Research Article

Distribution of Communication Disorders in Primary School Children

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Abstract

Evidence regarding incidence and prevalence of a communication disorder is essential for early identification, rehabilitation and prevention of occurrence of a disorder. The present study aimed to identify the distribution of communication disorders in primary school children. A total of 2010 primary school children had participated in the screening program for communication disorders. All the children were screened for speech and language disorders using various speech and language test tools. The results of the study revealed that around 11.5% of school children had some form of communication disorders. Among these, distribution of language disorders (7.4%) was in greater proportion when compared to speech disorders (3.8%) and multiple disorders (0.2%). Within the disordered group, boys (66.7%) were more likely than girls (33.3%) to have had any communication disorder with a ratio of around 2:1. The results indicated the importance of identifying communication disorders in school children as young as possible. Often communication disorders go undetected at the early stage in school children and result in major impact in their social and academic life. The findings of the study stress the need to plan for prevention strategies of communication disorders in terms of early identification and intervention in young children.

Background

Prevalence is defined as the proportion of cases in a given population at a specified time (Law, Boyle, Harris, Harkness & Nye, 2000). Knowing the exact prevalence of any condition or disorder will aid in planning and implementing various health services in terms of identification and providing appropriate rehabilitation services at the earliest. Communication disorders caused due to various underlying conditions in children, need special attention as these children are often missed out when compared to other visible disabilities and their numbers are often underestimated due to lack of sensitive measures/tools for identification or due to lack of awareness. The spectrum of communication disorders include speech and language disorders which could be due to underlying conditions such as intellectual disability, hearing impairment, autism, learning disabilities, Specific Language Impairment (SLI), voice disorders, fluency disorders (American Speech-Language-Hearing Association, 1997-2016). Communication disorders were estimated to affect one in every 10 individual with men and women being equally affected (Law, et al., 2000). Western literature suggests that the prevalence of communication disorders estimated in school age children was around 4.19% (De Andrade, 1997) and 11.08% (Beitchman, Nair, Clegg & Patel et al., 1986). However, in primary and high school aged children, prevalence of communication disorders was found to be 13% on teacher's identification method (McLeod & McKinnon, 2007) and language disorders was 20.6% (Harasty & Reed, 1994). With respect to specific type of communication disorders, studies reported the prevalence of speech delay among 6-year-old children to be around 3.8% (Shriberg, Tomblin & McSweeny, 1999). Among speech disorders, prevalence of articulation/phonological disorders was reported to fall in the range of 1.06% (McKinnon, McLeod & Reilly, 2007) to 3.9% (Duff, Proctor & Yairi, 2004) and the learning disability was reported to range from 6.3% to 15.7% (Roongpraiwan, Ruangdaraganon, Visudhiphan & Santikul, 2002; Dhanda & Jagawat, 2013; Roth, 2004; Agarwal, Agarwal, Upadhay & Singh, 1991; Karande & Kulkarni, 2005; Moqasale, Patil, Patil & Mogasale, 2012; Shah & Bajaj, 1994).

Literature on prevalence rate also exist in terms of gender with males found to be more prone to speech and language disorders than the females (Spee-van der Wekke, Ouden, Meulmeester & Radder, 2000; Keating, Turrell & Ozanne, 2001; Harrison & McLeod, 2010; Stich, Baune, Caniato, Miko-

lajczyk & Krämer, 2012). With respect to specific type of communication disorders, studies reported the prevalence of voice disorders were reported to be around 0.12% (McKinnon et al., 2007) with a higher prevalence in boys when compared to girls (Stich et al., 2012). With respect to cerebral palsy, the incidence of male to female prevalence ratios was reported to be around 1.4:1 (Johnson, 2002; Westbom, Hagglund & Nordmark, 2007; Yeargin-Allsopp, Van Naarden Braun, Doernberg, Benedict, Kirby & Durkin, 2008). The prevalence of Mental retardation was reported to be in the range of 1-3% (Roeleveld, Zielhuis & Gabreels, 1997; Accordo & Capute, 1998; Stromme & Magnus, 2000) to 25% (Koirala, Das & Bhagat, 2012). The prevalence rate of autism was reported to be 0.1% (Al-Farsi, Al-Sharbati, Al-Farsi, Al- Shafaee, Brooks & Waly, 2010); 2% (Blumberg, Kogan, Schieve, Jones & Lu 2013); 5.6% to 9.4% (Kočovská, Biskupst, Gillberg, Ellefsen, Kampmann, Stórá, Billstedt, Gillberg, 2012). Language delay was 8.4% (Craig, Hancock, Tran, Craig & Peters, 2002) with boys at greater risk than girls (14.2% vs. 11.9% respectively) (Shriberg et al., 1999). Boys were found to be at greater risk than girls for learning disability (2.8% vs.1.6% respectively (Cortiella & Horowitz, 2014); 3.4:1 respectively (Roongpraiwan et al., 2002).

In a developing country such as India, the proportion of hearing disability was found to be 18.9%, speech disability was 7.5% and mental retardation 5.6% of the total population (Census of India, 2011). Earlier studies reported that prevalence of communication disorders have broad variability in the prevalence rates in western and Indian literature. Screening of all school children should be done in order to identify at risk of future difficulty especially the lack of ability to meet academic expectations (Meisels, Samuel, Martha, Wiske & Tivnan, 1984). However, the communication impairment often go unnoticed or does not get prioritized due to lack of identifiable signs (Devadiga, Varghese & Bhat, 2011) especially in children. Lack of identification of these communication disorders in school going children can have an impact beyond their academic skills including cognition, behavior, emotions, social relationships, and also participation and inclusion (Lewis, Freebair & Taylor, 2000; Bryan, 2004).

There are only few studies reported in literature on prevalence of communication disorders in school going children (Agarwal et al, 1991; Karande et al, 2005; & Koirala, et al, 2012) in India. The prevalence estimated data and distribution of communication disorders in school children is essential in order to identify at risk children, refer them for detailed evaluation and rehabilitate them as early as possible. The data will also bring focus on that population of school children which require attention by professionals for rehabilitation. Routine school screening programs will provide approximate estimate of communication disorders in school aged population. With this relevance, the present study aimed to estimate the distribution of communication disorders in primary school children.

Method

Participants

The study was a retrospective study which included a total of 2010 school going children from grades 1 to 7 in the age range of 6 years to 12 years screened for communication disorders. The data was collected from a screening program for school children as part of an activity of the institute between the years 2012 to 2014. The study included clustered randomized samples from twenty-five regular schools (both government and private schools) in rural and urban regions of Mysuru. Out of the 2010 screened children, 1093 were boys and 917 were girls.

Procedure

All the school children were screened for speech and language disorders if any, through the Assessment checklist for speech-language skills (Swapna, Jayaram, Prema & Geetha, 2010) to check for speech and language skills; Early Literacy Screening Tool (Shanbal, Goswami, Chaithra & Prathima, 2011) to check for literacy skills. Children were screened informally through general conversation and/or story narration to check for voice, fluency and articulation. If the child failed in screening, further referral was made to administer an appropriate speech and language tests on identified child to confirm the deficit. Routine detailed diagnostic evaluations were carried out by qualified Speech-Language Pathologists and Audiologists. The details of the tests used are indicated in the appendix. The procedure conforms to the scientific requirements as per the ethical considerations provided by the declaration of Helsinki (2013).

Speech disorders considered were articulation/phonological disorders (APD), fluency disorders (FD), voice disorder (VD) and hypernasality with repaired cleft lip/palate (HRCP). Similarly specific language impairment (SLI), intellectual disability, childhood dysarthria (CD), autism spectrum disorder (ASD), Learning disability (LD) was considered under language disorder. Multiple disorders included two or more disorders existing within language and speech disorders and or in combination. The data collected were analyzed using the Statistical Package for Social Sciences (SPSS), version 18.0.

Table 1: Distribution of communication disorders in primary school children

Disorders	Total		Boys		Girls	
	N	%	N	%	N	%
Language disorders	149	7.4	96	4.8	53	2.6
Speech disorders	77	3.8	55	2.7	22	1.1
Multiple disorders	5	0.2	3	0.1	2	0.1
Total	231	100	154	66.7	77	33.3

Results

Overall, 2010 children were screened for communication disorders. Among those, 231 (11.5%) children were identified with some form of communication disorders. Boys were found to have greater percentage (66.7%) when compared to girls (33.3%). Percentage of distribution of each communication disorders viz. language disorders, speech disorders and multiple disorders was done using Crosstabs descriptive statistics. Table 1 shows the distribution of communication disorders in primary school children. Among the identified disordered group, the distribution of language disorders was found to be 7.4%, Speech disorders was 3.8% and multiple disorders was 0.2%.

Chi-square test was done to check the association between three disordered group and the gender. Results indicated that, there was no statistically significant association in the pattern of distribution across the disordered group and the gender [$\chi^2(2)=1.22$, $p>0.05$]. However, it can be seen from the table 1 that, there was a higher distribution of all three disorders in boys as compared to girls.

The data was further analyzed descriptively within the disordered group in school children to study the pattern of distribution of specific type of disorder. Table 2 shows the distribution of specific types of communication disorders in children.

Results of the descriptive statistics indicated that the children with Learning disability were more commonly distributed (43.3%) among the language disorders. The other disorders that were more prevailed in school children include Intellectual disability (10%), Specific Language Impairment (7.8%), multiple disorders (2.2%), and Autism Spectrum Disorders (0.9%).

Among the speech disorders, children with Articulation/ Phonological disorder were found to be more common (18.6%) compared to other speech disorders including Fluency disorders (10.8%), Voice disorders (2.6%), Childhood dysarthria (1.7%) and Hypernasality with repaired cleft-lip & Palate (1.3%).

Discussion

The present study aimed at identifying the distribution of communication disorders in school chil-

Table 2: Distribution of specific type of communication disorders between gender

Communication disorders	Total		Boys		Girls	
	N	%	N	%	N	%
Language disorders						
Learning disability	100	43.3	64	27.7	36	15.6
Intellectual disability	25	10.0	14	6.1	11	4.8
Specific Language Impairment	18	7.8	14	6	4	1.8
Autism spectrum disorder	2	0.9	2	0.9	0	0
Speech disorders						
Articulation/phonological disorder	43	18.6	30	13	13	5.6
Fluency disorders	25	10.8	19	8.2	6	2.6
Voice disorders	6	2.6	4	1.7	2	0.9
Childhood dysarthria	4	1.7	2	0.9	2	0.9
Hypernasality with repaired Cleft lip & Palate	3	1.3	2	0.9	1	0.4
Multiple disorders	5	2.2	3	1.3	2	0.9

dren. The study revealed that around 11.5% of school children had some form of communication disorders. Among these, distribution of language disorders was found to be 7.4%, speech disorders were 3.8% and multiple disorders were 0.2%. Chi-square test results indicated that there was no statistically significant association in the pattern of distribution for the type of communication disorder and the gender. Though, the results cannot be generalized as the study has been conducted only in few districts of Karnataka, the study has provided important information on the distribution of communication disorders in school population. In one of the previous study conducted by Sreeraj et al., (2013) it was found that the prevalence of speech and language disorders was found to be 9.42% (reported among the communication disorders identified which also included adult population). Among this, 2.9% in children who were less than 3 years and 61.9% in children in the age range of 3-15 years and 35.2% in the adults. The study reported that there was higher prevalence of communication disorders in children when compared to the adults. In this study, all those who were identified with some form of communication disorders through survey were referred to camp for further evaluations. A difference in the distribution of communication disorders in the current study and previous studies could be because, the previous study was done as part of a survey camp in a rural set up with lesser occurrence of communication disorders in children which could be due to factors such as poor awareness, education, lack of accessible facilities in these regions and to some extent poor socio-economic status due to which they may be unable to reach the place with available facilities. While in the present study, the professionals approached schools in a few rural and urban set up to screen children and identified at-risk children, who were further referred to the institute for a detailed evaluation. In the present study, an attempt was made to follow up all those children identified as at-risk during the screening process which could be one of the reasons for lesser drop outs for detailed assessment.

There is a variability of prevalence rates reported for children in the literature. Some of these reported the prevalence of communication disorders in children to be around 1.7% (Keating et al., 2001); 12.40 to 13.04% (McLeod et al., 2007) and around 14.4% to 18.7% (Okalindou & Kampanaros, 2001). Studies also reported the prevalence of speech impairment was 2.3-24.6%, and language impairment was 2.02-19% in children (Law et al., 2000). In terms of findings within gender, the results of the present study indicated that the distribution was found to be greater in boys when compared to girls for both speech and language disorders with a ratio of around 2:1 (as indicated in Table 1). However no significant difference was seen between gender. Various other studies have reported that the prevalence of speech delay was 1.5 times higher in boys than girls (Shriberg et al., 1999) and language delay was found to be greater in boys (14.2%) than girls (11.9%) (Shriberg,et al., 1999). In general, boys were found to be at greater risk to speech and language disorders than girls (Spee-van der Wekke, Ouden, Meulmeester & Radder, 2000; Harrison et al., 2010; Keating et al., 2001). The findings of the present study in general, revealed that amongst all the communication disorders, occurrence of these disorders was found to be higher in boys than girls except for childhood dysarthria of speech. The current study recommends carrying out a larger scale study in order to draw inferences on gender differences in general for communication disorders in school children.

Several studies have reported varied prevalence rates of communication disorders in school going boys and girls. A consensus of literature reports indicate that gender differences for communication disorders is not a significant factor amongst all communication disorders. For e.g., in studies of children with Learning disability (Dhanda, et al., 2013; Roth, 2004), Mental retardation (Helgason, 1964; Murphy, Yeargin-Allsopp, Decoufle, & Drews, 1995), Autism Spectrum Disorders (Werling & Geschwind, 2013) and others reported that though occurrence was greater in boys than girls, there was no significant difference reported within the gender. While, there are other studies that support gender differences for communication disorders in children, indicating occurrence to be greater in boys than girls (Lewis, 1990). The current study recommends carrying out a larger scale study in order to draw inferences on gender differences for communication disorders in school children, keeping in mind speculations across studies on gender and communication disorders.

Considering the limited sample size in the present study (as in Table 2), the results are limited to only presenting the distribution of the type of communication disorders amongst language, speech and multiple disorders. Within the language disorders, the results indicated that children with Learning disability were found to be in greater proportion than other language disorders such as those due to intellectual disability, specific language impairment, and those due to Autism Spectrum Disorders. Among the speech disorders, the occurrence of articulation/ phonological disorders were found to be higher in school children followed by fluency disorders, voice disorders, childhood dysarthria due to CP, hypernasality with repaired Cleft-lip & Palate and due to multiple disorders. The current study recommends carrying out a larger scale study in order to draw inferences on gender differences for specific communication disorders in school children, keeping in mind speculations across studies on gender and communication disorders.

With the limited data, the study indicates clinical implications in terms of the need for carrying out such studies to survey, screen and assess school going children with communication disorders so that those children identified with communication disorders can be sent for intervention program as early as possible. These intervention programs may in turn play a crucial role in reducing their language problems as indicated in literature.

Conclusion

The findings of the present study showed that the prevalence of communication disorders in school going children was around 11.5%. A higher prevalence of language disorders was noticed followed by speech disorders in these children. Findings of present study also indicated that there was no significant gender effect for communication disorders in children. Further, the occurrence of communication disorders in these school going children indicate the need for focusing on those children who are found to be at risk for some form of communication disorders. These could be those children who essentially require detailed assessment and rehabilitation as early as possible by professionals in the field of communication disorders. It is also suggested to conduct a large scale study in the population in different regions to estimate the actual incidence and prevalence rates of communication disorders in school going children.

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