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Social Communication Skills of Children with Down syndrome and Typically Developing Children: A comparative Study

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Abstract

Purpose: The purpose of the present study was to assess differences in the pragmatic language skills of children with Down syndrome and typically developing children.

Method: 60 Children with mental age 5.0-6.0 were recruited for both groups (Down syndrome=30, typically developing children=30). Non probability purposive sampling was employed and data was collected from special education schools. Demographic sheet and Orion's Pragmatic Language Skills Questionnaire (OPLS) consisting of nonverbal communication, expressive skills, conversational skills, speech conventions and peer skills was used for pre and post assessment.

Results: Data was analyzed statistically. The results shows statistically significant difference between pragmatic language skills of children with down syndrome and typically developing children (NVC= $t(58)=2.14$, $p>0.03$, ES= $t(58)=-5.47$, $p>0.001$, CSTM= $t(58)=-8.32$, $p>0.001$, CSTT= $t(58)=-6.32$, $p>0.001$, SC= $t(58)=-4.21$, $p>0.001$, PS= $t(58)=-5.43$, $p>0.001$, O= $t(58)=-7.16$, $p>0.001$).

Conclusion: It was concluded that nonverbal communication skills were stronger in Children with Down syndrome then typically developing children.

Keywords. Pragmatic Language Skills, Down Syndrome, Orion's Pragmatic Language Skills Questionnaire (OPLS),

Introduction

Down syndrome is a chromosomal condition allied with intellectual impairment, restrictions in adaptive skills, and anatomical variances in tongue size. It is triggered by the existence of all or fragment of a third copy of chromosome 21. John Langdon Down (1866), an English doctor, issued a precise portrayal of individual with Down syndrome in late nineteenth century. It enables him to earn the acknowledgement as the "father" of the disorder (Mandal, 2019). Down syndrome is one of the most prevalent genetic syndromes. It transpires in 13.65 percent in 10,000 births and affect around 5,500 children in United states each year (Roberts, Price & Malkin, 2007). It is considered as one of major cause of learning disability throughout the world. It is confirmed from the research that many individuals with down syndrome have Intelligence Quotient ranging from 30 to 70 and exhibits deficiency in cognition, receptive and expressive language skills. Attention is another concerned area in which down syndrome population face challenges when concentrating on any task (Oliver, 2012). Another problem related with down syndrome are hearing impairment and deviation in oral motor structure and functions that may affect their speech and language development. They have difficulties

associated to hearing, eye ailments and cardiac health. They also have obstructive sleep apnea, which is a state where the person's breathing momentarily stops during sleep (Pace, Shin, & Rasmussen, 2010). Development of language is delay in children with DS as compared to typically developing children. Linguistic skills are zone of major difficulty for them. Prelinguistic skills are developed before linguistic skills. These skills included vocalizations, gestures and facial expressions (Panevova, & Hana, 2011). They possess more powerful inventory of gestures when compared to typically developing children. Imitation is another strength of down syndrome population. They have capacity to imitate others and also engage these skills in social play with peers. They have interest in social interaction but they have little difficulty in joint attention. When engaged in any activity or play most common problem for them is maintaining long period attention on a task (Maria, Pereira, & Maria, 2009). Due to difficulties in early joint attention children with down syndrome face difficulties in developing language skills. Their expressive skills acquisition is slower than their nonverbal skills. They are labeled as having a specific speech and language delay (Adamson, Bakeman, Deckner, & Romski, 2009). Many of them eagerly interact and they have strong non-verbal communication skills. These skills comprise of eye contact, turn taking in games and using gesture to communicate. They use early gestures more efficiently and use them for longer period then typically developing children (Martin, Klusek, Estigarribia, & Roberts, 2009). Pragmatics is an element of language which focuses on person's ability of what to say, how to say it, how to interact appropriately in a specified situation and their nonverbal communication, which may comprise of body language, eye contact and facial expression of a particular person during his interaction with others (Leigh, 2018). Pragmatic language skills are vigorous traits in the down syndrome population. Although, they are typically social, caring and interactive with others. However, not all parts of pragmatics are reliable. Few children with down syndrome have problems while requesting and few exhibit topic maintenance skills alike typically developing children. They have many similarities with typically developing children while answering, protesting and commenting (Martin, Klusek, Estigarribia & Roberts, 2009). There are many factors that influence pragmatic skills such as gender, birth order, cultural differences, family system and size and parent child interaction. Genetic and developmental disorder like down syndrome, damage not only quality of life of individuals but also effects their speech and language development. It leads to deficiencies in the language development in children. They are active and social but their pragmatic skills are delayed as compared to typically developing children. Expressive and conversational skills are poor in children with down syndrome as compared to typically developed children of same mental age (Zimmerman, 2018). Language is one of the important skills of an individual. Through language an individual interacts with others which is necessary for survival as humans are social beings and they need others to communicate with. Pragmatics is the most important component of language allowing people to use language in real life interaction with others. Pragmatic skills are important for children with Down syndrome to interact with others. The present study provides comparison of pragmatic language skills of children with DS and typically developing children in Pakistan. It will be helpful to identify areas of pragmatic language deficits and strengths in down syndrome. Cunha and Limongi (2010) studied the influences of contextual and environmental variables on pragmatic language skills of children with down syndrome while interacting with parents and therapist. Results showed that socioeconomic status and qualification of caregivers had most influence on the pragmatic language skills of children with down syndrome in both interaction situations. The communicative mode was significantly influenced by the socioeconomic level, and by the caregiver education. Safwat and sheikhny (2014) studied the contribution of quantity and quality of parent child interaction in language development. Results indicated that the interaction score of parent and the child's total language age were significantly positively correlated. Socioeconomic status significantly predicted the child's language outcomes. Maria, Pereira and Maria (2009) conducted a research to identify the

pragmatic skills and their influence on communicative use in individuals with down syndrome. The results of the research revealed that among the communicative functions, the most frequent were commentary and narrative. The most frequent communicative medium was verbal. All participants used communicative functions including comment, recognition of the other and shared game and 90% of the communication direction was carried out by children and adolescents. Bush and Losh (2017) explored that children with DS had difficulty in controlling cognitive and language abilities while comparing to typically developing children. Girls with DS showed similar results when comparing with typically developing girls in the areas of nonverbal communication and scripted language abilities. Pragmatic skills of children with DS were showed to be developed at delayed rate when compared with control group. Smith, Naess and Jarrold (2017) identified that children with DS had deficiencies in all areas of pragmatics as compared to typically developed children. They have significantly stronger nonverbal communication, while significantly poorer area of understanding context. Saeed, Rana and Tarar (2016) examined the relationship among social predictors, pragmatic skills and conversational maxims in children of age range 5.1 to 5.12 years and 6.1 to 6.12 years. Results of the study showed that no significant difference was present in pragmatic skills of children on the basis of gender, age, and types of schooling. Amjad and Muhammad (2019) conducted a qualitative research aimed for developing the understanding of the learning difficulties faced by students with Down syndrome through the perspectives of special school teachers and psychologists. Results of the present study showed that according to teachers and psychologists perception students with Down syndrome absolutely face many difficulties in their learning such as lack of obligatory skills, low IQ, memory storage problems, interaction problem, behavior problems and distraction issues.

Method:

Cross-sectional research design was employed to compare the pragmatic language skills of children with down syndrome and typically developing children of matched mental age of 5 to 6 years (Setia, 2016). Sample of 60 children (Down Syndrome=30, Typically Developing Children=30) was recruited through non probability purposive sampling. Sample size was recruited with the reference of previous researches (Smith, Naess & Jarrold, 2017; Guralnick, 2011). In present study participants whose mental age was ranging from 5.0 to 6.0 were selected for both sample groups. Participants were 30 children with down syndrome (boys=14, girls= 16) and 30 typically developing children (Boys=16, girls=14). Sample was recruited from 2 special education schools and down syndrome community of Lahore, Pakistan. Participants were screened and those who met the criteria were selected. The total sample collected from school one included 10 children, school two included 35 children and community included 15 children. Total 80 children were screened for their intellectual ability out of which only 60 met the criteria. The inclusion criteria for children with down syndrome was mental age 5.0 to 6.0 years, taking treatment sessions and attending schools and able to understand and speak Urdu language. Children with down syndrome with a history of sensory-neural, visual or hearing problems and severe behavioral issues were exclude. The inclusion criteria for typically developing children were mental age 5.0 to 6.0 years and children who were able to understand and speak Urdu language. Typically developing children with any serious medical condition or impairment were excluded.

Instrument:

The Slosson Intelligence Test (SIT-R3) was used to identify an individual's mental ability. This test assesses mental age, IQ of children and adults. It can also be used on individuals with visual impairment. It assesses six verbal cognitive areas including general information, similarities and differences, quantitative, comprehension, vocabulary and auditory memory. Age range for Slosson intelligence test is from 4-65 years. In the present study Slosson Intelligence Test was

used to profile mental age of children with DS and typically developed children (Nicholson & Hibshamp, 2002). Orion's Pragmatic Language Skills (OPLS) Questionnaire was used as a standardized measure of pragmatic skills. It was developed by Dr Kathryn Stewart in 2007. It consists of 53 items assembled in five subsections such as nonverbal communication, expressive skills, conversational skills (topic maintenance and turn taking), speech conventions and peer skills. It is a 5-point Likert scale ranging from 1 (almost always) to 5 (never). Reliability of this checklist is 0.92. It is a tool used by parents and professionals who is familiar with the child. OPLS was used to identify the pragmatic language skills of both sample groups (Stewart, 2007). A demographic sheet was designed by researcher on the basis of literature and expert opinion for collection of participant's information. This sheet consists of the questions related to participants' age, gender, family system, school starting age, parent child interaction time, numbers of family members number of siblings, mother and father education, birth order, parents' qualification, speech and developmental milestones, health and behavioral issues.

Procedure

Initially pilot study was conducted on ten children five with DS and five typically developing children. The participants were recruited from special education schools in Lahore, Pakistan. Mothers were contacted through school and those who signed consent form were recruited for further study. The participants were screened for their intellectual functioning through Slosson intelligence test. Those who met the criteria of mental age 5.0 to 6.0 years were selected. Sample was recruited through non probability purposive sampling. The authority figures of concerned schools were contacted for the purpose of data collection and permission was granted. Sample was recruited from 2 special education schools and Down syndrome community of Lahore, Pakistan. First step was the screening of the participants. Slosson intelligence test was used as screener to find children of matched mental age for both sample groups. Orion's pragmatic language skills questionnaire was applied to evaluate pragmatic language skills of children in both groups. Slosson intelligence test was administered to recruit the sample according to targeted mental age for both sample groups. The average screening time was 20-25 minutes. After applying slosson intelligence test those who were not matching criteria were excluded and those who met the criteria were included for further procedure. Demographic form along with Orion's pragmatic language skills questionnaire was presented to the parents of child. Parents were asked to fill those questionnaires. The data was completed in four weeks. Research ethics were kept into consideration. After data collection data was enter in SPSS. Statistical analysis was done and data was analysed.

Results

Statistical Analysis

SPSS (Statistical Package for Social Sciences) version 21 was used for analysing the data. Independent sample t-test was used to discover the difference in the pragmatic language skills of children with DS and typically developed children. Differences were also identified on the basis of gender for both groups through Mann Whitney U test. Pearson correlation was employed to inspect the correlation between demographics and pragmatic language skills. Descriptive for demographics were identified for both groups.

Table 1

Psychometric Properties of the Study Variables

Variables	K	M	SD	α	Range
OPLS	53	130.33	28.80	.96	1-5
NVC	8	15.3	3.16	.73	1-5
ES	8	21.40	4.66	.75	1-5
CSTM	6	16.77	6.01	.93	1-5
CSTT	6	15.98	4.49	.84	1-5
SC	6	12.95	3.36	.75	1-5

PS	12	30.15	7.04	.85	1-5
O	7	17.73	4.86	.82	1-5

Note: OPLS= Orion's pragmatic language skills questionnaire, NVC=nonverbal communication, ES=expressive skills, CSTM=conversational skills-topic maintenance, CSTT=Conversational skills-turn taking, SC=speech convention, PS= peer skills, o=other social behaviors Inter- rater reliability of the Orion's pragmatic language skills checklist and its sub-scales was evaluated through Cronbach Alpha value. Table 1 showed the inter-rater reliability of the OPLS. The inter-rater reliability of the OPLS was .96 which is considered as perfect. Reliability of subscales was also ranging from .73 to .93.

Table 2

Independent Sample T-Test assessing Pragmatic Language Skills (N=60)

	Child category								
	DS (n=30)		TD(n=30)				95%CI		
Variables	M	SD	M	SD	T	P	LL	UL	Cohen's d
NVC	14.5	3.40	16.2	2.70	2.14	.036	.110	3.28	.5
ES	24.1	4.78	18.7	2.49	-5.47	.001	-7.37	-3.42	1.41
CSTM	21.16	5.15	12.36	2.64	-8.32	.001	-10.91	-6.68	2.15
CSTT	18.83	4.04	13.13	2.82	-6.32	.001	-7.50	-3.89	1.63
SC	14.56	3.51	11.33	2.30	-4.21	.001	-4.768	-1.69	1.08
PS	33.63	7.60	26.6	4.24	-5.43	.001	-10.14	-3.78	1.14
O	20.23	5.29	15.23	2.61	-4.62	.001	-7.16	-2.83	1.19

Note: CI=Confidence interval, NVC=nonverbal communication, ES=expressive skills, CSTM=conversational skills-topic maintenance, CSTT=Conversational skills-turn taking, SC=speech convention, PS= peer skills, o=other social behaviours.

Table 2 shows differences in the mean, standard deviation and t value for children with down syndrome and typically developing children on pragmatic skills. The higher mean shows the weakness of that skills. Results indicated that there was significant difference in the means of nonverbal communication skills for both sample groups t(58)=2.14, p>0.03. It indicated that typically developing children score higher on nonverbal communication (M=16.2, P>0.03) as compared to Children with down syndrome (M=16.2, p>0.03). There was significant difference in the means of expressive skills t(58)=-5.47, p>0.001. It specified that children with down syndrome score higher on expressive skills (M=24.1, P>0.001) as compared to typically developing children (M=18.7, p>0.001). Significant difference was present in the means of topic maintenance skills t(58)=-8.32, p>0.001. It showed that children with DS score higher on topic maintenance skills (M=21.16, P>0.001) as compared to typically developing children (M=12.36, p>0.001). There is also significant difference in the means of turn taking skills t(58)=-6.32, p>0.001. It indicated that children with DS score higher on turn taking skills (M=18.83, P>0.001) as compared to typically developed children (M=13.13, p>0.001). Results also showed that there is significant difference in the means of speech conventions t(58)=-4.21, p>0.001. It revealed that children with DS score higher on speech convention (M=14.56, P>0.001) as compared to typically developing children (M=11.33, p>0.001). Significant difference was present in the means of peer skills t(58)=-5.43, p>0.001. It indicated that children with DS score higher on peer skills (M=33.63, P>0.001) as compared to typically developing children (M=26.6, p>0.001). There was also significant difference in the means of social behaviors t(58)= -7.16, p>0.001. It showed that children with DS score higher on other social behaviors (M=20.23, P>0.001) as compared to typically developing children (M=15.23, p>0.001).

Table 3

Mann Whitney u test assessing gender differences in children with down syndrome

Variables	Mean rank		U	Z	P
	Boys	Girls			

NVC	18.38	12.21	66.00	-1.925	.058
ES	21.72	8.39	12.50	-4.14	.001
CSTM	21.09	9.11	22.50	-3.73	.001
CSTT	20.19	10.14	37.00	-3.15	.001
SC	20.72	9.54	28.50	-3.49	.001
PS	21.66	8.46	13.50	-4.10	.001
O	20.47	9.82	32.50	-3.31	.001

Note: NVC=nonverbal communication, ES=expressive skills, CSTM=conversational skills-topic maintenance, CSTT=Conversational skills-turn taking, SC=speech convention, PS= peer skills, o=other social behaviours.

Table 3 present the gender differences in the pragmatic skills of children with down syndrome through Mann Whitney U test. The higher scores show the weakness of that skills. Results indicates that there is significant difference in the mean ranks of nonverbal communication skills of boys (Mean Ranks=18.38) than girls (Mean Ranks=12.21). It showed that girls with down syndrome had stronger nonverbal communication than boys (U=66, P=.05). There is also significant difference in the mean ranks of expressive skills of girls (Mean Ranks=8.39) and boys with down syndrome (Mean Ranks=21.72). It indicated that boys score higher on expressive skills as compared to girls (U=12.50, P=.001). Significant difference was present in the means of topic maintenance of boys (Mean Ranks=21.09) than girls (Mean Ranks=9.11). It indicated that boys had scored higher on topic maintenance skills as compared to girls (U=22.50, P=.001). There is also significant difference in the mean ranks of turn taking skills of boys (Mean Ranks=20.19) than girls (Mean Ranks=10.14). It indicated that boys score higher on turn taking skills (U=37, P=.001). Mann Whitney U test also showed significant difference in the mean ranks of speech convention of boys (Mean Ranks=20.72) and girls (Mean Ranks=9.54) indicating that girls had stronger speech convention skills than boys with DS (U=28.50, P=.001). There is significant difference in the mean ranks of peer skills of girls (Mean Ranks=8.46) and boys (Mean Ranks=21.66) suggesting that boys had score higher on peer skills as compared to girls (U=13.50, P=.001). There was also significant difference in the mean ranks of other social behaviors of boys (Mean Ranks=20.47) and girls (Mean Ranks=9.82). It indicated that boys had higher scores on other social behaviors (U=32.50, P=.001).

Table 4

Mann Whitney U Test Assessing Gender Differences of Typically Developing Children

Variables	Mean rank		U	Z	P
	Boys	Girls			
NVC	18.89	12.53	64	-1.99	.047
ES	17.29	13.94	87	-1.05	.313
CSTM	15.86	15.19	107	-.210	.854
CSTT	16.57	14.56	97	-.629	.552
SC	15.50	15.50	112	.00	1.00
PS	17.18	14.03	88.50	-.98	.334
O	16.43	14.69	99	-.548	.608

Note: NVC=nonverbal communication, ES=expressive skills, CSTM=conversational skills-topic maintenance, CSTT=Conversational skills-turn taking, SC=speech convention, PS= peer skills, o=other social behaviours.

Table 4 presents the gender difference in the pragmatic skills of typically developing children through Mann Whitney U test. Mann Whitney U test presented statistically significant difference for nonverbal communication of typically developing boys and girls (U=64, P=.047). The mean ranks for boys was (Mean Ranks=18.89) and girls (12.53). Results disclosed that there was no significant difference present in the expressive skills of typically developing girls and boys (U=87, P=.313). The mean ranks for boys was (Mean Ranks=17.29)

and girls (Mean Ranks=13.94). Results also showed that there was no significant difference present in the topic maintenance skills of typically developing girls and boys (U=107, P=.854). The mean ranks for boys was (Mean Ranks=15.86) and girls (Mean Ranks=15.19). Mann Whitney U test also revealed that there was no significant difference present in the turn taking skills of typically developing girls and boys (U=97, P=.552). The mean ranks for boys was (Mean Ranks=16.57) and girls (Mean Ranks=14.56). Results also revealed that there was no significant difference present in the speech conventions of typically developing girls and boys (U=112, P=.1.00). The mean ranks for boys was (Mean Ranks=15.50) and girls (Mean Ranks= 15.50). Results showed that no significant difference was present in the peer skills of typically developing girls and boys (U=88.50, P=.334). The mean ranks for boys was (Mean Ranks=17.18) and girls (Mean Ranks=14.03). Results revealed that typically developing girls and boys had no significant difference present in the other social behaviors (U=99, P=.608). The mean ranks for boys was (Mean Ranks=16.43) and girls (Mean Ranks=14.69).

Table 5 showed that there was no statistically significant difference present between pragmatic language skills of children with down syndrome and typically developing children on the basis of family system.

Table 5

Independent Sample T-Test Assessing Family System differences.

	Family system								
	Nuclear		Joint				95%CI		
Variables	M	SD	M	SD	T	P	LL	UL	Cohen's d
NVC	14.00	3.08	15.15	3.80	-.918	.366	-3.72	1.42	.332
ES	23.23	3.56	25.23	6.00	-1.13	.265	-5.59	1.59	.405
CSTM	20.82	4.61	21.61	5.95	.411	.684	-4.73	3.15	.148
CSTT	18.11	4.02	19.76	4.07	-1.13	.275	-4.69	1.38	.407
SC	13.82	2.9	15.53	4.07	-1.34	.190	-4.32	.898	.483
PS	31.58	7.49	36.30	7.15	-1.74	.092	-10.2	.828	.644
O	19.70	4.75	20.92	6.06	-.617	.542	-5.25	2.82	.224

Note: CI=Confidence interval, NVC=nonverbal communication, ES=expressive skills, CSTM=conversational skills-topic maintenance, CSTT=Conversational skills-turn taking, SC=speech convention, PS= peer skills, o=other social behaviour.Next the relationship between different demographic characteristics with the pragmatic language skills was find out by Pearson product-moment correlation coefficient (PPMCC).

Table 6

Pearson Product Moment Correlation of Pragmatic Language Skills and Demographic Characteristics in Children with Down Syndrome (N=30)

Measures	1	2	3	4	5	6	7	8	9	10	11
1. NFM	-	.137	-.097	.075	.292	.217	.094	.211	.219	.233	.101
2. SSA	-	-	.202	.123	.354	.114	.120	.153	.073	.031	.100
3. PCI	-	-	-	.242	.287	.303	.378*	.170	.298	.277	.156
4.UFW	-	-	-	-	-.015	.473	.265	.279	.362*	.248	.218
5. NVC	-	-	-	-	-	.53**	.599**	.570**	.417**	.594**	.493**
6. ES	-	-	-	-	-	-	.788**	.778**	.741**	.810**	.690**
7. CSTM	-	-	-	-	-	-	-	.720**	.763**	.813**	.771**
8. CSTT	-	-	-	-	-	-	-	-	.575**	.757**	.648**
9. SC	-	-	-	-	-	-	-	-	-	.812**	.804**
10. PS	-	-	-	-	-	-	-	-	-	-	.864**
11.O	-	-	-	-	-	-		-	-	-	-

Note: NFM=no. of family members, SSA=school starting age, PCI=parental child interaction time, UFW=utterance of first word, CSA=conversation starting age, NVC=nonverbal communication, ES=expressive skills, CSTM=conversational skills-topic maintenance, CSTT=Conversational skills-turn taking, SC=speech convention, PS= peer skills, o=other social behaviour.

Table 6 showed that number of family members does not show any correlation with pragmatic skills. School starting age also had not any correlation with pragmatic skills. Parent child interaction time had significant positive correlation with topic maintenance skills (r=.378, p=.03). Utterance of first word had significant positive correlation with conversation starting age (r=.466, p= .01) and speech convention (r=.362, p=.04). Nonverbal communication had significant positive correlation with expressive skills (r=.535, p=.002), topic maintenance skills (r=.599, p=.001), turn taking skills (r=.570, p=.001), speech conventions (r=.417, p=.02), peer skills (r=.594, p=.001) and other social behaviors (r=.493, p=.006). Expressive skills significantly positively correlate with topic maintenance skills (r=.788, p=.001), turn taking skills (r=.778, p=.001), speech conventions (r=.741, p=.001), peer skills (r=.810, p=p=.001) and other social behaviors (r=.690, p=.001). Topic maintenance skills showed significant positive correlation with turn taking skills (r=.720, p=.001), speech conventions (r=.763, p=.001), peer skills (r=.813, p=.001) and other social behaviors (r=.771, p=.001). Turn taking skills also had significant positive correlation with speech conventions (r=.575, p= .001) peer skills (r=.757, p=.001) and other social behaviors (r=.648, p=.001). Speech conventions showed significant positive correlations with peer skills (r=.812, p=.001) and other social behaviors (r=.804, p=.001). Peer skills had significant positive correlation with other social behaviors (r=.864, p=.001).

Next the frequency and percentage of the participants who are in neurotypical and deficiency range were identified.

Table 7

Frequency and Percentage of Neuro Typical and Deficiency Range (N=60)

Variabes	Child category			
	DS(n=30)		TD (n=30)	
	f	%	f	%
NVC				
Neurotypical	28	93.3	26	86.7
Deficiency	1	3.3	1	3.3
ES				
Neurotypical	6	20	19	63.3
Deficiency	23	76.7	8	10
CSTM				
Neurotypical	3	10	25	83.3
Deficiency	26	86.7	2	6.7
CSTT				
Neurotypical	3	10	22	73.3
Deficiency	25	83.3	5	16.7
SC				
Neurotypical	15	50	28	93.3
Deficiency	12	40	1	3.3
PS				
Neurotypical	10	33.3	23	76.7
Deficiency	19	63.3	5	16.7
O				

Neurotypical	9	30	25	83.3
Deficiency	21	70	5	16.7

Note: NVC=Nonverbal communication, ES=Epressive skills, CSTM=conversational skills-topic maintenance, CSTT=conversational skills-turn taking, SC=speech conventions, PS=peer skills, O=other social behaviors

Table 7 showed that on nonverbal communication skills down syndrome group had 93.3% participants on neurotypical range and 3.3% on deficiency range. Whereas typically developing had 86.7% participants on neurotypical range and 3.3% on deficiency range. Which indicated better nonverbal communication in down syndrome group. Expressive skills section included only 20% down syndrome participants on neurotypical range whereas 76.7% on deficiency range as compared to 63.3% typically developing children on neurotypical range. Topic maintenance skills and turn taking skills had only 10% participants on neurotypical range from down syndrome group whereas 86.7% on deficiency range as compared to typically developing group had 83.3% on neurotypical range. Speech convention section had 50% participants from down syndrome group on neuro typical range as compared to 93.3% typically developing children. Which indicated that down syndrome showed good performance on speech convention skills as compared to their other pragmatic skills. Only 33.3% participants from down syndrome group had neuro typical range on peer skills. 30% participants were on neuro typical range from down syndrome group and 83.3% from typically developing groups on other social behaviors section.

Discussion

In the present study data was collected from children whose mental age was ranging from 5.0 to 6.0 years after screening their intellectual ability. Data was collected from schools and down syndrome community in Lahore. Parental report on pragmatic language skills was obtained on Likert scale covering nonverbal communication skills, expressive skills, topic maintenance skills, turn taking skills, speech conventions, peer skills and other social behaviors. First it was hypothesized that there is likely to be significant differences in the pragmatic language skills of children with down syndrome and typically developing children. The results of the study support this hypothesis. Significant difference was present in all areas of pragmatic language skills of children with DS and typically developing children of the matched mental age including expressive skills, topic maintenance skills, turn taking skills, speech conventions and peer skills. However, the results also showed that children with down syndrome had stronger nonverbal communication skills than typically developing children. Researches with mixed result findings are present in the literature. The finding of this study is in line with study by Lee (2017). He examined the pragmatic language competency of children with DS and typically developed peers of the matched mental ages ranging from 4.98 to 5.93 years. According to his research findings children with down syndrome present pragmatic impairments as compared to control group of the same mental age. Children with down syndrome showed stronger nonverbal communication skills. According to Berglund (2001) children with DS are capable of using expressive language for discussing absent objects, past and future situations but in findings of present research expressive skills were poor in children with DS when compared to typically developed children. Abbeduto (2007) had done a metanalytic review of pragmatic language skills of children with DS and typically developing children. According to his study requesting and commenting are thought to be a strength in down syndrome. Kumin (1996) conducted a research which stated that children with DS are capable to request and commands efficiently. They are also able to maintain topic. They respond appropriately to request for clarification when communicating with others. The difference and conflict in these researches may be due to cultural differences across globe. According to Chen (2010) Cultures are in distinction with each other because the language spoken in these cultures itself varies. People of east and west have cultural differences by

languages they speak. Due to language difference in different cultures speakers of different languages are also cognitively different. People use different pragmatic skills across different culture. (Lam,2017). Eastern languages use numerous speech acts such as complaints, appreciation, requests and respond to compliments in different styles than people of west. It means that children belonging to different cultures may have different results in pragmatic language skills. Statistically there was difference in pragmatic language skills of down syndrome and typically developing children. Children with down syndrome showed stronger nonverbal communication skills. Along with nonverbal communication speech conventions were also better in down syndrome. Although there was statistically difference in speech convections but half of the children with down syndrome scored neuro typical range in this section. According to results children with down syndrome have poor peer skills but they demonstrate empathy with others. They also accept and offers compliments. These findings go in line with the research findings of Kumin (1996). The second hypothesis was that there is likely to be significant gender difference in the pragmatic language skills of children with down syndrome. The findings of a research support this hypothesis. There was statistically significant difference in the pragmatic language skills of children with Down syndrome. Girls performed better in all areas of pragmatic skills than boys with down syndrome. The result of this hypothesis is in row with study by Lee, (2017). According to the results of this study there is significant difference in the pragmatic skills of children with DS on the basis of gender. Girls have better pragmatic skills then boys with down syndrome. The reason maybe that girls often start speaking earlier than boys. Third hypothesis was that there is likely to be significant gender difference in the pragmatic language skills of typically developing children. The outcomes showed that typically developing girls and boys had no statistically significant difference in the pragmatic language skills except the nonverbal communication on which girls outperformed. This outcome was in row with the results of study by Lee (2017). Typically developing girls and boys had similar results in all areas of pragmatic skills. Afterwards it was hypothesized that there was likely to be difference in the pragmatic language skills of children with down syndrome and typically developing children belonging to different family systems. The results showed that there was no significant difference present in pragmatic skills on the basis of family system. Das and Priya (2017) research findings are at the odd of this result which revealed that there is significant difference present in the language skills of children belonging to different family systems. Children from joint family had better language development than nuclear family system. The reason for this can be because family system is not the only factor that can influence pragmatic language skills. It was hypothesized that there is likely to be relationship of variables such as number of family members, birth order, parent child interaction time, school starting age, mother and father education, utterance of first word with the pragmatic language skills of children with down syndrome. The results revealed that school starting age has no correlation with pragmatic skills of down syndrome. No research studies were found out in favor or against of this finding. But the research discussing the influence of school starting age on language development by Rockville (2007) claimed that children starting kindergarten at early age had stronger word recognition skills but their linguistic knowledge was poor. The results of the study showed that parent child interaction had significant positive correlation with topic maintenance skills of children with Down syndrome, although exact research is not available in the support of this finding but there is a research conducted by Safwat and Sheikhnay (2014) which showed that parent-child interaction is one of the most important factors in the language expansion of a child. When child interact with parents and spend more time with then their language skills improve a lot. They learn new ways from parents to communicate with others. The results of study showed that number of family members had no significant correlation with pragmatic skills of both children with down syndrome and typically developing children. According to Ortiz (2009) large family size have more members and relatives so it improves the child interaction with

others and their use of language will also improve. The cause of no relationship between number of family members and pragmatic language skills is that now days every person in family use gadgets and social media they do not spend time with each other either they are living in same house. It was revealed that there was no correlation between birth order and pragmatic language skills of both groups. There is no direct research in support of this finding but there is a research by Falkum (2018) which explains that important disparities in language learning settings exist on the basis of family structure, birth order and sibling role. Accessibility of family resources, parental care, time vigor, and affiliation with family members and parents are different for children in different birth orders. And it may have influence on younger sibling language development. The results showed that utterance of first word is likely to have significant positive correlation with speech convection in children with down syndrome. According to Niano (1985) first word that child learn are probably rules for the lexicalization of specific communicative acts. So, if the child learns to utter meaningful words it means that they will develop language and its use in daily life. It was identified that nonverbal communication skills, expressive skills, conversational skills, speech convection, peer skills and social skills are all interlinked with each other and significant positive relation was found out between them. which mean that increase in one skill will increase other skills. These findings go in line with the research study by Munday, Sigman, Kasari and Yirmia (1988) which suggested that expressive language is associated with early developing nonverbal requesting skill among children with down syndrome. Children who will have better nonverbal skills will have better expressive skills and those who have deficits in nonverbal skills will associate with deficits in expressive skills. Those who have better expressive skills will have better conversational skills and their peer and social skills will also be better.

Conclusion

It was concluded from the present study that there was statistically significant difference in pragmatic language skills of children with down syndrome and typically developing children of the matched mental age of 5 to 6 years. The results of the study are consistent with many earlier researches. There were also statistically significant gender differences between pragmatic skills of children with down syndrome. Girls with down syndrome performed better in all areas of pragmatic skills than boys with down syndrome. There was no significant difference present in pragmatic skills on the basis of family system. The results of the study revealed that demographic characteristics had significant positive correlation with pragmatic language skills of children with down syndrome. The findings of this research may help as baseline for future researches on down syndrome. It may also help for development of intervention program for children with down syndrome. Further this research also extends the literature based on the pragmatic language skills of children with down syndrome.

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