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Original article

Speech language disorders unfolded in Islamabad's periphery: A tertiary health care facility experience

Nazia Mumtaz[1], Muhammad Naveed Babur[2], Ghulam Saqulain[3]

[1]Riphah International University, Lahore, Pakistan. [2]Isra University, Islamabad Campus, Pakistan.
[3]Capital Hospital PGMI, Capital Development Authority, Islamabad-46000, Pakistan.

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Corresponding author

Ghulam Saqulain

Professor & HOD,
Capital Hospital PGMI,
Capital Development Authority,
Islamabad-46000, Pakistan.
Phone: +92-3335101134
Email:
ghulam_saqulain@yahoo.com

Abstract

Speech language disorders are common and result in communication problems. Impaired hearing, speech, language, fluency, cognition, and neuro-motor mechanisms of speech may be involved in causation. Prevalence varies from place to place, setups and socio demographic factors. Islamabad's periphery harboring low- and middle-income population was focused in this observational cross-sectional study to retrospectively determine the prevalence of speech-language disorders and their association with socio-demographic variables. This study included all cases with speech language disorders (SLD's), from departmental patient record of Speech Language Pathology clinic, Al-Nafees Medical College & Hospital, Isra University from 1st January 2014 to 31st December 2018. Population included male and female genders with no limitation of age. Descriptive analysis was performed using SPSS version 21. Population included n=3148 cases, with M:F ratio of 2.28:1 and mean age of 11.8±13.38 years. Most prevalent pathology was SLD secondary to hearing impairment (19.82%), followed by SLD secondary to intellectual disability (17.4%), stuttering (16.84%) and delayed speech and language (15.2%). This study concludes that speech language disorders due to hearing impairment and intellectual disability are most prevalent and have association with lower and middle socio-economic class, male gender, consanguinity, being first child, increase in number of children and a weak referral system.

Key words: Hearing Impairment, Intellectual disability, Speech-language disorders

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Speech language disorders are a common occurrence[1,2] and can affect all age groups irrespective of gender and race. Problems in communication can occur due to impairment in hearing, speech, language, fluency, cognition and neuro-motor mechanisms of speech[3]. Any change in the ability to comprehend verbal and non-verbal communication results in a communication disorder with its severity ranging from mild to profound. Communication disorders can occur due to congenital or acquired conditions including disorders of hearing, genetic, brain anomalies, metabolic disorders, exposure to toxic substances, nutritional deficits, injuries including trauma to brain injuries and epilepsy[3].

In the United Kingdom expressive language disorders are more prevalent as compared to receptive language disorder at <7 years of age[4]. A Canadian study reported prevalence of language impairment as 8.04%[5], while a Pakistani study involving children aged 8-12 years found a prevalence of 17.6% for articulation disorders[6]. Also results of a study conducted in child psychiatry outpatients of a tertiary hospital in Lahore reported a prevalence of speech language related problems as 46.5%[7]. Hence the prevalence of speech and language disorders varies from place to place and variety of setups. Also, socio-demographic factors may be associated like ethnicity and origin[8], and socioeconomic level[9].

Since the health facility is located in periphery of Islamabad, with its neighboring areas harboring low and middle income population, this scenario provided the researchers an opportunity to conduct this study to determine the prevalence of SLD and their association with socio-demographic variables.

This study could provide information and statistical base for perceiving the future management needs for catering to the SLD's and plan further research to reduce the burden of disability induced due to communication disorders not only socially but academically as well.

Materials and methods

This is an observational retrospective cross-sectional study conducted at Speech Language Pathology (SLP) Clinic at Isra Institute of Rehabilitation Sciences (IIRS), Al-Nafees Medical College Hospital (ANMCH), Islamabad Campus, Isra University. Following approval of Institutional Research Committee (Approval No. 9190 dated 06-12-2019) records of patients who attended SLP clinic over a period of 5 years from 1st January, 2014 to 31st December 2018 were reviewed. Study included all departmental case records of cases with issues covered in the domain of SLP, and included male and female genders with no age limitation. Cases with incomplete data, duplicate records and those who visited with issues not in the domain of speech language pathology, were excluded from the study. Data collected included socio-demographic details and diagnostic information. The diagnosis were categorized as delayed speech language development (DSL); speech and language disorder (SLD) secondary to cerebral palsy (CP), hearing impairment (HI), intellectually challenged (IC) previously used term as mentally retarded (MR), autism spectrum disorder (ASD), dysphagia, developmental dysfluency, stuttering, voice disorders, dysarthria, phonological disorders, aphasia, selective mutism, apraxia, psychiatric dysfluency.

Data was collected and entered in MS Excel worksheet. Descriptive analysis was performed using SPSS 21. Variables specially studied included diagnosis, disability, age, gender, area of origin, source of referral, consanguinity, number of siblings, birth order and education etc. Quantitative variables like age were presented by Mean±SD, while qualitative variables like gender, diagnosis, disability, area of origin, referral origin and age groups were presented by frequency and percentage and cross tabulated. The data was then compared with available national and international literature and deductions observed were then discussed.

Results

Our study population comprised of N=3148 cases with complete data out of a total of 5028 case records screened, who visited speech clinics at the Isra Institute of Rehabilitation Sciences over a 5 year period between 1st January 2014 to 31st December 2018 for speech language pathology (SLP) disorders. As depicted in table 1, a significantly higher number of patients were included in 2018 (1144, 36.34%) compared to the remaining years with lowest turnover in 2014 (302, 9.59%). Also SLP disorders were significantly more commonly seen in males 2188 (69.50%) compared to females (960, 30.50%) with a p value of < 0.001 with male to female ratio was 2.28:1. Their age ranged from 1 to 60 years with mean age of study population being 11.8±13.38 years, with significant difference in sample in different age groups with maximum population of 960 of >12 years age group, followed by 4-6 years age group (912) and age group of 1-3 being third most common (710). Birth order of population revealed that SLD's were most common in first child (1324), followed by second child (908) and reducing order of frequency of SLP's were noted and difference was found to be statistically significant. Also SLP's were most commonly reported in children with 3 siblings (836), followed by 2 siblings (562), and 4 siblings (422). Consanguinity was also noted as an important significant factor with majority cases (1912) being off springs of consanguineous parents. The referral system was noted to be weak as most cases (2024) were brought to the speech clinic by the parents after noting a disorder. However of the referral sources, ENT department referred most cases (400) followed by referral from physiotherapy units (214). The literacy level of the population showed that most parents had done their bachelor's degree

(graduates) (836), followed by HSC (700). Majority of the patients hailed from Farash Town and Ali Pur, which are neighboring poor localities with 928 and 246 cases respectively.

Table 1: Socio-demographic variables *Prevalence of speech language disorders. Cross tabulation and Chi-square association (n=3148)

Variable		N	X^2	p
Year	2014	302	1057.45	0.000
	2015	222		
	2016	800		
	2017	680		
	2018	11444		
Age group	1-3	710	1257.93	0.000
	4-6	912		
	7-12	566		
	>12	960		
Gender	Male	2188	273.33	0.000
	Female	960		
Birth order	1	1324	701.42	0.000
	2	908		
	3	480		
	4	298		
	5	114		
	6	8		
	8	8		
	9	8		
Siblings	0	352	1536.64	0.000
	1	342		
	2	562		
	3	836		
	4	422		
	5	332		
	6	158		
	7	72		
	8	40		
	9	24		
	11	8		
Cousins	Yes	1912	195.11	0.000
	No	1236		
Source of referral	Self	2024	1127.224	0.000
	ENT	400		
	Physiotherapy	214		
	Gynecology	2		
	OPD	136		
	Pediatrics	190		
	Others	182		
Education level	Illiterate	434	568.32	0.000
	Primary	324		
	SSC	594		
	HSC	700		
	Bachelor	836		
	Masters	260		
Area of origin	Farash Town	928	175.64	0.000
	Nilore	154		
	Taramri	162		
	Khana	26		
	Tarlai	152		
	Ali pur	246		
	Lehtrar	22		
	Bara Kahu	24		
	Others	1434		

X2= Chi-Square, P= P-Value, N= Frequency

The breakdown revealed that the most prevalent pathology was SLD secondary to HI in 19.82% cases, followed by SLD in Intellectually challenged (IC) children in 17.4% cases, stuttering in 16.84% cases, delayed speech and language in 15.2%, dysarthria in 10.8% and low prevalence of other disorders (Table 2).

A gradual increase in number of reported cases over a 5 year period (from 2014 to 2018) was noted for DSL and voice disorders. While a more abrupt increase was noted in 2016 and onwards for SLD-HI, SLD-IC, stuttering, dysarthria and phonological disorders; also an abrupt increase in 2017 was noted for aphasia.

Discussion

The present study evaluated the SLD which presented to the speech clinic over 5 years of its functioning revealing a large influx of cases with SLD's to the tune of N=3148 cases over a 5 year period. As depicted in table 1, a significantly higher number of patients were entertained in 2018 (1144, 36.34%) compared to the remaining years with lowest turnover in 2014 (302, 9.59%). The low turnover initially in 2014 could be due to the fact that the department started functioning in this year and the community was not aware of the therapeutic services available. Over the years not only the population has become aware of the services available but due to increase in general awareness of SLD's there has been witnessed an increased influx to such clinical institutions. According to one

study factors effecting prevalence in different age groups include awareness and earlier screening of developmental delays[10]. A study based on parental response of HI children enrolled in special education centers of Pakistan concluded that majority of parents vouched for the fact that early detection could hail benefits and awareness regarding the early screening of HL and provision of early intervention and management could not only benefit the child but the family and the community by an enhanced quality of life[5].

Table 2: Frequency of SLP disorders * Year wise breakdown. Cross tabulation (n=3148)

SLP Disorders	Year Wise Breakdown					Total	
	2014	2015	2016	2017	2018	N	%
DSL	24	78	88	102	184	476	15.12
SLD-CP	42	2	0	32	0	76	2.41
SLD-HI	30	22	240	128	204	624	19.82
SLD-IC	40	30	88	114	276	548	17.4
ASD	18	12	0	16	32	78	2.47
Dysphagia	0	16	8	0	0	24	0.76
Dev. Dysfluency	2	6	0	0	24	32	1.02
Stuttering	82	24	152	88	184	530	16.84
Cluttering	0	0	8	0	0	8	0.25
Voice Disorder	50	12	48	32	72	214	6.80
Dysarthria	4	8	136	104	88	340	10.8
Phonological Dis.	6	2	24	16	16	64	2.03
Aphasia	4	2	0	32	56	94	2.99
Selective Mutism	0	0	0	8	0	8	0.26
Apraxia	0	0	0	8	0	8	0.26
NNF	0	8	8	0	8	24	0.76
Total	**302**	**222**	**800**	**680**	**1144**	**3148**	**100**

The breakdown of disorders as reported to the clinics (table 2), revealed that the most prevalent pathology was SLD's secondary to HI in 19.82% cases, followed by SLD's in IC children in 17.4% cases, stuttering in 16.84% cases, delayed speech and language in 15.2%, dysarthria in 10.8% and low prevalence of other disorders. In contrast a Karachi based study by Bukhari and Khatoon conducted at Institute of Clinical Psychology reported prevalence of SLP's as problems of articulation (7.1%), expressive language (3.5%), fluency (4.5%), language (45.4%), phonological (15.6%), pragmatic language (1.4%), receptive (7.1%) and problems while stuttering being noted in 13.5% and voice disorders at 1.9%[1]. In contrast to our study Angst et al in a study on kindergarten children reported a high prevalence of disorders of orofacial myology in 31.30%, speech in 21.37% and language in 4.58%[11]. Prevalence of language delay of 13.7% was reported in another study by Binu et al[2].

National Institute on Deafness and Other Communication Disorders in United States reported that out of every one thousand, 2 to 3 children are born with measurable HL in one or both ears and approximately 13% or 30 million have HL[3]. It is a matter of serious concern that due to lack of trend of neonatal screening for HI in Pakistan, this invisible disability is detected late even if is noticed earlier by parents/caregivers[6]. Timely hearing screening can ensure early diagnosis of permanent HL but in Pakistan due to policy level and technological limitations such trends are not in practice yet[7,12], which is evident from the increase in number of reported cases in the current study.

In underdeveloped countries like Pakistan, Sri Lanka and Bangladesh multiple factors contribute to intellectual disability such as pre, peri and postnatal difficulties due to poor maternal health, poverty, malnutrition and lack of health care facilities[13]. In a population-based survey in Karachi prevalence of MR was estimated as 65.3/1000 and 19/1000 children for mild and severe mental retar-

dation respectively among 2 to 9 years old children[8]. Estimated prevalence of mild MR was 6.2/100 among 6-10 years old children in Lahore, which was lowest in upper socioeconomic class with 1.3/100 and highest in outskirts as 10.5/100 with low socioeconomic status[14]. Similarly, higher prevalence was noticed in our study since the population belonged to lower middle income population

Stuttering was the third most prevalent (16.84%) disorder in the current study. Similarly in a Karachi based study stuttering was noted as the third most common disorder (13.5%)[1].

A gradual increase in number of reported cases over a 5-year period (from 2014 to 2018) was noted for SLD's and voice disorders. A high prevalence of SLDs (27%) was also noted in another study[15]. However, a more abrupt increase in frequency of cases was noted in 2016 and onwards for SLD-HI, SLD-IC, stuttering, dysarthria and phonological disorders. Also, an abrupt increase in 2017 was noted for aphasia. These surges may be due to increasing awareness of these disorders.

In the current study the prevalence of SLD's due to cerebral palsy (CP) was low 2.41%, though it was the commonest disability identified in a study to determine early childhood disabilities in one district of rural Sindh, Pakistan by Ibrahim and Bhutta[16].

In the current study SLP disorders were significantly more commonly seen in males 2188 (69.50%) compared to females (960, 30.50%) females with a p value of < 0.001 with male to female ratio at 2.28:1. Their age ranged from 1 to 60 years with mean age of study population being 11.8±13.38 years, with significant difference in sample in different age groups with maximum population of 960 of > 12 years age group, followed by 4-6 years age group (912) and age group of 1-3 being third commonest (710). Birth order of population revealed that SLDs were most common in 1st child (1324), followed by 2nd child (908) and reducing order of frequency of SLD's were noted and difference was statistically significant. Also SLD's were most commonly reported in children with 3 siblings (836), followed by 2 siblings (562), and 4 siblings (422). Consanguinity was also noted as an important significant factor with majority cases (1912) being off springs of consanguineous parents. This could be due to the still prevailing cultural impact of traditions. The referral system was noted to be weak as most cases (2024) were brought to the speech clinic by the parents after noting a disorder, However of the referral sources otolaryngologists referred most cases (400) followed by physiotherapists (214). The literacy level of the population showed that most parents had done their Bachelors (836), followed by HSC (700). Different studies reported association of SLD's with male gender[17,18], prematurity[17,19], one child[17,19, 20], 1st by birth order[16], family history[17,19,21], child's health, prematurity, long hospital stay, deleterious oral habits[19], age, socioeconomic status, ethnic origin[18], birth asphyxia, fits and deformities in oropharyngeal region, low education level of parents, consanguinity, family history, multilingual and inadequate stimulation[21].

Majority of the patients hailed from Farash Town and Ali Pur, which are neighboring suburban localities harboring population of lower middle income class as per Sustainable Development Institute of Pakistan survey, with 928 and 246 cases respectively. Similarly in a Karachi based study, prevalence of SLD's was 16.8% in lower socioeconomic status, 74.9% in middle socioeconomic status and just 8.3% in upper socioeconomic status population[1]. Higher prevalence of HI cases was noted by Lin CY et al in a Taiwanese study in rural compared to urban population less than 17 years age[4]. Similar results have been reported in another study linking poverty, health and disability in LMIC[9]. In contrast Melchiors Angst OV et al. reported no association between speech-language disorders and social indicators like socioeconomic status and education[11].

Conclusion

This study concludes that speech language disorders due to hearing impairment and intellectual disability are most prevalent and have association with lower and middle socioeconomic class, male gender, consanguinity, being first child, increase in number of children and a weak referral system.

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