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Original Article

Prevalence of communication disorders in a rural population at taluq level of Gujarat, India

Sujeet Kumar Sinha^{a,*}, Jyothi Shivaswamy^b, Animesh Barman^c,
Divya Seth^d, Danush Seshadri^d, S.R. Savithri^e

^a Reader, Department of Audiology and NSS Programme Officer, AIISH, Mysore, India

^b Research Assistant, Department of Audiology, AIISH, Mysore, India

^c Professor, Department of Audiology, AIISH, Mysore, India

^d NSS Student Leader, AIISH, Mysore, India

^e Director, AIISH, Mysore, India

ARTICLE INFO

Article history:

Received 29 June 2016

Accepted 17 August 2016

Available online 5 September 2016

Keywords:

Survey

Prevalence

Communication disorders

ABSTRACT

Objectives: The main objective of the study was to estimate the prevalence of communication disorders between genders and across age groups.

Methods: The All India Institute of Speech and Hearing, Mysore conducted a Speech and Hearing camp as a part of the annual activity of National Service Scheme (NSS) in Sinor Taluq, Vadodara district, Gujarat State of India. Speech and Hearing camp was conducted in 15 villages of Sinor Taluq. These villages were selected randomly and the population of these villages was 28,954 (twenty eight thousand nine hundred fifty-four).

Results: Among the 28,954 individuals surveyed, 1187 (4.09%) individuals were found to have communication disorder. The overall prevalence of ear-related disorders was 3.30% (male – 1.66%, female – 1.63%) and prevalence of speech- and language-related disorder was 0.79% (male – 0.60%, female – 0.24%).

Conclusion: The results of the present study could be used to plan and execute policies for the identification, management, and rehabilitation of individuals with communication disorders.

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1. Introduction

For intervention of any communication disorder, prevention is the first and crucial component. Communication disorders are hidden disabling conditions, which have affects on the social

and emotional well-being, cognition, behaviour,^{1,2} and academic achievement in the school and college years and also affect vocational choices later in adulthood.³ Communication disorder is an umbrella term, which includes a variety of speech, language, and hearing disorders.⁴ Although several studies have described the communication disorders in a

* Corresponding author at: Reader, Department of Audiology, AIISH, Manasagangothri, Mysore 570006, India.
E-mail address: sujitks5@gmail.com (S.K. Sinha).

<http://dx.doi.org/10.1016/j.cegh.2016.08.006>

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variety of ways, there is a lack of clear and empirically derived definitions and classification systems. This has always resulted in poorly developed evidence, based on which most of the identification and management of communication disorder is done across the globe.⁵ The planning of any rehabilitation programme for communication disorder requires adequate prevalence data to understand the nature and severity of the communication disorder in a particular region.

Several studies across the globe have reported the different amount of prevalence rate for communication disorders. In a group of 2980 children (age range 1–11 years), De Andrade⁶ reported 4.19% prevalence for the communication disorder. Annie et al.⁷ reported the prevalence of communication disorder to be 21.5% for hearing impairment. Theys et al.⁸ reported prevalence of neurogenic stuttering to be 5.3% in a group of individuals with stroke in Belgium. Roongpraiwan et al.⁹ reported prevalence of dyslexia to be 6.3% in a group of children in the age range of 7–11 years. Beitchman et al.¹⁰ reported the prevalence of speech and language disorders to be 11.08% in a group of 1655 children aged below 5 years. Shriberg and group¹¹ reported prevalence of speech disorders to be 6.8% in a group of 7218 children below 6 years of age. Silva et al.¹² reported prevalence of speech disorder to be 1.51%.

Among the Indian studies, the National Sample Survey Organisation¹³ reported that in India 21 out of every 1000 children have hearing loss. Singh et al.¹⁴ reported the prevalence of hearing impairment to be 7.3% for hearing impairment in a rural population of Lucknow district. Kumar et al.¹⁵ reported that prevalence of mental retardation to be 2.3% in Karnataka. Devadiga et al.¹⁶ reported that more prevalence for auditory disorders (62%) followed by language disorders (24%) and then speech disorders (14%) in a register-based study. Devadiga et al.¹⁶ also reported that the disorders were more prevalent in males compared to females for the disorders under study across all the age groups. Sreeraj et al.¹⁷ reported prevalence of communication disorder to be 6.07% in a rural population of Karnataka (sample size – 15,441 individuals). Sreeraj et al.¹⁷ also reported that otological disorders were more prevalent compared to speech and language disorders and prevalence of communication disorder was more in males compared to the females.

There are different ways in which these prevalence studies are carried, for example out such as questionnaire, surveys, parental interview, teachers interview, register-based studies, etc. The prevalence rate of communication disorders vary according to the method adopted for the study. For example, Leske¹⁸ reported those lower prevalence rates are typically reported in the studies that involve questionnaire or survey method (including parental interview or teacher's interview). Shriberg et al.¹¹ reported that prevalence rate is reported better when a survey method is followed by the screening of the individuals suspected for the communication disorders. Law et al.¹⁹ also reported that prevalence of communication disorders was always underreported when the studies did not involve the survey and a follow-up assessment. In the present study, we first conducted a door-to-door survey followed by screening of individuals who were suspected to have communication disorders.

2. Need of the study

There is a wide variation in the prevalence of communication disorders reported across several studies across the globe. The wide range of variability across the studies could be due to different methods adopted in various studies, for example such as definition of the disorder, classification of the disorder, total population studied, the age of the participants in the study, rural versus urban population, etc. In India, there is a dearth of published data regarding prevalence of communication disorders. There is also a dearth of information on prevalence of otological versus speech and language disorders in India. Thus, there is a need to study the prevalence and characteristics of these communication disorders. Further, there could be differences in the prevalence of communication disorder across different parts of India as India is culturally, socially and geographically a diverse country. In addition, the Sinor Taluq that was selected for the survey and screening of the communication disorder is a rural area of Gujarat. Awareness of the communication disorder is always less in rural areas compared to the urban areas. Hence, the current study was conducted to see the distribution of communication disorders in Sinor Taluq of Gujarat.

3. Aim of the study

The aim of the study was to estimate the prevalence of communication disorders in a group of 28,954 individuals based in Sinor Taluq of Gujarat.

4. Objective of the study

The specific objective of the study was to identify the individuals with communication disorder by conducting door-to-door survey and screen these individuals in order to understand the nature and characteristic of the communication disorder.

5. Method

The All India Institute of Speech and Hearing, Mysore conducted a Speech and Hearing camp as a part of the annual activity of National Service Scheme (NSS) in Sinor Taluq, Vadodara district, Gujarat State of India. Speech and Hearing camp was conducted in 15 villages of Sinor Taluq. These villages were selected randomly and the population of these villages was 28,954 (twenty-eight thousand nine hundred fifty-four). The study aimed at surveying and screening all the individuals irrespective of the age and the gender residing in these villages. Clustered sampling method was adopted for the same.

The Speech and Hearing camp was conducted in two phases. First phase involved door-to-door survey of communication disorders and an informal screening with questionnaire. Second phase involved the screening of the individuals who were identified to have communication disorders during

the first phase. The door-to-door survey was conducted for four days and the screening was carried out for the next 3 days. For the first phase, a total of 48 NSS volunteers and 10 Speech and Hearing professionals participated. These NSS volunteers were the undergraduate and postgraduate students of All India Institute of Speech and Hearing, Mysore, India.

In the first phase, the NSS volunteers and the NSS officers conducted a door-to-door survey to identify the individuals who had any type of communication disorders. A questionnaire was used by the NSS volunteers about the risk factors associated with the communication disorders. The questionnaire included the demographic data of the family, other details of the family and questions related to prenatal, natal and post-natal history of the individuals to identify the communication disorders. Questions also included prenatal histories, such as: problem to mother during the pregnancy, excessive vomiting, history of miscarriage, drugs taken during pregnancy, infections during the pregnancy, Rh incompatibility, blood sugar levels, exposure to radiations (scan) during the pregnancy and consanguinity. Questions for natal history included premature birth, delayed birth cry, structural abnormalities, neonatal asphyxia, low birth weight, high bilirubin levels, type of delivery and admission to neonatal intensive care unit. Post-natal history included development of motor milestones, development of speech and language milestones, development of hearing milestones, history of illness, seizures, history of trauma, infections to the ear, infections to the throat, other kind of infections, exposure to excessive noise, exposure to ototoxic drugs, vocal abuse/misuse, and family history of communication disorders. NSS volunteers asked these questions related to the communication disorder during the door-to-door survey in every house. Individuals who had a positive history on different questions, irrespective of their chronological age, were referred for detailed evaluation. Individuals who were found to have communication disorder through the questionnaire were referred for the second phase of the study, i.e. all these individuals were screened using various audiological, speech and language, and psychological tests.

For the second phase, other professionals such as Audiologists, Speech-Language pathologists, Psychologist, ENT surgeon, Ear mould technicians and Electronic Engineer joined the team. Among these professionals, Audiologists, Speech-Language pathologists, Psychologist and ENT surgeon were involved in screening of the individuals with communication

disorders. Apart from the above-mentioned professionals only NSS volunteers of AIISH (graduate and postgraduate students of AIISH) were involved in the screening of the individuals with communication disorders. The second phase of the study was conducted at Sree Chotubhai Patel hospital and community health centre, Motafofalia, Gujarat. For the audiological evaluation, pure tone audiometry and immittance audiometry were carried out on all the individuals who were referred for the audiological evaluations. Basic pure tone audiometry included testing of air conduction thresholds at 500 Hz, 1000 Hz, 2000 Hz, and 4000 Hz for both the ears separately. Before these individuals went for audiological evaluations, an otoscopic examination was done for all the individuals by an ENT surgeon. Also, the calibration of all the equipments was ensured before the evaluations. If the pure-tone average (PTA) for octave frequencies 500, 1000, and 2000 Hz was between 0 and 25 dB, hearing sensitivity was considered to be within normal limits. Mild hearing loss has PTA between 26–40 dB and 41–55 dB refers to moderate hearing loss, 56 and 70 dB as moderately severe hearing loss, 71 and 90 dB as severe hearing loss and PTA more than 90 dB refers to profound hearing loss. For Speech-Language and Psychological evaluations standardised test materials were utilised. The survey and the screening results have been mentioned for three age groups (Paediatrics – aged between 0 and 14 years, Adults – aged between 15 and 50 years and Geriatric – aged 51 years and above).

6. Results

6.1. First phase of the study

During the first phase of the study, survey of 28,954 individuals was done. Among the 28,954 individuals surveyed, 1187 (4.09%) individuals were found to have communication disorder. The overall prevalence of ear-related disorders was 3.30% (male – 1.66%, female – 1.63%) and the prevalence of speech- and language-related disorder was 0.79% (male – 0.60%, female – 0.24%). Out of 1187 individuals identified with communication disorders, 79% of the individuals had ear-related problems, whereas 21% of the individuals were found to have speech and language problems. The details of the survey are given in [Table 1](#).

It can be seen from [Table 1](#) that individuals with ear-related problems were more compared to the individuals identified

Table 1 – Male and female data of the individuals identified with ear, fluency, articulation, voice, and language related problems.

Types of problems	Gender					
	Male			Female		
	Groups					
	Paediatric	Adult	Geriatrics	Paediatric	Adult	Geriatrics
Ear related	47	456	275	44	130	294
Fluency	38	22	3	10	5	0
Articulation	28	4	3	8	1	4
Voice	1	1	3	3	6	0
Language	45	20	4	23	6	3

EVALUATION AT SPEECH DEPARTMENT

Fig. 1 – Details of the individuals reported to Speech section.

with the speech and language problems. Also, it can be seen that ear-related problems were more prevalent in geriatrics compared to the adults and paediatrics. Speech and Language problems were more prevalent in the paediatric population compared to that of adults and geriatrics.

However, out of 1187 individuals, only 720 (428 males and 292 females, total 60.65%) individuals reported for the screening. Among the reported population, 115 (92 males and 36 female, total 15.97%) individuals reported with speech and language problems (paediatric – 86, adults – 23, Geriatrics – 6), 605 (336 males and 256 females, total 84.02%) individuals reported with ear related problems (paediatric – 64, adult – 171, Geriatrics – 370).

Among the individuals who reported with ear-related problem, geriatric individuals were more compared to paediatric and adult cases (Geriatric males = 220, Geriatric females = 150, paediatric males = 36, paediatric females = 28, adult males = 83, adult females = 88). Among the individuals who reported with speech related problems, paediatric cases were more compared to the adults and geriatric cases (Geriatric males = 5, Geriatric females = 1, paediatric males = 65, paediatric females = 21, adult males = 14, adult females = 9).

6.2. Second phase of the study

During the screening of the individuals, i.e. in second phase of the study, in Speech-Language section a total of 128 (100 males and 28 females) clients were screened (115 reported, 13 referred from other section on screening day). Out of 128 clients 65 had language problems (paediatric – 52, adult – 10 and geriatric – 3, total – 50.78%), 30 had fluency problems (paediatric – 24, adults – 6, total – 23.43%), 27 had articulation problems (paediatric – 22, adults – 4 and geriatric – 1, total – 21.09%), and 6 of them (4.6%) had voice related problems (paediatric – 2, adults – 1 and geriatric – 3). None of the individuals reported to speech section had normal speech and language (i.e. 100% of the individuals had speech- or language-related problems). The details of the cases evaluated are given in Fig. 1.

It can be seen from Fig. 1 that in speech section, paediatric cases were more compared to adults and geriatrics cases. Also, it can be seen from Fig. 1 that male individuals were more compared to the females.

In Audiology section, a total of 507 clients were screened. Out of 507 clients (1014 ears) screened at audiology section, 139 ears had normal hearing sensitivity (13.70%); out of 139 ears with normal hearing sensitivity, only 40 individuals had

AUDIOLOGY EVALUATION

Fig. 2 – Details of the individuals reported to Audiology section.

Fig. 3 – Details of the hearing aid prescribed.

bilateral normal hearing sensitivity and the remaining individuals had hearing loss in one of the ears. 145 ears had mild hearing loss (14.29%), 263 ears had moderate hearing loss (25.93%), 185 ears (18.24%) had moderately severe hearing loss, 169 ears (16.66%) had severe hearing loss and 79 ears (7.79%) had profound hearing loss. Remaining 17 clients (34 ears – paediatric, 3.35%) could not be tested because they could not be conditioned for pure tone audiometry. The details of the clients evaluated at Audiology section are given in Fig. 2.

It can be seen from Fig. 2 that most of the individuals had moderate to severe hearing loss. Also, it can be seen that geriatric cases were more compared to the adult and paediatric cases. Out of 507 clients, 324 clients were given hearing aids and 21 were suggested to manage without amplification. Remaining 162 clients were referred back to ENT surgeon for further evaluations. Out of 324 clients who were given hearing aid, ear mould impression was taken for 500 ears. These moulds were processed at ear mould laboratory of AIISH and were sent to the clients to their respective addresses. The details of the individuals who were prescribed hearing aid are given in Fig. 3.

In ENT section, a total of 407 clients (paediatric – 68, adults – 155 and geriatric – 184) were provided consultation for ENT problems. Further in ENT section, 190 clients were provided medicine free of cost for ENT-related problems. In Psychology section, a total of 81 clients were provided consultation.

7. Discussion

The prevalence of communication disorders in the present study is lesser compared to the earlier studies reported abroad.^{10,11} The different prevalence rates found in the present study compared to the earlier studies could be due to the fact that earlier studies conducted by Beitchman et al.¹⁰ and Shriberg et al.¹¹ were conducted abroad and not in India. However, the prevalence of communication disorder obtained in the present study is also lesser than one of the earlier published reports in India.¹⁷ Among the Indian studies, Sreeraj et al.¹⁷ reported a prevalence of 6.07% in Karnataka. This could be because of the geographical differences and socioeconomic status differences in two different states of India.

In the present study, the prevalence of ear related disorder was more compared to the speech and language disorders. Previous studies reported the prevalence of speech disorders from 1.51% to 11.08% in children.^{10–12} The present study also reported a prevalence of speech disorders to be 0.79%, which is much lesser compared to the studies reported earlier. However, the ear-related problems have been reported to be around 7.3% in a rural population of Lucknow.¹⁴ National Sample Survey organisation¹³ reported prevalence rate of hearing impairment to be 8% in rural areas, whereas 7% in urban areas. The prevalence of ear related problems was much lesser in the present study compared to the earlier studies. The differences in between the earlier studies and the present studies could be because of the methods adopted for the survey, i.e. in the present study we conducted a door to door survey, whereas in the other studies the data have been collected on random population.

Among the reported cases, individuals with ear related problems were 84.02%, whereas individuals with speech- and language-related problems were 15.97%. Devadiga et al.¹⁶ and Sreeraj et al.¹⁷ also reported a higher prevalence of auditory disorders compared to speech and language disorders. Devadiga et al.¹⁶ reported a prevalence of ear related problems in 62% of the individuals, whereas 38% of the individuals had speech- and language-related problems in a register-based study. Sreeraj et al.¹⁷ reported 90.58% individuals with audiological and otological disorders and 9.42% with speech and language disorders. The differences in the findings could be because of the differences in the study population in the three studies. Devadiga et al.¹⁶ collected the data in Mangalore which is southern part of the Republic of India, and typically Mangalore has a tropical climate. Sreeraj et al.¹⁷ collected the data in Lakshadweep, which is a group of islands in the Laccadive Sea in the Republic of India. These differences could be because these three regions are different in terms of cultural, social and geographical background.

Overall, during the first phase and the second phase of the study, the prevalence of speech and language disorder was higher in paediatric cases than in adult and geriatric cases. Sreeraj et al.¹⁷ also reported a higher prevalence of speech and language disorder in paediatric population compared to the adults and geriatrics. The present study is also in consonance

with earlier studies.^{11,12} More prevalence of speech and language disorders in children could be because individuals staying in rural areas have limited exposure to modern day technologies and the professional services to these rural areas are lesser. People in rural areas are unaware of the risk factors and the causes of communication disorders, and hence this may put children at risk for developing speech and language problems.

In the audiology section, the geriatric cases were more compared to the adults and paediatric cases. The present study is in consonance with earlier studies.^{17,20} The higher incidence of hearing loss in geriatric individuals could be because of the presbycusis and the other associated problems such as diabetes, which also could add to the severity of the problems.

8. Summary and conclusion

The prevalence rate obtained in this study for individuals who were found to have communication disorders was 4.09%. This information could be used to develop a database, which could include information from different regions across the country. This would help in better understanding the prevalence of communication disorders across different regions. The results of the present study could be used to plan and execute policies for the identification, management, and rehabilitation of individuals with communication disorders.

Conflicts of interest

The authors have none to declare.

Acknowledgements

Authors acknowledge the staff of NSS office, University of Mysore, for granting us permission to conduct the camp at Gujarat and granting financial aid in running the camp. Authors would also like to acknowledge the staff of the supporting agency of the camp: Shaktikrupa Chariatable trust, Motafofalia, Gujarat for their active involvement in coordinating the survey and camp. Authors also thank all the staff from various departments of AIISH and NSS volunteers for helping in smooth functioning of NSS camp. We also thank the anonymous reviewers for the comments on earlier version of the manuscript.

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