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DEVELOPMENT OF SCHOOL-AGE CORE URDU VOCABULARY FOR CHILDREN WITH DOWN SYNDROME

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Abstract

The need for core vocabularies is paramount and the development of such a tool is a necessity for functional communication. Augmentative alternative communication is heavily dependent on such tools and the need for this list stemmed from an existing gap in the literature for Urdu core vocabulary. These core words have been developed particularly for children with Down syndrome to be used across a variety of settings with a range of communication partners. To identify a set of Urdu Core Vocabulary words for school going children with Down syndrome. The study employed a descriptive study method and a sample of 20 children (5-12 years) with Down syndrome from 5 special needs schools and rehabilitation centers of Rawalpindi and Islamabad, through audio and video recordings. These children used Urdu as their primary means of communication. Three factors were addressed a) commonality at minimum 50% b) frequency of grammatical elements c) frequency of words. The study results show a total of 83 nouns, 24 verbs, 3 pronouns, 22 adjectives, 4 prepositions, 5 adverbs and 2 conjunctions. The total word sample consisted of 709 words. A highly frequent list of words led to the selection of 24 core vocabulary words. The present study has been successfully able to generate a set of core vocabulary words in Urdu for school aged children with Down syndrome.

Key words Core vocabulary, Augmentative alternative communication, Down syndrome

Introduction

Core vocabulary

Core-vocabulary is related to those words that are repeatedly and regularly used in a language for communicating meaning. Core vocabulary is described as a small set of words and phrases that do not alternate between ranges of environments or between variations of individuals. (1) There has been limited work on development of core vocabulary lists for Urdu speaking children. The lists that are currently being developed are for school aged children. Those that have been compiled have analyzed data from typically developing children and are mostly in other languages. The set of words that are considered to have a greater occurrence and commonality in any given language, are unmarked and lie at the nucleus of any language fall under the category of core words. (2) These words allow for maximum usage in spontaneous speech

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formation and also assist those who are non-verbal to use signs, pictorial symbols, and/or written means of communication. (3) This allows for a sample of only hundred words to be used by anyone to be able to produce 80% of what is required to be communicated. (4) Successful communication is when the person is able to employ the quickest and an automatic method of access to the most frequently used words. (5) This is a phenomena common in many languages where there is a scarcity of basic evidence based tools and resources in local or national languages. When an individual is likely inclined to the power to communicate, it decreases aggravations and outbursts, and stimulates optimistic societal communications(6). Core vocabulary consists basic of functional words, which stand in contrast to concrete words. Concrete words has person's extended vocabulary, also called fringe vocabulary. Extended vocabulary is considered large and highly individual, consisting mostly of nouns, pronoun, adverb, verbs, and/or adjectives. With these words, a person is capable to specify their particular actions, comforts, surroundings, and their own interest (7).

Development of Core Vocabulary around the World

Several languages have developed their own core vocabulary due to the diversity and between languages both with regards to the linguistics and also on the basis of culture. There is a separately developed list for Chinese and mandarin language based on the analysis of grammar of the language and cultural relevance language lists. (8) In a Korean study on core vocabulary, the classification of the most frequent and common words was carried out to develop a core vocabulary list for spontaneous speech samples (9). Similarly an Arabic core vocabulary list has been developed for Qatar. The core vocabulary was developed on a sample of 5 children and the users, their families, teachers and clinicians were involved in the development of the final symbol selection as part of the study (10). The most widely used and researched core vocabulary for toddlers was developed in natural settings with 50 children. In most of the studies that are linked to development of core vocabulary, two main activities and themes were selected which included play and meal times recordings(11). An Urdu core vocabulary list of 250 words for 18 to 35 years adults has been developed. (12) This list is not a true representative sample as it may not be appropriate for children with Down syndrome. Critical shortage of core vocabulary lists in Urdu for children with Down Syndrome is further highlighted via Dutch research in which core vocabulary lists for 30 kids with Down syndrome 2 and 7 years of age had been developed across three distinctive activities with multiple verbal exchange companions (unrestricted play with parents, lunch- or snack-time at domestic or at school, and speech therapy sessions). The authors argue that this population is missing in core vocabulary literature. (13)

Augmentative Alternative Communication (Aac)

Augmentative alternative communication (AAC) is any approach that assists in augmenting or providing an alternate means of communication. This can be where a person may have an existing means of communication which is not efficient and hence it is supported through signs, gestures, and devices. On the contrary alternative refers to a means of communication whereby a separate method of communication is provided and the person relies on that. (14) It also includes simple systems like pictures, gestures and pointing and lies between a continuum of low tech to high tech and from simple to complex mode of communication. AAC most systems depend on signs, pictures or object use in the place of device(15). The objective of Augmented

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and Alternative Communication is enhancement of speech capabilities of children who have difficulties in communicating with others verbally and are unable to produce speech due to deficits in language development(16).

Use of Core Vocabulary for Augmentative Alternative Communication

The AAC user will benefit from the usage of core vocabulary as it allows for the use of high frequency vocabulary allowing for vocabulary to be used in various contexts and situations with a range of communicative partners allowing for maximum use of communication and for a chance at production of novel utterances. (17) The evolving traits of vocabulary increase in kids with Down syndrome was evaluated through a parental record (the Italian version of the MacArthurBates Communicative Development Inventories [CDI]). This was a longitudinal research, including 18 kids with Down syndrome, and a cross-sectional study, comprising 27 adolescents with Down syndrome. An evaluation with normative statistics confirmed that children with Down syndrome had a substantially decreased vocabulary measurement than their typically developing peers. (18) It can be concluded from this study that core vocabulary can be targeted in AAC devices to overcome the lack in vocabulary size.The practice of science to aid in the communication, socializing, language, and motor capabilities of individual with DS is particularly important for countries like Pakistan where there are no such researches.. There is a necessity to validate any vocabulary which is socially applicable in order to ensure that it is relevant and useful for the person using the AAC system(19).The vocabulary classification is of vital significance in the adaption of AAC devices, and it is primarily based on core word lists proposals. Nine core word lists were revised and were placed in one list known as the Super List. The empirical outcomes exhibit that with a usual list of one hundred words it is feasible to recall fifty to seventy percent of children's utterance. The significance of core word lists is confirmed(20). Work on vocabulary list expansion recommends there must be three properties provides when selecting AAC vocabulary, it must have more often used vocabulary; it must stand for depiction of all global, important meaningful ideas; and it must encounter needs of users' anticipations of what may need to be communicated on a day to day basis, in any particular condition or surrounding.

Down Syndrome

Down syndrome is considered a congenital abnormally which affects 1000 babies in the UK. It takes place in people of all races, and men and women are equally affected. It was named after a British health practitioner who is credited as the first individual to describe the condition. Individuals with DS usually have special neurocognitive and neurobehavioral outlines that begin inside precise developing stages. Preliminary in infancy, moderate abnormalities from irrationally growing trajectories arise. When the individual is due to commence school, these difficulties and delays tend to become more pronounced and evident. Nonverbal capabilities shows deficit for intellectual age, however oral language discrepancies arise and stick around whole life. Nonverbal mastering and memory are strengths relative to verbal skills. Expression is hindered comparative to understanding. Features of language capabilities proceed to improve during puberty, even though verbal abilities persist to be compromised in adulthood. Discrepancies in attention decision-making features are existing in childhood and turn out to be extra more reported with age(21).

Individuals having trisomy 21 when intercede primitive speech therapy, physiotherapy and occupational therapy and are inclined to befitting medical

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guidance for distinctive health problems, can have a good elongated result as assimilated to other heretic antecedent of intellectual disability(22). The ultimate instances are because of mosaicism chromosome 21 and it could be the genetic code of a structural relocation leading to partial trisomy. Mosaicism and trisomy are not genetically possessed however originate from incomplete duplication of cells throughout the growth of the egg, semen or embryo. Similarly, full trisomy for chromosome 21 should be in addition divided into more instances of maternal foundation, and instances of paternal origin, less than 10 %(23).

People with Down syndrome might act and have similar shapes but each person has different abilities. Individual with Down syndrome commonly have an IQ (a measure of intelligence) in the mildly-to-moderately low range and are tardy to speak than other kids. Some usual bodily features of Down syndrome have : A flattened facial musculature , specifically the bridge of the nose, small pointed eyes that are leaned up, small neck, small ears, tongue that extends to stay out of the mouth, small white dots on the iris of the eye, short hands and feet ,single line throughout the palm of the hand .Small tiny fingers that often tend to move downward to the thumb, poor muscle tone or loose joints and short in height as children and adults(24).

In a study conducted on pregnant women in Pakistan was done. The findings of the study were 03 out of the 07 samples taken from pregnant mothers aged above 35 and one refinement from a patient aged less than 35, depicted DS. (25) Onset of first word acquisition is relatively slower and consequent development of expression of language is hindered as compare to normally developing children(26). Children with Down syndrome obtain their developmental capabilities with very slow pace and achieve ceiling scores at 12 years of age, a level below than of normal growing children was seen. (27) Receptive language is normally good than expressive language and face issues in mental representation, sentence structure and appropriate use of language socially. (28)

Core vocabulary and Down syndrome

Core vocabulary plays vital role for all AAC users, irrespective of somatic or intellectual disabilities. (5) Usage of technology to aid in the conversation, socializing, oral communication, and motor competencies of kids with DS is needed. The intention of the research was to examine conclusions concerning the unique contraptions of 'augmentative and augmentative verbal exchange' used in kids with DS. A complete of 1087 articles have been recognized. 13 articles met the inclusion standards. The devices maximize the utilization of SGDs and PECS. This encourages interaction with people among this population and their friends, contributing a good factor towards their life enhancement(29).

While there is significant inconsistency, most of children with DS have intellectual hindrance , speech and language insufficiencies, predominantly in producing verbal speech and structure of a sentence and deprived speech intelligibility.(30)the research findings indicate that by targeting core words language production can be enhanced to an optimal level. When the child is developing his language targeting of core vocabulary will be much beneficial to extend the length of language utterances and increase in vocabulary can lead to semantic capabilities thus it can be concluded that concentrating on functional vocabulary yielded favorable results. (31)

Core vocabulary plays a vital role in enhancement of language production individuals with Down syndrome as it marks 80% of entire words used in everyday conversation.

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Research findings indicate when core vocabulary and extended words are taught together the usage of AAC gets high. Core vocabulary makes users self-dependent and direct the communication. Alternative Augmentative Communication gives classifications of each activity which is related to the individual with communication barriers of daily need. AAC can clearly promote understanding of meaningful words; phrase or writing in context AAC can provide the structure in which words are set in grammatical pattern. Vocabulary selected might base on expressed communication purposes such as asking for a thing, observing, greetings, denial and protesting. Core vocabulary is lesser in scope variant across environment. Common words are used across all communication setting or between individuals (32)

The reason behind conducting this research stems from the need to fill a gap in the existing literature. There is currently no core vocabulary list available for use for Urdu in Pakistan for Down syndrome children. The single research to date in Urdu has been conducted on an adult population involving a specific topic for interaction. Core vocabulary which refers to set of words that is essential for communicating exists in other languages however; these cannot be translated for Urdu as there are linguistic and cultural barriers. The leading notion behind development of such list tends to establish the most frequent and commonly used words in a specific language. These words should have the ability to be used across a range of situations and in various manners. Such vocabulary lists are crucial for use with communication revolving around augmentative alternative communication. The list will be helpful for increasing vocabulary of individual with DS.

This is a novel study and the first study to establish core vocabulary for school going children with Down syndrome. These core vocabularies can then be used for academic and communication purposes. Augmentative Alternative Communication relies heavily on such vocabulary lists. Augmentative and alternative means of communication helps individuals who are incapable to use verbal speech to talk effectively and efficiently. It will open further avenues for Augmentative Alternative Communication use in Pakistan and will allow for further symbol development in Urdu for AAC users and it will contribute and enhance the existing body of knowledge in the field.

Materials And Methods

Participant

Children with DS were selected for this crossectional study from different special schools of Rawalpindi and Islamabad and speech and language therapist working with them. Children from 5 to 12 years old age were selected. Some researchers showed that children with Down syndrome do not develop language prior to 5 years. So it was decided to include of this age. Children who fulfilled following inclusion criteria were selected. Participants who are were selected were attending their speech therapy session twice or thrice a week.

Procedure

In the current study core vocabulary was identified by collecting language samples by interacting in multiple setting and with multiple communicative partners. Children were taken from English and Urdu medium schools. The data was recorded for 2.5 hours sessions during the school day in activities during lunch time, play time activities. Parents of children were asked to record their general conservation, meal time and play time activity at home for a minimum of 1 hour. The recordings were then analyzed and the data was statistically analyzed. Standardized language

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assessment was not possible due to lack of any standardized tools in Urdu in Pakistan. An informal assessment of language was conducted as a baseline for selection of the children. The baseline for selection was set at minimum 2 Information carrying word level understanding and a minimum of the second level of Blank Levels of questioning to match the language level of the Dutch Study. The children who responded correctly on 2 ICW's, and had a minimum of single word productions (verbal or gestural) were included in the study. Initially, it was recommended to place children into groups based on their IQ, however, schools and parents both declined for their children to be tested and requested that the language testing method alone should be considered as a pre-requisite and base. Digital voice recorder was used for audio recordings and Samsung S6 edge camera was used by the researcher for video recording. A self-designed tool for 1-3 ICW level understanding was used for language assessment.

Data Analysis and Transcription

Data was input and analyzed through excel and SPSS-21 software. Each word was placed in a list and the number of times that each words was produced was noted. Imitation of speech, noises, and symbol was excluded, imitated phrases, either spoken or guided words and phrases were excluded from the list, where a gesture was made in the absence of words, that was also used in the list for example a child gesturing another child to come was added as come to the list, names were removed from the list for the purpose of confidentiality.Commonality of words was selected based on a commonality score of minimum 10, which indicates the words that had been used by as a minimum of fifty percent of the individuals in the current study would be considered for the core vocabulary list. Words were placed into various grammatical categories such as nouns, verbs, pronouns, adjectives, prepositions and conjunctions. Core words were transcribed according to their pronunciation.

Results

The study results of the study have been complied through sample selection from special schools of Rawalpindi and Islamabad with the sample of 20 students the total number of words came out to be 709. The results show a total of 83 nouns, 24 verbs, 3 pronouns, 22 adjectives, 4 prepositions, 5 adverbs 2 conjunctions and 2 questions. Highly frequent words led to the selection of 24 core vocabulary words.

Table 1 shows demographics of the participants. The graph 1, clearly outlines the frequency of grammatical categories

Demographics	Frequency N
Gender	
Male Female	13 7
Age in years	

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5-6 7-8 9-10 11-12	4 8 5 3
Languages	
Monolingual Bilingual	17 03
Schools	
Sedum School Down Syndrome Club Hassan Academy Hope Inn Chambeli Profiles	06 04 05 03 01 01

Table No 1 Demographics

Below is the list of the 24 words that were used by school aged children who are with Down syndrome across most of the settings that has commonality in school i.e. (play time, lunch time and speech session) as well as in home recordings.

S.no	Words in urdu	Transcription	English	Percentage	Grammatical element
1	Nhi \na	nəhɪ	No	21.7%	Noun
2	Yeh	Je	This	16.8%	Pronoun
3	Ha	Hæ	Is	16.2%	Verb
4	Je\han	hɑ̃:/ d ʒi	Yes	15.7%	Noun
5	Mein \mera	mæ/ merɑ	I	9.2%	Pronoun

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6	Mama\ami	əmmɪ	Mother	5.8%	Noun
8	Idher	ɪ dʱ ər	Here	5.1%	adverb
9	Aik	e:k	One	4.8%	Adjective
10	Papa\abu	əbbu	Father	4.6%	Noun
11	Do	d o	Give	4.6%	Verb
12	Rehe	rəhi	-	4.3%	Verb
13	Acha\achi	ˈatʃ tʃɑ	Good	3.4%	Adjective
14	Mujhai	mʊʤʤʰ e	Me	3.1%	Pronoun
15	Two	tu	two	2.9%	Noun
16	Theek	ʈʰ i:k	Fine	2.7%	Adjective
17	Apple	æpəl	Fruit	2.6%	Noun
18	Raha	rəha:		2.6%	Verb
19	Meray	Mere	Mine	2.5%	Pronoun
20	Chalo	t ʃ əlo	Go	2.4%	Verb
21	Karo	kəro	Do	2.3%	Verb
22	Lo	Lo	Take	2.2%	Verb
23	Khao \kha	k^hao /k^ha:	eat	2.2%	Verb
24	Aisay	æ:se	Like this \as	2.1%	Adjective

Table No 2: Core Words

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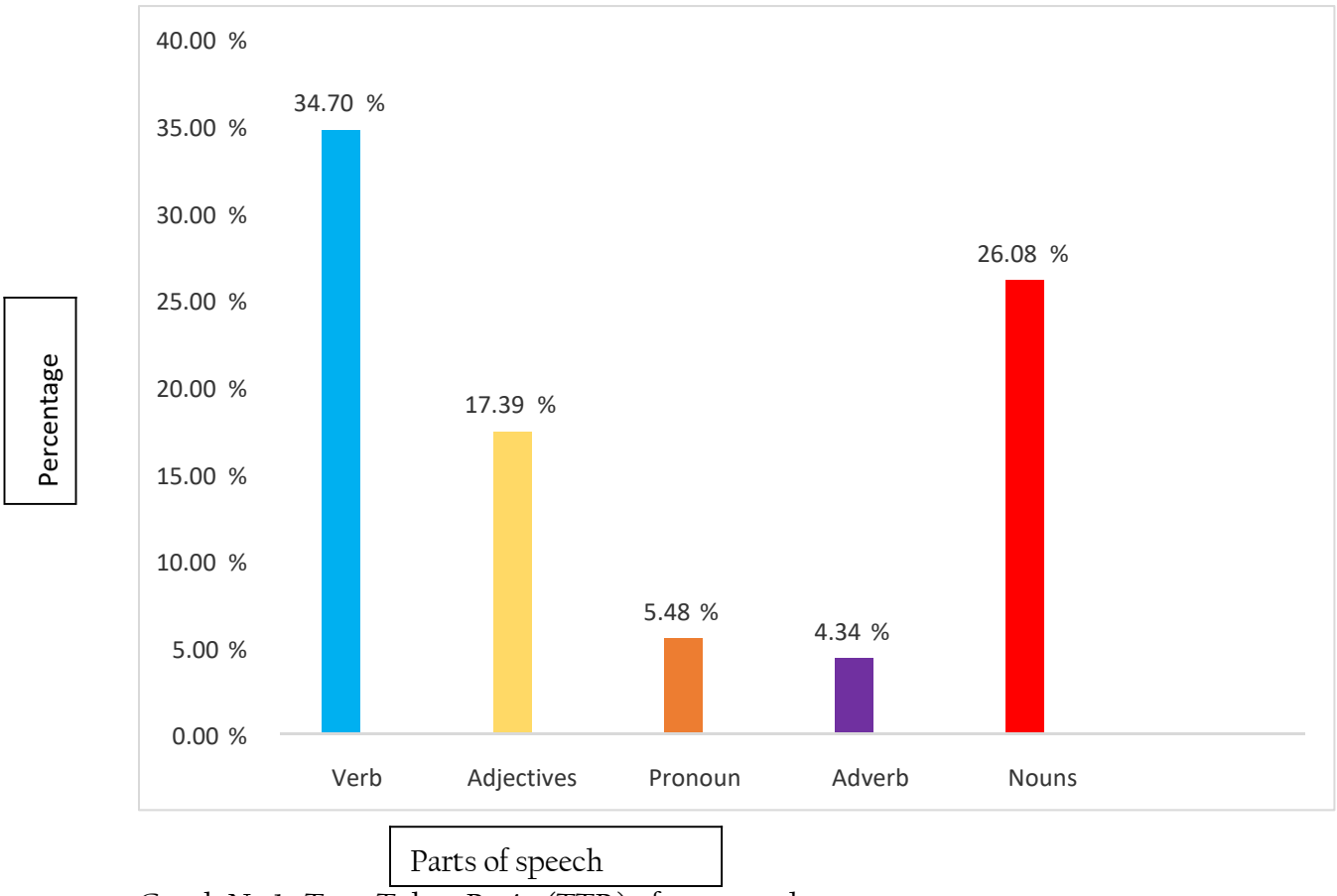

Graph No 1: Type Token Ratio (TTR) of core words.

Discusion

The current study is the first to have identified a set of Urdu core vocabulary for individuals with DS. The study employed participants from a range of settings with distinctive communication partners which resulted in total of 709 words. Children between the age ranges of 5 to 12 years were included in the study as several studies have documented a delayed development of speech prior to 5 years of age in individual with DS. (33). The frequency of words was studies and commonality was developed using the formula suggested by a study on Down syndrome. The study suggested a minimum of fifty percent of the participating children must use the specific words, which resulted in 16 words in the Dutch study and a total of 24 words for Urdu (3).

Children with Down syndrome have been known to excel in gestures in comparison to spoken language when matched with typically developing children. However, in Pakistan, most clinicians have knowledge of AAC but tend to focus on verbal speech and the use of signing and AAC in general is frowned upon. (27). The lack of intelligibility and a later onset of verbal speech have been associated with the introduction of AAC in children with Down syndrome (24). The present study used natural settings as was seen in all other studies such as the study in Arabic, Dutch, Korean and Afrikaans. The study on Afrikaans recorded spontaneous speech samples during regular preschool activities by means of small body-worn audio-recording devices This study also suggested two criteria for core word selection which included

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a frequency score of equal to or more than 0.5 percent, and a commonality score of six (suggesting at least 50% of the participants). The present study conducted in Urdu also mimicked the same pattern for commonality scores. The Afrikaans core vocabulary list consisted of 239 words accounting for 79.4% of words used in the entire speech sample that was collected. However, these children were from a diverse population of disabilities and not specifically from Down syndrome which accounted for a larger core vocabulary (3) .Other studies have tried to employ Speech language pathologists to give samples, however, in several studies not all SLP's participated leaving only two settings and target words could not always be reached in other studies using spontaneous language samples. Meal times also posed as a problem in several households as some parents make sure their children should not talk while eating(21). In the present study nouns were highly frequent at 22.9% and conjunctions were least frequent at 0.6%. A study that explored the vocabulary of fifteen children with intellectual difficulties showed 50% of the most frequently used words were personal pronouns and common verbs, showing an overlap of 100% between groups. (24) The current study also demonstrated 5.4% pronouns and 7.4% verbs.

When comparing core words of Urdu language with those of Dutch children of 2 to 7 years) some of the similar words were accounted (i.e mama ,baba,yes ,no ,I there, this, not, yeh one) the comparison table is given in the annex. This indicates that core vocabulary across different languages remains somehow same. The core vocabularies of individuals in the present study assist numerous word structure, semantic, and socially appropriate functions for use of langauge[11]. Core vocabulary words consist of adverb (idher), verbs (khao ,lo ,karo do). Semantic functions included use of agents (I), possession (meraa\meray), affirmation (yes), and negation (no) questions (how,what) The kind of words used in the core vocabulary of participant in the current study seems to be related in terms of, meaning, and to those core words identified by preceding study with other populations, Resemblances of the current outcomes to this previous study support the description of core vocabulary and has shown the use of core vocabulary through activities, surroundings, and conversational companions, for children with normal growth including individual with trisomy 21 and mental deficits. Access to core vocabulary permits young individuals with mental deficits to encounter a variety of syntactic, semantic, and pragmatic functions(1)

Mostly core vocabulary researches, suggest that the words yeah and nope are commonly used by individuals with trisomy. In the present study, those 2 words together are 14.9% of the total word sample. The Dutch study had a frequency of 19%. The overuse of confirmations and denials appears because of the element that conversational companions often ask yeah/nope questions of individual with trisomy 21. (24) In the present study it was also observed that children often respond through yes and no without having to explain themselves. In another study in which children have late developmental language onset and communication with their mothers was observed, minor levels of communication coherence was witnessed this suggests that mother often modify their language to an easy extend that is consistent with their baby development and at times below their developmental level in a conversation. (34) As in the present study participants used nouns more frequently (22.9%) than other parts of speech. Some other features of natural occurrence of language of individual with DS contain talking in one-word utterance which includes verbs, nouns and restricted use of interrogative words articles, and combinations of words.as it

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correlates with the current study some participants only said one word for communicating their needs and wants ("do" for taking thing "lo" for giving things to other people) and only two question were used. (35)

The Arabic study noted that Doha Arabic consisted of thirty eight nouns in the uppermost hundred words, where as in English it accounts for only 7%. The same is the case in the present study which also has an increased number of nouns. In the study conducted on Urdu speaking adults the noun count in Urdu was higher and was reported to be 38.8%. The same study also reported verbs at 25.2%, whereas the present study calculated the percentage of verbs as 7.43%. This result is similar to the result of 12.2% and 16% for two further studies in Arabic. (15) (36) In the present study on Urdu core vocabulary the total percentage of pronouns was calculated as 5.48% and in a study on sight words in Arabic the percentage of pronouns was calculated as 3.7%. In the Urdu core vocabulary list developed for adults the total percentage of pronouns was calculated as 5.4 % which matches the current established vocabulary. This suggests a similarity among core vocabulary lists developed for typical individuals and those with speech and language complications. (15) (36)

In the present study on Urdu core vocabulary the total percentage of adverb was calculated as 1.25% and in a study on sight words in Arabic the percentage of adverb was calculated as3.4 %. In the Urdu core vocabulary list developed for adults the total percentage was calculated as 7.8 %. (15) (36). In the present study on Urdu core vocabulary the total percentage of adjective was calculated as 5.50% and in a study on sight words in Arabic the percentage of adjective was calculated as10.0%. In the Urdu core vocabulary list developed for adults the total percentage was calculated as 17.8 %.(15) (56) prepositions was calculated in current study as 0.67% and in a study on sight words in Arabic the percentage of preposition was calculated as2.2%. In the Urdu core vocabulary list developed for adults the total percentage was calculated as 2.3%. Conjunction in present study was calculated as 0.66% and in a study on sight words in Arabic the percentage of conjunction was calculated as 0.8%. In the Urdu core vocabulary list developed for adults the total percentage was calculated as 0.9%. (15) (36)

However, it is stated the current study is the first to place emphasis on children with Down syndrome and the outcomes offer important understandings into core vocabulary and purposeful language usage in this participant set. Additionally, the outcomes are greatly similar with core vocabulary lists of researches done across in different populations. Upcoming researches must explore the core vocabulary of this group in extensive detail, plus individuals whom mental deficit is not associated to DS.

Conclusion and Limitations

The research has generated a list of twenty four core vocabulary words for school aged children who have Down syndrome. The list provides an opportunity to clinicians to be able to employ the words for use with individuals who require augmentative and alternative means of communication. The study bridges a gap both in the literature and in terms of clinical practice by providing the first core vocabulary list in Urdu for children who have Down syndrome. There are few limitations in the present study which require some consideration. Firstly the sample size of 2o participant is relatively very small. Although there has been work done on recruiting small population as children with DS isn't much feasible. A different

variability is observed in vocabulary development of Children with DS hence it can be concluded that current research relatively depicts characteristics of individuals with DS. A greater sample size would benefit future studies. Second limitations was equal representation of gender couldn't be addressed as equal numbers of gender could gave the clear picture of prevalence among males and females. Third limitation was some of the special school didn't allowed for the video recordings due to their confidentiality and privacy issues hence audio recording were obtained to gather the sample. Fourth limitation was data was collected only from twin cities of Pakistan i.e (Rawalpindi, Islamabad). Data from major cities can impact the result and generalization can be achieved. Final limitation is parental education and economic status couldn't addressed while these two can highly effect child growth spurt and vocabulary development. Further studies of core vocabulary on children with DS should investigate other contextual context in order to achieve commonality of core vocabulary in different environmental settings.

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