

Original Research Article

Awareness of typical speech-language development among parents of children with hearing impairment

Pooja Pallavi, Aarti P. Waknis*

School of Audiology and Speech Language Pathology, Bharati Vidyapeeth (Deemed to be University), Pune, Maharashtra, India

Received: 10 May 2021

Accepted: 17 June 2021

***Correspondence:**

Dr. Aarti P. Waknis,

E-mail: aarti.waknis@bharativedyapeeth.edu

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ABSTRACT

Background: Parents of children with hearing impairment who are aware of normal speech-language development play an effective and active role in the early detection, diagnosis, and habilitation of these children. Hence this study was aimed to explore the level of awareness about normal speech and language milestones in parents of children with hearing impairment.

Methods: Questionnaire assessing the parents' awareness of speech-language development in children from birth to 3 years was administered on 80 parents of children (birth to 5 years) with hearing impairment. These included 40 parents of children recently diagnosed with hearing impairment (group I HI-R) and 40 parents of children with hearing impairment who were fitted with appropriate hearing devices and enrolled in a speech and language habilitation program (group II HI-T).

Results: Results indicated that the level of awareness was moderate for both the groups for semantic and morphosyntax domains as well as total scores, but was low to moderate for the pragmatic domain. There was no statistically significant difference in the level of awareness between the two groups.

Conclusions: Moderate awareness levels indicates that parents of children with hearing impairment need to be made aware about the normal speech and language development so that it can guide them in the habilitation process. This information although important does not appear to have been provided to the parents of children already undergoing habilitation. Thus, there is need of including this as a goal in parental counseling.

Keywords: Mother's awareness, Hearing impairment, Speech language milestones, Speech-language habilitation

INTRODUCTION

Parents play a vital role in their child's life. Parents can positively influence their child's development. This is possible only when the parents are aware of their child's specific developmental needs and patterns. Research studies have identified a number of parent related factors that can have an impact on their children, that include but are not limited to maternal mental health, parents' level of education, parent gender, and the parents' understanding of child development and parental abilities.¹⁻⁶ A study found that parents often overestimate or underestimate their

children's abilities at different ages, such as when a child can understand simple directions, when babies begin solid foods, when babies utter their first word, or when children can construct 2-4 word sentences.⁷ Parents with lesser knowledge and awareness about the timings of certain milestones are reported to have inappropriate and unrealistic expectation from their children.^{8,9} Knowledge about child development also helps parents to achieve the developmental needs of their children.¹⁰

Hearing impairment (HI) is prevalent in India at a rate of approximately 6.3 percent (63 million people suffering from significant auditory loss), where adult-onset deafness

is estimated to be 7.6 percent, whereas childhood-onset deafness is estimated to be 2%.¹¹ The hearing loss can vary in terms of degree and type, and its effect on communication vary accordingly. Whereas higher degree like moderately severe to severe hearing loss cause more evident effect on communication like delay in onset of first word or even a mild degree of hearing loss can have a long lasting effect on communication like phonological disorder in speech in childhood or central auditory processing disorder (CAPD) manifested in the later adulthood.¹² India launched the National Programme for Deafness Prevention and Control in 2006 with the aim of identifying babies with bilateral severe-profound hearing losses by the age of six months and initiating rehabilitation by the age of nine months. However, in India most of the hospitals are not equipped with the proper infrastructure for such testing, and hence many of the newborns with hearing impairment still remain undetected and that can have a huge impact on the communication development of the children with hearing impairment.¹³ Speech and language delay is the most alarming and noticeable sign among children with hearing impairment which can easily be observed by parents. However, most parents cannot identify the typical ages at which children achieve various milestones. According to the study, mothers were knowledgeable about how to physically care for children but they have shown limited awareness about overall child growth.¹⁴ Parents of school-aged children with hearing impairments (68.6%) suspected delayed onset of hearing impairment around 1 year of age, and there was a considerable duration until the final diagnosis was confirmed. About 82.8% of children were identified around their first birthday and 41.3% were diagnosed after their third birthday.¹⁵ The age of identification could have been earlier if the parents would have been aware of the normal developmental milestones and detected the delay in child's responsiveness to sounds and delay in development of language comprehension and expression. Further knowledge of the normal developmental patterns would also help these parents of diagnosed children for being realistic about the goals and outcomes of therapy. A significant link has been found between children's development knowledge and children's developmental outcomes among the parents.¹⁶ Increased parental awareness tends to support children's optimum growth by increasing the degree of effective parental engagement and that results in a better overall quality of parenting for children.¹⁷⁻²⁰ But there are very few studies conducted in India which have assessed parental awareness and understanding about child development especially in parents of children with developmental disabilities including hearing impairment. Hence, there is a need to assess the awareness of speech-language milestones among parents of children with hearing impairment in India.

Aim of the research was to explore the awareness about speech and language development among parents of children with hearing impairment. Further, comparison was done of the level of awareness of speech and language

milestones in parents of children recently diagnosed with hearing impairment and parents of children with hearing impairment who were enrolled in speech and language therapy.

METHODS

Study design

This prospective exploratory cross sectional study was conducted during the period of November 2020 to March 2021 after getting approval from the institutional ethical committee. Purposive sampling was used to enroll the participants. Marathi speaking participants were predominantly from Pune, Maharashtra and Hindi speaking participants were from New Delhi.

Procedure

The study was conducted in two phases.

Phase I

Translation of the questionnaire of speech and language milestones from Marathi to Hindi language was done for investigating the level of awareness of speech-language milestones in Hindi speaking participants. The questionnaire was developed for exploring the level of awareness of speech language milestones of typically developing children from birth to 3 years of age. The questionnaire consists of 20 questions which are divided across 3 domains, semantics (9 questions), pragmatics (5 questions), and morpho-syntax (6 questions). Each question has 3 options, where one is a correct option.

Phase 2

Participants

A total of 80 parents of children with hearing impairment participated in the study. Consent was taken from all the participants. The participants were divided across two groups. Group I (HI-R) included 40 parents of children who were recently diagnosed with bilateral moderate to profound sensorineural hearing loss. These parents were not exposed to any type of speech and language therapy or other type of parental counseling. Group II (HI-T) included 40 parents of children diagnosed with bilateral moderate to profound sensorineural hearing loss who were enrolled in speech and language therapy for a period of a minimum of 3 months after diagnosis. All the children of group II were undergoing auditory habilitation and speech language therapy after fitting of appropriate hearing devices by certified audiologists. The age of children whose parents participated in the study was between 0-5 years. All the children were diagnosed with bilateral moderate to severe sensorineural hearing loss on conditioned pure tone audiometry or auditory brainstem evoked potentials by certified audiologists and their responses were in the speech spectrum with use of

appropriate hearing devices. None of the children had any other known sensory or motor deficits including visual impairments, syndromes, intellectual disabilities or neuromuscular conditions. All the parents had a minimum education level of matriculation, and spoke, read and wrote either Marathi or Hindi.

Case history data was collected through individual interviews from all the participants. The questions in case history included demographic history of the child, age of diagnosis, relevant pre, post and perinatal history, nature of impairment, family structure including presence of elder sibling, type of family (nuclear/joint family), parental education, occupation, time spent with the child etc. Parents whose children fulfilled the participant selection criteria and consented to participate in the study were given the questionnaire for awareness of speech and language milestones. Marathi speaking parents filled the original version of questionnaire developed by Patil and Waknis and Hindi speaking parents filled Hindi questionnaire translated in the Phase 1 of the study. Participants had to mark (tick or circle) the answer they believed was appropriate. The scoring of the questionnaire was done by binary system, where each correct answer scored 1 mark and incorrect answer was scored '0'. The maximum and minimum a participant could score was 20 and 0 respectively. Total score of each participant was calculated and entered in the data sheet for analysis.

Statistical analysis

Statistical analysis was done with statistical package for the social sciences (SPSS) version 20 software. Level of significance was 0.05 for the statistical analysis of the study. Descriptive statistics (mean, standard deviation, median, and range) was determined. Shapiro Wilk's test was administered to determine the distribution of scores. Result revealed that data was not normally distributed ($p < 0.05$). So, nonparametric statistics were used for statistical analysis.

RESULTS

The level of awareness about the normal development for language for the domains of semantics, pragmatics, and morpho-syntax were determined by plotting scatterplots for the scores for each of the domains and total score for the two groups- group I (HI-R) and group II (HI-T). Number of participants scoring below 50%, in the range of 50% to 80% and above 80% was determined for each of the domains and total scores for both the groups. Level of awareness was said to be low if there was a predominance of scores below 50%, moderate if the predominance was seen in the range of 50% to 80% and high if the predominance was above 80%.

The distribution of scores for domains of semantics, pragmatics, morpho-syntax and the total score for group-I (HI-R) is depicted in Figures 1-4.

As revealed in Figure 1, 20% ($n=8$) of the participants in group-I (HI-R) had scores below 50% of total score of semantic domain. 67% of the participants ($n=27$) had scores between 50% and 80%. 13% of the participants ($n=5$) had scored above 80% of total score. Thus, the awareness of semantic domain can be said to be moderate (Figure 1).

As revealed in Figure 2, 55% ($n=22$) of the participants in group-I (HI-R) had scores below 50% of total score of pragmatic domain. 45% of the participants ($n=18$) had scores between 50% and 80%. None of the participants had scored above 80% of total score. Thus, the awareness of pragmatic domain can be said to be low to moderate (Figure 2).

As revealed in Figure 3, 5% ($n=2$) of the participants in group-I (HI-R) had scores below 50% of total score of morpho syntax domain. 60% of the participants ($n=24$) had scores between 50% and 80%. 35% of the participants ($n=14$) had scored above 80% of total score, Thus, the awareness of Morpho-Syntax domain can be said to be moderate (Figure 3).

As revealed in Figure 4, 10% ($n=4$) of the participants had scored below 50% of the total score of the tool. 87% ($n=35$) of the participants had scores in the range of 50% to 80% of the total score. 3% ($n=1$) of the participants had scores more than 80% of the total score. Thus overall awareness of normal speech and language development appears to be moderate among parents of children recently diagnosed with hearing impairment (Figure 4).

Thus, the level of awareness of speech and language milestones in parents of children with hearing impairment who are recently diagnosed and not enrolled in therapy can be said to be moderate.

Similar to group I (HI-R), scatterplots were studied for group II (HI-T) to determine the level of awareness of parents of children with severe to profound hearing loss that were already enrolled in therapy. The scatterplots are given as Figures 5-8.

As revealed in Figure 5, 32% ($n=13$) of the participants in group-II (HI-T) had scores below 50% of total score of semantic domain. 60% of the participants ($n=24$) had scores between 50% and 80%. 8% of the participants ($n=3$) had scored above 80% of total score, Thus, the awareness of semantic domain can be said to be moderate (Figure 5).

As revealed in the Figure 6, 62% ($n=25$) of the participants in group-II (HI-T) had scores below 50% of total score of pragmatic domain. 35% of the participants ($n=14$) had scores between 50% and 80%. 3% ($n=1$) participants had scored above 80% of total score.

Thus, the awareness of pragmatic domain can be said to be low to moderate (Figure 6).

As revealed in the Figure 7, 10% (n=4) of the participants in group-II (HI-T) had scores below 50% of total score of morpho-syntax domain. 50% of the participants (n=20) had scores between 50% and 80%. 40% of the participants (n=16) had scored above 80% of total score. Thus, the awareness of Morpho-Syntax domain can be said to be moderate to high (Figure 7).

As revealed in Figure 8, 20% (n=8) of the participants had score below 50% of the total score. 77% (n=31) of the participants had scores between 50% and 80% of the total score. 3% (n=1) of the participants had scores above 80% of the total score. Thus overall awareness of normal speech and language development appears to be moderate among parents of children with hearing impairment who were enrolled in speech language therapy (Figure 8).

Comparison of level of awareness about speech and language milestones of parents of children with hearing impairment who were recently diagnosed (HI-R) and parents of children with hearing impairment enrolled in therapy (HI-T)

Descriptive statistics of the data indicates that the range of scores obtained was wide for all the domains as well as total score for participants for both the groups. The medians of scores for all the domains as well as total scores appear to be similar. Mann-Whitney U test was administered for statistical comparison of the data across group-I (HI-R) and group-II (HI-T) for the three domains as well as total scores. Results of descriptive statistics and Mann Whitney U test is given in Table 1.

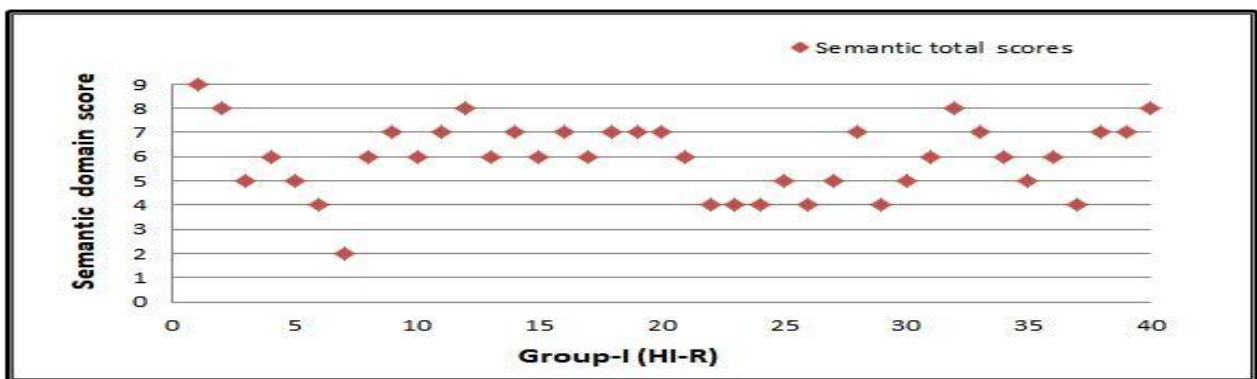


Figure 1: Age group distribution.

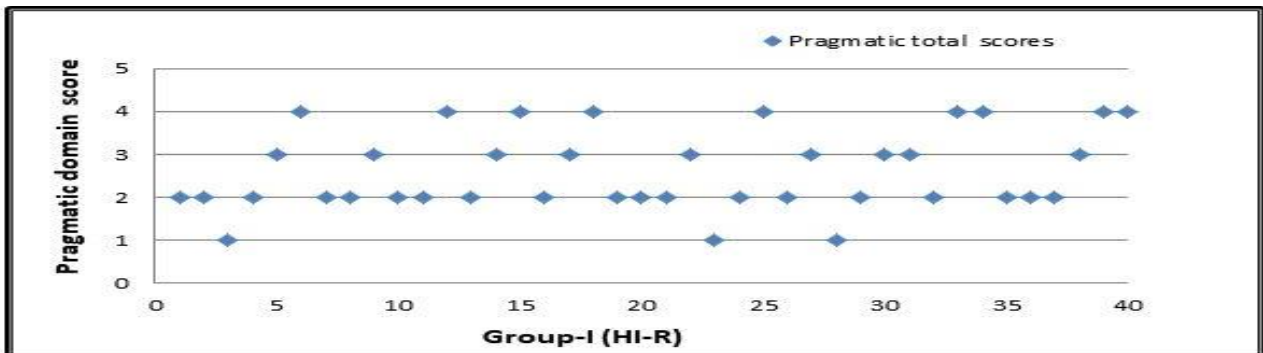


Figure 2: Scatter plot indicating distribution of scores for pragmatic domain of group-I (HI-R).

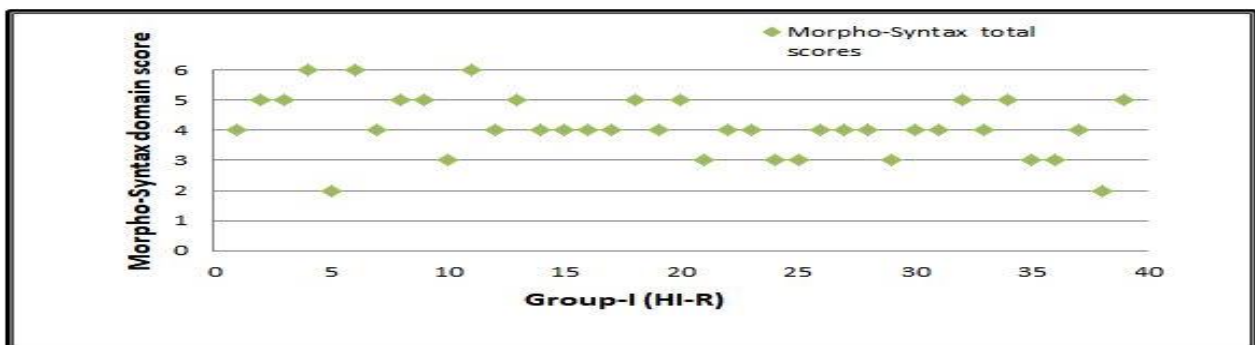


Figure 3: Scatter plot indicating distribution of scores for morpho-syntax domain of group-I (HI-R).

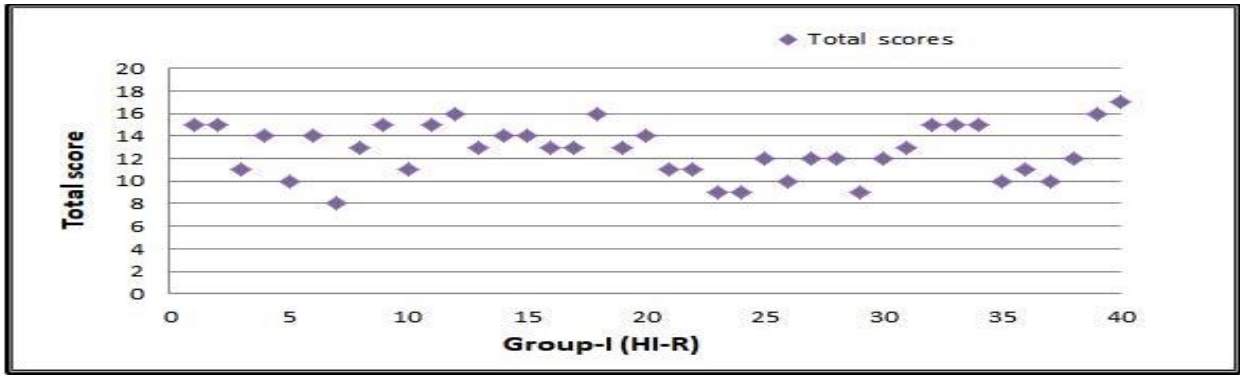


Figure 4: Scatter plot indicating distribution of total scores of group-I (HI-R).

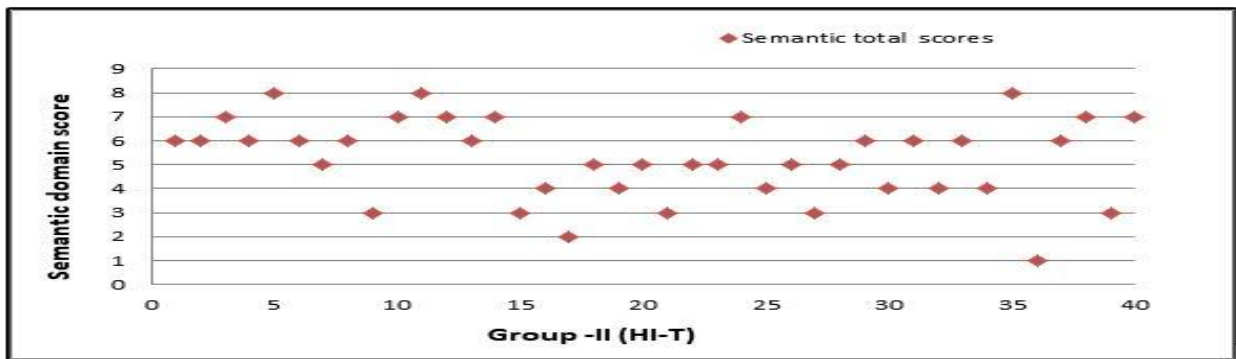


Figure 5: Scatter plot indicating distribution of scores for semantic domain of group-II (HI-T).

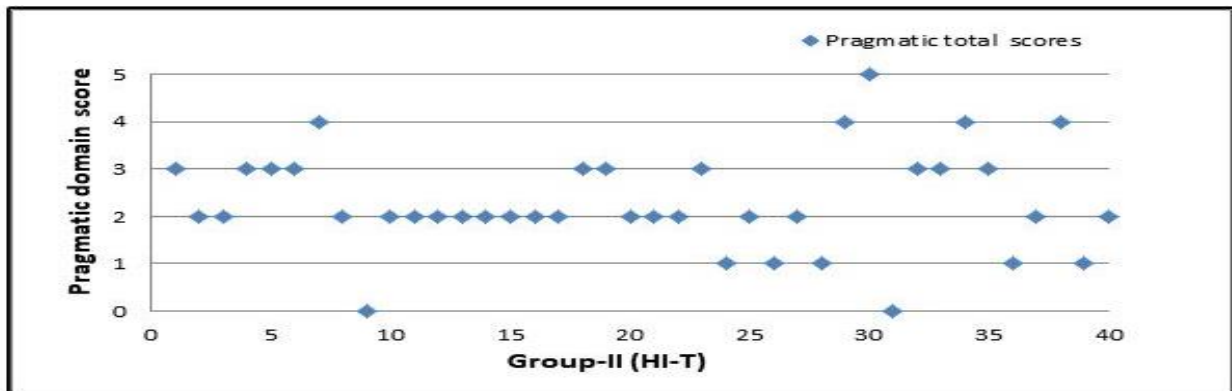


Figure 6: Scatter plot indicating distribution of scores for pragmatic domain of group-II (HI-T).

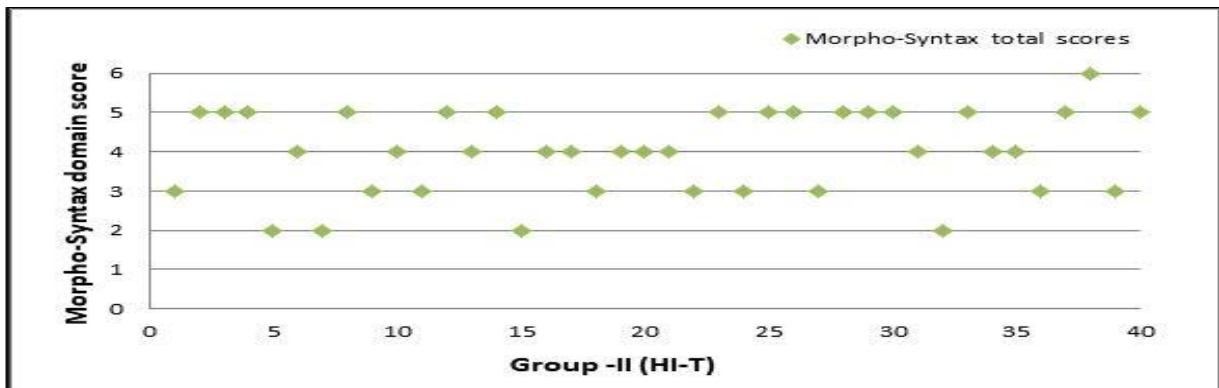


Figure 7: Scatter plot indicating distribution of scores for morpho-syntax domain of group-II (HI-T).

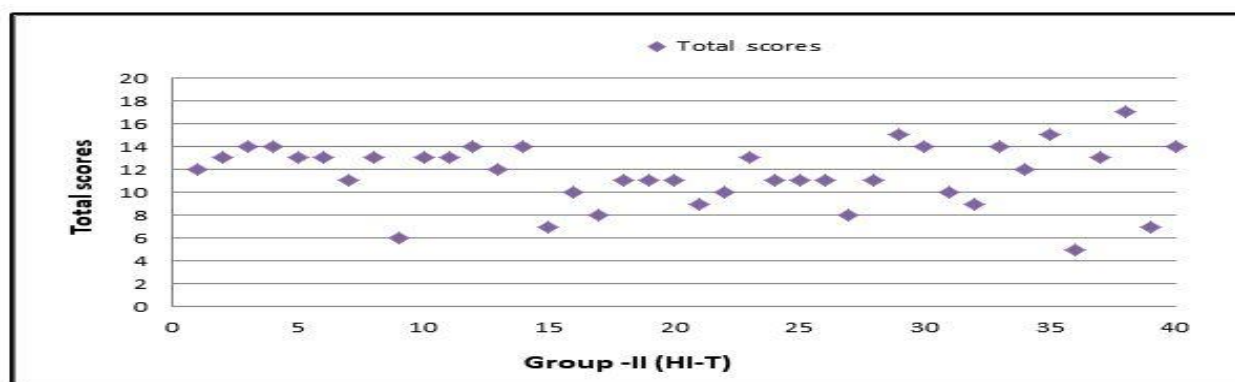


Figure 8: Scatter plot indicating distribution of total scores of group-II (HI-T).

Table 1: Comparison of awareness scores of parents of children recently diagnosed with hearing impairment (group-I, HI-R) and parents of children with hearing impairment who were enrolled in speech language therapy (group-II, HI-T).

Domain	Group	Mean	SD	Median	Range	Result of Mann Whitney U		
						Z	U	p
Semantic (maximum score=9)	I (HI-R)	5.95	1.48	6.00	2-9	1.79	617.00	0.07
	II (HI-T)	5.25	1.71	5.50	1-8			
Pragmatic (maximum score=5)	I (HI-R)	2.60	0.93	2.00	1-4	1.23	679.50	0.21
	II (HI-T)	2.30	1.07	2.00	0-5			
Morpho-syntax (maximum score=6)	I (HI-R)	4.15	0.98	4.00	2-6	0.43	757.00	0.67
	II (HI-T)	4.00	1.06	4.00	2-6			
Total (maximum score=20)	I (HI-R)	12.70	2.30	13.00	8-17	1.82	612.50	0.67
	II (HI-T)	11.55	2.66	12.00	5-17			

Results of Mann Whitney U test indicated that there was no statistically significant difference in any of the domains as well as total level of awareness of parents of group-I (HI-R) and group-II (HI-T).

Thus, the awareness level of both, parents of children recently diagnosed with hearing impairment and parents of children with hearing impairment who are enrolled in speech language therapy is same.

DISCUSSION

Results of the study indicates that there is moderate level of awareness of speech and language developmental milestones of 0 to 3 years among parents of children with hearing impairment in the range of 0 to 5 years. The study also revealed that the awareness level of parents whose children were recently diagnosed and parents of children who were already undergoing therapy was same. Thus it appears that either information about normal speech and language development is not provided to the parents of children with hearing impairment when they are enrolled in therapy or if the information has been provided, it has not been effective as there is no adequate retention of the information. Similar results have been reported in a study on pregnant women and new mothers, (new mothers of ‘not at risk’ infants and new mothers of ‘high risk’ infants).²¹ The awareness level reported was low to

moderate in pregnant women as well as new mothers. It has been found that mothers are not familiar with typical development of speech and language milestones.^{21,22} Studies across the continents have reported that mothers most often overestimated the developmental skills of the children. Mothers believed that vocalization, social smile, sight and overall brain development would be achieved in later months of life.²³ Low maternal awareness about the child development and the parenting skills have been reported, where parents were found to lack the knowledge about the developmental milestones including language and cognitive development.²⁴⁻²⁶

Parents must have a basic knowledge of infant and child developmental milestones and expectations, as well as the types of parenting strategies that facilitate children's attainment of these milestones, in order to maximize child development.²⁷⁻²⁹ This is of utmost importance especially for parents of children with developmental disorders. Given that awareness is moderate in the small population examined in this study, it becomes essential to conduct further research on a larger population. Additionally, parent awareness and education programs about speech and language development need to be carried out that can help in early detection, diagnosis as well as efficient and effective habilitation of children with developmental disabilities including hearing impairment.

CONCLUSION

This study has helped to understand that overall awareness level of typical speech-language milestones is moderate among parents of children with hearing impairment and that enrollment in speech language therapy has no effect on this awareness level. Hence there is a need for including this as a goal in parental counseling as it is likely to enhance the parent participation and effectiveness in speech language development of their children with hearing impairment.

ACKNOWLEDGEMENTS

Authors would like to thank Dr. Gauri Belsare and Dr. C. S. Vanaja, at School of Audiology and Speech Language Pathology Pune, for their support, encouragement and providing the platform to conduct this study at institute. They are also genuinely thankful to various clinics at New Delhi and Pune, and the participants of the study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Pallavi P, Waknis AP. Awareness of typical speech-language development among parents of children with hearing impairment. *Int J Otorhinolaryngol Head Neck Surg* 2021;7:1136-43.