

# The Prevalence of Speech Disorder in Primary School Students in Yazd-Iran

Sedighah Akhavan Karbasi<sup>1</sup>, Razieh Fallah<sup>2</sup>, and Motaharah Golestan<sup>1</sup>

<sup>1</sup> Department of Pediatrics, Shahid Sadoughi University of Medical Sciences and Health Services, Yazd, Iran

<sup>2</sup> Department of Pediatrics, Pediatric Neurologist, Shahid Sadoughi University of Medical Sciences and Health Services, Yazd, Iran

Received: 25 Dec. 2008; Received in revised form: 27 Aug. 2009; Accepted: 17 May 2010

**Abstract-** Communication disorder is a widespread disabling problems and associated with adverse, long term outcome that impact on individuals' families and academic achievement of children in the school years and affect vocational choices later in adulthood. The aim of this study was to determine prevalence of speech disorders specifically stuttering, voice, and speech-sound disorders in primary school students in Iran-Yazd. In a descriptive study, 7881 primary school students in Yazd evaluated in view from of speech disorders with use of direct and face to face assessment technique in 2005. The prevalence of total speech disorders was 14.8% among whom 13.8% had speech-sound disorder, 1.2% stuttering and 0.47% voice disorder. The prevalence of speech disorders was higher than in males (16.7%) as compared to females (12.7%). Pattern of prevalence of the three speech disorders was significantly different according to gender, parental education and by number of family member. There was no significant difference across speech disorders and birth order, religion and paternal consanguinity. These prevalence figures are higher than more studies that using parent or teacher reports.

© 2011 Tehran University of Medical Sciences. All rights reserved.

*Acta Medica Iranica*, 2011; 49(1): 33-37.

**Keywords:** Speech disorders; Stuttering; Voice disorders; Articulation disorders; Communication

## Introduction

Communication disorder is a common and widespread, lifelong problem that may affect social and emotional well-being, cognition, and behavior and associated with lowered school performance and psychosocial problems (1-4).

There are not optimal methods for screening and identify these disorders. There is not "gold standard" for screening across the studies. For accurately assessing the prevalence of speech and language disorders clear accepted definition are critical (5).

Disorders of fluency (stuttering), voice, and speech-sound production (articulation/phonology) are three particular communication disorders that are traditionally referred to as speech disorder (6).

Articulation disorders are difficulties in production of speech sounds without identifiable physical reason, occur for a variety of reasons that characterized by substitutions, omissions, additions of speech sounds that interfere with intelligibility (7).

There is wide variation in the Prevalence rates of speech-sound disorders and higher in younger ages (15.6 % in 3-year-olds (8) and 3.8% in 6-year-olds (9). For

speech sound disorders, long-term persistence and negative sequel are not as common.

Stuttering is a communication disorder that affects the rhythm and continuity of speech and has a high familial incidence and more common in male. Twin studies suggested that genetic and environmental factors can lead to stuttering in predisposed individuals. (10) lower prevalence rates at older age indicated "continuous diminution in the frequency and severity of stuttering over time", as 74% of children recover without treatment (11).

Voice disorder pertains to abnormal production and/or absences of vocal quality, pitch, loudness, resonance, and /or duration, which is inappropriate for the child's age and sex (12).

A evidence base study that reviewed the different methods used for describe voice disorder emphasized that too much etiological and diagnostic confusions make difficulty in prevalence studies (13).

Communication disorders can impact on academic achievement in school years and affect vocational choices later in adulthood (14) and early intervention may help minimize the more serious consequences of later learning disabilities .

**Corresponding Author:** Motaharah Golestan

Department of Pediatrics, Shahid Sadoughi University of Medical Sciences and Health Services, Yazd, Iran  
Tel: +98 351 8241424, 913 1524083, Fax: +98 351 8224100, E-mail: mogolestan@yahoo.com

The aim of this study was to determine prevalence of speech disorders specifically stuttering, voice, and speech-sound disorders in primary school students in Iran-Yazd.

### Materials and Methods

In a descriptive cross-sectional study, 7881 primary school students [4117 (52/2%) males and 3764 (47/8%) females] in Yazd evaluated in view from of speech disorders in 2005. The children were from the first year of formal schooling. Data about sex, birth order, paternal and maternal educational level and number of family members was were gathered and then researchers asked the student read their book and poems that they learned. Direct (face-to-face assessment including screening and diagnostic techniques) method employed for determining of speech disorders (Stuttering, voice and articulation disorders) (15) in the present investigation.

The data were analyzed using SPSS 13 statistical software. Chi-square test was used for data analysis of qualitative variables. We considered differences significant at  $P < 0.05$ .

Definition of speech disorders in this study:

Stuttering: Students produce a “repetition or prolongation of syllables, sounds, and speech postures.

Voice disorders: Students have a “consistently hoarse or husky voice with some periods of voice loss; voice has a nasal quality; voice is too soft/ loud/ high/ low.

Speech-sound (articulation) disorders : substitution, omission or distortion of speech sounds.

It is important to note that in the present study, speech disorder dose not include language disorder.

### Results

1166 children (14/ 8%) had speech disorder among whom 88/6% (1033 children) had speech-sound disorder (articulation disorders), 8/2%(96 students) stuttering and 3/2% (37 person) voice disorder.

The estimated prevalence of speech-sound disorders was 13/1%, stuttering was 1/2%, and voice disorders which characterized by hoarseness was 0/47% .

16/7% of males and 12/7% of female had speech disorders. Distribution of speech disorders types by sex are showed in Table 1 that indicate all three types of speech disorders is more prevalent in males. ( $P = 0.0035$ )

The prevalence of different pattern speech sound (articulation) disorder shows in Table 2. The most

common pattern was in pronunciation of S and Z (78.41%).

Table 3 shows the prevalence of speech disorder by number of family members that indicates speech disorder is more prevalent in highly populated families ( $P=0.05$ ).

Table 4 shows the prevalence of speech disorder by maternal education level. Speech disorders have lower prevalent in children of high educated mothers ( $P=0.0003$ ).

Table 5 shows the prevalence of speech disorder by paternal education level. Speech disorders is more prevalent in students of low educated fathers ( $P=0.0001$ ).

Table 6 shows the prevalence of speech disorder by birth order and speech disorders frequency not related to birth orders ( $P= 0.4$ ).

There was no statistically difference in prevalence of speech disorders and paternal consanguinity ( $P=0/99$ ), religious ( $P=0/8$ ) and mono lingual or by lingual students ( $P = 0.9$ ).

**Table 1.** Prevalence of speech disorder by gender

	Sex	Male	Female	Total
<b>Speech disorder</b>				
Speech-sound disorder		596	437	1033
Stuttering		69	27	96
Voice disorder		23	14	37
Total		688	478	1166

**Table 2.** Prevalence of articulation disorder patterns

Kind of pronunciation disorder	prevalence	Total percentage	Number
S,Z	10.27%	78.41	810
H,G	1.83%	14.03	145
SH,J	0.43%	3.3	34
L	0.2%	1.54	16
K,G	0.12%	0.96	10
F	0.08%	0.7	7
T,D	0.07%	0.56	6
other	0.06%	0.48	5
total	13.1%	100	1033

**Table 3.** Prevalence of speech disorder by number of family members

Number of family members	Number	Speech prevalence disorder	
2-4	2406	321	13.34
5-7	4084	634	15.52
8 or more	1391	211	15.16
total	7881	1166	14.8

**Table 4.** Prevalence of speech disorder by maternal education level

Maternal education level	Number	Speech disorder number	Prevalence
Illiterate and primary school	5173	852	16.47
Secondary and high school	2395	285	11.89
High education	313	29	9.26
total	7881	1166	14.8

**Table 5.** Prevalence of speech disorder by paternal education level

Paternal education level	No.	Speech disorder number	Prevalence
Illiterate and primary school	3903	660	16.91
Secondary and high school	3041	394	12.95
high education	937	112	11.95
total	7881	1166	14.8

**Table 6.** Prevalence of speech disorder by birth order

Birth order	No.	Speech disorder number	Prevalence
1-3	4943	721	14.58
4-6	2397	354	14.76
7 and more	541	91	16.82
total	7881	1166	14.8

## Discussion

The aim of this study was to determine prevalence of stuttering, voice, and speech-sound disorders in primary school students. Prevalence refers to "the proportion or percentage of cases in a given population at a specified time" and is of interest for a number of reasons. How many children have speech or language disorders? This question is important to parents, professionals, policymakers, and researchers who wish to understand communication disorders and optimize assessment and intervention services for these children (16).

"A variety of different methods have been used to establish case status or the presence of communication disorders. The methods dependent on both the age of

individual and the setting and prevalence rates also vary according to the method used" (7).

Lower prevalence rates are typically derived from questionnaire or survey methods (including Parent or teacher reports) in comparison to direct screening techniques (9). As a result of the varying definitions and cut off point used for communication disorder, comparison across studies is difficult. The lower prevalence rates at older ages are consistent with evidence that speech sound disorders may resolve over time (17).

In this study, prevalence of speech disorders on 7881 primary school students was 14.8%, that higher than studies reported by McKinnon *et al.* on 10425 children 5-12 years old age (1.51%) (7), and Keating *et al.* on 12388 children 0-14 years old age (1.7%) in Australia (15). This discrepancy may be due to the different age range and source of collection data that in their study base on report of employed teacher and parent and in the present study employed face-to-face assessment.

In the present study, prevalence of speech-sound disorders was 13.1% that is higher than the other studies: 1.06% in children from kindergarten to grade six in McKinnon *et al.* study (7), 3.8% in 6-year-old children in Shriberg study (9) and 1.7% in Keating (15) and 6.4% in Beitchman studies (18). Some data are emerging regarding the prevalence of particular type of voice disorders in children.

Law *et al.* concluded that underreporting of the prevalence of language disorders was more likely when studies did not include both a screening and a follow-up assessment and probably different methods for identifying of these cases (19).

Some children with speech sound disorders may be at increased risk for reading and other academic difficulties (20).

In the present study, speech sound disorder was more prevalent in boys that support other studies. (15, 18, 21) In this study prevalence of stuttering was 1.2%, that is lower than Manson (4.99%) (22) and Proctor (2.52%) (23) studies, and higher than Mc Kinnon (0.33%) (7) and Craig (0.72%) studies (24).

There are well recognized fluctuations in the reported incidence of stuttering at different ages. Higher prevalence rates were reported for younger children (1.44%) and the lowest rate was reported for adolescents (0.53%). Data from longitudinal and cross-sectional studies suggested that speech sound disorder and stuttering decrease with age (17, 24).

In our study the ratio of male to female in stuttering was 2.5 to 1, that similar to in Craig *et al.* study 2.3 to 1

## Speech disorders in Iran

in primary school-aged children (24) and lower than McKinnon *et al.* with ratio 7.5:1 (7).

In Bloodstein study, male to female ratio was 3–1 in stutterers of school-age (25).

In this study the prevalence of voice disorder was 0.47% that is higher than McKinnon (0.12%) (7) and lower than Carding study that prevalence of dysphonia by research clinicians was 6% compared with a parental report of 11% (26) and Duff (3.9%) study (27). In conclusion, in this study, initially identification speech disorder occurred via direct assessment. These prevalence figures are higher than more studies that using parent or teacher reports and further studies is needed.

## Acknowledgments

The authors wish to thank Mrs Khezri, speech-language therapists, the head Schools Office in Yazd, and student's parents for their collaboration in conducting the survey.

This study was funded by a grant from the Deputy for research of Azad University of Medical Sciences and Health Services, Yazd, Iran.

## References

1. Baker BM, Blackwell PB. Identification and remediation of pediatric fluency and voice disorders. *J Pediatr Health Care* 2004;18(2):87-94.
2. Dowling CF. Differentiating normal speech dysfluency from stuttering in children. *Nurse Pract* 1994;19(2):30, 34-5.
3. Schuele CM. The impact of developmental speech and language impairments on the acquisition of literacy skills. *Ment Retard Dev Disabil Res Rev* 2004;10(3):176-83.
4. Snowling MJ, Bishop DV, Stothard SE, Chipchase B, Kaplan C. Psychosocial outcomes at 15 years of children with a preschool history of speech-language impairment. *J Child Psychol Psychiatry* 2006;47(8):759-65.
5. Nelson HD, Nygren P, Walker M, Panoscha R. Screening for speech and language delay in preschool children: systematic evidence review for the US Preventive Services Task Force. *Pediatrics* 2006;117(2):e298-319.
6. Ukrainetz TA, Fresquez EF. "What isn't language?" A qualitative study of the role of the school speech-language pathologist. *Lang Speech Hear Serv Sch* 2003;34:284-98.
7. McKinnon DH, McLeod S, Reilly S. The prevalence of stuttering, voice, and speech-sound disorders in primary school students in Australia. *Lang Speech Hear Serv Sch* 2007;38(1):5-15.
8. Campbell TF, Dollaghan CA, Rockette HE, Paradise JL, Feldman HM, Shriberg LD, Sabo DL, Kurs\_Lasky M. Risk factors for speech delay of unknown origin in 3-year-old children. *Child Dev* 2003;74(2):346-57.
9. Shriberg LD, Tomblin JB, McSweeney JL. Prevalence of speech delay in 6-year-old children and comorbidity with language impairment. *J Speech Lang Hear Res* 1999;42(6):1461-81.
10. Yairi E, Ambrose N, Cox N. Genetics of stuttering: a critical review. *J Speech Hear Res* 1996;39(4):771-84.
11. Yairi E, Ambrose NG. Early childhood stuttering I: Persistency and recovery rates. *J Speech Lang Hear Res* 1999;42(5):1097-112.
12. Definitions of Communication Disorders and Variations. Ad Hoc Committee on Service Delivery in the Schools. American Speech-Language Hearing Association [Online]. 1993 [cited 2011 Mar 1]; Available from: URL:<http://www.asha.org/docs/html/RP1993-00208.html>
13. Oates J. The evidence base for the management of individuals with voice disorders. In: Reilly S, Douglas J, Oates J, editors. *Evidence-based Practice in Speech Pathology*. London: Whurr Publisher; 2004. p. 140-84.
14. Ruben RJ. Redefining the survival of the fittest: communication disorders in the 21st century. *Laryngoscope* 2000;110(2 Pt 1):241-5.
15. Keating D, Turrell G, Ozanne A. Childhood speech disorders: reported prevalence, comorbidity and socioeconomic profile. *J Paediatr Child Health* 2001;37(5):431-6.
16. Enderby P, Pickstone C. How many people have communication disorders and why does it matter? *Advances in Speech Language Pathology* 2005;7(1):8-13.
17. Shriberg LD, Gruber FA, Kwiatkowski J. Developmental phonological disorders. III: Long-term speech-sound normalization. *J Speech Hear Res* 1994;37(5):1151-77.
18. Beitchman JH, Nair R, Clegg M, Patel PG, Ferguson B, Pressman E, Smith A. Prevalence of speech and language disorders in 5-year-old kindergarten children in the Ottawa-Carleton region. *J Speech Hear Disord* 1986;51(2):98-110.
19. Law J, Boyle J, Harris F, Harkness A, Nye C. Prevalence and natural history of primary speech and language delay: findings from a systematic review of the literature. *Int J Lang Commun Disord* 2000;35(2):165-88.
20. Raitano NA, Pennington BF, Tunick RA, Boada R, Shriberg LD. Pre-literacy skills of subgroups of children with speech sound disorders. *J Child Psychol Psychiatry* 2004;45(4):821-35.
21. Howell P, Davis S, Williams R. Late childhood stuttering. *J Speech Lang Hear Res* 2008;51(3):669-87.

22. Mansson H. Childhood stuttering: Incidence and development. *J Fluency Dis* 2000;25(1):47-7.
23. Proctor A, Yairi E, Duff MC, Zhang J. Prevalence of stuttering in African American preschoolers. *J Speech Lang Hear Res* 2008;51(6):1465-79.
24. Craig A, Hancock K, Tran Y, Craig M, Peters K. Epidemiology of stuttering in the community across the entire life span. *J Speech Lang Hear Res* 2002;45(6):1097-105.
25. Bloodstein O. Some empirical observations about early stuttering: a possible link to language development. *J Commun Disord* 2006;39(3):185-91.
26. Carding PN, Roulstone S, Northstone K; ALSPAC Study Team. The prevalence of childhood dysphonia: a cross-sectional study. *J Voice* 2006;20(4):623-30.
27. Duff M, Proctor A, Yairi E. Prevalence of voice disorders in African American and European American preschoolers. *J Voice* 2004;18(3):348-53.

Archive of SID