MANPOWER RESOURCES AND NEEDS IN SPEECH PATHOLOGY AND AUDIOLOGY

Balakrishna E.P

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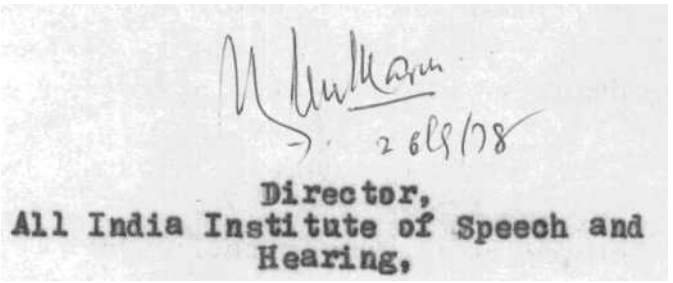
To

SRI GURUVAYURAPPAN

C E R T I F I C A T E

This is to certify that the dissertation entitled "Manpower Resources and Needs in Speech Pathology & Audiology" is the bona fide work in partial falfilaent for the degree of M.Sc. (Speech & Hearing), carrying 100 marks, of the student with Register No.



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CERTIFICATE

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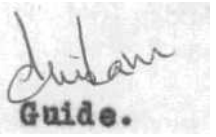

D E C L A R A T I O N

This dissertation is the result of my own study undertaken under the guidance of Dr. (Miss) Shailaja Nikam, Head of the Department of Audiology, All India Institute of Speech and Hearing, and has not been submitted earlier at any University for any other diploma or degree.

Mysore, Reg.No. 5

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Finally, I express my gratitude to all those people who have returned the questionnaires duly filled.

C 0 N T E N T S

CHAPTER I

INTRODUCTION

Survey Research

"Scientific search or research is an action producing truthful information about things and what happens to them." (Wolman, 1965). Truthful information is sought through different methods of research. Survey research is one among them.

The survey is a data-collection method in which an instrument is ased to solicit responses from a sample of respondents. (Lin, 1976). It takes many forms ranging from the mail questionnaire to in-depth personal interviews.

The survey method is applied to varioas fields of study. The significance of survey method is that it is an instrument of great versatality, applicable to a wide range of problems in the general area of social research. The advantage of survey research is that a great deal of

information can be obtained from a large population.

Surveys differ greatly in their scope, design and content. As in other methods of research the specific characteristics of any survey will be determined by its objectives (Campbell and Katonya, 1966).

Surveys in the field of Speech and Hearing

In the field of Speech and Hearing, survey method has been used to aeet various needs. Curlee (1975) used the survey method to study the Manpower Resources in Speech pathology and Audiology. Kapur (1966) conducted a survey of personnel, equipment and facilities available in India, in the field of Speech and Hearing. A Survey of Status of Warble Tone in Audiometers was conducted by Staab and Rintelmann (1972). These are a few examples of survey research done in the field of Speech and Hearing. Survey research seems ideally suited for obtaining facts regarding education, training and employment of manpower in Speech Pathology and Audiology.

Manpower with Critical Skills

Development of scientific manpower involves investment in higher education and training. As more and more advances are made in science, technology and medicine, increased specialization may be required to meet the different needs of the society. The Health Survey and Planning Committee (1961) had recognised the need for manpower resource development in Speech Pathology and Audiology. Keeping this in view, attempts were made to develop training programmes at various centres in India.

One of the first centres was established at Mysore in 1965. The All India Institute of Speech and Hearing, Mysore, provides training for B.Sc., M.Sc. and Ph.D. degrees in Speech and Hearing. At Bombay, the T.N. Medical College and B.Y.L. Nair Hospital, provide graduate training in Audiology and Speech Therapy since 1966. A Diploma Coarse in Clinical Technique (Audiometry) was started in New Delhi at the All India Institute of Medical Sciences. In the year 1972, the B.M. Institute of Mental Health, Ahmedabad, started B.Sc. Course in Speech and Hearing. The syllabus for the

training programme was drawn with special reference to the needs and conditions in India.

Speech Pathology and Audiology both in terms of diagnosis and rehabilitation of communication handicapped are the major subjects. Medical subjects, Clinical Psychology, Linguistics, Basic Electronics, Research Methods and Statistics are also incorporated in the syllabus.

Judging from the course of studies, it may be expected that the Speech and Hearing personnel can be employed in different settings: diagnostics of communication problems of various etiology, rehabilitation, in the prevention of problems concerned with communication, and in terms of training and research. This work they can do in hospitals, speech and hearing clinics, special schools, industries, training institutions such as colleges and universities. Besides, they can be engaged in research activities.

It is not enough to have trained personnel with "critical skill". The administrators and professionals

must be aware of the availability of people with these type of education and training, and services they can render. "All educational programmes for which resources are reqaired should be subject to the test of relevance of the skill and training they impart.' (Rao, 1966). One way of testing this would be to ascertain the pattern of utilization of manpower.

The present study was designed to determine the pattern of manpower utilization in Speech and Hearing field. On a small scale, the study included two areas, i.e., manufacturing industries and schools for special education, so as to find oat - (1) awareness of communication problems associated with noise exposure, physical or mental handicap; and (2) aware-aeas of the availability of persons trainned to deal with problems of communication.

Need for the Study

A survey of the characteristics of manpower in Speech and Hearing would serve a variety of needs.

First, high level manpower is a resource whose supply can be increased only investment in education. Investment in education is worthwhile if the personnel trained are employed gainfully. "Educated unemployment reflect wasteful investment in human resource development." (Devarajan, 1963).

Second, training programme for which resources are required should be subject to the relevance of the skill and training they impart. One way of testing the relevance of training is to ascertain the pattern of utilization of man-power. "Misallocation of skills is an economic waste and makes investment in education ineffective." (Devarajan, 1963)

Third, there are different levels of training in the profession such as certificate, diploma, B.Sc., M.Sc, M.S., at Ph.D. Higher the level of specialization in the subject, greater is the investment involved in education. Is the level of training correlated to the different organizational structures where they are employed? Are they performing duties that are commensurate with their levels of training? Information regarding these would reveal whether the services

of the specialists are usefully and economically employed.

Fourth, quality service delivery depends both on personnel and equipment. People may be employed but without their professional tools their "critical skill" cannot be effectively used. Tools need aintenance and test environment for their better performance. What equipment and facilities the professionals have in the field of Speech and Hearing need to be ascertained.

Fifth, Speech and Hearing speciality is one of the yoangest recognised speciality among the rehabilitation services. Like many other specialities, as Speech Pathology and Audiology has developed, it has expanded its areas of interest. Its broadening horizon need information of all of its activities in different fields. It is not known whether people who need the services of the profession are are aware of the availability of qualified persons in Speech Pathology and Audiology. In the hearing conservation programme in industries, in the educational programmes of Special Schools, their need is increasingly felt. However,

it is to be ascertained whether the industrial managements in India are aware of the noise hazards in their factories and whether they are aware of the availability of persons qualified for conducting hearing conservation programmes. So also, whether the administrators and authorities in Schools for Special Education are aware of the latest technology and persons available for helping communication handicapped children in their schools is to be known.

Sixth, availability of comprehensive information concerning man power and service needs would help the planners to involve Speech and Hearing Services. It is not yet known whether personnel performing similar duties or same levels of training carry similar job titles and salary. Review of present resources and its utilization gives useful information for meaningful planning. It helps standardizing job titles in relation to its requirements and salary scales in relation to job titles and job-requirement.

Seventh, information regarding the distribution of the professionals, that is, whether they are concentrated in some geographical area or diffused throughout the country is to be

ascertained. What role the Speech and Hearing personnel play in the rural health scheme? Does the professional service reach the consumer, to his community and even in his neighbourhood, if necessary? Valid information in this regard would help the health planners.

Eighth, continuing education helps the professionals to keep abreast with the latest development in the field. New techniques in diagnosis and therapy are constantly being evolved in Speech Pathology and Audiology. Information regarding such development may not be avaiable to all the profe-ssionals in the field. So, there is a need to find out whether the professionals need the services for continuing education or not. "In the rapidly changing and expanding world of knowledge it is imperative that our skill should be continually updated, that we all remain current. Currency can only be accomplished by the availability of continuing education opportunities and the gentle nudge that its require-ment will provide.' (Hattum, 1977).

Specifically, the study was designed to obtain information regarding the personnel, equipment and work environment.

The personnel information consisted of the demographic information, academic history, nature of duties, period of employment and unemployment, monthly income and professional interaction.

Regarding equipment, it consisted of information on the availability of basic instruments such as audiometers, individual hearing aids, other instruments such as group hearing aids, speech trainers, record players, tape recorders and accessories such as sound level meter, provision for free field tests and noise generators.

The test environment consisted of information regarding the availability of sound treated rooms, facilities for instrumental calibration and servicing of instruments.

As the study included industries and special schools, information regarding noise level in the factories, measures for noise control, awareness of the noise hazards, incidence of health hazards in the factory and awareness of qualified persons available in conservation of hearing.

Man power involved in special education, awareness of problems of communication and need for specialized persons were also included in this section.

CHAPTER II

REVIEW 0F LITERATURE

One of the first studies was the Survey of Public School Speech and Hearing Services (Research Committee, American Speech and Hearing Association,J.S.H.D. Monograph No.8, 1961).

The major objectives of the study were:

1) to identify the important technioal and professional procedures in the field of Speech and Hearing;

2) to provide authoritative information to the administrators of the clinicians in Speech and Hearing; and

3) to evaluate the significance of problems which could not be resolved and to supply modern methods of research to solve their problems.

Information through questionnaires was collected regarding the clinical practice, programme managment, number of staff and students in each institution. The information thus

collected gave the statistics related to the age range of the personnel, the sex distribution, salary range, educational qualifications, the age range of the clients being served in the school system. The mode of referral responses from the clinicians and supervisors indicated that practioally all public schools provided for audiological screening, "usually no less frequently than was every fourth year of a child's school attendance.

The above study reflected the need for strengthening the Speech and Hearing work force and also to improve training facilities for the specialists. However, a few studies were conducted on the utilization of man power in Speech and Hearing.

Curlee (1975) conducted a survey with the following objectives:

t) to know the utilization, distribution and future needs for Speech Pathologists and Audiologists in research, teaching and clinical care;

2) to describe the demographic and professional characteristics of the Speech Pathology and Audiology work force;

3) to identify the current pattern of man power utilization in Speech Pathology and Audiology;

4) to estimate the need for additional Speech Pathologists and Audiologists in the area of teaching, research and clinical care;

5) to specify those man power resources or needs that require additional study and analysis; and

6) to recommend appropriate goals for meeting the needs of the communicatively handicapped and to suggest means for meeting those needs.

Questionnaires were sent to both members and non-members of the ASHA. Included in the sample were also professional trainees. The information received from 62% of the members, 32% of the non-members and 40% of trainees was analysed.

The result of the study indicated that there were about 28250 Speech Pathologists and Audlologists, 56% of these being members of ASHA. Eightysix percent of the non-members were female. The study showed that ASHA members in general had higher educational qualifications compared to non-members. A majority, 85%, of the ASHA non-members were employed in elementary and secondary schools whereas only 36% of ASHA members were working in schools. The number of ASHA members

were concentrated in the metropolitan area whereas the non-members were in less densely populated areas.

Analysis of the information given by the training revealed that among the trainees the percentage of women was more than that of men. Trainees received financial support from the State.

In terms of professional goals, more students intended to specialize in Speech Pathology. The second most popular speciality was Language and Language Pathology. However, trainees at the doctoral level preferred Audiology.

The result indicated that 80% of the Speech Pathologists and Audiologists were involved in clinical activities, 15% in teaching and 5% in research.

The major clinical services were in the area of prevention, identification, evaluation and treatment. The study specified the major needs in the areas of clinical services, teaching and research. It was found that the available man power was not sufficient to meet the needs. A comprehensive

man power planning and placement system for Speech Pathologists and Audiologists, an effective system for continuing education of the professionals, and standardization of research work were some of his suggestions.

Kapur (1966) conducted a study through mailed questionnaire with the following objectives:

1) to know the availability of facilities such as sound treated rooms, facilities for calibration of audiometers and facilities for making ear moulds:
2) to know the number of diagnostic and therapy instruments such as audiometers, hearing aids and speech trainers; and
3) to know the utilization and distribution of technical personnel involved in speech and hearing services.

The result of the study indicated that out of 69 Teaching Hospitals, 9 did not have audiometers, 25 had one audiometer each but not in working condition and 35 did not have any facilities for audiological evaluation. It was reported that only 18 out of 69 Teaching Hospitals had a sound treated room and five rooms have had the ambient noise level measured.

Further, the study indicated that out of 69 Teaching Hospitals only 8 had speech training equipment.

Regarding the personnel, the survey indicated that five Teaching Hospitals had qualified Speech Pathologists and four Teaching Hospitals had Audiometricians. It revealed that the Audiometricians in ten Teaching Hospitals learned audiometry by practice.

Health Survey and Planning Committee (Mudaliar, 1961) reported that there was inadequate facilities for hearing evaluation and rehabilitation of the communicatively handicapped people in India. The Committee report indicated the need for development of training facilities for Audiologists and Speech Pathologists. The importance of indigenous manufacture of diagnostic and rehabilitation instruments like audiometers and hearing aids was stressed by the report. Uniform education of specialists and improving facilities for diagnosis and treatment were some of the recommendations of the survey.

One of the surveys regarding the physically handicapped people (NCERT, 1968) indicated about the technical man power

and therapy equipment available in the area of deaf education. Information was collected through mailed questionnaires. The analysis of data indicated that there were 583 teachers out of which 187 were qualified for teaching the deaf children. The number of schools were 67, oat of which 26 were institutions for adult deaf and 7 training colleges. The study revealed that the number of medical and para-medical personnel was less on the staff.

Regarding equipment, the study indicated that 18 schools had group hearing aids and 12 sohools reported having individual hearing aids for their children. Facilities for calibration of audiometers was not available in any of the schools. About 59 percent of the schools were private-aided and the remaining were government and local-body schools.

The criteria for admission were aydiological and E.N.T. evaluation and report. The age of admission was in the range of 5 to 6 years.

Rintelmann and Gasaway (1967) conducted a survey of Hearing Conservation Programmes in representative aerospace

industries. To obtain information concerning hearing conservation programme was the primary purpose of the survey. mailed questions were aent to 600 companies and the response was 56 percent.

Returns indicated that 66 percent had no hearing conservation programme and no plan to initiate such programme whereas 16 percent had complete programme. The need for hearing conservation was recognised by 8 peroent and 7 percent provided ear protection devices for their employees who were exposed to noise. A comprehensive programme of hearing conservation was being started by 3 percent.

The effect of noise on man was studied by Broadbent (1957) Kryton (1970); Yaffe and Jones (1961) recommended the hearing conservation measures when the noise level increases to 85 dB level. Similar studies were conducted by Feton (1961), Carpenter (1962), Kryton (1950), suggesting minimum safe sound pressure level at 85 dB. Jensen (1960), Andrinkin (1961) had showed the physiological changes due to continuous noise exposure in factories. Fosbroke (1831) was the first person

to study the effects of noise on industrial workers. Following him many researchers like Larson (1939). Sirala and others (1940), Macoy (1944) and Webester (1954) studied the effects of noise on workers in different types of industries.

Mahananda (1972) found that two sections of an industry in Mysore had noise predominantly high and in 12 sections the noise spectrum predominantly at the low frequencies and in ten sections the intensity of noise decreased with increase in frequency. He had stressed the need for periodic hearing evaluation of the factory workers who are exposed to continuous

Communication problems may be due to various etiology. In a survey, Telford and sawrey (1967) found that deafnesa caused forty percent of the incidents of delayed speech and language, developmental aphasia 26 percent of the incidents, mental deficiency caused 25 percent of the incidents, cerebral palsy caused 8 percent of the incidents and mental illness one percent of the illness. About 5 percent of the school children exhibited devient linguistic behaviour; of them

81 percent had articulation defects and 6.5 percent were stutterers. The diagnosis and treatment of communication disorders must be all encompassing. The authors had stressed the need for early diagnosis and treatment.

In a survey of the problems of the Hearing Impaired Children regarding scholastic achievements in normal school (Asok Kumar, 1975) it was found that majority of the teachers were not aware of the problems of impaired hearing. The study found that the scholastic achievement of the hard of hearing children in normal sohools was better. Constant use of hearing aids and help from both parents and teachers could improve the scholastic achievement of the hard of hearing children. The result of the study indicated the success of the integrated approach in the education of the aurally handicapped. A survey on parental attitude was conducted by Kurian (1977) emphasising the need for parental participation in the education at aurally handicapped children.

CHAPTER III

METHODOLOGY

A. Survey Design

The survey was designed to obtain pertinent demographic information, distribution and atilization of man power resources in the field of Speech and Hearing in India.

Further needs for Speech Pathologists and Audiologists in the areas of hearing conservation and special education was also investigated.

The data were obtained through questionnaires. Three types of questionnaire were prepared to collect the necessary information (See Appendix A).

B. Preparation of Questionnaires

(a) Questionnaire 'A'

The questionnaire 'A' was designed to obtain information from Speech Pathologists and Audiologists. The printed

questionnaire contained twentythree questions covering the following area:

1. Demographic Information: It comprised of the name, age,sex, religion, mother tongue and proficiency in other languages.

2. Academic History: It dealt with professional qualifications, the year of passing, and the institutions where studied. Qualifications other than professional (i.e., Speech Pathology and Audiology) were also included in this section.

3. Employment History: The following information was sought through this section: The institution where employed, nature of employment, years of employment, designation, salary, grade, total years of employment and unemployment, the employment setting - whether in the rural or urban area, whether la Central government, state Government,Quasi-government, private or self-employed.

4. Nature of duties: This section included questions

regarding the nature of duties,i.e., whether they are in the teaching profession in a college or university, or whether they are in Special Schools, or whether in research work, administration or clinical supervision, therapy and diagnosis.

5. Interaction with other Professionals: Information regarding professionals with whom they interact in discharging their professional duties and also with the same professionals were sought in this section.

6. Private Practice: Questions regarding private practice whether they are permitted to do private practice and if so, the number of cases they have for therapy, were asked.

7. Instrumentation: It dealt with the number of audiometers, other diagnostic and therapy instruments that are available with the professionals in their clinics.

8. Continuing Education: The professionals were asked to rate the library facilities available to them.

(a) Questionnaire 'B'

The questionnaire 'B' was prepared to obtain information from the manufacturing indastries in Karnataka State. The intention of sending this questionnaire was to know whether the management was aware of the health hazards due to noise, whether they follow hearing conservation programme in their indastries and whether they were aware of the availability of trained man power in hearing conservation programme.

The personnel managers of the industries were requested to furnish the information. Twentyfive questions were included in the questionnaire covering the following area.

1. General Information: The type of industry, materials manufactured, and the number of employees in the factory were included.

2. Technical Information: Noise level in the factory, type of noise, namber of persons exposed to noise, incidence of hearing loss and other health problems due to noise exposare.

3. Measures taken for hearing conservation: Whether

periodic hearing evaluation is made, whether ear protection devices are used by workers exposed to noise and what measures taken to control noise were asked in this section.

4. Awareness of Noise Hazards: Awareness on the part of the managment and workers of the noise hazards and the availability of technology to prevent and control noise were enquired. Question regarding compensation paid to the workers for injury to their health due to noise exposure was also included.

5. Technical "man power - Job-opportunity in the area of Hearing Conservation Programme in Industry: Whether the management was aware of qualified persons in the area of communication and whether they were prepared to employ persons qualified for hearing conservation programme were investigated.

Information regarding the industries in Karnataka state was collected from the Times of India Directory 1977.

(c) Questionnaire 'C'

The questionnaire 'C was designed to get information

from the Schools for Special Education. The intention of sending the questionnaire to the Principals of these schools was to know whether they had facilities for testing and therapy and whether they had qualified staff for doing such things, and whether they were aware of the availability of trained man power in the field of Speech, Language and Hearing. Information regarding the Special Schools were obtained from the Times of India Directory 1977.

The printed questionnaire contained nineteen questions covering the following areas:

1. General Information: This section included questions regarding the type of institution, number of children attending, whether financed by the Ceatral Government, state Government, Quasi-government, or private management.

2. Particular Information: Questions regarding the criteria for admission, authority for certifying, types of tests administered at the time of admission, qualifications of the personnel administering the tests, and also qualifications of the teachers were included in this section.

3. Instrumentation: This section included questions regarding the number of audiometers, hearing aids and therapy instruments, facilities for testing, diagnosis and therapy.

4. Specialists involved: Their qualifications, experience and place of training were asked.

5. Needs for Speech Pathologists and Audiologists: Whether the educational authorities were aware of the need for specialists for solving the problems of communication of the handicapped, and whether they need the services of personnel qualified in Speech and Hearing were asked.

(d) Covering Letter

The purpose of the study, the person conducting it, and instructions to the respondents were printed on the first page of the questionnaire.

(e) Selection of Subjects

About one hundred Speech Pathologists and Audiologists were selected for the study. Those who possessed a degree or

diploma in Speech Pathology and/or Audiology were requested to furnish information throagh the questionnaire. As the subjects were only aboat one hundred, sampling controls were net aaed. Questionnaire 'A' was mailed to every one of the professionals in Speech and Hearing.

About fifty manufacturing industries in the State of Karnataka were randomly chosen from the Times of India Directory 1977. It was ensured that all types of industries get adequate representation in the survey. Industries in the State of Karnataka was chosen because of their accessibility. Necessary information was to be collected without much loss of time. It was thought that the present survey would serve as a Pilot Study and further investigation with modification in the questionnaire would serve as a private study. The personnel managers of the Industries were requested to furnish the information. Questionnaire 'B' was mailed to the personnel managers of the selected industries.

Seventyfive Special schools were selected for the purpose of administering questionnaire 'C. The selection was made

with the help of Times of India Directory, 1977. Schools were randomly selected including schools for the Deaf, Schools for the Mentally Retarded and Institutions for Orthopedically handicapped. The questionnaire was mailed to the Principals/ Superintendents of the Schools or Institutions concerned.

(f) Confidentiality

Great emphasis was placed on personal anonymity and confidentiality of the information sought through the questionnaire.

(g) Mailing Procedures

A total of Two Hundred and Twentyfive questionnaires were mailed to the respective people. A self-addressed stamped return envelope was enclosed with the questionnaire mailed to each respondent to ensure early return.

(h) Follow-Ups

After two weeks of the despatch of the questionnaire, a reminder was sent to those people who did not retarn them, ta cases where there was response for four weeks, a second follow-up waa sent, requesting them to return the filled

questionnaire immediately.

(i) Data Processing

Questionnaires, on receipt, were reviewed and categorised according to the type of the questionnaire. Incomplete questionnaires ware separately kept.

The data were separately tabulated for each type of questionnaire and analysed.

CHAPTER IV

RESULTS

Findings of the sarvey is presented in this chapter.

Of the 225 qaeationnaires sent, 136 were retarned, i.e., 60%. Following is the distribution of the questionnaires returned.

Table 1 shows the number of returns and the appropriate percentage computed from the total returns.

Table 1 - Distribution of Questionnaires

Questionnaires	No. Maled	No. Retnrned	Percentage
A	100	70	70%
B	50	20	40%
C	75	42	56%
Total	225	136	60%

Data obtained from questionnaire 'A' were placed in nine sections and analysed. Major emphasis was given to discipline was given to description and analysis of the information.

1. Demographic Information: This section deals with age, sex, mother tongae, proficiency in other languages and religion of the professionals.

(a) Age: Data revealed that a higher percentage of the professionals were in the age group of 20-24 years. In the upper age groups only a few percentage of the professionals were found. Percentage of women were found to be more in the age group of 20-24 years. Table 2 shows the distribation.

(b) Sex: Out of seventy respondents, fortyone were males (59%) and twentynine were females (41%).

Table 2 shows the number of persons who responded according to age-wise and sex-wise and the appropriate percentage computed from the total returns. (See Figure No.1.)

(c) Religion: The analysis indicated that about 85 per cent of the respondents were Hindus. Christian subjects were

Fig. I. Distribution of Professionals by age.

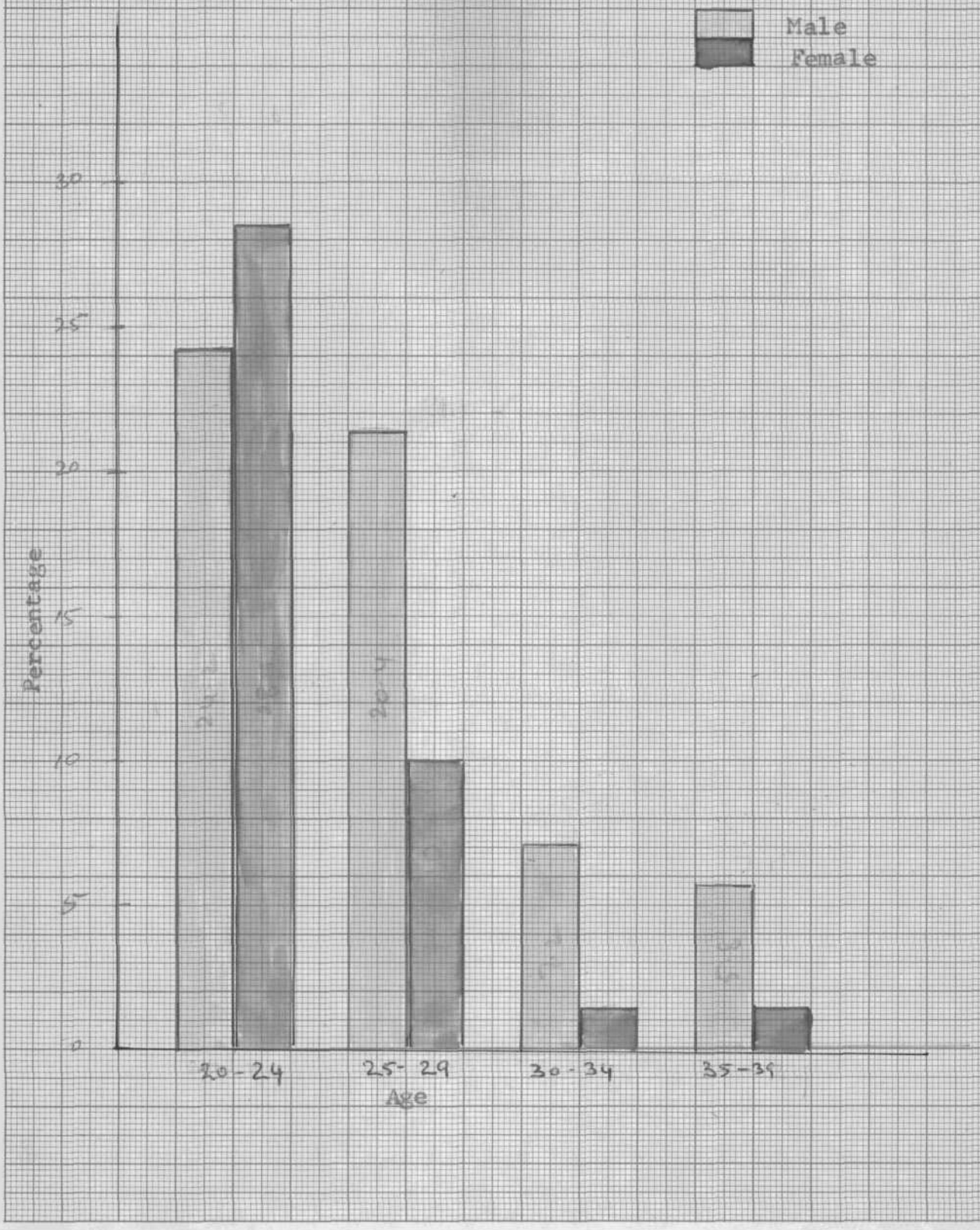


Table 2 - Distribution of Professionals by Age & sex

N-70

Age Gronp (years)	No.	%	Male	%	Female	%
20 - 24	37	52.8	17	24.2	20	28.5
25 - 29	22	31.5	15	21.4	7	10.0
30 - 34	6	8.5	5	7.2	1	1.4
35 - 39	5	7.2	4	3.a	1	1.4
Total	10	100.0	41	58.7	29	41.3

about ten percent, Muslims and Parsis were about five percent.

(d) Language: About 43 percent of the respondents spoke Kannada as their Bother tongue. Telugu, Tamil, Malayalam, Marathi, Gajarathi, Hindi, Urda, Bengali, Oriya and Sindhi were other languages spoken as mother tongue. Table 3 describes the linguistic distribution.

It was also found that everyone in the profession knew more than two langaages in addition to their mother tongue and

English.

Table 5 - Language-wise Distribution

N-70

Languages	No. of Persons	B.Sc.	M.Sc.	Total %
Bengali	1	1	-	1.4
Gujarathi	5	3	2	7.0
Hindi	3	-	3	4.2
Kannada	29	12	17	41.4
Malayalam	6	1	3	8.5
Marati	5	4	1	7.0
Oriya	1	1	-	1.4
Sindhi	1	14	-	1.4
Tamil	8	1	-	12.4
Telugu	10	4	6	14.2
Urdu	1	-	1	1.4
Total	70	28	42	100.0

Table 3 shows the nmaber of persons according to their mother tongaa and the relevant percentage of popalatioa speaking the langaage. It also shows the namber of

professionals according to their educational qualifications. About forty percent of the respondents possessed B.Sc. degree and sixty percent had M.sc. degree in Speech and Hearing.

2. Academic History: This section comprises of the professional qualifications and other academic achievements.

(a) Professional qualifications: Degrees and diplomas in Speech Pathology and Audiology possessed by the professional group is shown in Table 4. About twentynine persons possessed B.Sc. degree in Speech Pathology and Audiology, 41%. M.Sc. degree holders were more and the least was diploma holders.

(b) Academic qualifications: Qualifications other than B.Sc./M.Sc. or diploma are discussed in this section. Table 4 shows the number of persons having such qualifications. The number of Master degree holders with basic degree in Speech and Hearing and in other subjects, such as, Physical Science, Psychology, Linguistics, Education and Nursing, are also shown in Table 4.

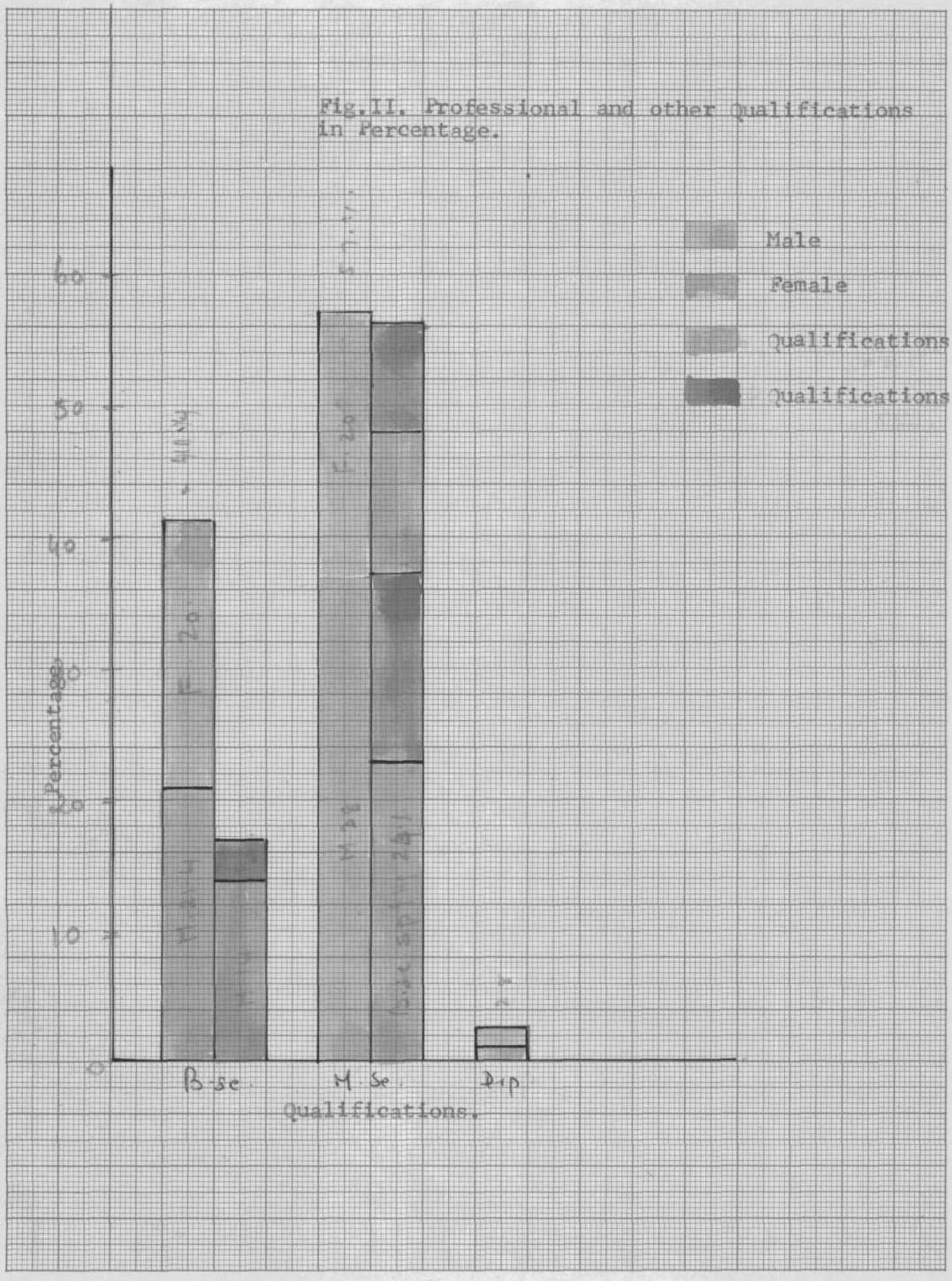
Table 4- Distribution of Educationakl Qualifications

N = 70

Professional Degrees		No.	%	General Degrees						
				B.Sc. Sp/Hg	B.Sc. Phycs	B.A. Psy.	M.A. Ling.	M.A. Psy.	MEd	PhD
	M	15	21.4	-	2	-	-	1	-	-
	F	14	20.0	-	-	-	-	-	-	-
Total		29	41.4	-	2	-	-	1	-	-
	M	26	37.0	16	2	3	2	2	1	1
	y	14	20.0	8	1	4	-	-	1	-
Total		40	57.0	24	3	7	2	2	2	1
Diploma	y	1	1.4	-	1	-	-	-	-	-

Table 4 indicates the number of persons in each category, according to their qualifications and also in percentage. M.Sc. degree holders are aore in number. Among the M.Sc. degree holders there are people with the basic B.Sc. in Speech and Hearing and in other subjects such as B.Sc. Physics, B.A. Psychology and M.A. Psychology, M.A. Linguistics and M.A. Education. About

Fig.II. Professional and other qualifications in Percentage.



60 percent of the respondents had the basic B.Sc. degree ia Speech and Hearing whereas about 40 percent had in subjects other than Speech and Hearing. (See Figure No.2.)

Employment History: Data regarding the institutions where employed, types of services, period of employment and unemployment since qualified and monthly income of the professionals are included in this section.

(a) Institutions: Speech and Hearing personnel work in different employment set up and institutions. Table 5 shows the distribution.

Table 5 shows the number of persons working in each institutions and the percentage computed from the total. Medical Institutions ana the Speech and Hearing Clinics had more percentage of the professionals employed. In the Special Schools, M.Sc. degree holders were only found. The other category Includes the Institute of physical Medicine aad Rehabilitation Centre, school for the Deaf and the Aphasic. (see Figure No.3)

The Central Government employed more number of persons

Fig.III. Distribution - Institution wise

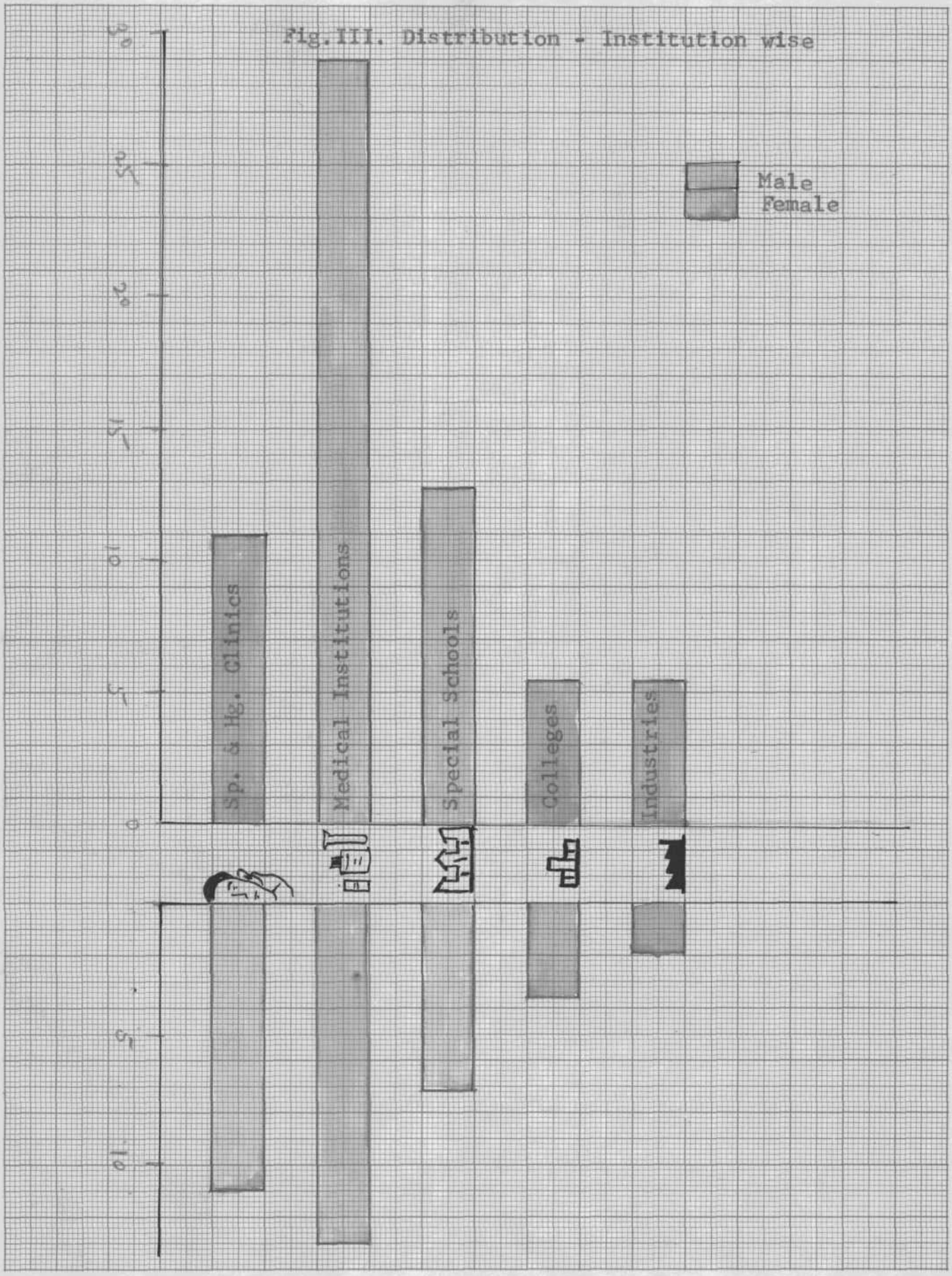


Table 5 - Percentage Distribution of Employment set Up and Institutions

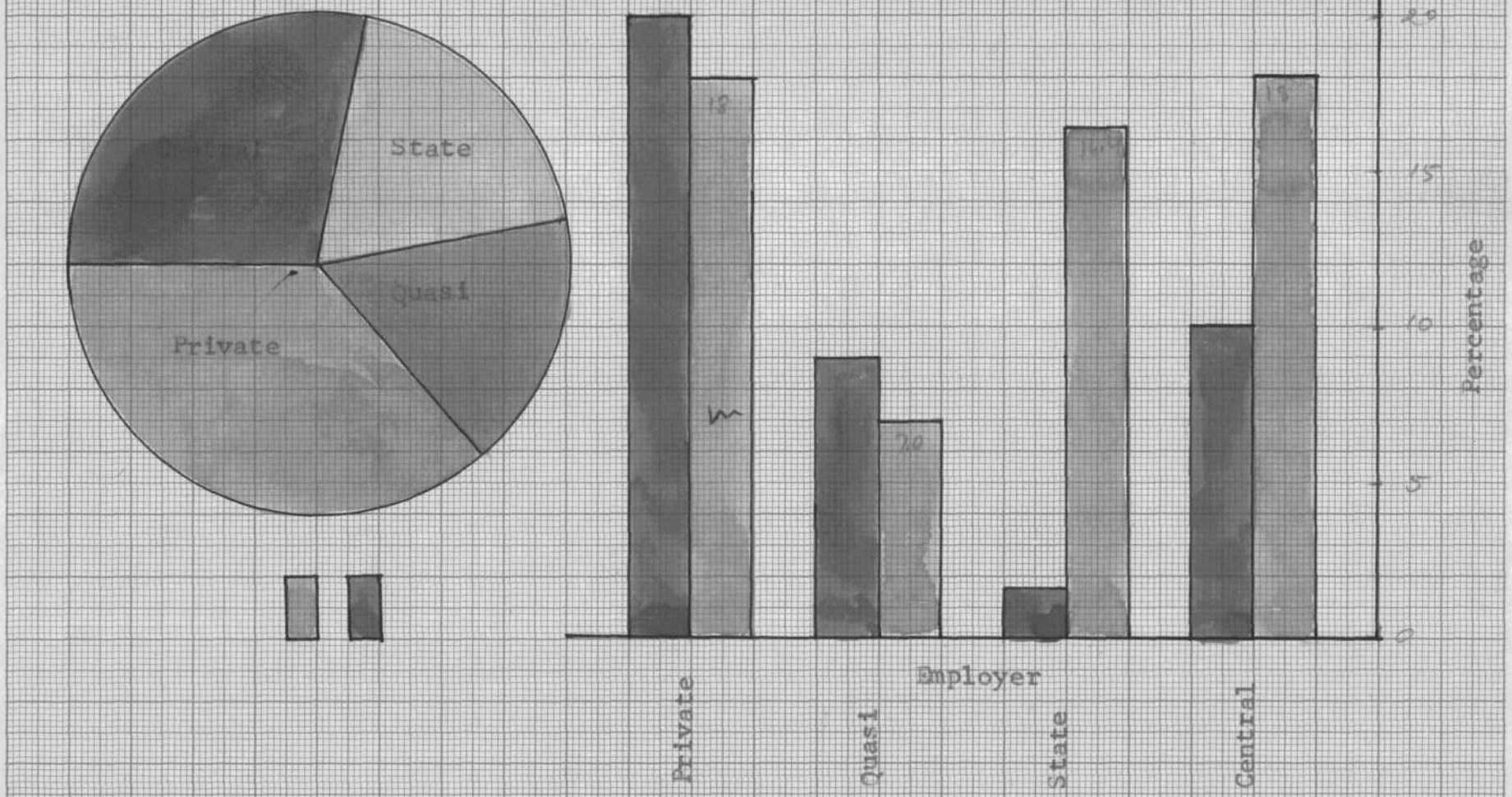
N-60

Institutions	Total No.	%	B.Sc.	%	M.Sc.	%
Industry	2	3.3	-	-	2	3.3
College/University	3	5.0	-	-	3	3.0
Special Schools	9	15.0	-	-	9	15.0
Medical Inst.	24	40.0	9	13.4	15	25.0
Sp & Hg Clinics	20	33.3	10	16.6	10	16.0
Others (Phy.Med.)	2	3.3	-	-	2	33
Total	60	100.0	19	316	41	68.2
Central Govt.	20	33.3	5	8.3	15	25.0
State Govt.	9	15.0	5	8.3	4	6.6
Quasi-Govt.	10	16.6	4	6.6	6	10.0
Private	21	35.0	7	11.6	14	23.2
Total	60	100.0	21	34.8	39	64.6

than the State Government or Quasi-Government. The private institutions employed the maximum number of persons.

See Figure No.4.

Fig.IV. Percentage distribution of professionals-service wise.



(b) Professional Experience: Number of years served as a Speech Pathologist and Audiologist and number of years unemployed since qualified for the job are shown in Table 6.

Table 6 - Length of Experience and Period of Unemployment

Experience in years	No. of persons	%	Period of Unemployment	No. of persons	%
1 yr & less	13	21.8	1 yr & less	39	65.0
1 - 2 yrs	8	13.3	1 - 2 yrs	7	11.6
2 3 "	8	13.3	2 - 3 "	3	5.0
3 - 4 "	4	6.6	3 - 4 "	2	3.0
4 - 5 "	6	10.0			
5 6 "	4	6.6			
6 - 7 "	4	6.6			
7 - 8 "	11	18.3			
Over 8 "	4	6.6			

Table 6 indicates the period of unemployment and length of service of those who were in service. About 65 percent of the professionals got their job within an year whereas 11.6 percent got within two years. However, only a small percentage, 8%,

of the people had to wait for the job for more than two years. A progressive reduction of unemployment could be seen.

The maximam percentage of the people have experience for one year or less. Aboat 6.6 percent of the people had experience for more than 8 years. Aboat 65% of the professionals had experience for less than five years. (See Figure No.3)

Income: Gross Monthly Income of the professionals are stated below in Table 7. Monthly Income inclades income derived from private practice, income due to additional services rendered as consultants or therapists.

Table 7 indicates the income distribution of the profe-ssionals. It also shows the years of experience with reference to income. Higher income in case of both M.Sc. and B.Sc. personnel is related to the years of experience. About 34 percent of the work force got a monthly income around Rs.500/-, whereas 44.8 percent of them received an income in the range of Rs.500-900; those who received an income in the range ef Rs.900-1100 were aboat 15.5 percent and the highest income groap i.e., over Rs.1100/- were only 11 percent. The table also

Fig 5

Fig. VII. Period of employment & unemployment

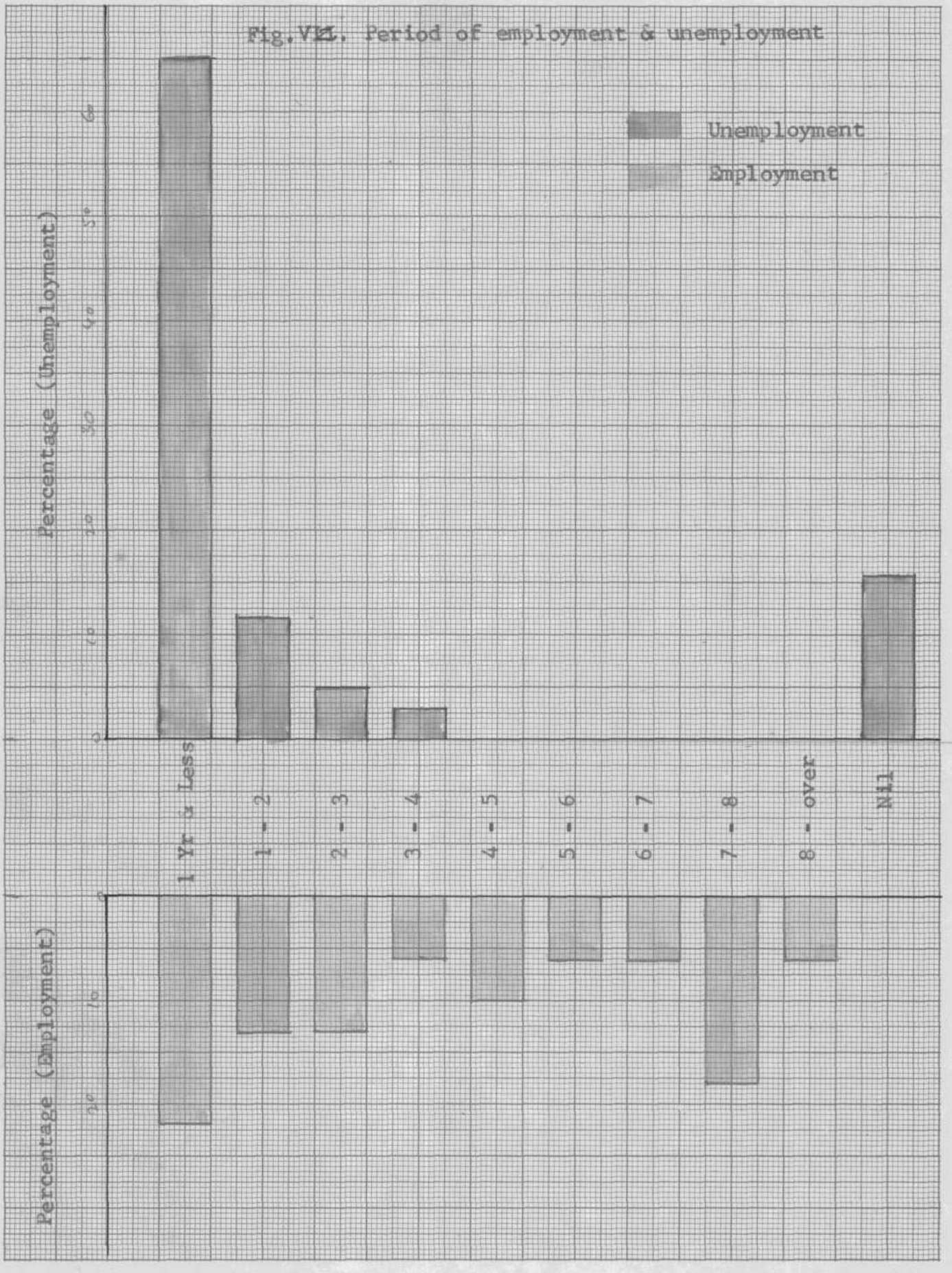
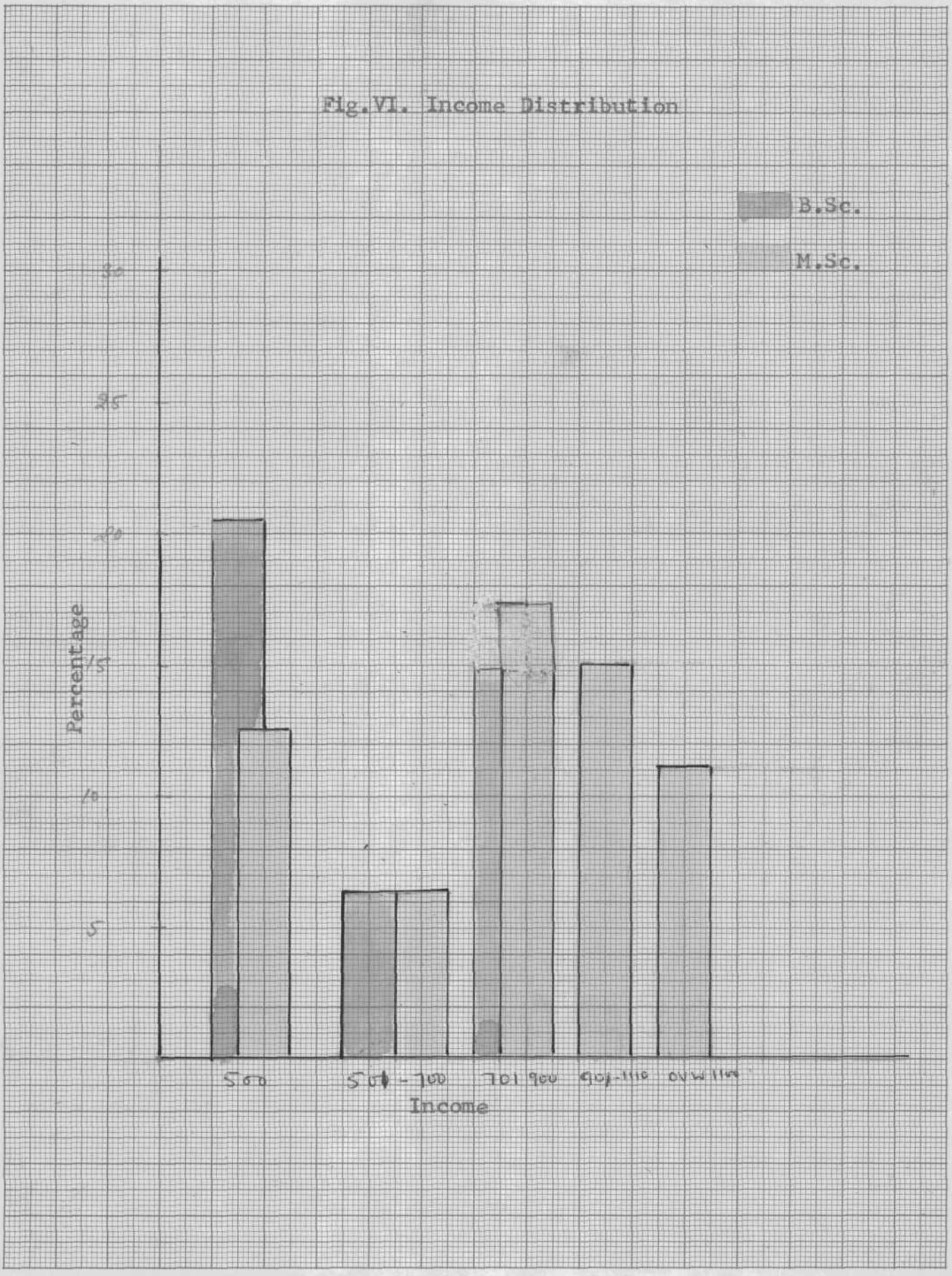


Table 7 - Distribution of Income According to Excellence in Percentage

Income in Rs.	Experience in yrs.	M.Sc.		B.Sc		Total		
		M	F	M	F	M.Sc	B.Sc	Total
500 &less	1 - 2 yrs	4.6	7.4	6.0	14.0	12.0	20.0	32.0
501 - 700	1 - 2 yrs	-	3.2	4.8	-	3.2	4.8	8.0
	2 - 3 "	-	3.2	-	1.6	3.2	1.6	4.8
		-	'6.4	4.8	1.6	6.4	6.4	12.8
701 - 900	1 - 2 yrs	10.7	3.4	3.0	-	14.1	3.0	17.1
	2 - 3 "	-	-	-	-	-	-	-
	3 - 4 "	1.6	1.6	-	1.6	3.2	1.6	4.8
	4 - 5 "	-	-	5.0	-	-	5.0	5.0
	5 - 6 "	-	-	5.0	-	-	5.0	5.0
		12.3	5.0	13.0	1.6	17.3	i4.6	31.9
901 - 1100	1 - 2 yrs			-				-
	2 - 3 "	1.6	-	-	-	1.6	-	1.6
	3 - 4 "	-	-	-	-	-	-	-
	4 - 5 "	1.6	-	-	-	1.6	-	1.6
	5 - 6 "	-	1.6	-	-	1.6	-	1.6
	6 - 7 "	-	-	-	-	-	-	-
	7 - 8 "	10.7	-	-	-	10.7	-	10.7
		13.9	1.6			15.5	-	15.5
1101 and above	1 - 2 yrs	3.4	-	-	-	3.4	-	3.4
	8 yrs&above	7.6	-	-	-	7.6	-	7.6
		11.0	-	-	-	11.0	-	11.0

Fig 6

Fig.VI. Income Distribution



describes the income in relation to qualifications. In the higher income group only M.Sc. graduates were found, whereas in both middle and lower income groups both B.Sc. and M.Sc. were found. (See Figare No.6.)

4. Natare of Duties: Speech Pathologists and Audiologists were involved in different types of professional activities. Data obtained on this account were categorised as follows: Teaching in Professional Colleges/University, teaching in Schools for Special Education, Research work, Administration and Clinical work. Table 8 shows the distribution of the nature of duties.

Table 8 indicates the aatare of duties that the Speech and Hearing personnel do. The predominant duty was that of the Clinical work, Research and it came next in order. In schools for Special Education, more percentage of Master's degree holders were found. Regarding administration work, both M.Sc. and B.Sc. degree holders were more or less equal. Others indicate programmes of orientation lectares, school screening programme and field publicity. (See Figare No.7)

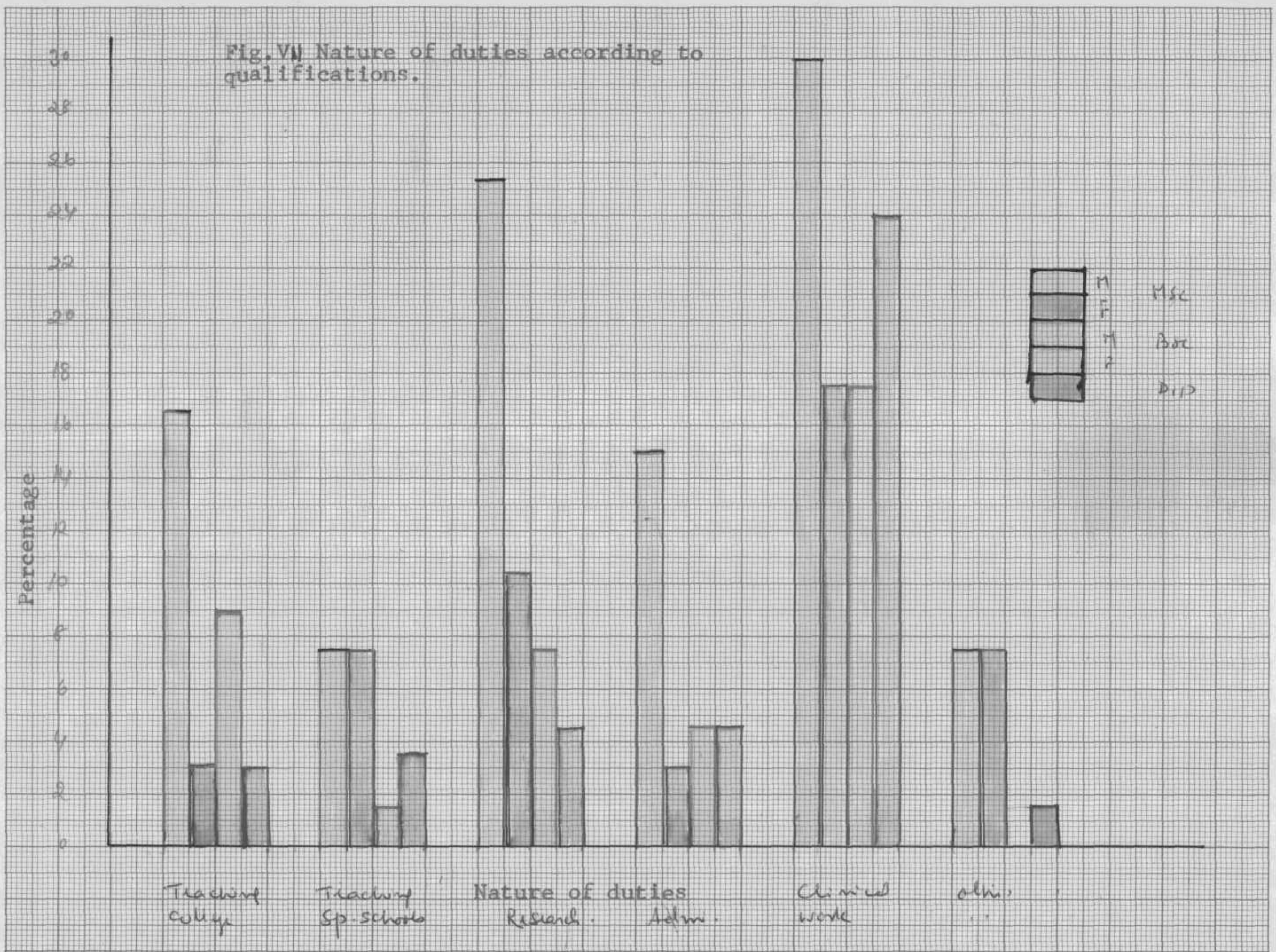


Fig. VII Nature of duties according to qualifications.

Table 3 - Distribution of Nature of Duties in Percentage Degree and Sexwise

N-67

Nature of Duties	M.Sc.		B.Sc.		Total		
	M	F	M	F	M.Sc	B.Sc	Total
Teaching in College/University	16.5	3.0	9.0	3.0	19.5	12.0	31.5
Teaching in Special schools	7.5	7.5	1.5	3.5	15.0	5.0	20.0
Research work	25.3	10.4	7.5	4.5	35.7	12.0	47.7
Administration	15.0	3.0	4.5	4.5	18.0	9.0	27.0
Clinical work	30.0	17.5	17.5	24.0	47.5	41.5	89.0
Others	7.5	-	1.5	-	7.5	1.5	9.0

5. Professional Interaction: Data regarding professional interaction, i.e., contact with other professionals with whom they interact in their employment is stated below in Table 9.

Table 9 shows the percentage of interaction of the Speech and Hearing personnel with other professionals ia their duties. All of the professionals stated in the Table were involved more or less equally. However, the the Medical professionals were

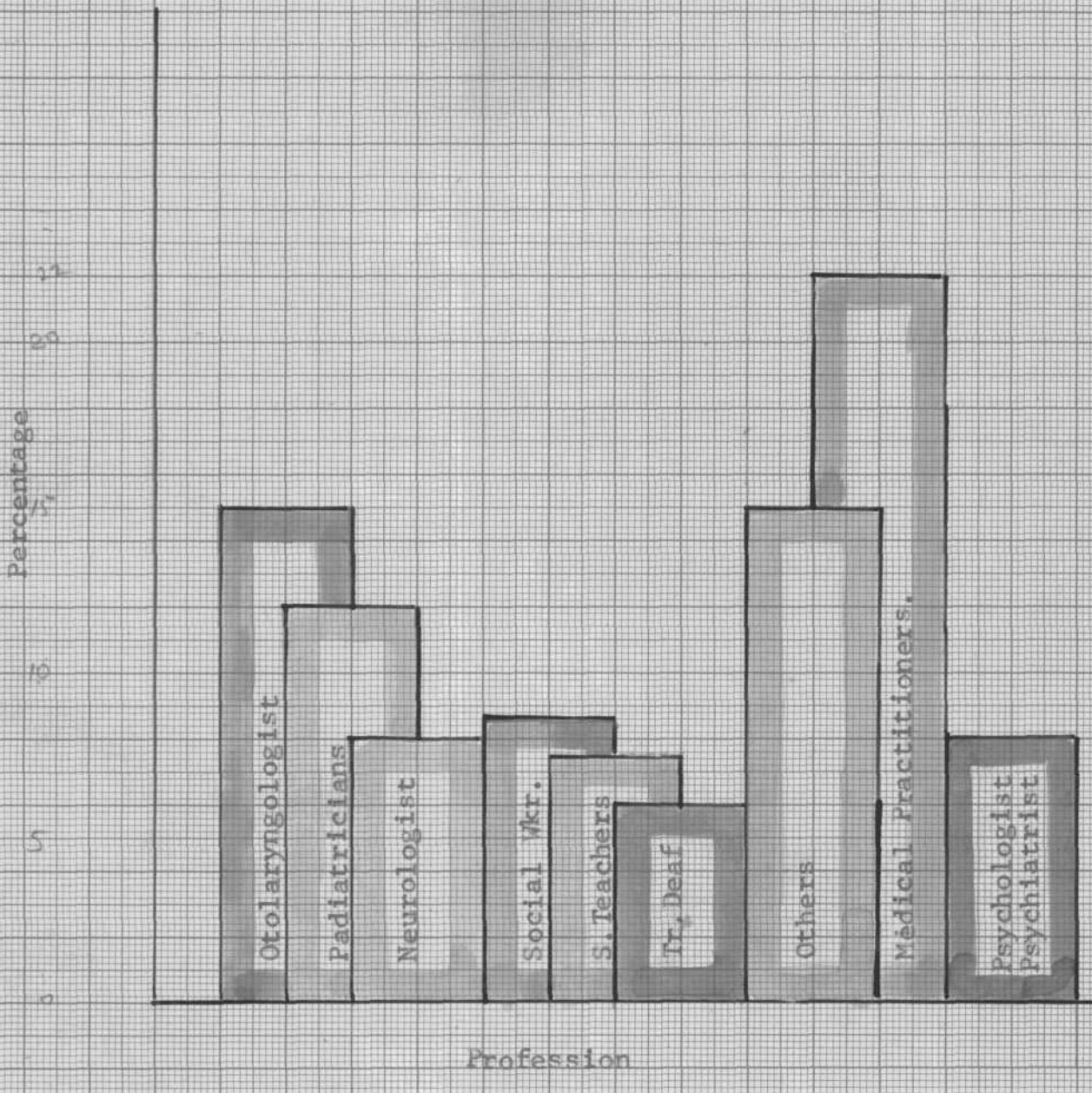
Table 9 - Interaction of Speech and Hearing Personnel with other Professionals

Other Professionals	% of Interaction
Medical Praotitioners	22.0
Necrologists	10.0
Otolaryngologists	15.0
Paediatricians	12.0
Psychologists	7.8
School Teachers	8.5
Teaohers of the Deaf	6.0
Others (Elec. Engineers)	15.0

foand to be more involved than non-medical persons. Among the medical profession, Otolaryngologists comprise of 15 percent. Distribution is also shown in Figure No.8.

6. Private Practice: Data obtained revealed that 55 percent of the practitioners were not allowed to do private practice, whereas 45 percent of them were allowed. Those who were allowed to do private practice were employed in private clinics and hospitals. They had an average of 28 hours of

Fig. VIII. Professional contact



private practice per week.

7. Instrumentation: Information received with regard to the number of diagnostic instruments and therapy equipment is stated below in Table 10.

Table 10 provides the number of diagnostic and therapy equipment available in the Speech and Hearing Clinics where the professionals are employed.

Both indigenous and foreign equipment were available. Oat of 91 audiometers, 72 were manufactured in India by Arphi Inc. and Bharat Electronic Ltd. The foreign audiometers were those of Madson, Beltone, Bekesy,Maico, Damplex and Madson Impedance Audiometers. Individual Hearing Aids and Group Hearing Aids were mostly indigenous products. The sophisticated equipment such as Stroboscopes, Oscilloscopes, S.L. Meters, T.V. Teller and Stammer Supressor were found to be imported from Western countries.

8. Test Environment and Technical Facilities: Data obtained with reference to Sound Treated Room, noise level

Table 10 - Number of Equipment & Instruments

Basic Equipment	Total	Indigenous	Foreign
Audiometers	91	72	19
Hearing Aids (individual)	42	32	10
Strobosoopes	1+2	-	1+2
Tuning Forks			
Oscilloscope	1	-	1
Therapy Instruments	12	-	12
Artificial Larynx	4	-	4
Hearing Aids (group)	12	12	-
Language Masters	3	-	3
Phonic Mirror	1	-	1
Record Players	8	8	-
Speech Trainers	18	14	4
Sonograph	1	-	1
Stammer suppressors	3	-	3
Tape Recorders	22	16	6
T.V. Teller	1	-	1
Accessories:			
Sound Level Meters	3	-	3

in the test environment, facilities for instrumental calibration of audiometers, servicing and repairing facilities for hearing aids and other instruments, and facilities for making custom earmoulds are grouped in this section.

(a) Sound Treated Room: The data revealed that about 48 percent of the Speech and Hearing Clinics had sound treated rooms. About 33 percent of the Clinics had one sound treated room each, about 12 percent of the Clinics had provisions for two sound treated rooms and 3 percent had three sound treated rooms. About 5% percent of the Clinics did not have facilities for sound treated room.

It was also reported that about 20 percent of the Clinics had made arrangements to build sound treated rooms.

(b) Noise Level: Questions regarding noise level were answered by 33.3 percent of the respondents. It was seen that the average ambient noise level at the test environment (in audiometric rooms) was within 40 dB S.P.L.

Only eleven percent of the respondents stated about the

work area. Data could not be analysed meaningfully.

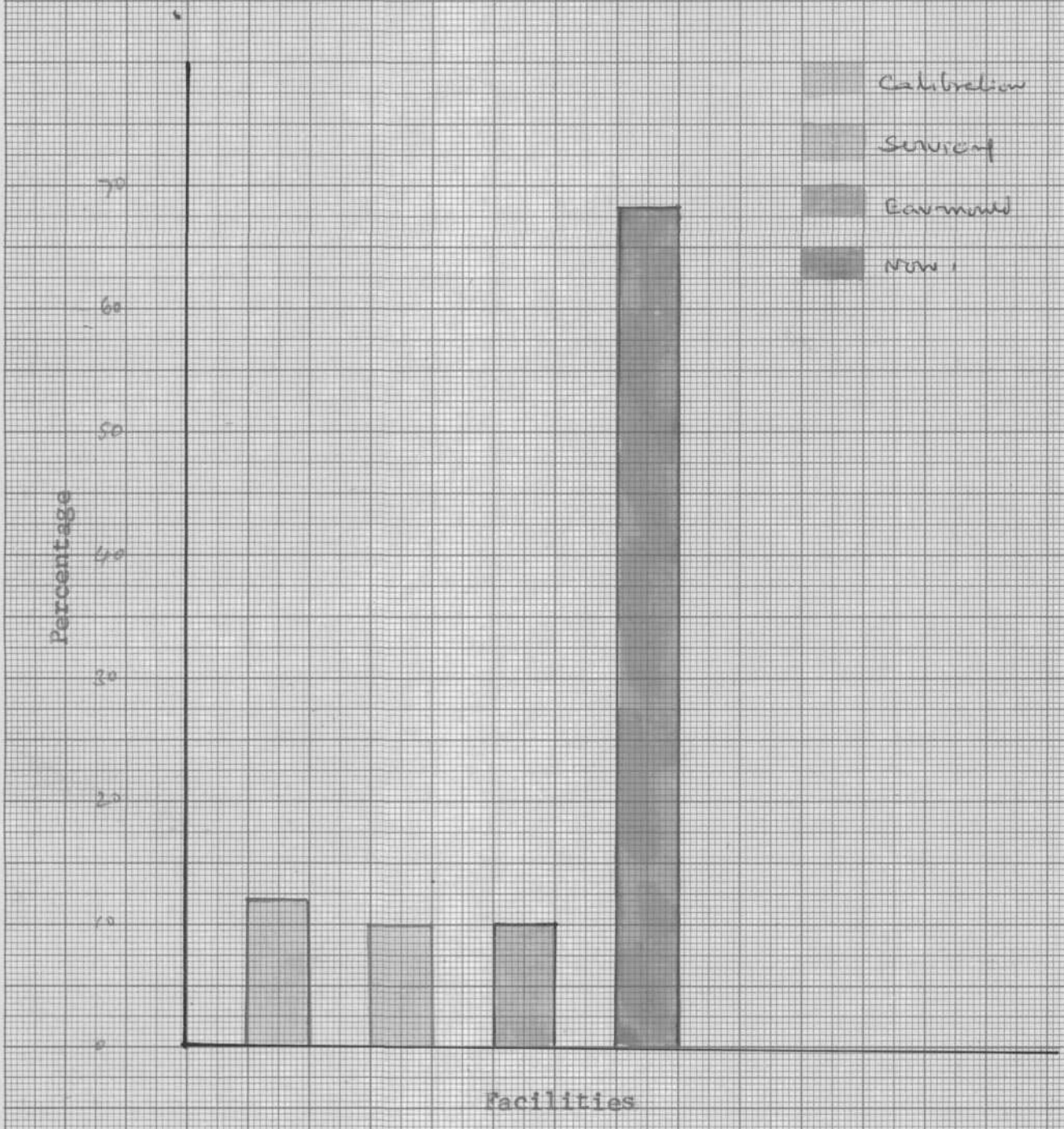
(c) Technical Facilities: Facilities for calibration of audiometers, repairing and servicing facilities of hearing aid: and audiometers, and facilities for making custom earmoulds are stated below in Table 11.

Table 11 - Percentage of Facilities Available

Facilities Available	Percentage
Instrumental Calibration of Audiometers	12%
Repair/Servicing	10%
Castom Earmould Making	10%
None of the above	68%

Table 11 shows the percentage of facilities available in the Speech and Hearing Clinics. About 68 percent of the Clinics did not have any facilities. For calibration, about 12 percent of the Clinics had facilities, for repair and servicing 10 percent of the Clinics had facilities and for making

Fig. IX. Technical facilities



customs earmoulds 10 percent of the Clinics had facilities. Percentage of distribation is also shown in Figure No 9.

9. Library Facilities: Table 12 below describes the facilities available for library.

Table 12 - Library Facilities

Facility	Percentage
Excellent	3%
Adeqnate	32%
Not Adequate	65%
Total	100%

Table 12 shows that only 3 percent of the professionals had excellent library facilities, whereas 65 percent of the people did not have adequate library facilities. It is also shown in Figare No.10.

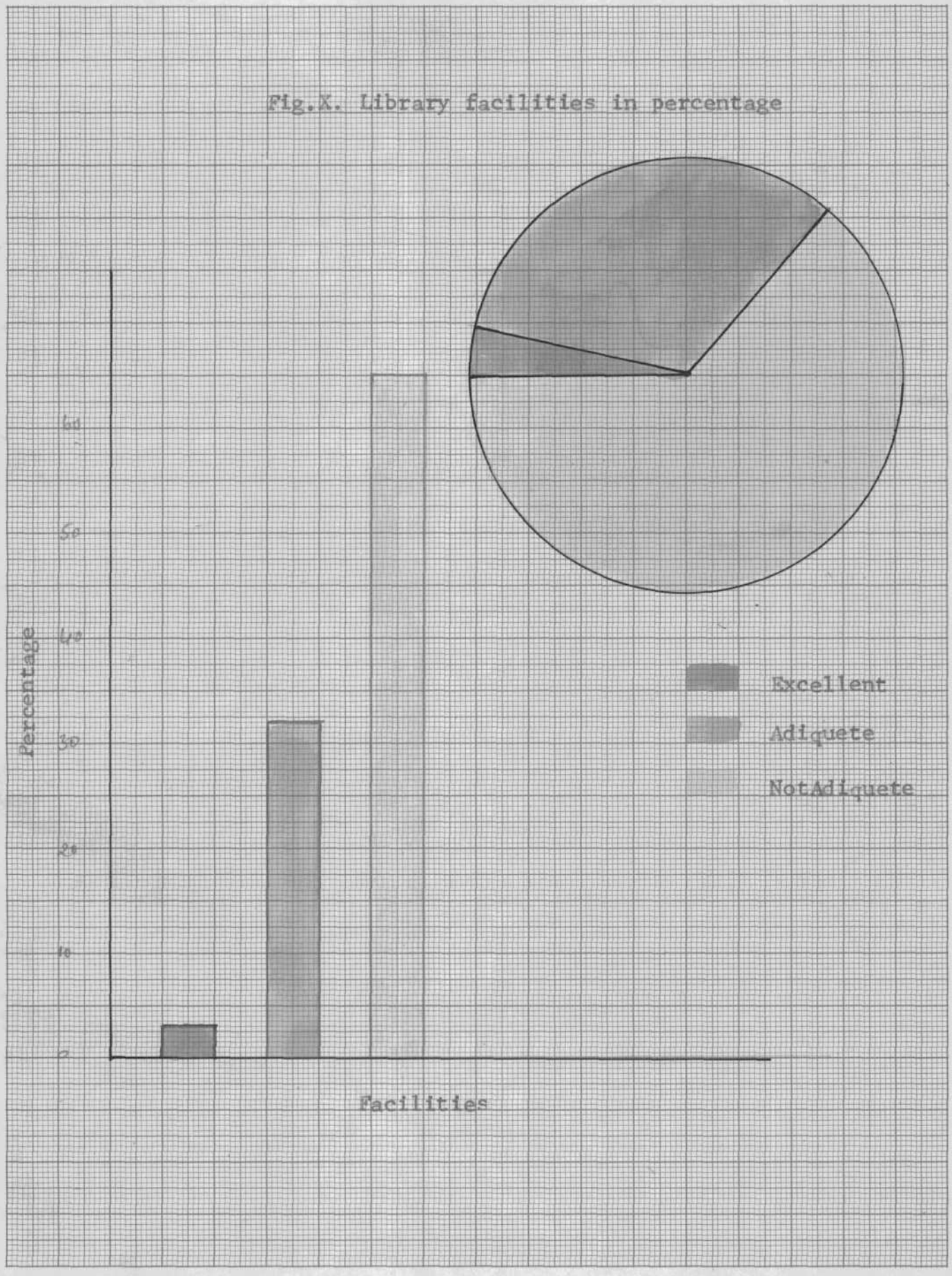


Fig.X. Library facilities in percentage
Percentage
60
50
40
30
20
10
0
Facilities
Excellent
Adiquete
NotAdiquete

Information obtained from the Questionnaire 'B' were processed and analysed in five sections. The findings are given below.

1. General Inforaation: Data regarding the type and nature of indastries, their products and number of workers are included in this section.

(a} Type/nature of Industries: Alltogether there were 20 factories producing 14 types of goods. Their numbers and products are given in Table 13.

(b) Number of Workers: Aboat 10,000 workers were distributed among the 20 factories. Maximum number of workers were found in Textile Manufacturing Industries and in Engineering Goods Manufacturing Concerns. Table 13 shows their distribution.

(c) Products: Different types of products were manufactured by these industries such as cattle feeds, sweet drinks, instruments, engineering tools, accessories of machinery, power transformers, glass and ceramics and textiles. Table 13 shows

their distribution.

Table 13 - Distribation of Workers. Products & Nature of Industries

Types	Products	Nos.	No. of Workers
Bottling	Sweet Drinks 1		43
Canning	Fruit Products 2		200
Food Products	Cattle Feeds 2		143
	Total	5	386
Tools	Micrometers		91
Instruments	Ele. Instruments	1	40
	Total	2	131
Containers	Boxes etc.		90
Engineering	Machine Tools	2	500
Tools/Accessories	Rolling Shutters	1	30
	Transformers		505
	Conductors	f	25
	Accessories		18
	Total	9	1168
Ceramic/	Porceline	1	1510
Glass	Glass	1	750
	Total	2	2260
Cotton Mills	Textiles	2	5998
	GRAND TOTAL	20	9943

Table 13 shows the distribution of industries according to their products. It shows that the maximum number of workers are in Textile Indastries, Ceramic and Glass Industries and also in Engineering Tools Manufacturing Industries.

2. Technical Information: Noise level in the factory, types of noise, number of persona exposed to noise and incidence of hearing loss are included in this section.

(a) Noise level in the factory: It was found that correct information could not be obtained. However, aboat 12 percent of the respondents stationed that there was too much noise in the factory and that it was difficult to hear even while speaking to each other at the top of their voice. Aboat 6 percent of the respondents reported aboat complaints of pain and fatigue.

(b) Number of persons exposed to noise: Data revealed that about 40 percent of the workers were exposed to continuous noise, about 20 percent to intermitant noise. About impact of noise there was no information. It was also seen that about 80 percent of the workers in the Textile Manufacturing Industries were exposed to continous noise.

3. Measures Taken to Prevent Noise Hazards: Data revealed that only 10 percent of the workers were provided with ear protection by the factories. About 60 percent of the management provided facilities for hearing evaluation in their factories. The evaluation was done by their factory medical officers.

4. Management Concern: Awareness of noise hazards, awareness of the availability of specialists in hearing conservation programmes and compensation paid for health injury are provided in this section.

(a) Awareness: Information received had shown that about 65 percent of the management knew about the health hazards due to noise exposure. No data was available about their awareness of specialists in the area of hearing conservation programmes.

(b) Compensation: Data did not reveal aboat the claim for workmen's compensation with reference to hearing loss due to noise induced hearing less.

5. Needs of the Management: It was seen that about 29 percent of the industrial management were willing to have

periodic hearing evalaation of the workers.

About 18 percent of them were willing to depate their officers for training in hearing evaluation and noise measurement. About 6 percent of the industrial management expressed their willingness to appoint persons qualified in hearing evaluation and noise control.

Data obtained from the questionnaire 'C were computed with reference to the purpose of the study. The results are stated below in five sections.

1. General Information: The organizational aspects such as type of schools, number of children attending,annual intake, age of admission and the management were included in this section.

(a) Type of schools: There were about 29 Schools for the Deaf-Blind, 10 Schools for the Mentally Retarded Children and 3 for others such as Orthopedically handicapped, emotionally distarbed and socially handicapped children. Table 14 shows the distribution.

(b) Number of children: About 4753 children, Deaf, Mentally Retarded and Emotionally Disturbed, attended those schools. The distribution ia shown in the Table 14.

(c) Annual intake: The average annual intake was about 20. Annual intake varied among the institutions, and, as many of them did not give the information, accurate number could not be given.

Table 14 - Distribution of Special Schools

Type of Schools	Nos	%	Children Attending		
			Male	Pemale	Total
Deaf-Blind	29	69%	3114	1222	4336
Mentally Retarded	10	22%	271	97	368
Others (Othopedically Handicapped etc)	3	7%	52	7	59
Total	42	100%	3437	1326	4753

(d) Management: About & 4.2 percent of the Schools were managed by the Central Government, 4 percent by the State

Government, 31 percent by the State Government and 42 percent were by the Private Organizations.

Table 14 shows that about 69 percent of the Schools for Special Education are Deaf-Blind Schools, 22 percent are for the Mentally Retarded Children and 7 percent for Orthopedically Handicapped, Emotionally Disturbed Children and Orphanage.

(e) Age of admission: Data revealed that the lower mean age for admission was 5.4 years and the upper mean age was 13 years.

2. Particular Information: Such as criteria for admission, authority certifying, the teats administered at the time of admission and the personnel involved in testing and diagnosis were included in this section.

(a) Criteria for admission: The admissions were based on certificates from the competent authorities such as Medical Specialists, Speech and Hearing Specialists, and Psychologists. Aboat 71 percent of the Schools insisted on such certificates.

(b) Test3 administered: At the time of admission different

tests were administered. Table 15 shows the percentage of children getting different types of tests.

Table 15 - Percentage of Children Tested at the Time of Admission

Type of Tests Administered	Percentage of Children taking the tests
Hearing Test	62%
Speech Test	50%
Psychological Test	48%
Medical Examination	26%
Visual Examination	19%

(c) The personnel involved in the testing and diagnosis were 32 percent medical personnel (E.N.T. specialists), 9 percent Speech Pathologists and Audiologists and 7 percent were Psychologists.

3. Instrumentation: Number of audiometers, hearing aids and other therapy instruments.

Data revealed that about 36 percent of the Schools for

Deaf had audiometers, 7 percent had sound treated rooms and 9 percent had facilities for calibration of audiometers.

About 10 percent of the schools for the Deaf had Group Hearing Aids. About 15 percent of the deaf children were provided with hearing aids.

4. Teachers qualifications, salary and their distribution are shown in Table 16.

Table 16 - Teachers Qualifications, salary & distribution

Qualifications	Nos.	%	Salary Scale
B.Sc. (Sp/Hg) 6		17	Rs.350-600
M.Sc. (" ") 7		19	550-750
	13	36	
M.Ed. 1		3	Rs. 550-750
M.S.W 1		3	
M.A.Psy. 1		3	
M.S. 1		3	Rs.1000
	4	12	
C.T.D.	15	41	(a) 250-450
D.D.Ed.	2	5.5	(b) 350-700
D.Ed.(M.R)	2	5.5	
	19	52	

Table 16 shows that there are 13 Speech and Hearing Specialists (professionals) working in Special Schools in two different scales of pay i.e., Rs.350-650 and Rs.550-700. However the majority of the Teachers are with diploma in Teaching Handicapped Children.

5. Needs: It was revealed that about 71 percent of the respondents felt the need for periodic evaluation of handicapped children. It was seen that only 36 percent of such children were periodically evaluated.

About 40 percent of the respondents did not know the availability of latest technology in special education, whereas 60 percent of them were aware of it.

CHAPTER V

DISCUSSIONS

Information about the demographic and professional characteristics of the work force, distribution and utilization of their man power and facilities available for their professional work are discussed in this chapter.

Demographic and Professional Characteristics of the Work Force

1. Personal Characteristics: The professionals in the field of Speech and Hearing were found to be of a younger age group, the mean age being 29.2 years. This may be ascribed to the fact that Speech and Hearing is one of the youngest professions in India.

The results indicated that the majority of the professionals were male, their mean age being 32.7 years. The mean age of the female was 25.8 years. Curlee (1975) reported that about 86 percent of the non-members of ASHA were females and their mean age was 29.3 years, compared to 32.2 years of the regular members.

2. Educational Characteristics: Differences in the levels of education was observed among the professionals. The majority of them had Master's degree in Speech and Hearing. Next in order comes B.Sc. degree holders and the last, diploma holders in Speech Pathology and/or Audiology.

Two levels of education were found among the M.Sc. degree holders. One with B.Sc. degree in Speech and Hearing as their basic degree, others with B.A., B.Sc. B.Ed., M.A. and M.Ed, in subjects like Psychology, Physical Science, Nursing, Education and Linguistics. How far these two levels of education are effective with reference to the professional activities was not studied. However, it is presumed that the exchange of ideas derived from other disciplines would help explore new areas for research in human communication.

Professional Characteristics

(1) Nature of duties: The Speech Pathologists and Audiologists were involved in a variety of duties in connection with their professional work. In teaching and research work persons with Master's degree were found to be more than that of

B.Sc. degree holders. In clinical work and administration their work was nearly equally distributed. Data regarding the type of research work and facilities available for doing research were not obtained. The work load of the professionals regarding their clinical and administrative work was not asked for. Whether they are involved in decision making, budget preparation and higher level of administrative work can be further investigated.

In the areas of public education, school screening and community health services more number of persons with Master's degree were found.

The nature of administrative duties with reference to qualifications was not studied. It was found that the natare of duties and qualifications of the personnel were correlated to the status of their professional education. More persons with Master's degree reported for research and teaching work.

2. Utilization of Personnel: Different institutions and rehabilitation centres utilized the services of Speech and Hearing personnel. Their employment set up, service cadre and

income depended upon the type of institutions where they were employed.

3. Employment Set-up: Medical inastitations and Speech and Hearing Clinics absorbed large majority of the services of Speech Pathologists and Audiologists. Next was the Schools for Special Education. Industries had utilized only a small percentage of their service. However, such duties also were similar to those of in medical institutions. The reasons for disparity in the utilization of the cervices of the Speech and Hearing professionals were not obtained. In medical and para-medical institutions the job opportunities would have beea greater and it would be one of the reasons for their greater absorption in such institutions. The income of the professionals also varied with respect to their job and type of institutions.

4. Income Level: The average monthly income of the professional with B.sc. degree and two-to-three years of experience was found to be rupees seven handred, with M.Sc. degree they earned about rupees thousand per month. With experience,their income increased.

Nearly half of the professionals whose experience ranged from five years to seven years received a monthly income over rupees thousand. In the higher income gronp only M.Sc. degree holders were found. However, income and length of service were mutually related, but there was no such relation with reference to qualification and type of service.

A uniform scale with reference to qualification and service cadre was not found. In the Central Government Service the pay scale was found to be better than in other services. The income of those in the private employment was inclusive of their earning in private practice and part time services in other institutions.

The private sector and Central Government services employed a large majority of the professionals. From the analysis of data it could be inferred that there was an increasing demand for the servioes of Speech Pathologists and Audiologists. Most of the qualified persons got employment within an year or two.

5. Period of Employment and Unemployment: Nearly three-fourths of the professionals got their jobs within an year or

less after qualifying themselves. About 3 percent of the professionals were to wait for job for more than two to three years. The reasons for their unemployment were not investigated.

A majority of the personnel had two to five years of experience in their profession. One-third of the professionals had experience for more than five years. Those who had long period of experience were postgraduates. However, the professional experience of the diploma holder was the longest one.

6. Facilities: The optimum use of one's skill depends upon the availability of instruments and proper environment. Speech and Hearing Clinic needs primary equipment such as tuning fork, audiometers, individual hearing aids, and facilities for testing and diagnosis. Sound treated audiometric room is a necessity. Group hearing aids, speech trainers, tape recorders and accessories such as sound level meter and noise generators are also required for better functioning of a Speech and Hearing Clinic on a scientific line.

From the analysis of data, it was found that about 65 per

cent of the clinics had the basic requirements such as audiometers and hearing aida, and 45 percent had soand treated rooms. Facilities for speech audiometry, impedance audiometry, free-field testing were very less. Not even one third of the clinicians had facilities for instrumental calibration and facilities for making custom earmoulds. Far maintenance of instruments the facilities were very mach less. Proper facilities would improve service delivery.

Both indigenous and foreign equipment were in use. Among the indigenous audiometers, Arphi audiometers were found to be more in use than B.E.L. Different types of hearing aids such as Oticon, Danavox and Elkon were used by the clinicians apart from a few foreign aids. Only one third of the clinicians had therapy equipment such as group hearing aids, individual auditory trainer and accessories.

Kapur (1966) reported that facilities for personnel and equipment were inadequate in teaching hospitals and other medical institutions. Meat of them did not have audiometers. Wherever the audiometers were available, most of them were not test-worthy.

A periodical evaluation of facilities in the field of Speech and Hearing may be necessary.

7. Underemployment: Even though the number of unemployed graduates in Speech and Hearing was very less, there seems to be underemployment. The 'critical skill' developed in higher specialization was not fully utilized due to the non-availability of proper diagnostic tools and therapy instruments. Technical and other facilities were not adequate for testing diagnosis and therapy. The data revealed that adequate attention was not given to the supply of diagnostic tools and test environment by the employers. And also, about two thirds of the postgraduates were treated equal to B.Sc.sin terms of their position and salary. It would seem, therefore, that the services of higher specialization are not fully utilized. Thus, it leads to underemployment and economic wastage in higher education. Motivation and incentive would ensure continuous supply of 'critical skill' in any specialized field.

8. Library Facilities: Self-improvement is one of the ways of developing human resources. Excellent library facilities are an imperative need for such improvement. In the

professional level the people are to get atreast with the latest advances in the profession throagh a system of continaing edacation. From the analysis it was foand that a large majority of Speech and Hearing personnel were devoid of adequate library facilities. It points to the possibility of stagnation of professional skill and needtoo immediate positive action.

9. Professional Interaction: Dealing in communication problems involve an inter-disciplinary approach. The Speech and Hearing professionals interact with a number of other professionals in their work. The majority of them were medical and para-medical persons. The non-medical persons with whom they interacted were the Psychologists, Social workers, Teachers, Lingaistists and Electronic Engineers. Hattum (1977) said that 'We are several specialists wedded by common interest and commitment rather than common function'. The Professional interaction reflected the common interest in the services of communicatively handicapped. Children with learning disability, delayed speech and language due to varioas etiology, hearing problems, speech defects and emotional problems may be found within the school and without. Such problems can be solved by a team approach.

10. Special Education: One of the areas where commonication specialists can be usefully employed is the Schools for Special Education. The analysis of data revealed that a good percentage of both B.Sc. and M.Sc. degree holders in Speech and Hearing were in the Teaching service of such Schools. Their services were utilized for testing, diagnosis and therapy.

Majority of the respondents indicated the need for periodic evaluation of speech, language and hearing of their handicapped school children. Some of them were aware of the problems of handicapped children aad the need of soientific approach to solve such probleas.

The Special schools were managed by both private organizations, State and Central Governments. In general, facilities available in the Government Institutions were better than those of the private ones. But a few of the private institutions possessed latest equipment ia the field of rehabilitation. Soae of the schools for the deaf had audiometers, sound treated rooms, group hearing aids, individual hearing aids and adequate maintenance facilities for equipment. About half of the

teaching personnel were qualified in teaching the deaf, teaching the mentally retarded and orthopaedically handicapped. Nearly one third of the teachers possessed postgraduate qualification according to the data available and they received a higher scale of pay. A study by NCERT (1968) foand 32 percent of qualified teachers in the Schools for the Deaf.

11. Awareness of Noise Pollution: Exposure to noise is potentially hazardous to hearing. The damaging effect associated with such noise could be controlled. Data revealed that a majority of the individual management were aware of the adverse effects of noise on the health of their workers, but they did not know the availability of qualified persons in the field of hearing conservation. However, some of them were willing to depute their staff for training in hearing evaluation and noise control.

The noise level in some of the factories were reported to be high that the workers could not hear each other even if they speak aloud. Most of the factories had continuous noise, but a few of them had reported having intermitant noise. A few percentage of the Textile workers were provided with ear muffs

to protect their ears.

Data did not show any incidence of health hazards doe to noiae exposure. Information regarding compensation paid to the workers in case of health injury was not given. However, a few of the industries were willing to have periodic hearing evaluation of the factory workers. Whether similar aspects would be reported by the workers if questionnaire were given to them, need further investigation.

12. Geographical Distribution: Carlee (1975) indicated that the Speech Pathologists and Audiologists were concentrated in larger metropolitan areas. A large majority of the profe-ssionals in India, according to the present study, were concen-trated in urban areas. The reasons for such concentration of the professionals in cities may be due to various factors such as availability of professional and personal conveniences, awareness of the people regarding specialised services in diffe-rent fields of science. However, their involvement in rural health schemes need to be improved that their services to be

"reached to the consaaer, to his community, sad even in his neighbourhood, if necessary".

CHAPTER VI

SUMMARY AND CONCLUSION

The survey was designed to determine the distribution and utilization of man power resources in the field of Speech and Hearing.

The needs for Speech Pathologists and Audiologists in the areas of industry and special education were also investigated.

Three types of questionnaires were prepared and mailed to the respective people. The responses were as follows: Questionnaire 'A' - 70%; Questionnaire 'B' - 40%: and Questionnaire 'C - 60%.

Information was collected through the qaestionnaires in the areas of demographic and professional characteristics of the Speeoh and Hearing personnel, Technical and other facilities available for their professional work, professional interaction and on continuing edacation.

The intention of sending qaestionnaires to the indastries

was to know whether the management was aware of the health hazards dne to noise exposure and whether they had implemented hearing conservation programme in their industries and whether they need trained personnel in the area of hearing conservation programme. Necessary information was collected throagh the queationnaire.

The educational authorities of the Special Schools were requested to provide information regarding personnel, equipment and facilities available with them for rehabilitation programme and also their need for specialists in the area of commanication.

Data were analysed and computed in appropriate percentage and shown graphically.

Following conclusions seem warranted:

The work force in the field of Speech and Hearing was foand to be of a younger age groap. About 80 percent of them were within the age of twenty nine.

Medical institutions, Speech and Hearing Clinics and Special Schools employed a large majority of the Speech and

Hearing professionals compared to industries, Training Colleges and Universities and other institutions.

In their interaction with other professionals the Speech and Hearing personnel had more contact with medical personnel.

More than three fourths of the professionals were employed within an year or less after qualifying themselves. Their monthly income ranged from Rs.500 to 1500 and over.

The "critical skill" of the Speech and Hearing professionals could have been effectively ased provided the technical and other facilities were adequate in their employment set up.

There were more number of professionals concentrated in the urban area compared to rural area.

Industrial management seemed to be unaware of the availa-bility of qualified persons in hearing evaluation and noise control.

Educational authorities of the Special Schools recognise the need for experts in communication disorders.

Suggestion for Further Research

Further studies in the following areas are suggested:

1. A periodic survey of manpower resources, equipment and Technical facilities available in the field of Speech and Hearing would be useful for health planning and review of Training Programme.

2. The study could be extended to more areas involving different types of industries, schools and rehabilitation organizations.

3. A survey of research done bythe Speech Pathologists and Audiologists, their facilities for research, their need and areas of interest would be useful.

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APPENDIX

ALL INDIA INSTITUTE OF SPEECH & HEARING
Manasagangothri, Mysore-6

A Survey Of Man Power Resources And Needs In Speech
A d Hearing Services In India

QUESTIONNAIRE—A

The information sought through this questionnaire is required for a project undertaken as part fulfilment of the requirements for the Master's degree programme- Hence, your co-operation in giving complete and accurate information will be very much appreciated. The information obtained will be kept strictly confidential except fcr use in studying the trends.

1 Name : Age: Sex :

Religion : Mother tongue :

Other languages known (Rate as Good, Average, Fair)

Sl	Language	Speak			Read			Write		
No.		G	A	F	G	A	F	G	A	F
1.										
2.										
3.										

2 Your Academic History [Speech and Hearing]

Sl No	Degree/Diploma	Year passed	Institution
1.			
2.			
3.			
4.			

3 Degree/Diploma in subjects other than Speech and and Hearing [Specify subjects]

1 Doctorate

2 Master's

3 Bachelor's

4 Diploma [Specify]

5 Others

4 Employment History

Sl No.	Institution	Year of employment From	To	Designation/ Grade	Salary/PM
1-					
2.					
3.					
4.					

5 Are you-Employed full-time/employed part-time/unemployed [Strike offwhich is/are not applicable.]

6 Are you in Central Govt. Service/State Govt. Service/Quasi-Govt. service Self-employed/Private [Cross out which are not applicable.]

7 Your total years of employment: . . . . . years and.....months

8 Your total years of unemployment since you are qualified for the profession .....years and.....months

9 In what setting are you employed ? [Cross out which are not applicable]

1 Industrial

2 University/College

3 Medical Institution

4 Special School (Specify)

5 Speech and Hearing Clinic

6 Others [specify]

10 Are you working in rural/urban area ?

11 If urban area, how frequently do you visit rural area for professional work ?

12 Nature of your duties [Please indicate by mark.]

1 Teaching in college/university

2 Teaching in special schools

3 Research »

4 Administration

5 Clinical work, supervision/therapy/diagnosis

6 Others [specify]

13. Other professionals with whom you interact in y6ur employment (Indicate by mark).

1 Otolaryngologists
2 Paediatricians
3 Physicians
4 Dentist/Orthodentist
5 Orthopaedics
6. Physiotherapist
7 Psychologist/Psychiatrist
8 Social Workers
9 School Teachers
10 Neurologists
11 Teachers of the Deaf
12 Others (specify)

14 How many Speech Pathologists and Audiologists are working with you ?

15 Do you have private practice ? Yes/No

If yes, for how many hours per week ?

16 Are you permitted to do private practice by your employer ? Yes No

17 State number of audiometers you have-

SI. No.	Name of Audiometer	Type	Nos.
1			
2			
3			
4			
5			

18 How many sound-treated rooms have you ?

19 What is the ambient noise level ?

20 Do you have facilities for- (Cross out which is not applicable).

1 Audiometric calibration

2 Audiometric repair

3 Making custom earmoulds

4 Hearing aid repair

21 List other diagnostic and therapy instruments you have-

Sl. No.	Name of instrument	Type/Model	Nos.
1			
2			
3			
4			

5	. . .
6	
7	
8	
9	

22 How much of work area do you have ?

23 Library facilities :

What facilities do you have in your Institution or nearby for keeping up with latest development in the field ?

(Indicate by \/mark) ,

Excellent Adequate Not adequate

ALL INDIA INSTITUTE OF SPEECH & HEARING
Manasagangothri, Mysore-6

A Survey Of Man Power Resources And Needs In Speech
And Hearing Services In India

QUESTIONNAIRE—B

The information sought through this questionnaire is required for a project undertaken as part fulfilment of the requirements for the Master's degree programme. Hence, your co-operation in giving complete and accurate information will be very much appreciated. The information obtained will be kept strictly confidential except for use in studying the trends.

I- Name of your Industry

2. Type of products manufactured

3. Total number of employees

4. Have the workers complained of too much noise in the work area
Yes/No

5. Due to noise do the workers find it difficult to speak to each other at a distance of 3 ft. Yes/No

6- Can the workers hear each other if their voice is raised ? Yes No

7. Do they find difficult in hearing even if they shout ? Yes/No

8. Is such noise prevalent in only a few sections or the entire factory ?
t strike off which is not applicable] Yes/No

9. What is the appoximate percentage of workers in such noisy aiea ?

10. Does the management feel that constant exposure to loud noise is a health hazard? Yes/No

11- Are-you aware that continuous exposure to loud noiee would cause hearing loss ? Yes No

12. Do the workers complain of fatigue head noise ringing in the ear/temporary hearing loss Permanent hearing loss/others ? (specify) [strike offwhich is not applicable] Yes No

13. As part of the medical exemination of workers do you include hearing test at the time of recruitment ? Yes/No

14. Does the management feel that the factory workers need periodic evaluation of their hearing ? . Yes/No

15- If yes who does the hearing test

His qualifications

Place of training

Salary

Grade

16. Are you willing to have periodic noise measurement made in your factory Yes/No

17. Do you think such measurements have to be made by person with specialised training Yes/No

18. If the answer is 'no' please state why ? [Strike off which is not applicable]

1- No funds

2- Do not feel the need for the services of such personnel

3. Not aware of the availability of such personnel .

4. Others [Specify]

20- Are you willing to depute your staff for training in noise measurements and hearing evaluation ? Yes/No

21. Do the workers themselves bring some ear protective device such as cotton plugs Yes/No

22. Do you give some devices to the workers to protect their ear against noise? Yes/No

23. If yes please state

1. Types of the protective devices

2- place of procurement

24. What type of noise is made by the operation of machines [Strike off which is not applicable]

1- Continuous noise

2. Tntermittant noise

3. Impact noise

25- What is the percentage of workers directly exposed to

1- Intermittant noise— %

Hours per day —

2- Continjio^noise — %

Hours per day —

3. Impact noise — % /

Hours per day—

ALL INDIA INSTITUTE OF SPEECH & **HEARING**
Manasagangothri, Mysore-6

A Survey Of Man Power Resources And Needs In Speech
And Hearing Services In India

QUESTIONNAIRE—C

The information sought through this questionnaire is required for a project undertaken as part fulfilment of the requirements for the Master's degree programme. Hence, your co-operation in giving complete and accurate information will be very much appreciated. The information obtained will be kept strictly confidential except for use in studying the trends.

1 Name of your Institution :

2 Whether it is a Central Government/State Government Private one [Strik off which is not applicable]

3 No. of childern attending your school :

Male.....

Female .....

4 What is the annual intake ?:.....

5 What is the criteria for admission of childern to your school ?

1l_____:

2_____

3_____

6 Age of admission : Lower age limit.....

: Upper age limit.....

7 Do you get a certificate from the competent authority identifying the child's problems like hearing loss, mental retardation ?

Yes..... No.....

8 If Yes, who is the competent authority/Institution :

9 At the time of admission, are the childern given :

1 Hearing Test ,
2 Speech Test .
3 Psychological lest
4 Medical examination
5 Visual Test
6 Other (Specify)

10 Do you think your school childern need periodic evaluation of their hearing?

Yes..... No.....

11 If yes, who does the hearing evaluation ?

His/her qualification

Place of Training

Designation

Salary

12 What are the facilities you have for hearing evaluation ?

1 Audiometers

2 Sound treated rooms

3 Audiometer calibration

13 How many of the childern attending your school wear hearing aids ?.....

14 Do you think the childern need periodic evaluation of speech and language?

Yes..... No.....,

15 If yes, who does the speech and language evaluation ?

His/her qualification

Place of training

Designation

Salary

16 How many of the school childern are periodically evaluated for speech **and** language problems ?.....

17 If you do not think that periodic evaluation of hearing and speech is not required, state reasons ?

1

2

3

18 Does your rehabilitation programme include auditory training ?

Yes..... No.....

19 Does your rehabilitation programme include speech and language training ?

Yes..... No.....