of the mode of response between the three groups on the item 3, it was
6 seen that majority (82%) of the typically developing children verbally indicated that they wanted
7 more food, however in the CP group 30% of them used gestures, while 23% of them indicated
8 wither verbally or though vocalization. The rest of them indicated through crying. In the group
9 with CP with ID, 29% of them indicated through crying and 23% of them indicated through
10 gestures or vocalizations. Only 6% of them indicated though speech. Further ³ there was a
11 significant difference across the three groups on response choice 3.1 and 3.3.

12 On comparison of the mode of response between the three groups on the item 4, it was seen that
13 majority (77%) of the typically developing children verbally indicated that they were full,
14 however most of (54%) the children in the CP group indicated the same through gestures. In the
15 group with CP and ID, most of them (23%) either resorted to store food in mouth or indicate
16 through vocalizations. Further ³ there was a significant difference across the three groups on
17 response choice 4.1 and 4.2.

18 IV. Comparison across the groups based on the meal time duration

19 The information regarding the meal time duration was obtained from the mothers of
20 children of the three groups, based on which they were divided into two groups as shown in the
21 table 6. The percentage of children in all the three groups with meal time duration less than 30
22 minutes and greater than 30minutes has been depicted in figure 1.



1

2 Figure 1: Percentage of children in all the three groups with meal time duration less than 30
3 minutes and greater than 30minutes.

4 From the figure 1 it can be observed that all children in the typically developing group had meal
5 time duration of less than 30 minutes, while 31% and 41% of children in the group with CP and
6 CP with ID, respectively had a prolonged meal time duration of greater than 30 minutes. The chi
7 square test revealed a significant difference across the groups [$X^2(2) = 8.583, p < 0.05$].

8

9 Discussion

10 The aim of the study was to investigate the interaction between mothers and their young children
11 with CP during mealtime. The mother initiated communication and child initiated
12 communication during mealtime of three groups of children including typically developing
13 children, children with CP and children with CP and ID were compared. The results have been
14 discussed in the section below:

15 Mother initiated communication: There was a significant difference between the three groups on
16 the section on mother initiated communication, with the mothers of the typically developing
17 group obtaining the highest mean score in comparison to the group with CP and CP with ID.
18 This indicated that the mothers of typically developing children interacted with their young ones

1 during mealtime more than mothers of the clinical group. The typically developing children
2 achieved the mealtime goals within shorter duration and hence mealtime was a delightful and
3 pleasurable experience. This possibly enabled the mothers to interact with their children during
4 mealtime.

5 The mothers of the clinical group were less interactive and less responsive. Probably mothers of
6 the clinical group were too occupied with feeding, as their children had additional motoric issues,
7 as this itself is stressful for the mother. Sullivan et al., (2000) also reported mealtime to be a
8 stressful experience. The mothers do not attempt to initiate communication as this is not their
9 primary goal, rather their main goal is to feed their neurologically involved child who had some
10 feeding issues. Chen et al., (2007) also reported that ¹¹ children with CP may be at risk for
11 receiving less frequent responsive linguistic input from caregivers.

12 Further, the ¹¹ mothers of children with CP with ID initiated communication with their young ones
13 to a lesser extent than ¹¹ mothers of children with CP. This could be due to the associated
14 comprehension and cognitive deficits in children with CP and ID, which made them less
15 interactive, which in turn affected the overall linguistic output during mealtime. Mothers of
16 children with CP did interact with their children during meal time. Preeja and Manjula (2008)
17 also reported that ² mothers were dominant communication partners, while children with CP were
18 passive communication partners as revealed from the frequent of occurrence of various
19 communicative functions during play situation.

20 When the item wise analysis ⁴ was carried out, it was seen that there was a significant difference
21 across groups on the responses obtained for item no. 3, 5 and 6 which were indicating the use of
22 praise, force feeding and bribing the child. Most mothers of the group with CP and ID reported

1 that their children could not comprehend these aspects. With respect to the responses to item no.
2 1, it was seen that most of the mothers of the typically developing group reported to interact with
3 their children by talking about the items/animals around their surroundings during mealtime. A
4 few of them also reported to sing to their children and describing objects around them. Story
5 narration was not carried out by any of the mothers/caregivers during mealtime. This is in
6 consonance with the study by Ferm et al., (2012) who reported that interactions between the
7 focus dyad (child with severe physical impairment and caregiver) were based on the mealtime
8 goals to be achieved while that of the comparison dyad (typically developing child and
9 caregiver) was based on advanced communicative goals. On item no. 2, more than 80 % of the
10 mothers/caregivers in the clinical group, diverted their children's attention in an attempt to feed
11 more using toys and videos, but they only showed these to the children and did not talk about it.
12 On item no. 4, greater no. of mothers in the typically developing group fed the child along with
13 the other family members, the child thereby getting exposed to verbal interaction between the
14 family members.

15 Child initiated communication: ¹² There was no significant difference between the three groups on
16 the child initiated communication. This indicated that all the three groups of children did
17 communicate during meal time to almost similar extent. ³ This could be attributed to the fact that
18 all children made attempts to communicate either through verbal or through nonverbal mode,
19 which could be due to the fact that all children in the clinical group were attending speech-
20 language therapy. Humphrey (1991) also reported that infants with motor problem, particularly
21 with CP tend use alternative means to communicate during feeding. However, the group with CP
22 with ID made lesser attempts to initiate communication compared to the other two groups.

1 Kennes et al., (2002) also reported that ¹ more severe the condition, the lesser are the child's
2 abilities to speak.

3 When the item wise analysis was carried out, it was seen that children with CP and CP with ID
4 made fewer attempts to indicate that they needed some more food. When the mode of response
5 across the four items in the section on child initiated communication were compared, it was
6 found that there was a significant difference among those response options which were related to
7 mode of communication either verbal or nonverbal.

8 The findings indicated that the typically developing children used verbal mode of response to
9 indicate their needs, while most of the children with CP and CP with ID used the nonverbal
10 mode. This could be due to the verbal communication deficits seen in children with CP and CP
11 with ID. A delay in developing language and learning to speak in children with CP has been
12 reported by few investigators ¹⁸ (Bishop, 1987; Largo, Graf, Kundu, Hunziker, & Molinari,
13 1990; Luoma, Herrgård, Martikainen, & Ahonen, 1998). They have difficulty in initiating
14 exchanges and take fewer turns in conversation with familiar adults and often fail to reply, taking
15 a largely respondent role ¹ (Jolleff et al., 1992; Light et al., 1985a; ¹ Light et al., 1985b; Pennington,
16 1999; Pennington & McConachie, 1999).

17 ²⁰ In the current study, it was also found that there was a significant difference between the three
18 groups on the meal time duration. The results revealed that 31% and 41% of children in the
19 group with CP and CP with ID, respectively had a prolonged meal time duration of greater than
20 30 minutes. Prolonged feeding duration was reported by many other authors in similar studies
21 (Sullivan, et al., 2000; Diwan & Diwan, 2013).

1 67% caregivers reported that feeding their child with disability took longer time than feeding the
2 siblings, while 18% reported feeding to take less time (Yousafzai, Filteau, & Wirz, et al., 2003a).
3 According to Adams (2009), 78.4% of the caregivers reported mealtime to be more than 30
4 minutes and 67% reported mealtime to be shorter at times. The perception of the mealtime
5 duration by itself reflects the difficulty and stress involved in feeding. According to Johnson and
6 Deitz (1985), caregivers reported an average feeding time for children with CP to be 3.5hours a
7 day. Some caregivers spent upto 7.5 hours a day.

8 The children with CP associated with ID in the present study, showed a longer feeding time
9 probably because of the presence of an additional associated cognitive condition as compared to
10 those with cerebral palsy alone. This is also cited by Reilly et al., (1996). They reported extreme
11 brevities in feeding duration ranging from 5 minutes to 41 minutes based on the increasing
12 difficulty.

13

14 **Conclusion**

15 The findings of the present study indicated that mealtime interaction initiated by the mother was
16 significantly different across the three groups considered in the study, however the child initiated
17 communication did not differ. Thus it can be concluded that though the mothers of children with
18 CP made lesser attempts to initiate communication with their children, the children with CP did
19 make attempts to communicate to their mothers, primarily through the nonverbal mode. The
20 findings also indicated that greater the extent of disability, lesser was the communication
21 attempt, as seen in the children with CP and associated ID in the current study.

22

1 This study throws light on the need to counsel the mothers about watching their
2 children's communication attempts closely during mealtime and responding to it appropriately
3 through the verbal mode. Mothers were sometimes too preoccupied with the feeding of their
4 neurologically involved child and hence their focus was on feeding, rather than communication.
5 The ¹² findings of the current study also indicated that most of the mothers of children with CP
6 spend more than 30 minutes for feeding their children, which is in itself, a stressful experience.
7 Hence the ² results of the present study, also reflect the fact that it is essential to identify their
8 feeding problems as early as possible and provide intervention for the feeding problems at the
9 earliest, so that the mothers are at ease during feeding and they can easily shift their focus to
10 communication as well. The parent child interaction during mealtime can also be focused during
11 the feeding therapy sessions which could improve the overall communication abilities of the
12 child.

13 ²⁴ There are some limitations of the study. Since, the sample size was small, generalization
14 of the results should be made with more caution. A video recording of the meal time interaction
15 would have contributed to more significant information regarding the communication. The
16 variables such as educational qualification of the mother, duration of therapy and severity or type
17 of CP were not controlled, which ³ could have influenced the results of the study. Future studies
18 could focus on a more detailed analysis of mealtime interaction through video analysis of
19 communication attempts on a larger sample by controlling the extraneous variables.

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