

**Profiling Awareness among Rehabilitation Professionals
about Indian Sign Language (ISL) used by Persons with
Hearing Disability**

A Minor Research Project

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By

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Declaration

I, Ms. Kasturi Kulkarni, hereby declare that work presented in the minor research titled **‘Profiling Awareness among Rehabilitation Professionals about Indian Sign Language (ISL) used by Persons with Hearing Disability’** is a record of original and independent research work done by me and has not been submitted for any other degree or any other university on any occasion.

The material that has been obtained from other sources is duly acknowledged in the report. To the best of my knowledge work carried out in this project has not been reported so far and hence this work can be considered as original.

Date:

Kasturi Arun Kulkarni

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- **Kasturi Arun Kulkarni,**
Assistant Professor,
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Chapter I

Introduction

1.1 About Sign languages

Language is a unique and exclusive gift to the mankind. Linguistic proficiency has been called a central requirement for human life (Magnuson, 2000). Sign language, which is highly visual-spatial, linguistically complete and natural language, is the main mode of communication among persons with deafness. A sign language is a language which, instead of acoustically conveyed sound patterns, uses visually transmitted sign patterns (manual communication) to convey meaning by simultaneously combining hand shapes, orientation and movement of the hands, arms or body and facial expressions to fluidly express the thought of a signer. Wherever communities of deaf people exist, sign languages develop. Presently hundreds of sign languages are in use around the world catering to the local deaf cultures. Some sign languages have attained some form of legal recognition, while others have no status at all. Sign languages were first recognized as natural languages in the 1950s and 1960s by Dutch linguist Bernard Tervoort and American linguist William Stokoe.

1.1.1 Brief about Indian Sign Language (ISL):

The sign language used in India is commonly known as Indian Sign Language (ISL). It is the mother tongue of the Indian deaf individuals. ISL can be considered visual – gestural language that conveys linguistic meaning by means of hand movements, facial expressions, head and body positions. There is no reliable information about when and how ISL originated. It is not known to be genetically related to any other SL. Focal points for the propagation of ISL are the deaf schools and deaf associations. ISL is not an officially recognized language anywhere in Indian subcontinent yet it is widely used in the educational system.

The All-India Federation of the Deaf puts the population of the deaf around 4 million with more than 10 million who are hard of hearing people in the country (Zeshan, et al, 2004). Studies revealed that, one out of every five deaf people in the world is from India. More than 1 million deaf adults and around 0.5 million deaf children use ISL as a mode of communication (Zeshan, et al 2004). In fact, ISL is not only used by the deaf people but also by the hearing parents of the deaf children, the hearing children of deaf adults and hearing deaf educators (Zeshan et al, 2004).

1.2 Origin of the research problem:

The primary concern of children or individuals with deafness is communication. There are various ways to deal with this challenge. These various ways can be categorized into three broad categories: use of verbal language, use of sign system and use of sign language. There is a need to create awareness among professionals and families related to these three broad categories. All the three options are not adequately understood by its users: families and professionals. It is needed that better understanding and appropriate skills be developed among all so that the individuals with deafness get the maximum benefit of the selected option. Although all three options are practiced in Maharashtra, the option of Indian Sign language is practiced by very few educational institutes / professionals due to misconceptions about it. Before creating awareness, one needs to identify and analyze the current level of awareness among the professionals. Hence, this study wishes to address the level of awareness with reference to common myths related to Indian Sign Language (ISL).

1.3 Need of the study

Professionals and paraprofessionals like audiologists, speech pathologists, special educators, psychologists, etc. play a significant role in the life of children with hearing loss. They are also involved in decision-making process and are responsible for important decisions in their life like, selection of amplification devices, selecting communication method, admission to regular or special school, etc. Their decisions have a lasting impact on life of children with hearing loss and their families.

Families are expected to take decision and professionals are expected to inform the families about the pros and cons of the decisions. Are the professionals in a position currently wherein they can give appropriate and relevant information to families? One needs to find out their awareness to ensure that correct information reaches the families. Hence, the present study envisages to find out the level of awareness about ISL among the rehabilitation professionals working with deaf individuals.

1.3.1 Rationale of the study:

With time, there has been a shift in the outlook towards persons with disability. Earlier medical model of disability was prevalent in the field of disability rehabilitation. It viewed persons with disability as ‘deficient’, who need treatment. Hence, they should be provided with treatment and made ‘normal’ so that they will be able to mingle up in the mainstream

society. No adaptations will be made in the society for them. For. e.g., person with hearing loss should learn speech so that he will be able to communicate verbally like other non-disabled individuals in the society.

Recently, as a result of UNCRPD (2006), the trend has shifted towards social model of disability. This new trend highlights ‘ADAPT- Able disabled all persons together- nothing for us, without us.’ According to this model, persons with disability are at the core and that they should have the power to make choices for themselves. This view supports the principle of inclusion and views professionals as equal partners in the rehabilitation process. It expects professionals to be aware about the trends in disability sector and undertake rehabilitation measures as per the needs of persons with disability. For e.g., Professionals dealing with deaf students should be able to use ISL. It will enable them to understand the needs of these students in a better way.

Overall, things are working out far better than earlier for the acceptance of ISL. The first step towards change is awareness. (Branden, YNK). One step before acceptance is awareness.

With this rationale, the present study aspires to find out the level of awareness about Indian Sign Language in rehabilitation-professionals working with children having hearing loss. It will enable us to identify areas in ISL about which these rehab-professionals are aware about and those areas in ISL which need to be popularized.

1.5 Statement of the Problem

Profiling Awareness among Rehabilitation Professionals about Indian sign language (ISL) used by Persons with Hearing Disability.

1.6 Variables of the study

1. Independent variable: There is one independent variable in the present study, namely, Rehabilitation Professionals. It has four levels: Special Educators, Audiologists, Psychologists and Mainstream Teachers.

2. Dependent variable: Awareness about Indian Sign Language (ISL) is the dependent variable in the present study. It has three levels: Awareness about Deaf Culture, Awareness about Grammar of ISL and Awareness about Application Issues of ISL.

3. Intervening variable: Intervening variables in the present study were boredom and fatigue experienced by the participants along with their attitude in general and issues and concerns in profession. It was controlled by the researcher by making a tool in the form of a google form which was easy to solve and included minimum number of essential items. This helped the participants to attempt all the items in a relatively short period of time.

1.7 Operational Definitions:

1.7.1 Indian Sign Language (ISL): In the present study, Indian Sign Language (ISL) refers to visual language of signs which is the mother tongue of Indian Deaf individuals. It refers to the visual-manual language used by the Indian Deaf community to satisfy their communication needs.

1.7.2 Awareness about ISL: In the present study, awareness about Indian Sign Language, refers to awareness about the cultural aspects, grammar and application issues related to Indian sign language with reference to the common myths when measured in terms of scores obtained by the participants on the researcher made tool.

1.7.3 Rehabilitation professionals: In the present study, rehabilitation professionals refer to professionals like audiologists/ speech therapists and special educators and para-professionals like counselors/psychologists and mainstream school teachers who are working with children having hearing loss currently and who consented to be participant for the said research.

1.7.4 Myths about ISL: In the present study myths about ISL refer to various myths as cited in work book titled ‘Indian Sign Language’ published by Ali Yavar Jung National Institute for Speech and Hearing Disabled – Divyanjan (AYJNISHD-D) and-DSE (HI)Manual titled ‘Language and Communication’ published by Rehabilitation Council of India which can be categorized into three types: cultural aspects, grammar, and applicability of ISL.

1.8 Aim:

The main aim of this research is to review the level of awareness about Indian Sign Language among different rehabilitation professionals working in the field of special education of

children with hearing loss with special reference to the commonly found myths and mis-concepts about ISL.

1.9 Objectives:

To review the **awareness about Indian Sign Language** among different rehabilitation professionals (audiologists/speech therapist and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths and mis-concepts about ISL

1. To comparatively review the **awareness about the cultural aspects of Indian sign language** among different rehabilitation professionals (audiologists/speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths and mis-concepts about ISL.
2. To comparatively review **the awareness about grammar of Indian sign language** among different rehabilitation professionals (audiologists/speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths and mis-concepts about ISL.
3. To comparatively review **the awareness about application issues of Indian sign language** among different rehabilitation professionals (audiologists/speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths/ mis-concepts about ISL.

1.10 Hypotheses of the study:

1.10.1 Null Hypothesis H₀₁

H₀₁ There exists no significant difference in the awareness about Indian Sign Language (ISL) among different rehabilitation professionals (audiologists, speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths/ mis-concepts about ISL.

H₀1a There exists no significant difference in awareness about **the Cultural aspects of Indian Sign Language (ISL)** among different rehabilitation professionals (audiologists, speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths/ mis-concepts about ISL.

H₀1b There exists no significant difference in awareness about **the Grammar of Indian Sign Language (ISL)** among different rehabilitation professionals (audiologists, speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths/ mis-concepts about ISL.

H₀1c There exists no significant difference in awareness about **the Application Issues of Indian Sign Language (ISL)** among different rehabilitation professionals (audiologists, speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths/ mis-concepts about ISL.

1.10.2 Alternate Hypothesis H_a1

H_a1 There exists a significant difference in the awareness about Indian Sign Language (ISL) among different rehabilitation professionals (audiologists, speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths/ mis-concepts about ISL.

H_a1a There exists a significant difference in awareness about **the Cultural aspects of Indian Sign Language (ISL)** among different rehabilitation professionals (audiologists, speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths/ mis-concepts about ISL.

H_a1b There exists a significant difference in awareness about **the Grammar of Indian Sign Language (ISL)** among different rehabilitation professionals (audiologists, speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths/ mis-concepts about ISL.

Ha1c There exists a significant difference in awareness about **the Application Issues of Indian Sign Language (ISL)** among different rehabilitation professionals (audiologists, speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths/ mis-concepts about ISL.

1.11 Scope and De-limitations of the study

- The present will be applicable to only four categories of rehabilitation professionals namely: audiologists/ speech therapists, special educators, counselors/psychologists and mainstream school teachers.
- The geographical limits of the study include Mumbai, Thane and Navi Mumbai.
- The present study will profile awareness of rehabilitation professionals in three areas pertaining to Indian Sign Language (ISL): Awareness about cultural aspects, awareness about grammar and awareness about application issues in ISL.

1.12 Relevance to Social Benefit by this R&D in the proposed area

The present study is socially relevant and beneficial because currently the research has proven that the attitude and perspective towards the Indian Sign Language among the parents, rehabilitation professionals and the para-professionals is neither pro-active nor positive. Because of this the children with hearing impairment are denied the opportunity to learn or acquire Indian Sign Language which can be considered as one of the communication options for which these children are biologically ready. Analyzing the awareness level would be socially important to plan the training programs and campaigns about Indian Sign Language so that it is better received by the professionals and the para-professionals. Also, it is important to note that the current training avenues available for Indian Sign Language are not explored fully by the professionals. The research conclusions of the said research can help facilitate the process of training and pro-active attitude towards Indian Sign Language.

1.12.1 Interdisciplinary Relevance of the project:

India is a signatory to UNCRPD (2006). As a result, many positive steps have been taken in the last few years for the growth of SLs. In the wake of international acts and national demands, the National Curricular Framework (NCF, 2005) gave some degree of legitimacy

to sign language education, by hinting that sign language may qualify as an optional third language choice for non-deaf students. NCERT in March, 2006 launched a class III test book that includes a chapter on sign language, emphasizing the fact that it is a language like any other and is “yet another mode of communication”. The aim has been to create healthy attitudes towards persons with disabilities. The policy makers are investing great efforts in framing variety of strategies for increasing awareness level about Indian Sign Language. Recently, many different institutes have started offering training in Indian Sign Language. Some of these courses are supported by Rehabilitation Council of India (RCI), while some other institutes are offering it without support from RCI. For. E.g., In 2001 the first ever ISL interpreter’s course was introduced at Ali Yavar Jung National Institute for the Speech and Hearing Disabilities (Divyangajan)(AYJNISHD-D). It offers A level, B, level & C level courses in two modes: part time and full time, separately for hearing and deaf students. It also offers a fulltime diploma in ISL known as Diploma in Indian Sign Language (DISLI). National Institute of Speech and Hearing (NISH), Thiruvananthapuram offers Massive Open Online Course (MOOC) on Indian Sign Language. Similarly, Ramakrishna Mission Swami Vivekanand University, Coimbatore, also offers courses in training professionals in Indian Sign Language. Recently, Indian Sign Language Research and Training Center (ISLRTC) has been established under the Department of Empowerment of Persons with Disabilities, Ministry of Social Justice and Empowerment. The center will lead the way in academic development, training and propagation of ISL. The range of professionals who enroll in these courses are empowered with knowledge and skills of using Indian Sign Language. However, those professionals who do not enter these training programs may not be aware about Indian Sign Language. Policy makers need to develop training programs for popularizing Indian Sign Language among such ‘un-reached’ professionals in the field of disability-rehabilitation. The present study will help to establish current level of awareness about Indian Sign Language in rehabilitation professionals and highlight those aspects that need to be popularized by policy makers.

Chapter II

Reviewed Literature

Extensive review of literature was undertaken about Indian Sign Language (ISL) in the international as well as national context. The reviewed studies are organized under the following heads:

2.1. Studies on Structure of Indian Sign Language (ISL)

2.2 Studies on awareness about sign languages among rehabilitation professionals in the global context

2.3. Studies on various aspects of Indian Sign Language

2.1. Studies on Structure of Indian Sign Language (ISL)

Linguistic studies on ISL started around 1978 and it was found that ISL is a complete natural language, which has its origin in India. It has its own morphology, phonology, syntax, and grammar (Vasishta et al, 1978; Zeshan et al, 2004). The research on ISL linguistics and phonological studies got hindered due to lack of linguistically annotated and well documented ISL data. In 1977, Vasishta, Woodward, and Wilson visited India with partial support from the National Science Foundation (USA) and collected signs used in four major urban centers (Delhi, Calcutta, Bombay and Bangalore) for linguistic analyses. Vasishta et al (1978) found that ISL is a language in its own right and is indigenous to the Indian subcontinent. Subsequent efforts by Vasishta et al between 1977 and 1982 resulted in the creation of four dictionaries of ISL with its regional varieties and some related materials. In 2001, another dictionary was published by the Ramakrishna Mission Vidyalaya in Coimbatore.

There was a big gap and dearth of research studies on ISL until Zeshan began publishing her work on Indo-Pakistani Sign Language from 1996 onwards. Zeshan's publication of her Master's thesis on ISL grammar was the first work of its kind on ISL, closely followed by the publication of the more extensive PhD thesis. Since then, regular successions of articles have resulted in ISL being a relatively well described SL as of today. Research by Zeshan (2003), has confirmed and expanded earlier work, showing that ISL is indigenous to India, and is used in the form of regional dialects all over the Indian subcontinent, also it has a

complex linguistic structure of its own and is not based on any SL. Further its grammar can be described by means of linguistic analysis. But this literature is not readily available within India, and most of it requires the reader to have at least some background of sign language linguistics.

2.2 Studies on awareness about Sign languages among Rehabilitation Professionals in the Global context

In one study, Department of Rehabilitation Services for the Hearing Impaired (DRSHI) (1981), designed an assessment tool for evaluating the receptive and expressive aspects of sign language proficiency among staff workers appointed for serving individuals with deafness. This tool worked as a screening tool for selecting those candidates who were good in using sign-language.

Humphries et.al (2017), found that although sign languages are natural languages, many professionals suggest caregivers of children with hearing loss that they should not learn sign language. The professionals may have many myths about sign language like 1. learning sign language is not easy 2. the consequences of bi-lingualism 3. sign languages lack script 4. sign language learning interferes with learning literacy skills 5. use of technology is assisting deaf 6. effects of using sign language on deaf person's family environment.

One study was conducted to evaluate awareness and usage of sign language among doctors (Modawey, 2018). Questionnaires were given to 112 house officers, 96 registrar, 85 medical officers, and 12 consultants. 52.1% of doctors got in touch with deaf people to solve the questionnaire. In 22.6% of the cases, use of relatives and other people for interpreting communication was the common method of communication. Only 12.5% used writing and 11.5% used sign language. Only 4 % used sign language. 95.7% were already aware about importance of sign language and 68.5% had agreed to include sign language in medical curriculum.

Kite (2019) studied the beliefs and value-system of family-members of 8 bilingual deaf students when they took decision about English and American Sign Language (ASL) when they formed their own language policy framework within their family. It is important to develop a family language policy framework which is inclusive in nature because, the professionals like audiologists, educators, medical professionals and specialists have a strong influence on the attitudes, opinions and beliefs about deafness. They may hold certain

wrong notions about ASL. Hence, there is a need to rectify these notions. This research paper informed the teachers, other professionals and researchers about potential advantages and disadvantages of providing support to the families with respect to framing their ASL and English language policy-framework.

This study about special educators comes from New Zealand. Powell, Boon & Luckner (2019) undertook a project to train the sign language skills of educators of the deaf. Many times, it is observed that deaf students who were sign language users found communication a major challenge. This is because, they were not exposed to adult role models who were expert signers. The results of the present study indicated that when the educators of the deaf were trained in using sign language, the communication of the deaf students also improved.

2.3. Studies on Various aspects of Indian Sign Language

The first study is about empowering parents in using Indian Sign Language (ISL). Bhuvaneshawari & Shrivastava (2016) studied the effectiveness of a training program on development of functional sign language of caregivers of deaf children. The study was conducted using pre-test post-test experimental group design. Convenient sampling method was used for selecting parents. Results of the t-test analysis indicated that there was a significant difference between the pre-test and post-test scores of caregivers on functional sign language. However, there was no difference in the educational status, gender, age, and locality of caregivers post intervention.

Few studies were found which focused on material-development of Indian Sign Language (ISL). Joy, Balkrishnan & Madhvankutty (2020) developed a bilingual mobile-based application in the form of a dictionary for Indian Sign Language (ISL) for improving the literacy skills of deaf children. It converted the text captured by camera and simple sentences spoken by the speaker into signs of ISL. 2900 users who installed this application across India, provided the feedback that they found it easy to learn ISL using this application. The distinguishing features of this mobile application which made ISL learning easy and effective included features like ease of availability, speedy operation and character-recognition.

One more study was reviewed about material-development in ISL. Aditya & Rajesh (2020) conducted a study on automatic sign language recognition by developing a video data set of hand gestures of words from Indian Sign Language (ISL) used in emergency situations.

Videos of 8 words from ISL were collected from 26 persons (12 males and 14 females between the age range of 22 to 26 years). 2 sample videos were collected from each individual in an indoor environment with normal lighting conditions. Such a video-dataset would help in automatic recognition of emergency situations from the sign language for the benefit of the deaf. The results of the study indicated that such video-sets of hand gestures of emergency words from ISL could be very effectively used for facilitating communication with deaf individuals.

Goswami, Ravindra & Sharma (2019) studied the impact of training in Indian Sign Language (ISL) in the context of Inclusive education. They provided ISL-training to 140 typically developing students in higher primary classes of a demonstration-school at Regional Institute of Education in Mysuru. This would improve the communication and teaching of students with deafness studying in mainstream school set-up. A total number of 24 sessions (40 mins per session) were conducted for a period of one month. Training about basic vocabulary, phrases useful in day-to-day life, simple sentences for conversation and Indian National Anthem in Indian Sign Language (ISL) was taught to the students. The results indicated that hearing children showed improved awareness-level about ISL, skill development in ISL and positive attitudes towards their deaf counterparts and use of sign language.

Researcher's Perspective:

Reviewed literature on various aspects of Indian Sign Language (ISL) in Indian context indicates that not much studies have been conducted on attitudes or awareness level or perceptions of rehabilitation professionals towards learning Indian Sign Language. Studies do exist about development of soft-wares, mobile applications, speech to sign applications developed in Indian Sign Language. Studies were also cited wherein training in ISL was provided to stakeholders like parents, educators, psychologists and regular hearing children. However, very less studies were found focusing on grammar and application issues in ISL. Hence, the need for undertaking the present study is justified.

Chapter III

Research Methodology

Introduction

Research Methodology is an important part of every research report. This chapter provides information about how the research study was conducted. In addition to this, research methodology also provides justification about why a particular research design or sampling technique was selected over others for conducting the present study. According Kothari (2008), research methodology includes research methods along with the justification of using a particular method in the study. Research methodology is comprised of few important components which includes the paradigm of research, the research design, sample size and sampling procedure, tool-development and the process of data collection.

3.1 Research Paradigm

There are two main types of research paradigms: Quantitative and qualitative paradigm. In the present study, the researcher had used quantitative paradigm. As per Daniel (2010) in quantitative paradigm as the name suggests, data is collected in the form of numbers. This numerical data is further subjected to statistical analysis for drawing meaningful conclusions about the samples.

3.2 Research Design: Survey Research

Quantitative research method was used in the present study. The research design used in the present study was Survey. Schutt & Check (2012) defined Survey research as a process of gathering information from a sample of population under study by asking questions. A survey may involve use of quantitative research methods like (questionnaires with numerical ratings), qualitative research methods like (questionnaires with open-ended questions) and combination of both quantitative and qualitative methods which is better known as mixed method research methods. Since, the main purpose of surveys to explore and describe human behavior, Singleton and Straits (2009) have stated that surveys are more often a part and parcel of social science research. Survey research have been typically used to obtain information from a large size of population. Fig. 3.1 below indicates three main types of survey:

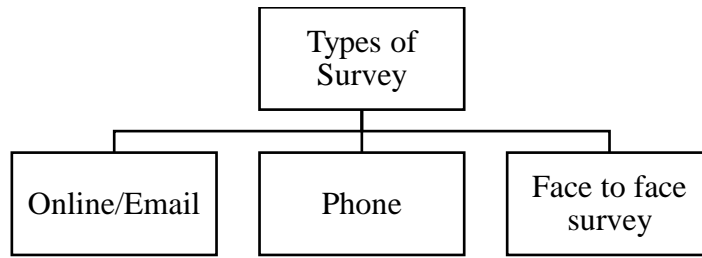


Fig.3.1: Types of surveys

3.2.1: Online/email survey:

One of the most popular ways of conducting survey research at present is by sending questionnaires to the participants through social media platforms and emails. The main advantage of this type of survey is that it is very cost-effective and also elicits accurate responses from the participants.

3.2.2 Phone survey:

When the researcher gathers information from the participants over phone it is known as phone survey. The questions from the questionnaire are asked orally over phone and the researcher marks the responses on the questionnaire in his/her hand. One disadvantage of this type of survey is that it is very time-consuming and costly.

3.2.3 Face to face survey:

In this type of survey, researcher conducts an in-depth interview with each and every respondent. This type of survey is used in a clinical set-up while dealing with difficult problems. Although the researcher is able to gather accurate information from the respondents this procedure is very time-consuming and costly.

3.3 Stages of the Survey Research Design:

Fig. 3.2 below represents five stages in survey research design.

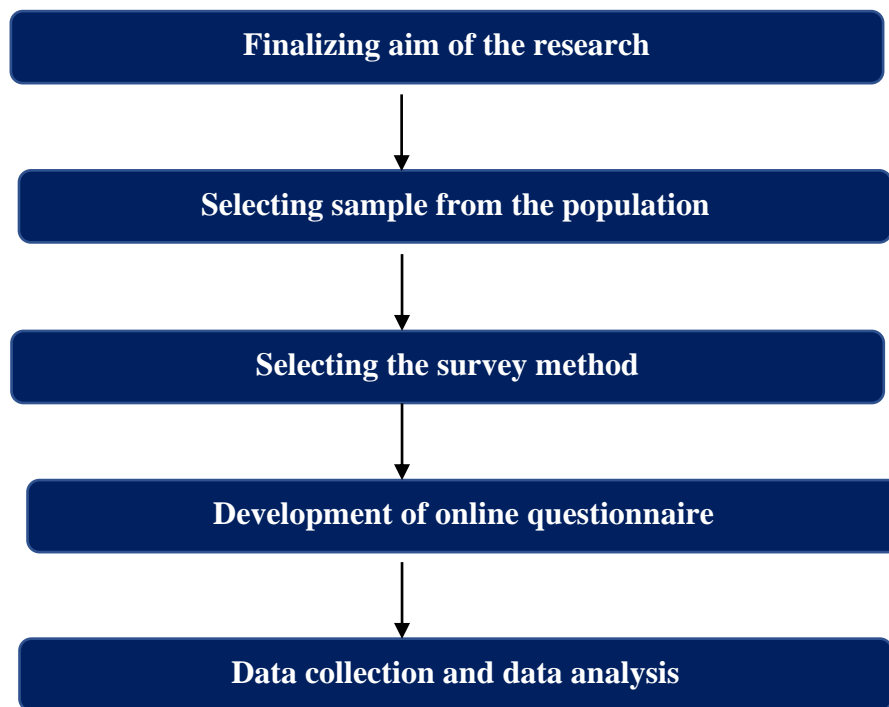


Fig 3.2: Five stages of survey research design

Source: Question-Pro Survey (2020)

Stage 1- Finalizing aim of research

The first stage in a survey is to determine the aim of research. This aim helps the researcher to conduct the entire survey and derive meaningful conclusions towards the end. During this stage, the researcher finalized the main purpose of conducting the survey. The main purpose of the present study was to check the awareness about Indian Sign Language among different rehabilitation professionals working with children with hearing impairment.

Stage 2- Selecting sample from the population.

At this stage the researcher took into account not only the quantity, but also the quality of the participants selected from the population. The opinion of the participants determines the results of the survey. Hence, the participants from each category of rehabilitation professionals were selected using non-random sampling with utmost care. Only those participants who had minimum 2 years of work experience with deaf children/adults were selected in the present study.

Stage 3- Selection of the survey method

A variety of survey methods like online questionnaire, face to face interview, telephonic interview are available for conducting survey. In the present study, online survey was selected for collecting information from the participants. The researcher had developed a google form which was sent to different WhatsApp groups and also emailed to many participants. In this way information about awareness of Indian Sign Language was collected using online survey.

Stage 4- Development of online questionnaire

The items in the questionnaire were validated by a pool of 6 experts from the field of Indian Sign Language. Most of the experts were themselves deaf and belonged to Deaf community. After the validity-check, the questionnaire was subjected to reliability check. After checking the psychometric properties of the questionnaire, the tool was developed in the form of a google-form. It had a total number of 24 items. Each item was a multiple-choice question with 4 alternatives. The participants had to click on one and any one correct alternative. The scoring was easy. One mark for correct answer and zero marks for incorrect or no answer.

Stage 5- Data collection and data analysis

Once the google form was ready, it was sent across different WhatsApp groups of rehabilitation professionals. The data collected was subjected to statistical analysis. One-way Anova which is a parametric statistical test was used to analyze the data and derive meaningful conclusions.

3.4 Sampling Design:

3.4.1 Population: The population of the present study consisted of the following:

1. Rehabilitation professionals including (Special educators and audiologists, / Speech therapists)
2. Para-professionals including (counselors / psychologist, mainstream school teachers) working in the field of rehabilitation of children with hearing loss in India.

3.4.2 Sample size:

The following table 3.1 represents the sample size of each category of rehabilitation professionals:

Table 3.1: Sample size of four groups of Rehab-professionals

Rehabilitation Professionals	Special educators	Audiologists/ Speech therapists	Counselors / psychologist	Mainstream school teachers	Total Sample size
Sample Size (N)	41	39	37	41	158

The table 3.1 above indicates that large sample size was selected for the study from each category of rehabilitation professionals. The total sample size was 158 which consisted of 41 special educators, 39 audiologists/speech therapists, 37 counselors /psychologists and 41 mainstream school teachers.

3.4.3 Sampling technique:

For the present study, rehabilitation professionals were selected using non-random sampling procedure. This is also known as purposive sampling technique.

3.4.4 Inclusion criteria for the samples:

- Those rehabilitation professionals and para-professionals who were currently practicing in Thane, Mumbai and Navi Mumbai were included in the study.
- The rehabilitation professionals with Rehabilitation qualification as per RCI norms (CRR number) were included in the study.
- Minimum 2 years of work experience in the field of Rehabilitation of children with hearing impairment was the inclusion criteria for including samples in the present study.

3.5 Tool Development:

The main aim of the present study was to review the level of awareness about Indian sign Language (ISL) among different rehabilitation professionals working in the field of special education of children with hearing loss with special reference to the commonly found myths and mis-concepts about ISL. For this purpose, the researcher decided to undertake an online survey. The tool for the present study was a multiple-choice-questionnaire developed in the form of a google form. The questionnaire was developed in two parts. First part of the

questionnaire asked the participants to fill in their background details related to their profession, years of experience, contact details. They were informed that the information obtained from them would be kept confidential. While filling the questionnaire, they had to follow two instructions: 1. They were supposed to click on one and only one correct option out of the four given under each item. 2. They were asked to answer all the items. The second part of the questionnaire consisted of the 24 multiple-choice questions developed by the researcher. Each question had four alternatives. The participants had to select any one correct alternative out of the four given in the questionnaire (google form).

3.5.1 Steps in the development of the Online-Questionnaire

Fig 3.3 below represents the steps in the development of the online - questionnaire.

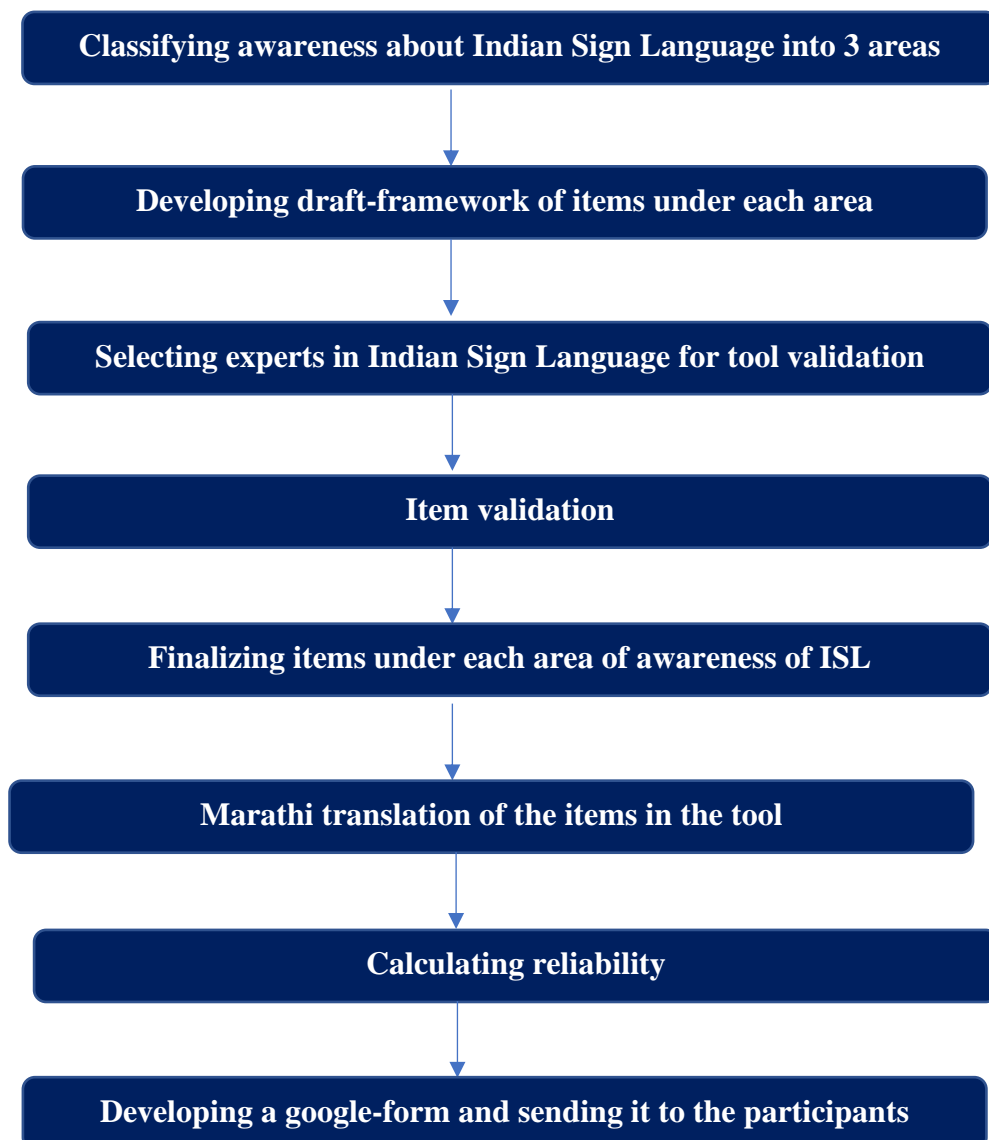


Fig 3.3: Steps in the development of the tool (google form)

➤ **Classifying awareness about Indian Sign Language into 3 areas:**

The researcher conducted a thorough review of literature about trends in Indian Sign Language (ISL). Based on the reviewed literature it was decided to operationally define awareness about Indian Sign Language among rehabilitation professionals in terms of three areas given below in Fig 3.4



Fig 3.4: Three areas of awareness about ISL in the present study

➤ **Developing the draft framework of items under each area:**

At this step, the researcher developed a rough draft of items under each area of ISL-awareness. The first area of awareness about Indian Sign Language (ISL) was awareness about cultural aspects of ISL. It consisted of a total number of 12 items. Similarly, the second area namely awareness about grammar of ISL consisted of 12 items while the third area of awareness about application of ISL had 11 items. Thus, before tool-validation, the rough draft of the tool on awareness about ISL consisted of a total number of 35 items. The table 3.2 below represents this information:

Table 3.2: Distribution of draft framework of items under each area in the tool on awareness about ISL.

Sr. No	Areas of awareness about Indian Sign Language (ISL)	Number of draft items under each area in the tool
1.	Awareness about cultural aspects of ISL	12
2.	Awareness about grammar of ISL	12
3.	Awareness about application of ISL	11
4.	Total number of items in the tool	35

➤ **Selecting experts in Indian Sign Language (ISL) for tool-validation**

A group of 6 experts in the field of Indian Sign Language (ISL) were selected for the purpose of validating the items developed for the tool. Out of the total number of experts, 3 experts were themselves ‘Deaf’ and belonged to deaf community. They were followers of deaf culture. The remaining 3 experts were hearing individuals. They had obtained a doctoral degree in the field of Linguistics and had mastery in Indian Sign Language (ISL). Two of the experts were working as university professors in national institutes of repute and had already conducted enormous research in the field of ISL. Three of the experts were of Indian origin and were working as faculties in foreign universities. One of the experts was employed as Indian Sign Language interpreter. Thus, the group of experts selected provided good suggestions and validated the draft tool of awareness about Indian Sign Language (ISL).

➤ **Item validation:**

The pool of experts from Indian Sign Language (ISL) were asked to validate rough draft of the questionnaire developed to measure awareness about ISL among professionals consisting a total number of 35 items. From all the three areas of awareness about ISL mentioned in the tool (namely awareness about deaf culture, grammar of ISL and application issues of ISL), each of the expert was asked to delete any 3 items which in his/ her opinion did not go well with the objectives of the

present study. Apart from this, they were also asked to provide suggestions about re-framing the language of the items mentioned in the draft-framework of the tool. Towards the end of the item-validation process a total number of 9 items were deleted from the questionnaire. Thus, the total number of items in the tool were 26. 2 items were further deleted from the tool by the researcher as per the suggestions provided by majority of the experts. Thus, the final questionnaire for measuring awareness about Indian Sign Language (ISL) consisted of a total number of 24 items. Following table 3.3 indicates number of items in each area of the tool on awareness about ISL both, before and after tool-validation by experts.

Table 3.3: Number of items in each area of the tool before and after tool-validation

Sr. No	Areas of awareness about Indian Sign Language (ISL)	Number of items under before tool-validation	Number of items under after tool-validation
1.	Awareness about cultural aspects of ISL	12	08
2.	Awareness about grammar of ISL	12	08
3.	Awareness about application of ISL	11	08
	Total number of items in the tool	35	24

➤ **Finalizing items under each area of ISL-awareness**

After validation of items by the experts, each and every item in the questionnaire was checked for meaningfulness, specificity and accuracy. The final list of 24 items was ready at this stage.

➤ **Marathi translation of the tool**

Most of the rehabilitation professionals belonged to Marathi medium schools and had Marathi as their mother-tongue. In order to avoid ambiguity and for better comprehension, the final questionnaire was translated into Marathi language with

the help of three experts who had good command on Marathi language. Thus, the final version of the tool was available in English and Marathi language.

➤ **Calculating reliability**

A tool can be considered as reliable, if it produces consistent results. (Kothari, 2008). Reliability refers to stability, which means that when the same tool is administered on same person it needs to produce consistent scores. In the present study test-retest method was used to calculate the reliability of the tool. The reliability coefficient was calculated using Cronbach's Alpha. This is widely used measure of calculating reliability. Alpha equals 1 when all the items measure only the true score and there is no error component. The reliability coefficient calculated using Cronbach's Alpha for the present tool was 0.965.

Cronbach Alpha score of 0.70 or more is interpreted as acceptable (Cortina, 1993). In the present study, the reliability score of the tool was above 0.70 and hence was acceptable.

➤ **Developing a google-form and sending it to the participants**

At this stage, the questionnaire was converted into a google form. Google-link of the questionnaire was generated. The google link was shared with the rehabilitation professionals through WhatsApp groups and emails. The instructions for filling the questionnaire were provided in the form itself. Items were scored in the google form itself. A score of one was given for each correct answer, while a score of zero was given for incorrect or no answer. The scoring happened automatically as and when the participants filled the google form. Thus, raw score of each of the participant was automatically generated in the excel sheet attached with the google form. This online google form made the entire data-collection process time-saving and cost-effective.

Chapter IV

Statistical Analysis and Discussions

Introduction

This chapter presents the statistical techniques used to analyse the data and derive meaningful results regarding awareness about Indian Sign Language (ISL) among rehabilitation professionals working with children having hearing impairment. Statistics is a science. It involves collecting, analysing and interpreting numerical data. Descriptive and inferential are the two types of statistics, wherein, descriptive statistics summarizes large groups of data in consolidated form. Thus, mean, median, mode and other forms of dispersion are the forms of descriptive analysis of data. As per Kothari (2008) the main purpose of inferential statistics is to draw conclusion from the sample and generalize it to the entire population. In the present study, both descriptive and inferential analysis of data were conducted. After collecting the data on awareness of ISL among rehabilitation professionals, it was organized systematically in a tabular form in an excel sheet. The data analysis was undertaken using SPSS package 20.0.

4.1 Test of Normality of the data

The first step in the data analysis process was to check whether the data was normally distributed. The results of the normality check would help the researcher to decide whether to use parametric or non-parametric test for analysing the data. In the present study, normality of the data was checked using Shapiro-Wilk (S-W) test. It was developed by Stanford Shapiro and Martin Wilk. As per this test if the value of Shapiro-Wilk test, is greater than 0.05 then the data are normally distributed. If the value is less than 0.05 then the data are not normally distributed. The results of S-W are presented in Table 4.1.

Table 4.1: Results of S-W for Total Score of Awareness about ISL among Rehab-professionals

Rehabilitation Professional	Shapiro-Wilk		
	Statistic	df	p-value
Special Educator	0.984	41	0.83
Audiologist	0.982	39	0.763
Psychologist	0.975	37	0.563
Mainstream Teacher	0.981	41	0.706

From results of the S-W test in the table 4.1 above, it is clear that all the distributions of Total Score, could be assumed normal ($p>0.5$). For the four distributions, further inspection was carried out to identify nature of deviations, if any, from normal distribution.

Table 4.2: Measure of Skewness and Kurtosis for Total Score by Rehab- Professional

Rehabilitation Professional	N	Skewness	Std. Error of Skewness	Coefficient of Skewness	Kurtosis	Std. Error of Kurtosis	Coefficient of Kurtosis
Special Educator	41	0.07	0.369	0.190	0.265	0.724	0.366
Audiologist	39	0.298	0.378	0.788	-0.13	0.741	-0.175
Psychologist	37	-0.395	0.388	-1.018	0.053	0.759	0.070
Mainstream Teacher	41	0.092	0.369	0.249	-0.43	0.724	-0.594

Measures of coefficients of skewness and kurtosis were obtained for all the distributions and it was checked if the coefficients of both skewness and kurtosis were within ± 1.96 limits, as the data was not very large. In addition, histograms were visually inspected to learn more about deviations from normality, if any.

The coefficient of skewness (refer Table 4.2) is negative only for psychologists indicating very few professionals were with very low total score. Furthermore, the observed coefficients were closer to zero, which were unlikely to affect the mean total score of the respective professionals. Coefficients of Kurtosis were negative for audiologists and mainstream teachers, indicating heavier tails in the distribution. This indicates less crowding near the center of the distribution. In case of the special educators and psychologists the positive coefficient of kurtosis reveals, thinner tails and crowding of scores around the center of the distribution. Again, all the coefficients of kurtosis are within ± 1.96 , which will not affect mean total score inadvertently. Thus, there is enough reason to assume that the four distributions are normal with respect to the total score. This was confirmed through visual inspection of the data, using histograms. These are presented in Figures 4.1,4.2,4.3 and 4.4 for four professionals.

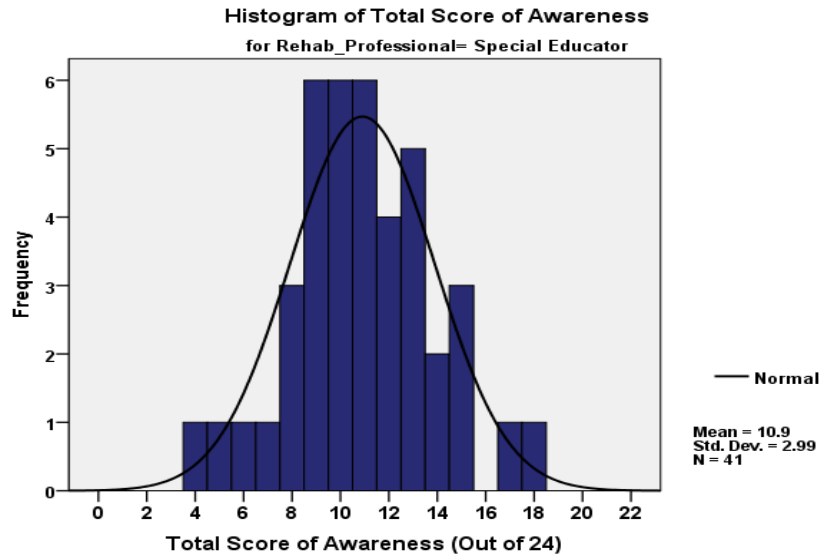


Fig 4.1- Histogram showing Awareness of Special educators about ISL

In Figure 4.1 the normal curve superimposed on the histogram of total score for special educator, appears balanced at both the ends. However, the peak is leptokurtic. Thus, majority of the Special Educators' Total Scores are around the score 11.

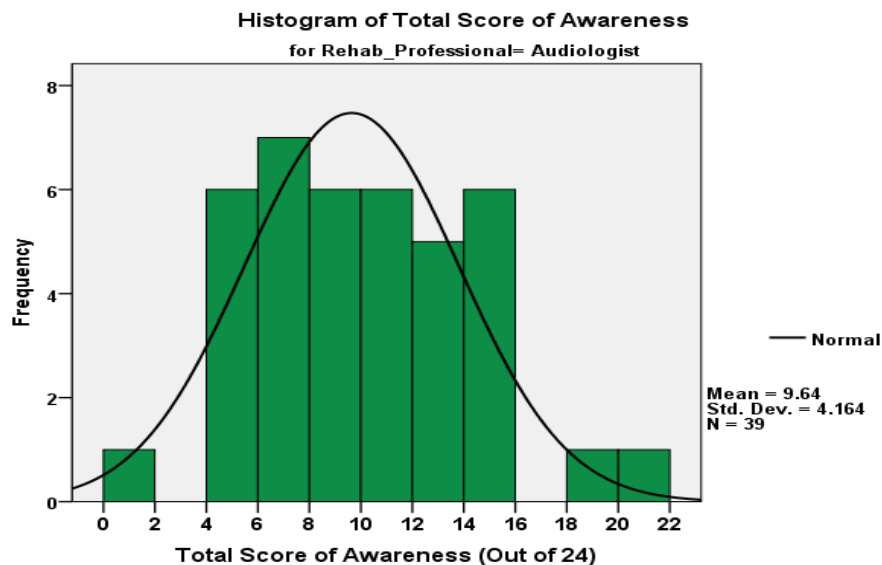


Fig 4.2: Histogram showing Awareness of Audiologists about ISL

In Figure 4.2 the normal curve superimposed on the histogram of Total Score for Audiologist, appears depressed at the right-end. This indicates that very few Audiologist have higher Total Scores compared to others in the group. However, platykurtic peak, is indicating more spread-out of Total Scores for Audiologists.

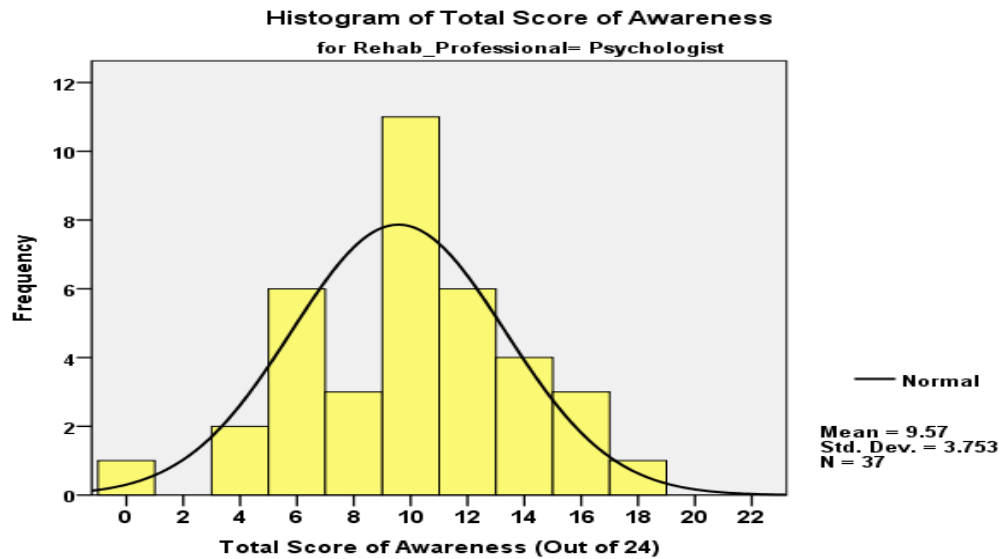


Fig 4.3: Histogram showing Awareness of Psychologists about ISL

In Figure 4.3 the normal curve superimposed on the histogram of Total Score for Psychologist, appears depressed at the left-end. This indicates that very few psychologists have a very low Total Score compared to other members of the group. However, the peak is leptokurtic, indicating more crowding of Total Scores near the center of the distribution, compared to those observations lying towards both the ends.

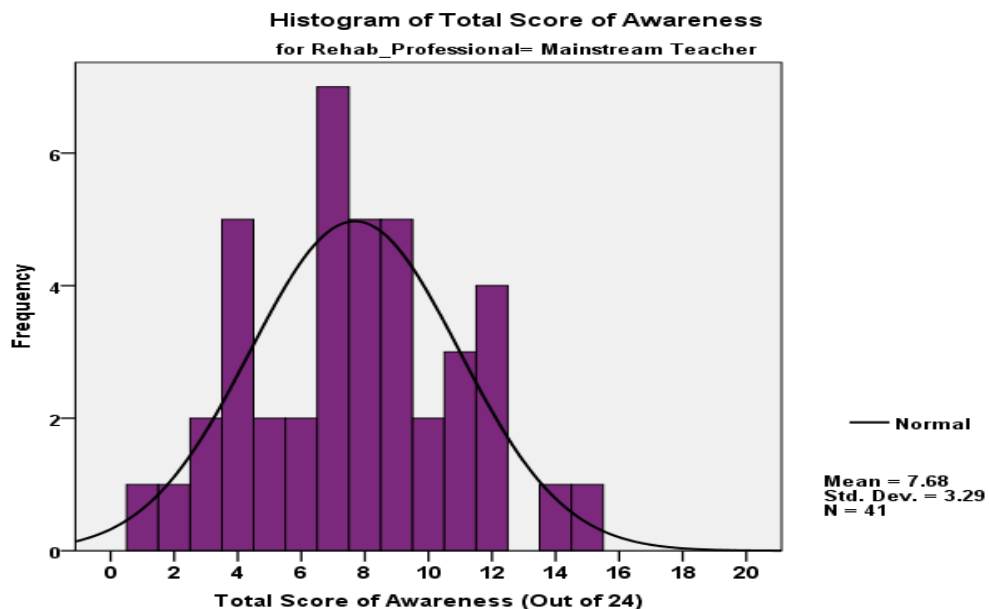


Fig 4.4: Histogram showing Awareness of Mainstream teachers about ISL

In the Figure 4.4 the normal curve superimposed on the histogram of Total Score for Mainstream Educator appears depressed slightly at the right-end. This indicates that few Mainstream Educators have a very high Total Score compared to majority in the group. The peak, however, is platykurtic, indicating less crowding of Total Scores near the center than at the two ends of the distribution.

In general, the four distributions of Total Scores, could be assumed normal for the purpose of conducting One-way ANOVA.

4.1.1. Assumption of Homogeneity of Variances

This was checked using Levene's test which is a kind of an inferential test. Levene's test assesses the assumption that variances of the populations from which different samples are drawn are equal. As per Levene (1960), it is used to assess the equality of variances for a variable calculated for two or more groups. The results are presented in Table 4.3.

Table 4.3: Levene's test for Homogeneity of Variances for Four levels of Rehabilitation Professionals

F	df1	df2	p-value
1.845	3	154	0.141

The Levene's statistic presented in Table 4.3 for Total Score is not statistically significant. Levene's Statistic $(3,154) = 1.845$, $p > 0.05$. This reveals that the four Rehabilitation Professionals in this study are homogeneous with respect to their variances of Total Score. Therefore, results of post-hoc tests with 'variances assumed equal' could be used for comparison of means of various pairs involved. Since, the important assumptions hold for the data, results of the One-way ANOVA could be interpreted properly for the Total Score of Awareness.

4.2 Descriptive Analysis of data

The essential descriptive statistics for four Rehabilitation Professionals is presented in Table 4.4.

Table 4.4: Descriptive Statistics for Total Score of Awareness

Rehabilitation Professional	Mean	Std. Dev.	Std. Error	95% Confidence Interval		Bootstrap Results (1000 samples)		
						Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound		Lower Bound	Upper Bound
Special Educator	10.9	2.99	0.467	9.96	11.85	0.46	10.0	11.85
Audiologist	9.64	4.16	0.667	8.29	10.99	0.64	8.37	10.91
Psychologist	9.57	3.75	0.617	8.32	10.82	0.60	8.38	10.68
Mainstream Teacher	7.68	3.29	0.514	6.64	8.72	0.51	6.67	8.73

The descriptive statistics presented in Table 4.4 reveals that there is gradual decline in the mean total score from the Special Educator to Mainstream Teacher, with Audiologist and Psychologist lying in between, in that order. The Std. Deviations however, do not show any systematic pattern with regard to the size. For the distribution for Audiologist is highest and for the Special Educators it is lowest (Refer size of Boxes and whiskers in the Boxplots in Fig. 4.5). Thus, the Total Scores for Audiologists are spread out more compared to that in the distributions of remaining professionals.

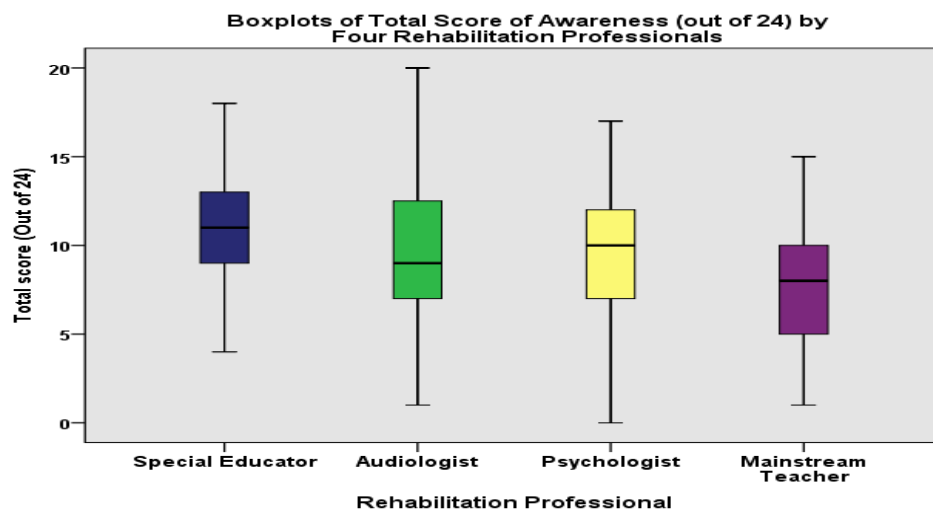


Fig 4.5: Boxplots of total scores of awareness on ISL by Four Rehab-professionals

The sizes of the boxes in the boxplots do not vary in an obvious manner, indicating homogeneity of the variances. Furthermore, the boxplots for the first three rehabilitation professionals appear to overlap each other, indicating comparable means of Total Score of Awareness. Similar observation applies to the last three boxplots in Figure 4.5. As against this the boxplots for Special Educator and Mainstream Teacher indicate less overlap and major portions are left uncovered. This indicates that the mean total scores of the Special Educator and Mainstream Teacher differ more and the difference between them is likely to be significant.

The comparisons between the means of the total score on awareness about ISL for four rehabilitation professionals are presented graphically in Figure 4.6.

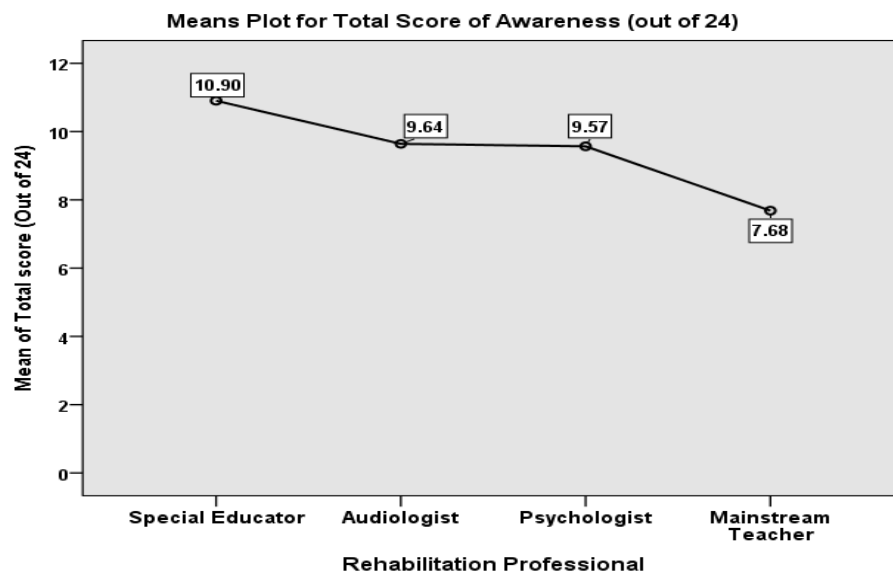


Fig. 4.6- Means Plot for Awareness about ISL among four Rehab-professionals

The graph presented in Figure 4.6 underlines the observations made earlier using boxplots. The mean Total Score of the Special Educator differs from that of the Mainstream Teacher in a larger way (3.22). Such differences are small for Special Educator and Audiologist (1.26) or Special Educator and Psychologist (1.34) groups. The differences in the other pairs are less than 2, thus no pair has a difference in mean Total Scores like that obtained for the pair Special Educators and Mainstream Teachers.

4.3 Inferential Analysis of data

Since, the assumptions about normal distribution of data were met and the dependent variables were of a ratio type, the researcher decided to use parametric test for statistical

analysis of data. One-way ANOVA was the most suitable parametric test for identifying if the mean scores of any two of the possible pairs differ significantly. One-way ANOVA (Analysis of Co-variance) is used to determine if the difference between two or more independent groups is statistically significant. If the result of ANOVA was significant further comparisons for all possible pairs would be carried out using post-hoc tests. The practical significance of the mean difference would be confirmed using effect size obtained through the test of Cohen's d.

4.4 Objective: 1: Awareness about Indian sign language among different rehabilitation professionals and para-professionals with reference to the common myths and mis-concepts about ISL.

In the present study, the main objective of the study was to review the the awareness about Indian sign language among different rehabilitation professionals (audiologists/speech therapist and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths and mis-concepts about ISL.

The main null hypothesis Ho1 stated that there exists no significant difference in the awareness about Indian Sign Language (ISL) among different rehabilitation professionals (audiologists, speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths/ mis-concepts about ISL. Results of the One-way ANOVA for Total Score are presented in Table 4.5.

Table 4.5: Results of One-way ANOVA for Total Score

Source	Sum of Squares	df	Mean Square	F	p-value
Between Groups	216.444	3	72.148	5.679	0.001
Within Groups	1956.543	154	12.705		
Total	2172.987	157			

Results 1:

The one-way results presented in Table 4.5 are statistically significant ($F(3,154) = 5.68$, $p < .05$). Thus, the mean Total Score of at least one of the six pairs differ significantly. To identify the pair of rehabilitation professionals that differ significantly with respect to the mean Total Score, post-hoc tests (Bonferroni) were carried out. Results of the associated Multiple Comparisons in this study are presented in Table 4.6.

Table 4.6: Results of Multiple Comparisons for Mean Total Score

(I) Rehabilitatio n Professional	(J) Rehabilitation Professional	Mean Differenc e (I-J)	Std. Error	p-value	95% Confidence Interval		Bootstrap Results		
							Std. Erro r	95% Confidence Interval	
					Lower Bound	Uppe r Bound		Low er Bound	Upp er Bound
Special Educator	Audiologist	1.261	0.797	0.694	-0.87	3.39	0.793	-0.307	2.778
Special Educator	Psychologist	1.335	0.808	0.604	-0.83	3.5	0.76	-0.08	2.861
Special Educator	Mainstream Teacher	3.220*	0.787	<0.0005	1.12	5.32	0.676	1.869#	4.553#
Audiologist	Psychologist	0.073	0.818	1	-2.11	2.26	0.872	-1.643	1.789
Audiologist	Mainstream Teacher	1.958	0.797	0.091	-0.17	4.09	0.814	0.242#	3.474#
Psychologist	Mainstream Teacher	1.885	0.808	0.126	-0.28	4.04	0.789	0.223#	3.348#

Inspection of the results of the multiple comparisons in Table 4.6 revealed following important conclusions:

1. The mean difference Total Score (3.22) is significant ($p < 0.5$) for the pair of professionals, Special Educator and Mainstream Educator. The 95% CI for normal comparison is 1.12 to 5.32. The 95% CI for bootstrap comparison is 1.97 to 4.55. Taking bootstrap results as more valid the mean Total score of Special educators will be higher by approximately 2 to 5 scores than that of Mainstream Teacher. The effect size for the mean difference is 1.04, revealing large positive effect and has practical importance.

2. The mean difference of Total Score (1.89) is not significant ($p>0.05$) for the pair Psychologist and Mainstream Teacher by normal comparison. However, the 95%CI (0.242 – 3.474) obtained for bootstrap does not include zero, hence is significant. The lower bound of the 95% CI for bootstrap is closer to zero and could be approximated to zero. Hence, though the bootstrap leads to significance it is marginal and cannot be considered to have important implications for the study. However, the associated effect size 0.54 indicates moderate positive effect. To get more understanding, more data could be checked or a new study could be designed.
3. The mean difference of Total Score (1.96) is not significant ($p>0.05$) for the pair Audiologist and Mainstream Teacher by normal comparison. However, the 95%CI (0.223 – 3.448) obtained for bootstrap does not include zero, hence is significant. The lower bound of the 95% CI bootstrap is closer to zero and could be approximated to zero. Hence, though the bootstrap allows for label of significance, it is really approximately zero and might not have important implications for the study. Since the effect size associated with this difference is moderate positive (0.53) it could be investigated further using more data or designing a special study.
4. The mean difference in the total score for pairs Special Educator – Audiologist (1.26, effect size = 0.35), Special Educator – Psychologist (1.34, effect size = 0.4), and Audiologist – Psychologist (0.07 effect size = 0.02, I.e., 0 or near zero effect) are not significant ($p>0.05$). Thus, the mean Total scores of the three professionals (Special Educator, Audiologist and Psychologist) could be treated as comparable.

In summary, the present study of Total Scores of Awareness reveals that only the two professionals, Special Educators and Mainstream Educators, differed with respect to their mean total score of awareness. Moreover, Special Educators, Audiologists and Psychologists were comparable with respect to their mean total score of awareness. However, the Mainstream Teachers mean Total Score did not differ significantly from that of the Audiologist or Psychologist.

4.5 Discussion: Awareness about Indian Sign Language (ISL) among different rehabilitation professionals and paraprofessionals

From the statistical analysis of the data presented in the table 4.4 it is clear that the mean scores of special educators, audiologists, psychologists and mainstream teachers are 10.9, 9.64, 9.57 and 7.68 respectively. Out of the total score of 24, means of all the four rehabilitation professionals are saturated in the range of 7 to 10 scores. This indicates that all the four groups of rehabilitation professionals have scored lower on the test of awareness about Indian Sign Language. The main reason behind this lower score can be attributed to the pre-service training in ISL provided to the rehabilitation professionals.

4.5.1 Pre-service training in ISL:

In India, training courses in Indian Sign Language in the form of diplomas were provided by Ali Yavar Jung National Institute for Speech and Hearing Disabilities (AYJNISHD) Divyangajan (D), Bandra, Mumbai since 2001. They offered A, B and C level courses in ISL. The duration of each level was around 6 months for part-time courses and 3 months for full-time courses. These courses were separately run for hearing and deaf individuals. (Zeshan, Vasishtha & Sethna, 2005). Hearing individuals who were family members or friends of deaf individuals or students doing B.Ed or M.Ed in Hearing Impairment or students of BASLP and MASLP could pursue this course. However, this course was not a compulsory component of any of the professional-courses in the field of special education of children with hearing loss. The students or persons who felt interested in learning ISL would join the course. As per the UGC mandate, in the year 2015-16, the duration of the B.Ed program was extended to 2 years. Indian Sign Language was included as a part of the practical in the revised B.Ed syllabus. Most of the special educators who took the survey on awareness about ISL had completed their B.Ed program before 2015-16. Apart from this, ISL as a practical component was not included in the syllabi of other programs like psychology, audiology and general B.Ed . As such, majority of the rehabilitation-professionals working with deaf individuals were not exposed to ISL during their pre-service training. This could have been the major reason for low score of rehabilitation professionals on awareness about ISL.

4.5.2. In-service training:

As indicated by Zeshan, Vasishtha & Sethna (2004), the rehabilitation professionals who were themselves hearing, preferred to enrol in part-time ISL courses offered by AYJNISHD

(D). Their full-time commitment with their employment did not allow them to pursue full-time courses in ISL. Many professionals found it very difficult to complete the ISL courses because travelling was big challenge for them. They had to travel from their job-location all the way to Bandra, Mumbai to avail training offered by the ISL Cell at AYJNISHD (D). The timings of these courses were not convenient for most of the rehabilitation professionals. Moreover, the organizations in the field of disability-rehabilitation provided in-service training in the area of research, cross-disability, technology, teaching methods to their employees. However, they hardly organized for training courses in ISL for their employees. As such, the rehabilitation professionals especially special educators learned sign structure and signs of ISL from the deaf students in their own class without much formal training. Thus, low score of rehabilitation professionals on awareness about ISL could be attributed to dearth of in-service training opportunities for these professionals.

4.5.3. Bi-lingualism V/s Oralism

There are three main methods of developing language among deaf students: Oralism, total communication and educational bi-lingualism. (Huddar, 2006). The philosophy which emphasizes on developing speech in a deaf child by using listening and speaking is known as oralism. This philosophy emphasizes on early identification and early intervention of hearing loss, regular use of amplification devices and social inclusion of a deaf child in the mainstream society. The philosophy similar to oralism, which emphasizes on developing speech in a deaf child by using listening and speaking with the support of sign system is known as total communication. The philosophy which is exactly opposite to the earlier two philosophies is educational bi-lingualism. It propagates individualistic goals rather than social goals. The emphasis is on developing sign language in a deaf child with the support of visual manual mode and it discourages use of speech.

At present, we are living in the age of technological explosion. There is boom in the field of hearing devices like digital hearing aids, programmable hearing aids and cochlear implants. As a result, majority of the children with deafness are getting early identified and intervened. Majority of the parents wish that their child with hearing loss should be able to speak and be a part and parcel of mainstream society. The technological advancement in the field of audiological assessments and amplification devices is making this dream come true. With the use of regular, appropriate and early amplification devices, children with hearing loss are able to develop age-appropriate language and speech skills. They are able to manage

well in mainstream schools with regular hearing children. As per the demand, special educators as well as other rehabilitation professionals have to give more weightage to oral techniques and oralism as compared to sign language and educational bi-lingualism. Children with hearing loss are able to communicate well orally with the rehabilitation professionals during assessments and therapy sessions. As such, parents and rehab-professionals do not feel the need to opt for ISL while dealing with their young deaf clients. They get very less opportunity to practice ISL with deaf clients who generally communicate using speech with them. This might be one of the reasons for low score of rehab-professionals on awareness about ISL.

4.6. Sub-objective 1a: Awareness about Deaf Culture

The first sub-objective of the study was to review the 1a) awareness about the cultural aspects of Indian sign language among different rehabilitation professionals (audiologists/speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths and mis-concepts about ISL. The sub-hypothesis was: There exists no significant difference in awareness about Ho1a) the Cultural aspects of Indian Sign Language (ISL) among different rehabilitation professionals (audiologists/speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths and mis-concepts about ISL. The results are presented in the table below:

4.6.1. Result: Awareness about Deaf Culture

This section presents the scores obtained by four groups of rehabilitation professionals on their awareness about the area of deaf culture.

4.6.2 Test of normality: Awareness about Deaf culture

It was decided to use Kolmogorov-Smirnova test and Shapiro-Wilk test to determine whether the data about awareness of rehabilitation professionals about deaf culture was normally distributed. Kolmogorov-Smirnov test was developed by Andrey Kolmogorov and is named after Nikolai Smirnov. It is a non-parametric test also known as K-S test. In statistics, this is a test of the equality of continuous, one-dimensional probability distributions that can be used to compare a sample with a reference probability distribution,

or to compare two samples. Along with K-S test, Shapiro-Wilks test developed by Stanford Shapiro and Martin Wilk was also used to check the normality of data. As per this test if the value of Shapiro-Wilk test, is greater than 0.05 then the data are normally distributed. If the value is less than 0.05 then the data are not normally distributed. The results of the test are presented in table 4.7 below:

Table 4.7: Test of normality – Scores on Awareness about Deaf culture

Rehab- professionals	Kolmogorov-Smirnov			Shapiro-Wilk			Result
	Statistic	df	Sig.	Statistic	df	Sig.	
Special Educator	0.256	41	0	0.894	41	0.001	Significant, Normality is violated
Audiologists	0.191	39	0.001	0.93	39	0.017	Significant, Normality is violated
Psychologists	0.158	37	0.02	0.946	37	0.07	Not significant, normality can be assumed
Mainstream Teachers	0.134	41	0.061	0.923	41	0.008	Not significant, normality can be assumed

From the table 4.7 above we can conclude that in case of special educators and audiologists the distributions have violated the assumption of normality. However, the distributions could be assumed normal in case of psychologists and mainstream teachers.

4.6.3 Descriptive analysis of the data

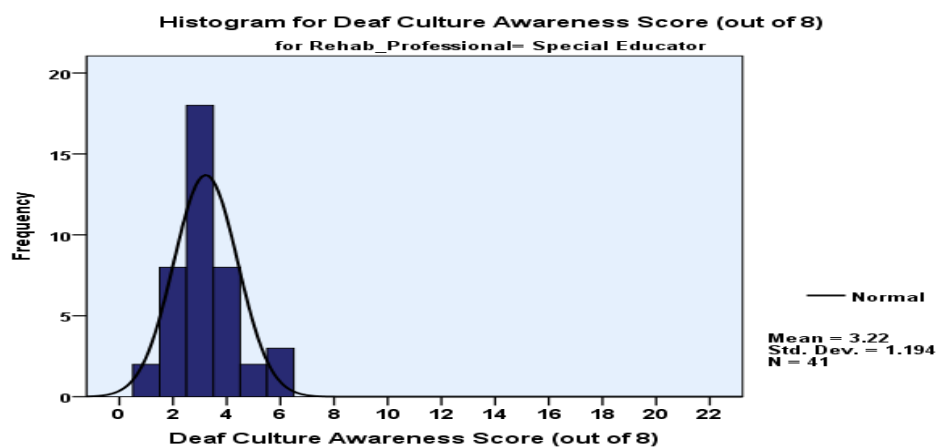
The essential descriptive statistics for four Rehabilitation Professionals with respect to their awareness about deaf culture is presented in Table 4.8

Table 4.8: Descriptive Statistics for Awareness about Deaf Culture

Rehab Professionals	N	Mean	Median	Mode	S.D	Variance	Skewness	Kurtosis	Min	Max
Special Educator	41	3.22	3	3	1.194	1.426	0.664	0.601	1	6
Audiologists	39	3	3	2	1.638	2.684	0.681	0.264	0	7
Psychologists	37	2.73	3	2	1.465	2.147	-0.062	-0.428	0	6
Mainstream Teachers	41	2.29	2	2	1.585	2.512	0.163	-0.868	0	5

The table 4.8 above indicates that the means of special educators (3.22), audiologists (3) and psychologists (2.73) do not differ much with respect to their awareness about deaf culture. However, the mean of the special educators (3.22) and mainstream teachers (2.29) differ significantly with respect to awareness about deaf culture.

The descriptive statistics on awareness about deaf culture from table 4.9 is represented in the form of histograms for all four types of rehabilitation professionals. (Refer fig 4.7, 4.8, 4.9 and 4.10 below)

**Fig 4.7: Histogram for Deaf Culture-Awareness for Special Educators**

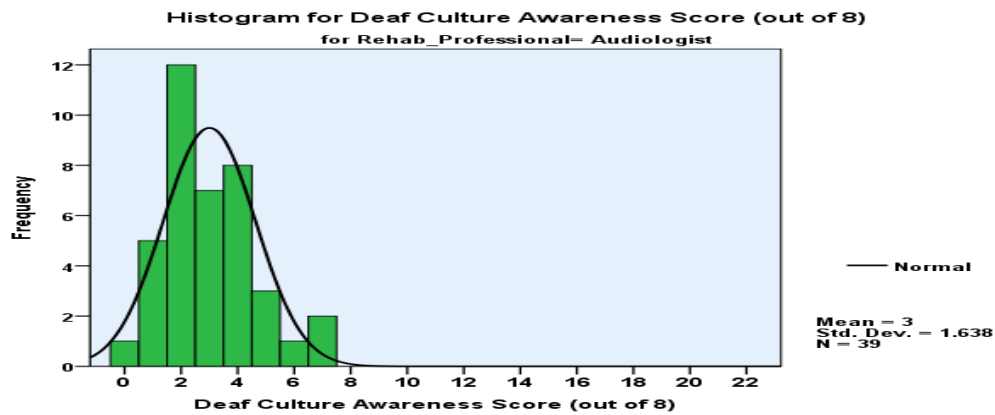


Fig 4.8: Histogram for Deaf Culture-Awareness for Audiologists

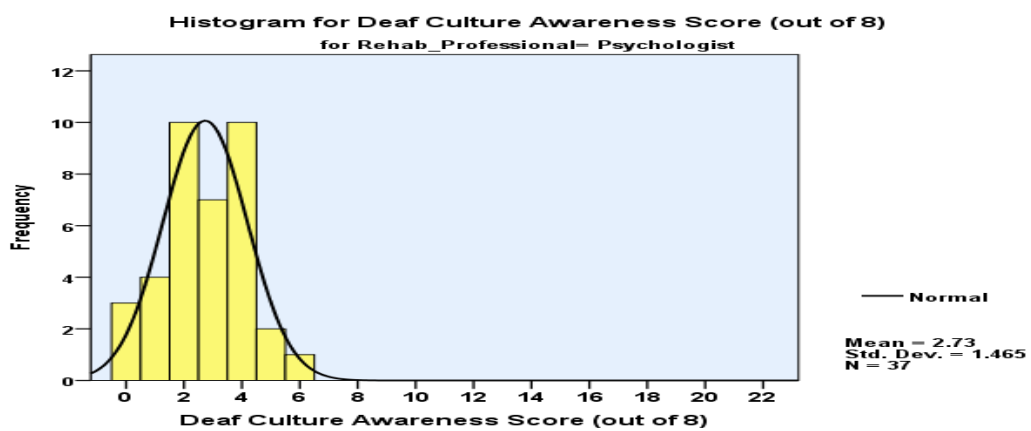


Fig 4.9: Histogram for Deaf Culture-Awareness for Psychologists

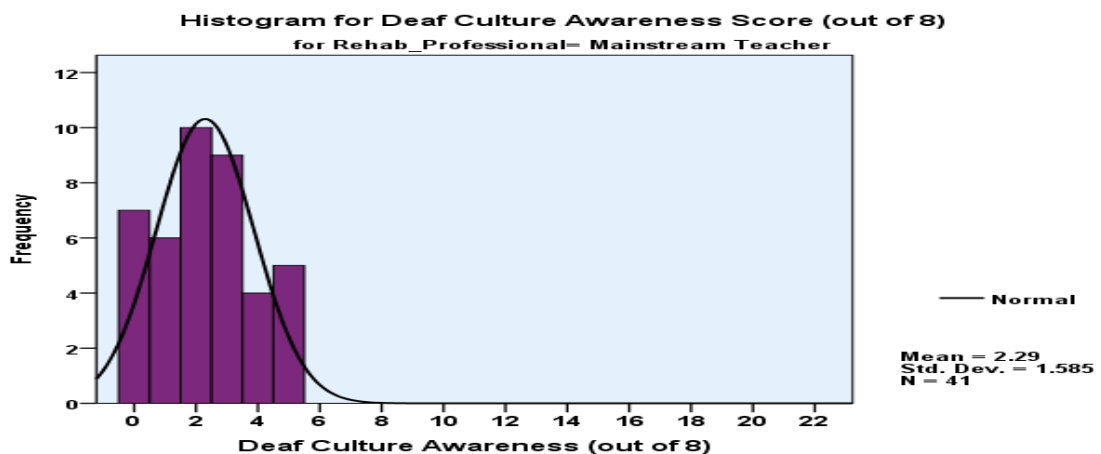


Fig 4.10: Histogram for Deaf Culture-Awareness for Mainstream teachers

The comparative analysis of the total scores obtained by four group of rehabilitation professionals on their awareness about deaf culture is represented in the form of a boxplot given below:

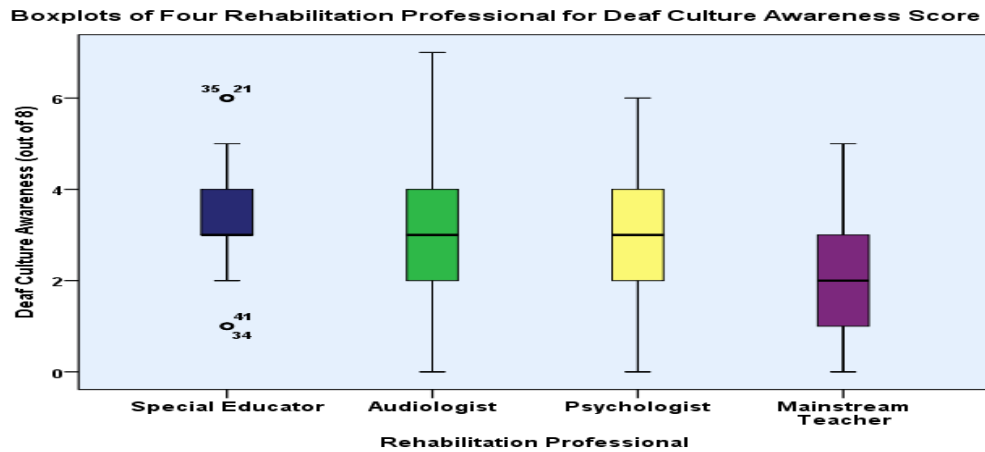


Fig 4.11: Comparison of total scores obtained by four group of rehab-professionals

The above fig 4.11. indicates that the mean scores obtained by special educators (3.22), audiologists (3) and psychologists (2.73) do not differ much with respect to their awareness about deaf culture. However, the mean of the mainstream teachers (2.29) differs significantly from that of the special educators. The boxplot also indicates few outliers. Outliers are the scores which deviate significantly from the mean. The difference among the mean scores of four group of rehabilitation professionals with respect to their awareness about deaf culture are also represented in the form of a means plot (fig 4.12) given below:

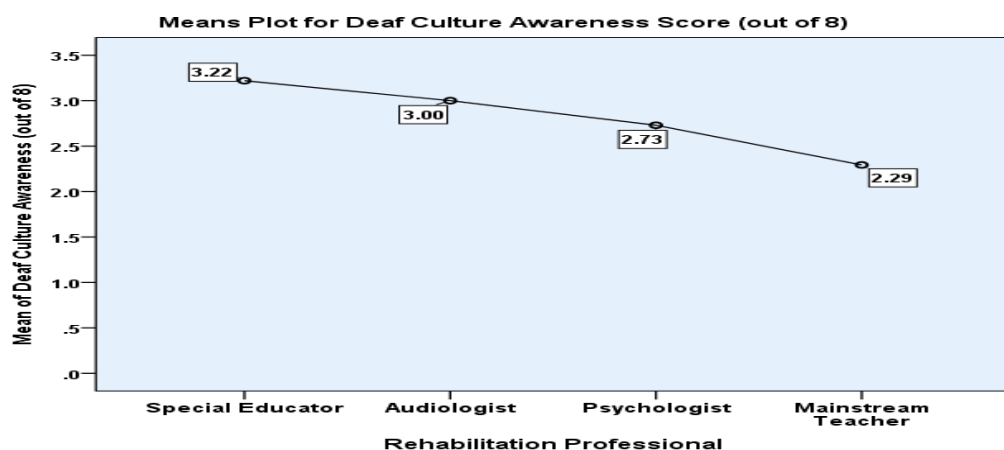


Fig 4.12 : Means plot for Deaf culture awareness score among four groups of rehab-professionals

4.7 Discussion: Awareness about Deaf Culture

Deaf culture is a part and parcel of deaf community. The members of deaf community use sign language for the purpose of communication. The followers of deaf culture make distinction between ‘deaf’ and ‘Deaf’. The term ‘deaf’ is used to refer to biological deafness in a person expressed in decibels. However, the term ‘Deaf’ is used to refer to cultural deafness. The followers of deaf community consider themselves as ‘normal’ individuals. According to them deaf and hearing are two separate communities on the basis of language. Hearing community which is a majority community uses speech for communication, while deaf community which is a minority community uses sign language for communication. These two communities should co-exist in the society. The majority community should not enforce their hearing culture and speech on deaf individuals. The deaf community should be respected as a separate minority community using separate language which is sign language for communication. (Clason, 2019).

Apart from sign language, deaf culture has three more important components. Behavioural norms, values and traditions. All the three components are based on visual communication, use of touch rather than calling or speaking to get attention, use of technology such as vibrators and light systems, face to face communication in person or using video-calls for communication. Kyle and Woll (1985) listed the deaf-behaviours which includes giving compulsory eye-contact to the communication partners, touching or throwing weightless objects for getting attention, making extra facial expressions during communication as main components of deaf culture.

Thus, deaf cultural experience goes beyond learning ISL grammar. Deaf culture is a broad term. It includes shared social beliefs, institutions, experiences, values and way of life influenced by deafness and which predominantly involves use of sign language for communication. Thus, ‘participation’ in a deaf community and interacting with the deaf members of a deaf community is the basic prerequisite for understanding deaf culture.

The results of the present study indicate that mean scores obtained by special educators (3.22), audiologists (3) and psychologists (2.73) do not differ much with respect to their awareness about deaf culture. However, the mean of the mainstream teachers (2.29) differs significantly from that of the special educators. This might have happened because special educators, audiologists and psychologists get an opportunity to interact with the deaf community. They are exposed to deaf culture as a part and parcel of their profession. Special educators are exposed to deaf culture in their special class while interacting with their deaf students. They observe their deaf students for a longer period of time and hence become familiar with most of the components deaf culture naturally.

However, mainstream teachers hardly get any exposure to the deaf culture. They are part of the majority hearing community and most of the times get an opportunity to interact with deaf students integrated in a mainstream class who are fluent in using verbal language. They seldom get chance to communicate with deaf individuals using ISL. Hence, their awareness level about deaf culture is far below the awareness level of other three groups of rehabilitation professionals working with deaf individuals.

4.8. Sub-objective 1b: Awareness about Grammar of ISL

The second sub-objective of the study was to review the 1b) the awareness about grammar of Indian sign language among different rehabilitation professionals (audiologists/speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths and mis-concepts about ISL. The sub-hypothesis was: There exists no significant difference in awareness about Ho1b) the grammar of Indian sign language among different rehabilitation professionals (audiologists/speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths and mis-concepts about ISL.

4.8.1. Results: Awareness about Grammar of ISL

This section presents the scores obtained by four groups of rehabilitation professionals on their awareness about the grammar of ISL.

4.8.2 Test of normality: Awareness about Grammar of ISL.

It was decided to use Kolmogorov-Smirnova test and Shapiro-Wilk test to determine whether the data about awareness of rehabilitation professionals about Grammar of ISL was normally distributed. The results of the test are presented in table 4.9 below:

Table 4.9: Test of normality – Scores on Awareness about Grammar of ISL

Rehab- professionals	Kolmogorov-Smirnov			Shapiro-Wilk			Result
	Statistic	df	Sig.	Statistic	df	Sig.	
Special Educator	0.135	41	0.058	0.956	41	0.118	Not significant, normality can be assumed
Audiologists	0.159	39	0.014	0.922	39	0.01	Significant, Normality is violated
Psychologists	0.179	37	0.004	0.927	37	0.018	Significant, Normality is violated
Mainstream Teachers	0.181	41	0.002	0.915	41	0.005	Significant, Normality is violated

From the table 4.9 above we can conclude that except for the special educators, the distributions have violated the assumption of normality in case of audiologists, psychologists and mainstream teachers.

4.8.3 Descriptive analysis of the data: Awareness about Grammar of ISL

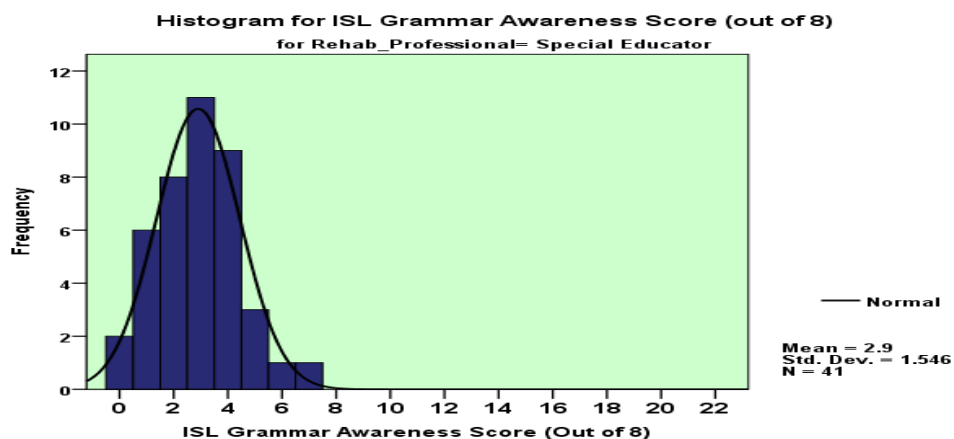
The essential descriptive statistics for four Rehabilitation Professionals with respect to their awareness about grammar of ISL is presented in Table 4.10

Table 4.10: Descriptive Statistics for Awareness about Grammar of ISL

Rehab Professionals	N	Mean	Median	Mode	S.D	Vari- ance	Skew ness	Kurtosis	Min	Max
Special Educator	41	2.9	3	3	1.546	2.39	0.299	0.172	0	7
Audiologists	39	2.23	2	3	1.58	2.498	0.483	0.023	0	6
Psychologists	37	2.32	3	3	1.582	2.503	0.097	-0.461	0	6
Mainstream Teachers	41	1.8	2	1	1.4	1.961	0.538	-0.354	0	5

The table 4.10 above indicates that the means of special educators (2.9), audiologists (2) and psychologists (2.32) do not differ much with respect to their awareness about grammar of ISL. However, the mean of the special educators (2.9) and mainstream teachers (1.8) differ significantly with respect to awareness about grammar of ISL.

The descriptive statistics on awareness about grammar of ISL from table 4.10 is represented in the form of histograms for all four types of rehabilitation professionals. (Refer fig 4.13, 4.14 and 4.15 below)

**Fig 4.13 Histogram for Awareness about ISL-grammar for Special Educators**

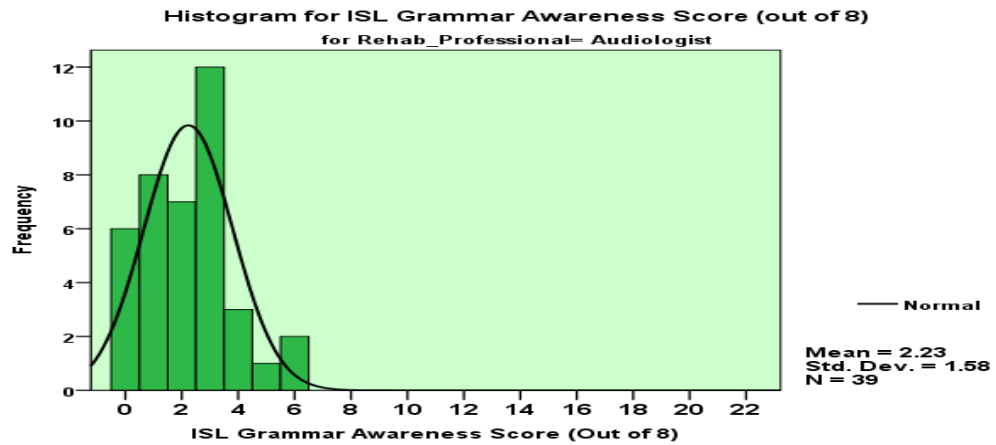


Fig 4.14: Histogram for Awareness about ISL-grammar for Audiologists

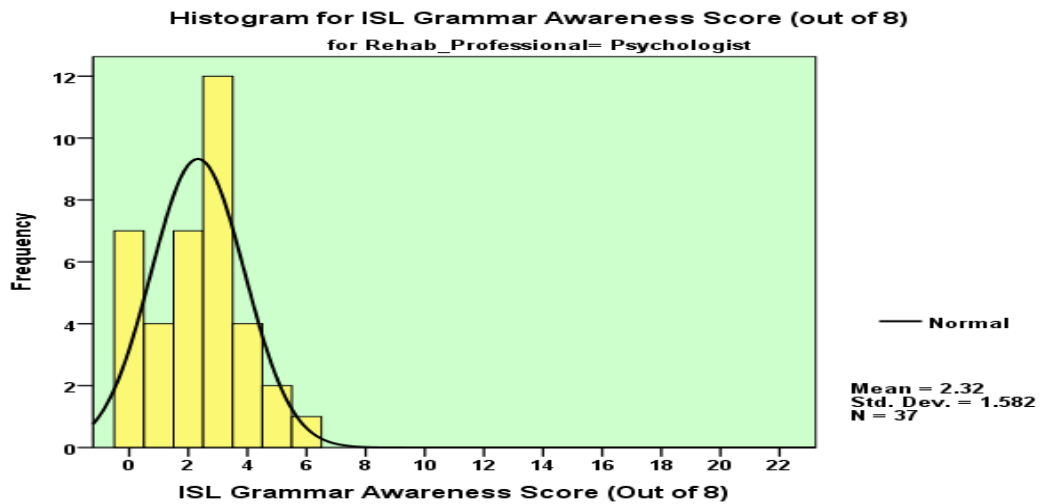


Fig 4.15 Histogram for Awareness about ISL-grammar for Psychologists

The comparative analysis of the total scores obtained by four group of rehabilitation professionals on their awareness about grammar of ISL is represented in the form of a boxplot given below:

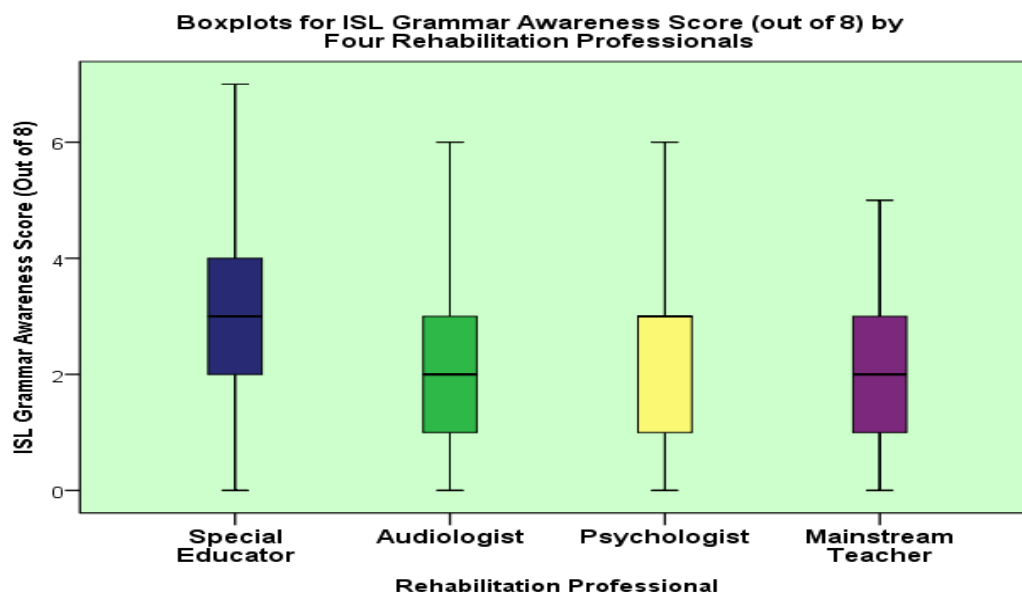


Fig 4.16: Comparison of total scores obtained by four group of rehab-professionals

The above fig 4.16. indicates that the mean scores obtained by special educators (2.9), audiologists (2.23) and psychologists (2.32) do not differ much with respect to their awareness about grammar of ISL. However, the mean of the mainstream teachers (1.8) differs significantly from that of the special educators. The difference among the mean scores of four group of rehabilitation professionals with respect to their awareness about grammar of ISL are also represented in the form of a means plot (fig 4.17) given below:

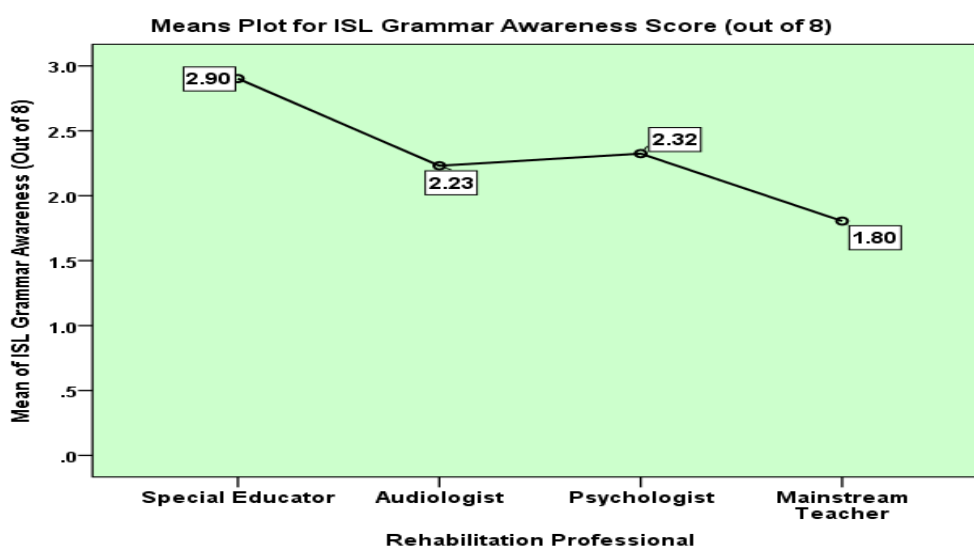


Fig 4.17: Means plot for ISL Grammar-awareness score among four groups of rehab-professionals

4.9 Discussion: Awareness about Grammar of ISL

All the 4 groups of rehab-professionals have achieved very low score on awareness about grammar of ISL. The means of special educators (2.9), audiologists (2) and psychologists (2.32) do not differ much with respect to their awareness about grammar of ISL. However, the mean of the special educators (2.9) and mainstream teachers (1.8) differ significantly with respect to awareness about grammar of ISL. This result could be attributed to the lack of pre-service and in-service training in ISL. Humpries et.al (2017) in their research indicated that many individuals including parents and professionals have very less or no opportunity of using sign language with deaf individuals and children. Hence, they feel scared about difficulties in learning sign language. This fear might result from lack of resources, infrastructure and training avenues for learning sign language formally. Since, they have very little previous knowledge about signing, they tend to develop a bias against the use of sign language in teaching and communicating with deaf students. In the present study, the rehab-professionals may have developed such a bias against the use of ISL and fear of learning ISL.

One more adversity that comes in the way of learning ISL is that, it is only visual and does not consist of any script of its own. The main reason people learn a particular verbal language like Hindi, English etc is because these languages are accompanied by corresponding symbol system of script. The script of language makes it easy to preserve the language-codes and transfer it to more and more people. In the absence of script, it becomes more difficult to learn sign language for the professionals. Further, it increases the dependency on deaf teachers because it is only through interaction with deaf signers the hearing individuals can learn and practise sign language. (Kyle, et.al 1979 ; Esam, 1981).

The first work on grammar of ISL appeared when Ulrike Zeshan published her M.Ed thesis on grammar of ISL in 2000. Even though most of the previous research studies focus on grammar of sign language, simply reading researches does not empower professionals in skill-development of actually using sign language for communication. Hence, rehab-professionals may not be aware about the grammatical aspects of ISL.

4.10 Sub-objective 1c: Awareness about Application Issues of ISL

The third sub-objective of the study was to review the 1c) the awareness about application issues of Indian sign language among different rehabilitation professionals (audiologists/speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths and mis-concepts about ISL. The sub-hypothesis was: There exists no significant difference in awareness about Ho1c) application issues of Indian sign language among different rehabilitation professionals (audiologists/speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths and mis-concepts about ISL. The results are presented in table below:

4.10.1. Result: Awareness about Application issues of ISL

This section presents the scores obtained by four groups of rehabilitation professionals on their awareness about application issues of ISL.

4.10.2 Test of normality: Awareness about Application issues of ISL

It was decided to use Kolmogorov-Smirnov test and Shapiro-Wilk test to determine whether the data about awareness of rehabilitation professionals about application issues of ISL was normally distributed. The results of the test are presented in table below:

Table 4.11: Test of normality – Scores on Awareness about Application issues of ISL

Rehab-professionals	Kolmogorov-Smirnov			Shapiro-Wilk			Result
	Statistic	df	Sig.	Statistic	df	Sig.	
Special Educator	0.173	41	0.004	0.93	41	0.015	Significant, Normality is violated
Audiologists	0.146	39	0.034	0.935	39	0.027	Significant, Normality is violated
Psychologists	0.198	37	0.001	0.945	37	0.067	Not significant, normality can be assumed
Mainstream Teachers	0.161	41	0.009	0.948	41	0.06	Not significant, normality can be assumed

From the table 4.11 above we can conclude that the first two distributions of special educators and audiologists have violated the assumption of normality. However, the last two distributions of psychologists and mainstream teachers could be assumed normal.

4.10.3 Descriptive analysis of the data

The essential descriptive statistics for four Rehabilitation Professionals with respect to their awareness about application issues of ISL is presented in Table 4.12

Table 4.12: Descriptive Statistics for Awareness about Application Issues of ISL

Rehab Professionals	N	Mean	Median	Mode	S.D	Vari- ance	Skew ness	Kurtosis	Mi n	Max
Special Educator	41	4.78	5	5	1.388	1.926	-0.057	-0.579	2	7
Audiologists	39	4.41	4	4	1.788	3.196	-0.108	-0.993	1	7
Psychologists	37	4.24	4	4	1.64	2.689	-0.454	0.213	0	7
Mainstream Teachers	41	3.59	4	4	1.36	1.849	0.125	0.12	1	7

The table 4.12 above indicates that the means of special educators (4.78), audiologists (4.41) and psychologists (4.24) do not differ much with respect to their awareness about application issues of ISL. However, the mean of the special educators (4.78) and mainstream teachers (3.59) differ significantly with respect to awareness about application issues of ISL.

The descriptive statistics on awareness about application issues of ISL from table 4.13 is represented in the form of histograms for all four types of rehabilitation professionals. (Refer fig 4.18, 4.19 and 4.20 below)

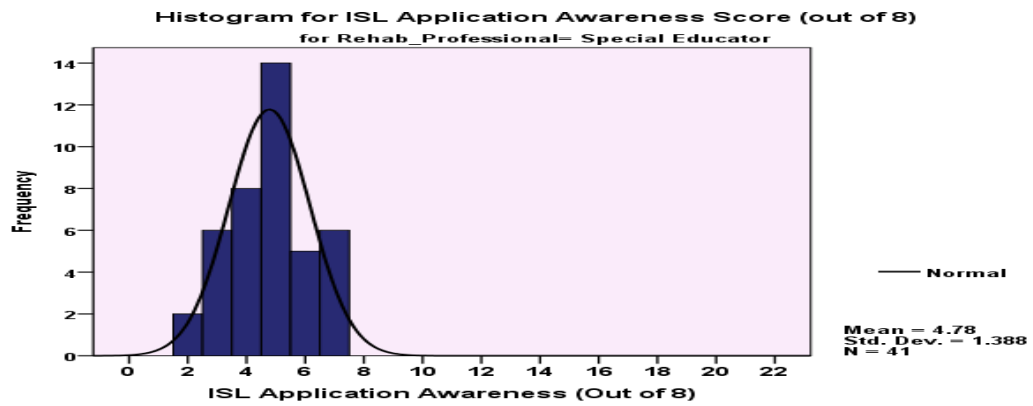


Fig 4.18 Histogram for Awareness about Application issues of ISL for Special Educators

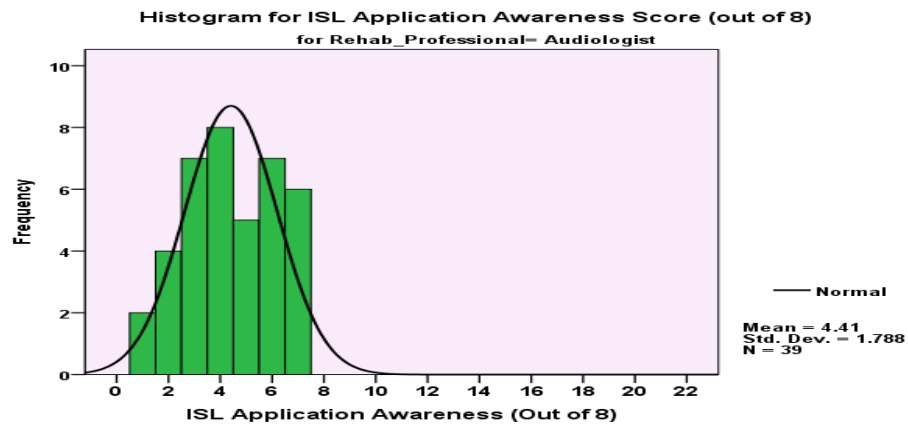


Fig 4.19 Histogram for Awareness about Application issues of ISL for Audiologists

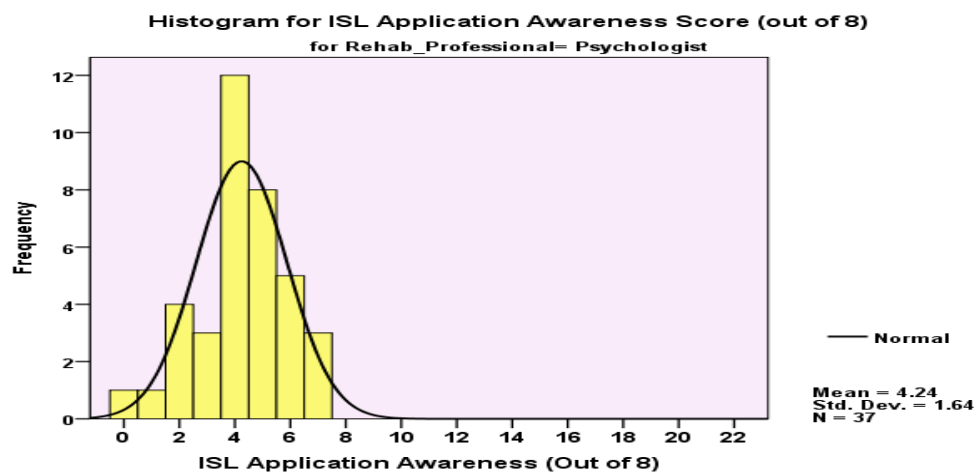


Fig. 4.20 Histogram for Awareness about Application issues of ISL for Psychologists

The comparative analysis of the total scores obtained by four group of rehabilitation professionals on their awareness about application issues of ISL is represented in the form of a boxplot given below:

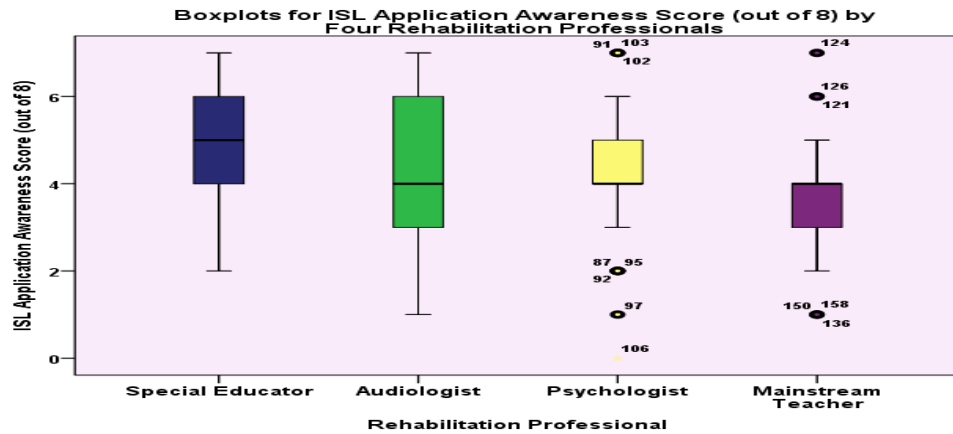


Fig 4.21: Comparison of total scores obtained by four group of rehab-professionals

The above fig.4.21 indicates that the mean scores obtained by special educators (4.78), audiologists (4.41) and psychologists (4.24) do not differ much with respect to their awareness about application issues of ISL. However, the mean of the mainstream teachers (3.59) differs significantly from that of the special educators. The boxplot also indicates few outliers. Outliers are the scores which deviate significantly from the mean. The difference among the mean scores of four group of rehabilitation professionals with respect to their awareness about application issues of ISL are also represented in the form of a means plot (fig 4.22) given below:

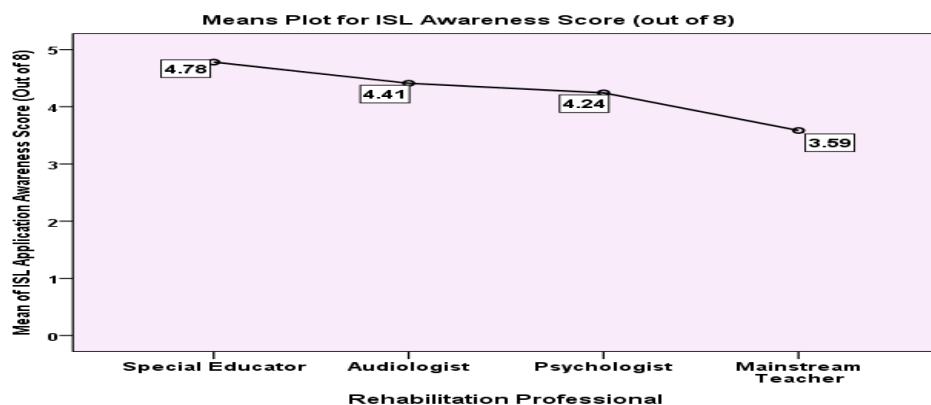


Fig 4.22: Means plot for awareness about application issues of ISL among four groups of rehab-professionals

4.11 Discussion: Awareness about Application Issues of ISL

As compared to other two areas of ISL, namely awareness about grammar and deaf culture, all the four groups of rehabilitation professionals have scored higher score in the area of application issues of ISL. The results from table 4.13 above indicate that the means of special educators (4.78), audiologists (4.41) and psychologists (4.24) do not differ much with respect to their awareness about application issues of ISL. However, the mean of the special educators (4.78) and mainstream teachers (3.59) differ significantly with respect to awareness about application issues of ISL. Majority of the rehabilitation professionals have experienced the practical issues in using ISL while dealing with deaf students. Hence, even in the absence of proper training in grammar of ISL and exposure to deaf culture, the rehabilitation professionals have scored higher in the area of application issues of ISL on the basis of their real-life experiences with deaf students.

Chapter V

Summary, Conclusion & Recommendations.

5.1 Summary:

This section summarizes the results of the study. Summary is presented in the table 5.1 below:

Table 5.1: Summary of results in the light of the objectives:

Sr. No.	Objectives	Null Hypotheses	Findings
1.	To review the awareness about Indian sign language among different rehabilitation professionals (audiologists/speech therapist and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths and mis-concepts about ISL	H₀₁ There exists no significant difference in the awareness about Indian Sign Language (ISL) among different rehabilitation professionals (audiologists, speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths/ mis-concepts about ISL.	Null hypothesis was rejected. The mean Total Score of the Special Educators differs from that of the Mainstream Teachers in a larger way (3.22). Such differences are small for Special Educator and Audiologist and Psychologists.
1a.	To comparatively review the awareness about the cultural aspects of Indian sign language among different rehabilitation professionals and paraprofessionals with reference to the common	H_{01a} There exists no significant difference in awareness about the Cultural aspects of Indian Sign Language (ISL) among different rehabilitation professionals & paraprofessionals with reference to	Null hypothesis was rejected. There is no significant difference in the means of special educators, audiologists and psychologists. However, the

	myths and mis-concepts about ISL	the common myths and mis-concepts about ISL	means of special educators and mainstream teachers differ significantly.
1b.	To comparatively review the awareness about the grammar of Indian sign language among different rehabilitation professionals & para-professionals with reference to the common myths and mis-concepts about ISL	H₀1b There exists no significant difference in awareness about grammar of Indian Sign Language (ISL) among different rehabilitation professionals & para-professionals with reference to the common myths and mis-concepts about ISL	Null hypothesis was rejected. Findings are similar to earlier sub-objective 1a. above.
1c.	To comparatively review the application issues of Indian sign language among different rehabilitation professionals & para-professionals with reference to the common myths and mis-concepts about ISL	H₀1 There exists no significant difference in awareness about application issues of Indian Sign Language (ISL) among different rehabilitation professionals & para-professionals with reference to the common myths and mis-concepts about ISL	Null hypothesis was rejected. Findings are similar to earlier sub-objective 1b. above.

5.2 Conclusion:

1. There exists a significant difference in the awareness about Indian Sign Language (ISL) among different rehabilitation professionals (audiologists, speech therapists and special educators) and paraprofessionals (like counselors/psychologists and mainstream school teachers) with reference to the common myths/ mis-concepts about ISL. From this study we can conclude that the rehabilitation professionals have low awareness about ISL. There is a

need to train mainstream teachers about ISL and appoint ISL interpreters for dealing with deaf children in their class.

2. There exists a significant difference in awareness about the Cultural aspects of Indian Sign Language (ISL) among different rehabilitation professionals and para-professionals with reference to the common myths and mis-concepts about ISL. The rehabilitation professionals' awareness about deaf culture is low. Although special educators are aware about deaf culture, audiologists and psychologists have little awareness about ISL. Mainstream teachers need to be exposed to ISL since, there is great difference in the scores of mainstream teachers and special educators.

3. There exists a significant difference in awareness about grammar of Indian Sign Language (ISL) among different rehabilitation professionals & para-professionals with reference to the common myths and mis-concepts about ISL. The awareness of rehabilitation professionals about grammar of ISL is also found to be low. This awareness was found to be lowest among mainstream teachers. There is a need to conduct in-service training programs for empowering mainstream teachers in using ISL.

4. There exists a significant difference in awareness about application issues of Indian Sign Language (ISL) among different rehabilitation professionals & para-professionals with reference to the common myths and mis-concepts about ISL. As far as application issues of ISL are concerned, the awareness of rehabilitation professionals seems to be better than awareness about grammar and deaf culture. The mainstream teachers have shown low score on awareness about application issues of ISL than other group of rehabilitation professionals.

5.3: Recommendations:

There are few areas which are beyond the scope of present research. These areas provide the platform for building further research. They are presented below:

5.3.1 Recommendations for rehabilitation professionals:

- Rehabilitation professionals like audiologists, special educators, psychologists and mainstream teachers involved in the rehabilitation of deaf students should be empowered with the knowledge and skills of using ISL.

- Like B.Ed (special education) programs, other professional training programs for empowering audiologists, psychologists, regular teachers need to incorporate ISL as a mandatory component of skill-development. Thus, ISL should be incorporated as a part of pre-service training program for preparing rehabilitation professionals in using ISL effectively with deaf individuals.
- It is recommended that the institutions in the field of rehabilitation and special education should organize regular long term and short term ISL training- programs and workshops for the rehabilitation professionals as a part of in-service training initiative.

5.3.2: Recommendations for parents:

Many deaf children are born to hearing parents. Thus, there is a mismatch between the communication method used by parents and their deaf children. It is recommended that parents need to develop positive and favourable attitude towards ISL. They should learn ISL for communicating with their deaf child as well as rehabilitation professionals.

5.3.3: Recommendations for future researchers:

- Although present research involved large sample size, further study may be replicated on still larger sample. It will help to provide more evidence for ensuring the validity and reliability of the research tools.
- The present study used survey research design. Further research may use an experimental design. Rehabilitation professionals may be trained in using basic ISL skills for a short period of time. The effectiveness of the training program may be measured by using a pre-test and post-test.
- In the present study awareness about ISL was defined as consisting awareness of three areas: awareness about cultural aspects of deafness, grammar of ISL and application issues in ISL. Further research may be conducted by selecting other variables for defining awareness about ISL.
- Further research may be replicated in other locations other than those mentioned in the present study.
- In the present study rehabilitation professionals included only four groups of professionals. Further researchers may select other group of rehabilitation professionals for studying awareness-level about ISL.

5.3.4: Recommendations for Government and Non-Government Organizations:

- It is recommended that Government Organizations and Non-Governmental Organizations whose mission is to train people in Indian Sign Language (ISL) should concentrate on orientation as well. Training involves skill development. Training is offered to those who are formally enrolled in the training programs. However, these GOs and NGOs should also organize awareness and sensitization programs about ISL over and above training for those rehab-professionals who are not enrolled in the formal training programs. This will help to facilitate a positive attitude towards ISL and motivate them to learn ISL as an independent language.

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APPENDICES

Appendix – A

Validated Tool

AWARENESS ABOUT INDIAN SIGN LANGUAGE (ISL) AMONG PROFESSIONALS & PARA-PROFESSIONALS

Kasturi Kulkarni, Assistant Professor, CCYM'S HACSE

व्यावसायिकांमध्ये भारतीय सांकेतिक भाषेविषयी (आय.एस.एल) जागरुकतेचे मापन करण्याची प्रश्नावली - August 2020.

(Awareness about ISL with regard to its Cultural background, Grammar, and Application)
(सांस्कृतिक पार्श्वभूमी, व्याकरण व उपयोग यासंदर्भातील जागरुकता.)

(Background Information)

Email address:

Name of the professional: व्यावसायिकाचे नाव

Name of the institute: तुमच्या संस्थेचे नाव

Choose your Profession: तुमचा व्यवसाय निवडा

- 1.Special Educator /विशेष शिक्षक
2. Audiologist or speech therapist/ऑडिओ लॉज ईस्ट किंवा स्पीच थेरेपिस्ट
- 3.Psychologist/ Counselor/मानस शास्त्रज्ञ किंवा समुपदेशक
4. Mainstream teacher/मुख्य प्रवाहातील शिक्षक

Total years of professional experience: व्यावसायिक अनुभवाची एकूण वर्षे

INSTRUCTIONS FOR FILLING QUESTIONNAIRE/प्रश्नावली भरण्याच्या सूचना

1. I assure you that your responses would be kept confidential and would be used exclusively for the purpose of the research.

आपल्या प्रतिक्रिया गोपनीय ठेवल्या जातील व केवळ संशोधनाच्या उद्दिष्टाने वापरल्या जातील.

2. Please click on one and only one correct alternative from the three given below each question

प्रत्येक प्रश्नाच्या खाली दिलेल्या तीन पर्यायांपैकी केवळ एकच योग्य पर्याय निवडा.

3. DO NOT LEAVE any item blank. कोणताही प्रश्न रिक्त ठेवू नका.

I read it and I agree/ मी सूचना वाचल्या आणि मी या सूचनांशी सहमत आहे

(Test Items from the Google form)

1. What does the deaf community consist of? / बहिन्याच्या समुदायामध्ये कोण कोण येतात?
a. Only deaf individuals./ केवळ बहिन्या व्यक्ती.
b. Deaf and hearing individuals./ बहिन्या आणि ऐकू येत असलेल्या व्यक्ती.
c. All the individuals using ISL./ आय.एस.एल वापरणारे सर्व व्यक्ती.
d. I don't know./ मला माहित नाही.
2. Who has developed the grammatical structure of ISL? / आय.एस.एल च्या व्याकरणाची रचना कोणी विकसित केली आहे?
a. Hearing individuals./ ऐकू येत असलेल्या व्यक्तींनी.
b. Nobody developed it. It evolved on its own./ कोणीच विकसित नाही केलं. ते आपोआप उत्क्रांत झालं.
c. Researchers conducting experiments in ISL./ आय.एस.एल मध्ये प्रयोग करणारे संशोधक.
d. I don't know./ मला माहित नाही.
3. Which barrier comes in way of any parent learning ISL? / आय.एस.एल शिकण्याच्या मार्गावर कोणत्याही पालकांना कोणता अडथळा येतो?
a. Inadequate ISL training avenues./ आय.एस.एल चे प्रशिक्षण देणाऱ्या अपुऱ्या संस्था.
b. Unfavorable mindset towards ISL./ आय.एस.एल बदल प्रतिकूल मानसिकता.
c. Both./ वरील दोन्ही पर्याय बरोबर.
d. I don't know./ मला माहित नाही.
4. Which is the correct term for the audiological label of deafness? / बहिरेपणाच्या ऑडिओ लॉजिकल लेबल साठी योग्य पद कोणते आहे?
a. 'Deaf'
b. 'deaf'
c. 'DEAF'
d. I don't know./ मला माहित नाही.
5. Why is it said that ISL is an independent language like Hindi? / असे का म्हटले जाते की हिंदी सारखी आय.एस.एल एक स्वतंत्र भाषा आहे?
a. ISL and Hindi have common grammar structures./ आय.एस.एल आणि हिंदीची व्याकरण रचना समान आहे.
b. ISL's grammar structure is based on Hindi./ आय.एस.एलची व्याकरण रचना हिंदी वर आधारित आहे.
c. ISL has its own independent grammar just like Hindi has its own. / आय.एस.एल चे देखील स्वतःचे स्वतंत्र व्याकरण आहे जसे हिंदी चे स्वतंत्र व्याकरण आहे.
d. I don't know./ मला माहित नाही.
6. Which stakeholders should learn ISL? / कोणत्या भागधारकांनी आय.एस.एल शिकली पाहिजे?
a. Only Deaf children./ केवळ बहिरी मुले.
b. Deaf children and their family members./ बहिरी मुले आणि त्यांच्या कुटुंबातील सदस्य.

c. Deaf children and all connected with the child./ बहिरी मुले आणि त्यांच्याशी निगडित सगळेजण.

d. I don't know./ मला माहित नाही.

7. What is the meaning of the term 'deaf gain'?/ डेफ गेन (बहिऱ्याचा लाभ) या पदाचा अर्थ काय आहे?

a. The government schemes, concessions and facilities available for the deaf individuals./ बहिऱ्या व्यक्तींसाठी उपलब्ध असलेल्या शासकीय योजना सवलती व सुविधा.

b. The contribution of deaf individuals to the society./ बहिऱ्या व्यक्तींचे समाजासाठी योगदान.

c. The contribution of hearing individuals towards deaf individuals./ ऐकू येणाऱ्या व्यक्तींनी बहिऱ्या व्यक्तींसाठी केलेले योगदान.

d. I don't know./ मला माहित नाही.

8. Which is not used while using ISL?/ आय. एस. एल मध्ये कशाचा वापर केला जात नाही?

a. Sign system./ सांकेतिक प्रणाली.

b. Mouthing of spoken language words./ बोलीभाषेतील शब्दांप्रमाणे ओठांची हालचाल करणे.

c. Finger spelling./ फिंगर स्पेलिंग.

d. I don't know./ मला माहित नाही.

9. Who is certified to teach ISL to other deaf students?/ इतर बहिऱ्या व्यक्तींना आय. एस. एल शिकविण्यासाठी कोण प्रमाणित आहे ?

a. A deaf person certified to teach ISL./ आय. एस. एल शिकविण्यासाठी प्रमाणित एक बहिरा व्यक्ती.

b. A hearing person certified to interpret ISL./ आय. एस. एल इंटरप्रीट करण्यासाठी प्रमाणित असलेली श्रवणक्षम व्यक्ती.

c. A hearing person certified in teaching school subjects./ शालेय विषय शिकविण्यासाठी प्रमाणित असलेली श्रवणक्षम व्यक्ती.

d. I don't know./ मला माहित नाही.

10. Name the cultural identities that are found among deaf individuals./ कर्णबधिर व्यक्तींमध्ये आढळणाऱ्या सांस्कृतिक स्व-ओळखीची नावे सांगा.

a. Only deaf or only hearing identity./ केवळ बहिरा किंवा केवळ ऐकू येणारा अशी स्व-ओळख.

b. Neither deaf nor hearing identity./ बहिरा ही नाही आणि ऐकू येणारा ही नाही अशी स्व-ओळख.

c. Range of multiple identities./ अनेक स्व-ओळखीची रेंज.

d. I don't know./ मला माहित नाही.

11. How Indian Sign Language (ISL) differs from American Sign Language (ASL)?/ भारतीय सांकेतिक भाषा (आय. एस. एल) ही अमेरिकन सांकेतिक भाषा (ए. एस. एल) पेक्षा कोणत्या प्रकारे वेगळी आहे?

a. ASL is richer than ISL./ ए. एस. एल ही आय. एस. एल पेक्षा समृद्ध आहे.

b. ISL and ASL are equally rich./ आय. एस. एल आणि ए. एस. एल हे एक सारखेच समृद्ध आहेत.

c. ISL is richer than ASL./ आय. एस. एल ही ए. एस. एल पेक्षा पेक्षा समृद्ध आहे.

d. I don't know./ मला माहित नाही.

12. What is the percentage of special schools that use sign language in India?/भारतामध्ये सांकेतिक भाषा वापरणाऱ्या विशेष शाळांची टक्केवारी किती आहे?

a. More than 50%./पन्नास टक्क्यांपेक्षा जास्त.

b. Around 20%./जवळ-जवळ 20 टक्के.

c. Such survey has not been conducted in the last decade in India. Hence, no updated data is available./गेल्या दशकात भारतात असे सर्वेक्षण झाले नाही. म्हणून कोणतीही अद्ययावत माहिती उपलब्ध नाही.

d. I don't know./ मला माहित नाही.

13. Which is the commonly accepted essential condition for belonging to a deaf community?/ बहिऱ्याच्या समुदायाचा भाग होण्यासाठी सामान्यतः स्वीकारलेली पूर्वअट कोणती आहे?

a. Knowing and perceiving sign language as primary language for communication./संप्रेषणासाठी सांकेतिक भाषा म्हणजे प्राथमिक भाषा म्हणून बघणे आणि तिला तसे समजणे.

b. Presence of deafness./बहिरेपणा असणे.

c. Holding membership of a deaf association./बहिऱ्याच्या असोसिएशनचे सदस्यत्व असणे.

d. I don't know./ मला माहित नाही.

14. How months are expressed in ISL?/आय. एस. एल मध्ये महिने हे कसे व्यक्त केले जातात?

a. Using a separate single sign for each month./प्रत्येक महिन्यासाठी स्वतंत्र एक संकेत चिन्ह असते.

b. Every month has two signs./प्रत्येक महिन्यासाठी दोन संकेत चिन्ह असतात.

c. There is only one common sign for all the months./सर्व महिन्यांसाठी एकच सामान्य संकेत चिन्ह असते.

d. I don't know./ मला माहित नाही.

15. What happens to literacy development in schools where sign language is used?/ ज्या शाळांमध्ये सांकेतिक भाषा वापरली जाते तेथे साक्षरता विकासाचे काय होते?

a. Literacy is not the focus of education in such schools./अशा शाळांमध्ये शिक्षणाचे लक्ष साक्षरतेकडे नसते.

b. Literacy remains to be impossible for the students of such schools./अशा शाळांमधील विद्यार्थ्यांसाठी साक्षरता अशक्य आहे.

c. Language foundation is essential for development of literacy and if used effectively ISL can provide that to the deaf students./ साक्षरतेच्या विकासासाठी भाषेचा पाया आवश्यक आहे आणि प्रभावीपणे वापरल्यास आय.एस.एल कर्णबधिर विद्यार्थ्यांना ते प्रदान करू शकते.

d. I don't know./ मला माहित नाही.

16. Why deaf communities are viewed as separate minority communities?/बहिऱ्याच्या समुदायाला स्वतंत्र अल्पसंख्यांक समुदाय म्हणून का पाहिले जाते?

a. Members of the group are biologically deaf./गटातील सदस्य हे जैविक दृष्ट्या बहिरे असतात.

b. Members want to preserve ISL as a unique cultural identity./सदस्यांना आय.एस. एल एक अनोखी सांस्कृतिक ओळख म्हणून जपण्याची इच्छा असते.

- c. Members keep away from hearing individuals./ऐकू येणाऱ्या व्यक्तीपासून ते लांब राहतात.
d. I don't know./ मला माहित नाही.

17. What is the rule regarding the use of 'negation' in ISL? /आय.एस.एल मध्ये नकार वापरण्याबाबत काय नियम आहे?

- a. There is only one sign to represent all negatives./सर्व प्रकारच्या नकारात्मकतेचे प्रतिनिधित्व करण्यासाठी एकच संकेत चिन्ह वापरतात.
b. Separate signs are used to represent different negatives./वेगवेगळ्या नकारात्मकतेचे प्रतिनिधित्व करण्यासाठी वेगवेगळी संकेत चिन्ह वापरतात.
c. All negative responses are communicated by only nodding head./सर्व नकारात्मक प्रतिक्रिया केवळ डोक्याने नाही म्हणून कळवतात.
d. I don't know./ मला माहित नाही.

18. Can a deaf ISL user child be enrolled in an inclusive school?/सर्वसमावेशक शाळेमध्ये बहिरेपणा असलेल्या आणि आय.एस.एल वापरणाऱ्या मुलाला प्रवेश मिळू शकतो का?

- a. Yes, because inclusive schools are about diverse population learning together./होय कारण सर्वसमावेशक शाळा विविध मुलांना एकत्रितपणे शिकविण्यासाठीच आहेत.
b. No, because no one in an inclusive school would know ISL./नाही कारण सर्वसमावेशक शाळेत कोणालाही आय.एस.एल माहित नसते.
c. No, because there is no law ensuring admission of a signer into normal school./नाही. कारण असा कोणताही कायदा नाही जो आय.एस.एल वापरणाऱ्या मुलाचा प्रवेश सर्वसमावेशक शाळेत निश्चित करेल.
d. I don't know./ मला माहित नाही.

19. Which component plays an important role in ISL?/ आय.एस.एल मध्ये कोणता घटक महत्त्वाची भूमिका बजावतो ?

- a. Knowledge of verbal tongue./बोली भाषेचे ज्ञान.
b. Possessing literacy skills./साक्षरता कौशल्य असणे.
c. Use of facial expressions and hand movements./चेहऱ्यावरील भाव आणि हाताच्या हालचालींचा वापर.
d. I don't know./ मला माहित नाही.

20. How will you develop English literacy skills among deaf children by using ISL?/आय.एस.एल चा वापर करून तुम्ही कर्णबधिर मुलांमध्ये इंग्रजी साक्षरता कौशल्य कसे विकसित कराल?

- a. By directly translating ISL to print form of English./आय .एस. एलचा थेट अनुवाद इंग्रजीच्या मुद्रणासाठी करून.
b. By introducing verbal English before literacy skills./साक्षरता कौशल्यांची ओळख करण्यापूर्वी मौखिक इंग्रजीची ओळख करून देऊन.
c. By practicing handwriting skills./हस्ताक्षर कौशल्याचा सराव करून.
d. I don't know./ मला माहित नाही.

21. Which subjects cannot be taught in sign language?/कोणते विषय सांकेतिक भाषेमध्ये शिकवले जाऊ शकत नाहीत?

- a.Science and maths/विज्ञान आणि गणित
- b. Literature/साहित्य
- c.None of the above./वरीलपैकी काहीही नाही.
- d. I don't know./ मला माहित नाही.

22. What represents the concept of 'audism'? /ऑडीझम या शब्दाचा अर्थ काय?

- a.A technique to improve listening skills among deaf individuals./बहिऱ्या व्यक्तींमध्ये ऐकण्याची कौशल्य सुधारण्याचे तंत्र.
- b.The discrimination faced by deaf individuals for being unable to hear./बहिऱ्या व्यक्तींना बहिर असल्यामुळे सोसावा लागणारा भेदभाव.
- c. The term to represent communication patterns used by the majority hearing community/बहुसंख्य श्रवण समुदायाद्वारे वापरल्या जाणाऱ्या संप्रेषण पद्धतीचे प्रतिनिधित्व करणारा हा शब्द.
- d. I don't know./ मला माहित नाही.



23. Which of the following statement is true?/पुढीलपैकी कोणते विधान खरे आहे?

- a. Grammar of ISL is inferior as compared to verbal languages./ मौखिक भाषांच्या तुलनेत आय.एस.एलचे व्याकरण निकृष्ट आहे.
- b. ISL has independent grammar and it cannot be used for teaching school subjects./आय.एस.एल चे स्वतंत्र व्याकरण आहे आणि ते शालेय विषय शिकवण्यासाठी वापरले जाऊ शकत नाही.
- c. ISL has independent grammar and hence it can be used for teaching school subjects./आय.एस.एल चे स्वतंत्र व्याकरण आहे आणि म्हणून याचा उपयोग शालेय विषय शिकविण्यासाठी केला जाऊ शकतो.
- d. I don't know./ मला माहित नाही.

24. How many degree colleges are using ISL in India?/भारतात किती पदवी महाविद्यालये आय.एस.एल चा वापर करत आहेत?

- a.None./कोणीच नाही.
- b.Few./काही.
- c. Many./ बरेच.
- d. I don't know./ मला माहित नाही.

Appendix – B
Permission Letter for Data Collection



Chembur Colony Yuvak Mandal's
HASHU ADVANI COLLEGE OF SPECIAL EDUCATION
B Ed (Special Education - Hearing Impairment) • B Ed (Special Education - Learning Disability)
Affiliation: University of Mumbai • Recognition: Rehabilitation Council of India • Grant in aid: DHE, Govt. of Maharashtra
NAAC accredited with 'B' grade • 2 (f) & 12 (B) Listed : UGC

Date: 15/7/2020

To _____

**Sub: Permission for data collection on the research topic related to
Indian Sign Language (ISL)**

Dear Sir / Mam,


Ms. Kasturi Kulkarni, Assistant Professor from our college has undertaken a minor research project titled '**Profiling Awareness among Rehabilitation Professionals about Indian sign language**'. This research has been approved by Mumbai University and our college has received minor research project grant for this purpose.



Ms. Kasturi Kulkarni is the Principal investigator of this project. She has developed a tool to measure the awareness about ISL among different rehabilitation professionals especially special educators, audiologists, psychologists / counsellors and mainstream teachers.

You are requested to fill up the questionnaire developed by Ms. Kasturi Kulkarni which is in the form of a Google form. Ms. Kasturi Kulkarni will email / WhatsApp you the tool on awareness about Indian Sign Language which contains 24 items. You are supposed to click on any one alternative from the 4 given in the tool.

Hope, you will be able to spare some of your valuable time for this assignment. We look forward to your support for the betterment of practices for empowering persons and children with hearing impairment.

Thanking you,


Regards,
Dr. Asmita Huddar,
Principal,
CCYM'S HACSE



64/65, Collector's Colony, Chembur, Mumbai-400 074, Maharashtra, INDIA
☎ (022) 25531041, 25530451, email: hac_ccym@yahoo.co.in, principal.hacse@gmail.com,
< www.hacse.org.in > 🌐 <https://www.facebook.com/ChemburColonyYuvakMandal>

Appendix – C

Request for Tool Validation

tool validation

Inbox x

⬆️ ⬇️ ⬆️



Asmita Huddar <principal.hacse@gmail.com>
to me ▾

Mar 22, 2020, 11:43 PM ☆ ↶ ⋮

Dear Expert,

I need your help in **research on Indian Sign Language** undertaken by one of the faculty of my college. Ms. Kasturi Kulkarni, Assistant Professor from my college has undertaken a minor research project titled '**Profiling Awareness among Rehabilitation Professionals about Indian sign language**'. This research has been approved by Mumbai University and our college has received minor research project grant for this purpose.

Ms. Kasturi Kulkarni is the Principal investigator of this project. She has developed a tool to measure the awareness about ISL among different rehabilitation professionals: Tool to measure the awareness about ISL among rehabilitation professionals.

As an expert in the field of ISL and deaf culture, you are requested to validate the items in the tool in 2 ways:

1. You are requested to read each item in the tool and **indicate any three items** which you wish to **delete from the tools**. There are 3 parts: Part A, B and C. In each part there are items and you have to indicate which 3 items you wish to delete from each part.
2. **Provide your suggestions (if any) about re-framing the language of the items** in the space provided below each item.

The objectives of the study, operational definitions and the tools are attached herewith for your reference. Kindly **validate** the tool and email it back to me as soon as you can, preferably within three to four days. It is a small tool and it will take very less of your valuable time to **validate** the tool. Looking forward to your suggestions in this project. I am sure your expert advice will make this project a great success.

My faculty, Ms. Kasturi Kulkarni will share the outcomes and findings of this research with you once it is over. Thanks a ton for your contribution.

Last but not the least - **DEADLINE** 🕒 **31/3/2020**

Thanking you,
