



Mealtime interaction between mothers and their young ones with cerebral palsy

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Abstract

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

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Introduction

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

of the feeding interaction as well as feeding performance.

In most children, the communication acts during feeding and the entire process of feeding occurs normally, enabling them to take in food with ease and fulfilling their food/hunger related requirements, making the meal time an enjoyable and comfortable activity. However, in some children, especially those with communication disorders, such as cerebral palsy, intellectual disability, autism spectrum disorders, this is affected. They exhibit problems in verbal communication as well as feeding (Benfer, Weir, Bell, Ware, Davies, & Boyd, 2013; Nadon, Feldman, Dunn, & Gisel, 2011; Rezaei, Rashedi, Gharib, & Lotfi, 2011). Minor feeding problems have been reported in typically developing children too, during their early childhood, ranging from 25% to 35% (Colin & Dana, 2002). These problems could have a direct impact on the type and pattern of interaction between the parent and the child, specifically during mealtime.

One such commonly occurring developmental disability leading to both verbal communication and

feeding is cerebral palsy. Cerebral palsy (CP) is a group of permanent disorders of the development of movement and posture causing activity limitation that are attributed to non-progressive disturbances that occurred in the developing infant or fetal brain. The motor disorders of CP are often accompanied by disturbances of sensation, perception, cognition, communication and behavior, epilepsy and by secondary musculoskeletal problems (Rosenbaum, Paneth, Leviton, Goldstein, Bax, Damiano, Dan, & Jacobsson, 2007). The incidence of CP is estimated to be 2 to 2.5 in 1000 live births (Kriger, 2006; Pirila et al., 2007). Shahanawaz, Palekar, and Shah (2015) reported that in the Indian context, the incidence of CP is up to 2 to 2.5 cases per 1000 live births. It is one of the most common conditions leading to developmental disability in children and is frequently associated with a variety of feeding problems.

Research findings indicate that children with CP have poor oral suction, poor intake, nasal regurgitation, choking, aspiration, gagging, weak suck, excessive air intake, vomiting, difficulty in swallowing, self-feeding and spoon feeding, later introduction of solid food, and improper feeding positions (Clarren, Anderson, & Wolf, 1987; Reilly, Skuse, & Poblete, 1996; Sullivan, Lambert, Rose, Ford-Adams, Johnson, & Griffiths, 2000; Gangil, Patwari, Aneja, Ahuja & Anand, 2001; Wilson & Hustad, 2009; Benfer, Weir, & Boyd, 2012; Diwan & Diwan, 2013; Benfer, et al., 2013). They also exhibit lengthy feeding times (Diwan & Diwan, 2013; Gangil et al., 2001; Sullivan et al., 2007). As a consequence to the feeding problems, children with CP have health related problems, growth failure and their nutritional status is affected. These problems may affect the interaction between the parent and the child during meal time. Brizee, Sophos, and McLaughlin (1990) suggested that feeding problems can lead to problems in parent-child interaction. In addition to these findings on feeding problems, it has also been reported that children with CP experience a delay in developing language and learning to speak (Bishop, 1987; Largo, Graf, Kundu, Hunziker, & Molinari, 1990; Luoma, Hergard, Martikainen, & Ahonen, 1998). Children with CP rarely initiate exchanges in conversation with familiar adults, taking a largely respondent role, while adults introduce topics and start most conversations (Jolleff, McConachie, Winyard, & Jones, 1992; Light, Collier, Parnes, 1985a; Light, Collier, Parnes, 1985b; Pennington, 1999; Pennington & McConachie, 1999). They also take fewer turns in conversation than do their adult partners and often fail to reply unless obliged to do so (Light et al., 1985a). In addition, they produce many yes/no answers and seldom ask questions (Basil, 1992, Light et al., 1985b; Pennington, 1999; Pennington & McConachie, 1999). In other words, many children with CP are hindered in their development of narrative skills and functional communication (Basil, 1992, Jolleff et al., 1992, Light et al., 1985a, Light et al., 1985b, Pennington, 1999;

Pennington & McConachie, 1999; Pennington, Goldbart, & Marshall, 2004). Problems in communication, especially poor speech production, may be a direct result of the motor impairment due to a disturbed neuromuscular control of speech mechanism, i.e. dysarthria (Crary, 1995; Pennington, 1999; Pennington & McConachie, 2001a; Pennington & McConachie, 2001b; Pirila et al., 2004; Strand, 1995). These problems in communication can lead to dissatisfaction in the achievement of meal time goals for the caregiver and the child. For example, Humphrey and Freud (1991) reported in his study that infants with motor problem, particularly with CP tend to take more time to respond while feeding and also use alternative means to communicate.

Further, children with CP may be at risk for receiving less frequent responsive linguistic input from caregivers that facilitates communication and language development (Chen, Klein, & Haney, 2007). Moreover, attempts of communication that a child with CP makes are often misinterpreted or not acknowledged at all. Kennes, Rosenbaum, Hanna et al., (2002) reported that the more severe the condition, the lesser are the child's abilities to speak and to be understood by family members. Eventually the child may lose the intent to communicate due to a lack of reciprocity. Hanzlik (1990) studied nonverbal interaction patterns of forty mothers and their infants with CP employing free play strategy. Results revealed that the mothers of infants with CP had fewer face-to-face interactions and engaged in fewer positive behaviors in their initiation and response communication patterns to their infants. The infants with CP were more compliant, less responsive, engaged in fewer voluntary responses, and were held more frequently than their counterparts.

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

Another study aimed at examining parenting representations and feeding interactions of fifty eight mothers and their children aged between 16months to 52months with mild to severe CP. Correlation and regression analysis examined relation between representations (compliance with parental requests,

achievement, secure base, enmeshment, worry about child's future and emotional pain), demographic characteristics, diagnostic severity and developmental status. The results revealed that mothers with more compliance related concerns showed less sensitivity, acceptance and delight during feeding. Mothers experiencing more emotional pain displayed more hostility. Mothers who reported worries about their children displayed sensitivity and delight. The findings of the study indicated that mother's representation of mother-child relationship was related to their behavior with their child with CP, independent of the child's skills and abilities (Sayre, Pianta, Marvin, & Saft, 2001).

Since the child has limited speech and language in addition to the other problems, this can also influence the quality of the interaction between the parent and the child especially during meal time. A few studies attempted to investigate the interaction between caregivers and their children with CP specifically during mealtime. Welch, Pianta, Marvin, and Saft (2000) examined the relative importance of children's feeding skills and abilities and mothers' psychological state regarding their child's diagnostic status in predicting the observed quality of mother-child interaction during a naturalistic feeding situation. The participants were 69 children with cerebral palsy (CP), aged 14 to 53 months, and their mothers with their functional impairments ranging from mild to severe. Mother-child interaction was observed during 20 minutes of feeding and was scored using global ratings of mothers' and children's socioemotional behavior. In addition, mothers' feeding interactions were dichotomously coded for sensitive and responsive behaviors. Children's feeding skills and abilities were also assessed by maternal report and by observation. Mothers' resolution of grief associated with the child's diagnosis was assessed using standardized interview procedures. The findings indicated that, contrary to expectations, the mothers' resolution status was not related to qualities of the feeding interactions (either dyadic or mothers' behavior) and that feeding interactions are best predicted for children with CP by their skills and abilities.

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

Ferm, Ahlsen, and Bjorck-Akesson (2012) investigated the pattern of interaction between a child aged 6 years 6 months with severe physical impair-

ment affecting major mobility and hand function, and caregiver (focus dyad) and a child of the same age without impairment and caregiver (comparison dyad). Results revealed that interactions between the focus dyad was based on the mealtime goals to be achieved while that of the comparison dyad was based on advanced communicative goals such as talking about personal experience. The limitation of the study was the possibility of the knowledge about the activity being video recorded having influenced the caregiver interaction.

The results of the study done by Adams (2009) in Bangladesh revealed that 89% of mothers of children with CP reported mealtime being stressful, 78.4% reported mealtime to be more than 30 minutes and 67% reported mealtime to be shorter at times. Results based on verbal interaction revealed that 84% of the caregivers used positive verbal encouragements either never or occasionally in the initial observed mealtime. Negative verbal interactions were recorded in 80% of the cases and 87% negative physical behaviors were recorded.

A systematic and indepth review of the existing literature revealed that children with CP exhibit feeding and communication problems. Mealtime interaction is essential in order to make the mealtime, an enjoyable and satisfactory process. However, this is reported to have been affected in children with CP due to the problems in feeding and communication. These difficulties tend to interrupt the quality of relationship between caregivers and their children. Though studies to assess the mealtime interaction are limited, other studies investigating the mother-child interaction during free play have reported that the interactions were maternally dominated, with the child with CP making limited attempts to communicate. In the Indian context, such studies investigating meal time interaction between mother and the child are limited. The studies carried out in the Indian context, focused on only the mother-child interaction in children with CP during play. Cultural variations in the feeding and communication patterns could influence the mealtime interactions seen in different parts of the world. Hence it becomes essential to conduct such studies in the Indian population as well. Intellectual disability (ID) is most commonly associated with CP. The prevalence of intellectual impairment in this population varies from 20% to 70% (Beckung & Hagberg, 2002; Pelligrino, 2007; Sigurdardottir, Indredavik, Eiriksdottir, Einardottir, Gudmundsson, & Vik, 2010). Singhi Ray and Suri (2002) in a study in India also reported ID in 72.5% of the affected children with CP. The feeding and communication issues seen in these children with multiple problems may be greater, leading to poorer meal time interaction, compared to those with only CP. Research indicates that children with ID also have feeding and communication problems (Linscheid, 1983; Rezaei, et al., 2011). Calis et al (2008), reported in their study

a prevalence of dysphagia of 99%, in a representative sample of children with severe generalized CP and ID. The existing studies that have investigated the mealtime interaction patterns in children with CP have excluded participants with associated ID. Studies investigating the mealtime interactions in children with CP with associated ID are limited.

Studies investigating the mealtime interaction between children with CP and their parents/caregivers are essential, since these would provide an insight into the nature of communication, if any, that happens between the dyad. Studies on feeding problems and the interaction between the mother and child dyad, throw light on the need to increase caregiver awareness and responsiveness to their child's feeding problem. Such studies would further help in counselling the mothers and making them sensitive to their child's communicative attempts and to respond in appropriate ways to their child, which in turn would help in strengthening the quality of feeding and consequently the parent-child bonding. In order to support the communication between the mothers and their children with CP and improve the feeding, such studies on mother-child interaction are important. In this context, the present study was planned. An attempt was made to investigate the mealtime interaction in children with only CP and those with CP associated ID. The aim of this study was to investigate the mealtime interaction between mothers and their young children with CP. A control group consisting of age matched typically developing children was also included. The specific objectives of the study were to compare mealtime interaction between a) children with CP and typically developing children, b) children with CP associated with ID and typically developing children and c) children with CP and children with CP associated with ID.

Method

The study was undertaken in the following phases:

Phase I: Construction of the questionnaire and its validation.

Initially the preliminary version of the questionnaire for the assessment of mother and child initiated communication during meal times was developed. This was prepared by collating information from the literature (Veness & Reilly, 2008; Adams, 2009). In the initial phase of the development, the questionnaire consisted of twelve questions. These were divided across two sections; Mother initiated communication and child initiated communication. The section that related to mother initiated communication consisted of eight questions and the section on child initiated communication consisted of five. Mother initiated communication included questions that focused on understanding the nature of interaction exhibited by the mother, the reinforcement given

to the child, the inclusion of the child in the routine mealtime interaction with other members of the family etc. The child initiated communication included questions that focused on the mealtime goals that were to be achieved, such as expressing hunger, indicating like/dislike towards a specific food, expression of requirement of some more food or feeling of fullness etc. Also the mode of expression of the child to indicate the above such as crying, pointing, usage of gestures, vocalizations, speech, spitting food, refusal to open mouth, running away from the meal, etc. was elicited.

A rating scale was also prepared to rate the responses obtained from the mother in order to obtain an objective score. Each question was accompanied with a response choice in the form of 'Yes' or 'No'. Few questions consisted of the response choice of "specify" if answered as "Yes" in order to elicit details regarding the nature of the interaction. A response of "yes" was marked as a score of 1 and "no" as a score of 0. An achievement of a greater score on the questionnaire indicated that the mothers were sensitive to the activity of interaction during mealtime and the children were interacting with their mothers to satisfy mealtime needs.

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

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

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

Phase II: Administration of the questionnaire on the participants

Participants

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

Participants belonging to low, middle and high socio-economic statuses were included which was ascertained using the NIMH socioeconomic status scale developed by Venkatesan (2009). The scale has sections such as occupation and education of the parents, annual family income, property, and percapita income to assess the socioeconomic status of the participants. Mothers of seventeen typically developing children matched for age, gender, and socioeconomic status were selected and they comprised the control group. Children with no history of neurological, oromotor, communicative, cognitive, or sensorimotor, and academic impairment were included. This was ensured using the 'WHO Ten-question disability screening checklist' (Singhi, Kumar, Malhi & Kumar, 2007).

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

Procedure

The participants were selected based on the criteria mentioned above. A rapport was established with the mother. Only those mothers/caregivers who were directly involved in feeding the children were interviewed. Information regarding the mealtime interaction between the mothers and their children was gathered using the final version of the questionnaire through a telephonic interview. As the questionnaire was based on the responses given by the mothers, an interaction between the experimenter and children was not deemed essential. In addition, information regarding the duration of mealtime was also

gathered. The children were divided into two groups based on the mealtime duration, viz. greater than 30 minutes and less than 30 minutes. This was based on the review study by Arvedson (2013) who reported that mealtime duration of more than 30 minutes on a regular basis, signaled the presence of a feeding/swallowing problem.

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

Scoring and analysis

The responses obtained from each participant in the three groups were scored based on the rating scale and a total score was obtained for each participant. The total scores obtained were subjected to statistical analysis via SPSS version 21 software. Descriptive statistics was used to compute the mean, median and standard deviation. Chi square test was used to determine the association between the groups and the response to each question contained in the questionnaire. One-way MANOVA was used to compare the scores across the three participant groups. The scores obtained on mother and child initiated communication were taken as two dependent variables. Cronbach's alpha test was administered to assess the test-retest reliability. The results obtained have been described in the following section.

Results

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

I. Comparison across groups based on mean scores:

a) Mother initiated communication: Descriptive statistics was computed for the section on mother initiated communication and the mean scores and standard deviation obtained across the groups have been depicted in table 1.

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

The mean values obtained by the mothers of the group of typically developing children were the highest, followed by the mothers of the group of children with CP (Table 1). The mothers of the group of children with both CP and ID obtained the lowest mean value compared to the other two groups. The results of one way MANOVA revealed that there was a significant difference between the groups [F (2) =6.28, p< 0.005].

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

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

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

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

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

From the table 3, it can be observed that within the typically developing group, all the items yielded a positive response from more than 60% of the mothers except item 7 for which only 47% of them responded

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

b) Child initiated communication: The number of positive responses obtained from the mothers on each of the item in this section on child initiated communication from all the three groups were totaled and converted into percentage. This has been depicted in table 4. The table also shows the results of the chi-square test, which was done to check for any significant differences in the responses of the group. From the table 4, it can be observed that when the percentage of positive responses was compared across the three groups for all the items on child initiated communication, more than 90% of the mothers of typically developing children responded positively to a majority of the questions. For the items 1 and 2, the mothers of all the three groups responded positively. However for items 3 and 4, lesser percentage of mothers in the CP with ID group responded positively compared to the mothers in the CP group. When these scores were compared statistically using the chi square test, it was seen that there was no significant difference on all the four items across the three groups.

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

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

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

Item No.	Positive responses (%)			$\chi^2(2)$	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

* indicates significant difference ($p < 0.05$)

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

Item No.	Positive responses (%)			$\chi^2(2)$	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

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

Item No.	Response choice	No. of children			$\chi^2(2)$	p value
		Typically developing group	CP group	CP with ID group		
1.1	Crying	5.88	53.80	70.50	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

* indicates significant difference

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

46% of children in the CP group verbally indicated or pushed the food out of the mouth. Also 38% of them preferred not to open their mouth indicating dislike. However in the CP with ID group, all four response choices were exhibited, with the response option of 2.1 being more prevalent. It was also seen that none of the children ran away from food. However there was no significant difference across the three groups on all the response options.

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

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

IV. Comparison across groups based on the meal time duration

The information regarding the meal time duration was obtained from the mothers of children of the three groups. The percentage of children in all the three groups with meal time duration less than 30 minutes and greater than 30 minutes has been depicted in figure 1.

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

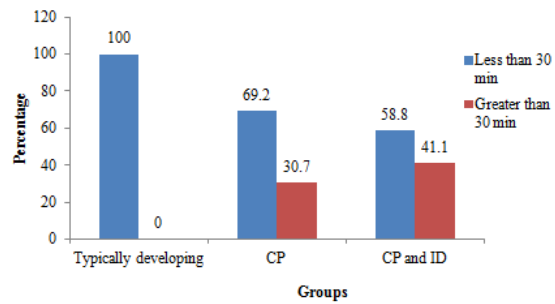


Figure 1: Percentage of children in all the three groups with meal time duration less than 30 minutes and greater than 30 minutes.

Discussion

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

Mother initiated communication: There was a significant difference between the three groups on the section on mother initiated communication, with the mothers of the control group obtaining the highest mean score in comparison to the clinical groups. This indicated that the mothers of typically developing children interacted with their young ones during mealtime more than mothers of the clinical group. The typically developing children achieved the mealtime goals within shorter duration and hence mealtime was a delightful and pleasurable experience. This possibly enabled the mothers to interact with their children during mealtime.

The mothers of the clinical group were less interactive and less responsive. Probably mothers of the clinical group were too occupied with feeding, as their children had additional motoric issues, which were difficult to handle and was stressful for the mother. Sullivan et al., (2000) also reported mealtime to be a stressful experience. The mothers do not attempt to initiate communication as this was not their primary goal, rather their main goal was to feed their neurologically involved child who had some feeding issues. A few studies do support this finding, though they have not investigated the interaction pattern during meal time specifically. Hanzlik (1990) reported that the mothers of infants with CP had fewer face-to-face interactions and engaged in fewer positive behaviors in their initiation and response communication patterns to their infants. Chen et al., (2007) reported that children with CP may be at risk for receiving less frequent responsive linguistic input from care-

givers.

Further, the mothers of children with CP with ID initiated communication with their young ones to a lesser extent than mothers of children with CP. This could be due to the associated comprehension and cognitive deficit in children with CP and ID, which made them less interactive, which in turn affected the overall linguistic output during mealtime.

When the item wise analysis was carried out, it was seen that there was a significant difference across groups on the responses obtained for item no. 3, 5 and 6 which were items related to indicating the use of praise, force feeding and bribing the child. Mothers of the group with CP and ID reported that their children could not comprehend the verbal reinforcement and instructions related to bribing and force feeding. With respect to the responses to item no. 1, it was seen that most of the mothers of the typically developing group reported to interact with their children by talking about the items/animals around their surroundings during mealtime. A few of them also reported to sing to their children and describing objects around them. Story narration was not carried out by any of the mothers/caregivers during mealtime. This is in consonance with the study by Ferm et al., (2012) who reported that interactions between the focus dyad (child with severe physical impairment and caregiver) were based on the mealtime goals to be achieved while that of the comparison dyad (typically developing child and caregiver) was based on advanced communicative goals. On item no. 2, more than 80% of the mothers in the clinical group, diverted their children's attention in an attempt to feed more using toys and videos, but they only showed these to the children and did not talk about it indicating restricted verbal interaction. On item no. 4, greater no. of mothers in the typically developing group fed the child along with the other family members, the child thereby getting exposed to verbal interaction between the family members, while only a few mothers of other groups encouraged this. This could be consequent to the feeding difficulties exhibited by the child. Very few mothers of all groups used the timeout strategy during meal time.

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

compared to the other two groups. Kennes et al., (2002) also reported that more severe the condition, the lesser are the child's abilities to speak.

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

The findings indicated that the typically developing children used verbal mode of response to indicate their needs, while most of the children with CP and CP with ID used the nonverbal mode. This could be due to the verbal communication deficits seen in children with CP and CP with ID. A delay in developing language and learning to speak in children with CP has been reported by few investigators (Bishop, 1987; Largo, Graf, Kundu, Hunziker, & Molinari, 1990; Luoma, Herrgard, Martikainen, & Ahonen, 1998). They have difficulty in initiating exchanges and take fewer turns in conversation with familiar adults and often fail to reply, taking a largely respondent role (Jolleff et al., 1992; Light et al., 1985a; Light et al., 1985b; Pennington, 1999; Pennington & McConachie, 1999). In the current study, it was also found that there was a significant difference between the three groups on the meal time duration. The results revealed that 31% and 41% of children in the group with CP and CP with ID, respectively had a prolonged meal time duration of greater than 30 minutes. Prolonged feeding duration was reported by many other authors in similar studies (Sullivan, et al., 2000; Diwan & Diwan, 2013). 67% caregivers reported that feeding their child with disability took longer time than feeding the siblings, while 18% reported feeding to take less time (Yousafzai, Filteau, & Wirz, et al., 2003a). According to Adams (2009), 78.4% of the caregivers reported mealtime to be more than 30 minutes and 67% reported mealtime to be shorter at times. The perception of the mealtime duration by itself reflects the difficulty and stress involved in feeding. According to Johnson and Deitz (1985), caregivers reported an average feeding time for children with CP to be 3.5 hours a day. Some caregivers spent upto 7.5 hours a day.

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

Conclusion

The findings of the present study indicated that mealtime interaction initiated by the mother was significantly different across the three groups considered in the study, however the child initiated communication did not differ. Thus it can be concluded that though the mothers of children with CP made lesser attempts to initiate communication with their children, the children with CP did make attempts to communicate to their mothers, although through a different mode. However in comparison to the typically developing children, the communication attempts made by the children were significantly lesser. The findings also indicated that the presence of an additional disability affected the mother initiated and child initiated communication during mealtime.

This study throws light on the need to assess the mealtime interaction between mothers and children during feeding and to incorporate this as a treatment goal during intervention, since the mealtime interaction serves as a platform for language learning, which eventually leads to better fulfillment of mealtime goals, thereby leading to greater satisfaction for the mother and the child during feeding. This study also has implications for counselling the mothers about watching their children's communication attempts closely during mealtime and responding to it appropriately through the verbal mode. Mothers were sometimes too preoccupied with the feeding of their neurologically involved child and hence their focus was on feeding, rather than communication. The findings of the current study also indicated that most of the mothers of children with CP spend more than 30 minutes for feeding their children, which is in itself, a stressful experience. Hence the results of the present study, also reflect the fact that it is essential to identify their feeding problems as early as possible and provide intervention for the feeding problems at the earliest, so that the mothers are at ease during feeding and they can easily shift their focus to communication as well. The mother-child interaction during mealtime can also be focused during the feeding therapy sessions which could improve the overall communication abilities of the child. There are some limitations of the study. Since, the sample size was small, generalization of the results should be made with more caution. A video recording of the meal time interaction would have contributed to more significant information regarding the communication. The variables such as educational qualification of the mother, duration of therapy and severity or type of CP were not controlled, which could have influenced the results of the study. Future studies could focus on a more detailed analysis of mealtime interaction through video analysis of communication attempts on a larger sample by controlling the extraneous variables.

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APPENDIX I

QUESTIONNAIRE TO ASSESS THE MEALTIME INTERACTION

Section I: Communication initiated by mother during feeding

1. Do you verbally interact with your child during feeding? Yes No

If yes, then specify

Talks about different items at home/animals/others

Says stories

Sings songs/rhymes

2. Do you divert your child's attention during feeding in an attempt to feed more? Yes No

If Yes, Specify

3. Do you praise your child when he/she eats a morsel of food? Yes No

4. Do you feed your child along with the family during the common meal time?

Yes No Not Applicable

5. Do you force the child to have more food/a particular type of food verbally, despite the child's rejection of a particular food?

Yes No

6. Do you promise your child something other than food if he or she eats?

Yes No Not Applicable

7. Do you warn your child that you will take away something other than food if he or she doesn't eat ?e.g., a favourite toy

Yes No Not Applicable

Section II: Communication initiated by the children during feeding

1. Does your child indicate to you that he/she is hungry? Yes No Not Applicable

If Yes then, specify through which of the following mode

Crying Pointing

Pulling you to kitchen Verbal (vocalization etc)

2. Does your child indicate in any form, his/her dislike to a specific food you provide?

Yes No Not Applicable

If yes, specify

Spitting the Food

Does not open the mouth

Runs way from food

Crying

3. Does your child indicate in any form that he/she wants some more food?

Yes No Not Applicable

If yes, then specify

Crying Gestures

Speech Others (vocalizations)

4. Does your child indicate in any form that he/she does not want to eat any more food or is full?

Yes No Not Applicable

If yes, then specify

Gestures Speech

Show signs of gagging food

Storing food in the mouth for a longer time

Others (vocalizing)

5. Does your child indicate in any way that his/her meal time is pleasurable? Yes No

If Yes, specify