

## Benchmarks for Predictors of Hearing Aid Use Time in Children's with Congenital and Acquired Hearing Loss - A Comparative Study

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### Abstract

**Objectives:** Various objectives were sated to know the percentage of hearing aid (HA) usage time based on HA models, early years and current using time, before HA goes on, consistency of using HA's and open-ended responses in specific challenges.

**Design:** HA usage questionnaire was used. This survey has 18 questions based on HA usage time in various locations and situations. 60 parents of children with both congenital and acquired hearing loss were asked to complete this survey. Participants were divided into two groups: one with 30 parents of congenital hearing impaired (HI) children and another with 30 parents of congenital hearing impaired (HI) children. They were all given a 5-point rating system to use to score the questions. Simple percentage analysis was one to know the benchmarks for the stipulated objectives.

**Results:** Starkey and Siemens HA's were used frequently by both the groups. During early years it was observed that 33% of children in the congenital group (CG) wore for longer duration (i.e., 5 to 6 hrs) whereas in the acquired group (AG) wore for limited duration i.e., 3 to 4 hrs. Similarly, in the current use time 33.3% in CG wore for 10 hrs and 30% in AG wore for 9 to 10 hrs. Maximum time utilized by 30% of children in CG is 9 hrs whereas 33.3% of AG wore by 7 hrs respectively during week days and weekends. HA goes time was observed to be lesser (30 mins) in 63.3% of CG, whereas 63.3% of AG reported 1 hr. In general, neither group utilized HA's in the day care setting; however, all of the children used HA's during school hours. The consistency of HA use time by CG revealed that 76.6- 100% of children used "always" in various situations like transport, play school, meal time, play alone, book sharing, play ground and public places. Similarly in AG noticed that 100% showed always during school time whereas in other situations it is observed to be 66.7-83.3% "often" used HA's in public places, book sharing, meal time, playground and transport. This indicates that CG, on the other hand, wore HAs in the majority of instances, whereas the AG's use varied. This suggests that the CG has adapted to HA. Finally results indicated that most of the CG's facing problems in loud events and child state categories whereas equipment issues and breaks in routine categories were reported by AG.

**Conclusions:** HA's utilized by CG are longer durations and HA goes time are less when compared to the AG. According to the findings of the current study, congenital children are adapted to HA's and are more accustomed to wear them at all situations. HA's used less consistently by the AG than CG. Parents reported that the problems related to equipment issues are frequently seen. The findings of the study also provided as a benchmark for the hearing aid use time. Authors stated that the usage of hearing aid time and adapting HA is critical in a child's overall development.

**Keywords:** Congenital and Acquired Hearing Loss; Hearing Impaired; Questionnaire; Hearing Aid Use Time; Benchmarks

## Introduction

If hearing loss is not treated at the early stage, it can lead to many problems like lower socioeconomic level, poor socialization skills, depression, and so on. If the problem is discovered at the early stage, it is possible to receive appropriate treatment, which results in improve outcomes for hearing impaired people. The early years of a child's life are critical for speech and language development. It is necessary to provide better amplification for hearing impaired children so that they can access speech and other noises in their surroundings.

Early identification and intervention showed positive impact on the speech and language out comes of young children with hearing loss [1,20]. When we have a problem in hearing loss in our hearing sensitivity which generally occurs very slowly over a period of years may lead to communication problems. When we lose the ability to hear, nerve begins to stop sending certain sound signals to the brain and it begins to "forget" that these signals exist in the surrounding. If the brain forgets certain sound's existence, it will begin to rewire to focus on those sounds that remain and do the best what it can with remaining. When the brain becomes desensitized to this type of sound, the rewiring process becomes more "cemented." Hearing aid candidates wait averagely five to ten years before considering about their hearing loss. Patient's ability of adaptation will affect if they delay using the hearing aids.

In children there are several possible causes for hearing loss, it is categorized into congenital or acquired. Children may have different type of hearing loss they are conductive, sensorineural, or mixed types. All parents care takers, physicians, teachers should know one important factor that early hearing loss especially which was not diagnosed will cause more development and emotional problems in children with hearing loss and it will show long lasting effects. There are various hearing aids like body worn hearing aids, behind the ear, in the ear and completely in the ear canal which also has benefits based on their performance. Advantages of hearing aids are enhanced directional perception, improved conversational comprehension, and amplification of specific voices (Target) or sounds (non target) which are trying to focus on. The disadvantages of hearing aids are high price, potential discomfort, maintenance issues.

A scientific review of large no. of surveys related to quality of life of hearing-impaired individual with hearing aids reveals that

most of the individuals improved their quality of life, greater self-confidence, stronger self-image, and better communicative functioning, which results in overall higher self-esteem than those who are not using hearing aids.

They can also reduce deterioration in psychological functioning by using hearing aids. HI people can reverse social, emotional and communication dysfunctions caused by using hearing aids and they can improve most aspects of emotional life and have less negativity in personal relationships as compared to HI without hearing aids.

Most researchers found that hearing aids helps an individual to get a better relationship with family members, to do better in their jobs, participates in social gatherings, feels less tired or exhausted, have better mental health, improves physical wellbeing, concentrates better, and also can increase their social contacts.

The Measure of Audiologic Rehabilitation Self-Efficacy for Hearing Aids (MARS-HA) [19] is used to assess self-efficacy with 24 items that addressed basic hearing aid handling, advanced handling and knowledge, adjustment to the sound of hearing aids, and aided listening skills. This revealed a consistent statistically and clinically significant predictor of both hearing aid satisfaction and benefit, with a theoretical range of 0 percent to 100 percent. According to the authors, hearing aid use in elderly people decreases by 5%-10% if their hearing loss falls below 80%.

Earlier authors [13] reviewed longitudinal reports from parents who consistently used the device in a group of seven infants. Their age range was 10 and 28.5 months, with mild to moderate hearing loss. They conducted structured interviews with their mothers and used hearing aids in various settings (eg., in the car, at meals, playing outside, etc.) to assess the baby's daily habits. Their results show that hearing aid use is inconsistent and more consistent with age early in life, and parental reactions fall into three categories. ii) Activity-related issues, breastfeeding only, or playing. iii) Temperament/condition cause fatigue, fatigue, or illness.

Researchers [16] investigated hearing aid use in young children with hearing loss and the factors that influenced hearing device use. According to the mother, consistent usage of hearing aids for newborns with mild-to-moderate hearing loss increased throughout the second year of life compared to the first year of life.

A study [17] on predictors of hearing aid usage time in children with mild to severe hearing loss, as well as barriers to consistent hearing aid use and parental reliability and found that certain variables were significantly related to the amount of time children wore their hearing aids. Rating scales were frequently used to provide insight into situations that were difficult for families. Clinicians and researchers may be able to estimate HA use time using both parent and data reports and data logging.

Trends and Predictors of Longitudinal Hearing Aid Use for Children with Hearing Loss [18]. Parents of 290 children with mild to severe hearing loss were recruited to participate. They inquired about the average amount of time the child spent using HAs every day during the week and on weekends. Their findings found that on weekdays, children wore their hearing aids for 10.78 hours per day and on weekends; they wore them for 10.24 hours per day.

A study using MARS-HA [10] was done and found that a similar group of older persons (n = 153, M = 73.7 years) had an average of 81.7% (SD = 12.8%). MARS-HA recommends an 80% composite as a benchmark for identifying future intervention needs.

A total of 1961 patients with hearing loss were involved in the study [9] on the prediction of successful hearing aid therapy in first-time and experienced hearing aid users. All patients had their hearing tested, were fitted with hearing aids, and completed the IOI-HA questionnaire. The items of the IOI-HA were scored as Factor 1 (usage of HA, perceived advantages, satisfaction, and quality of life) and Factor 2 (residual activity limitation, residual participation restriction, and impact on others) in a factor analysis. The degree of hearing loss, word recognition score, motivation, HA usage time, tinnitus, asymmetry, and sex were all found to have a significant relationship with overall IOI-HA, Factor 1, or Factor 2 scores. When HAs been renewed, the seven IOI-HA items increased by an average of 0.4 (p 0.001). At the follow-up, the total median IOI-HA score for experienced (n = 460) and first-time users (n = 1189) users was 29 (7). The degree of hearing loss, word recognition score, motivation, tinnitus, asymmetry, and sex can all be utilized to identify individuals who need extra help to become successful HA users, according to the study.

The purpose of this current study is to document certain benchmarks for the hearing aid use time by the children with

hearing loss in Hyderabad region. The benchmarks may give an idea of how much percentage the children are able to use the hearing aids.

There is limited research in this field where no benchmarks for hearing aid use time have been established. The benchmarks will result in an average estimated percentage that can be applied to children to reap the benefits. As a result, the study's goal is to establish guidelines for hearing aid usage time in children who have congenital or acquired hearing loss. The longer a child wears hearing aids, the greater the results. In addition, the HA usage time depends on the workload in various situations. Hence, the current study was framed in this aspect based on the following questions that arose during the research process.

- Is the usage time varies based on different types of HA models?
- How much percentage of HA's been used during the early years?
- How much percentage of HA's been used currently?
- How much percentage of HA's been used during weeks and weekends?
- How much percentage of time is required before HA goes on?
- What percentage of the time do children in both the groups used HA consistently?
- What percentage of the time taken by open ended responses in specific challenges?

### Method and Materials

A total of the 60 parents of HI children were participated in this study. Children's age ranged from 5 to 12 years. They were divided into two groups. Group 1 consists of 30 parents of Congenital Hearing Loss (CHL) and group 2 consists of 30 parents of Acquired Hearing Loss (AHL). The following are the criteria for including and excluding subjects.

### Inclusion criteria

- **Group 1:** Children should be diagnosed as congenital hearing loss at the time of birth through neonatal hearing screenings.
- **Group 2:** Children should be diagnosed as acquired HL between 5-12 yrs of age.

Participants are selected regardless of gender or severity of deafness.

All participants must be previous users of hearing aids and must have a minimum of two years’ experience.

All children should use behind-the-ear hearing aids with unilateral or bilateral edema.

**Exclusion criteria**

Children with multiple disabilities and with any emotional or psychological problems were excluded in the study.

**Test material and procedure**

Questionnaire for hearing aid users [13] was adapted. The examiner asked all parents to rate their child’s academic performance on a 5-point scale in eight different listening environments: in the car, at school, at daycare, during meals, when playing alone, when sharing books, on playgrounds and in public places (e.g., zoos or restaurants). The scale includes the following ratings: 0 = never, 1 = rare, 2 = sometimes, 3 = often, 4 = always and not applicable. The questionnaire also included an open-ended question, asking parents to identify situations where it would be difficult for a child to wear HA. The questionnaire on HA use is provided in Appendix.

**Analysis**

A simple percentage analysis was done to set benchmarks for HA usage time in both groups by using following formula (variables will vary).

$$\text{Percentage} = \frac{\text{No. of childrens}}{\text{Total no. of childrens}} \times 100$$

**Results**

**Percentage of various hearing aid models use time by both the groups**

Both groups used hearing aids from four different companies (Starkey, Oticon, Siemens, and Resound). Most of the children used Starkey and Siemens HAs out of four companies.

**Congenital hearing loss**

Starkey HAs been used by 10 (33.3%) of the children, Siemens were used by 10 (33.3%) of the children, Oticon was used by 5 (16.7%) of the children and Resound was used by 5 (16.7%) of the children.

**Acquired hearing loss**

Out of 30 children, 9 (30.0%) used Starkey hearing aids, 10 (33.3%) used Siemens, 5 (16.7%) used Oticon and 6 (20.0%) used Resound hearing aids.

**Total (both groups)**

Out of 60 children, 19 (31.7%) children used Starkey hearing aids, 20 (33.3%) children used Siemens, 10 (16.7%) children used Oticon, and 11 (18.3%) children used Resound hearing aids. The whole data was represented in table 1 and graph 1.

Group	Starkey	Siemens	Oticon	Resound
Congenital	*(10) 33.3%	(10) 33.3%	(5) 16.7%	(5) 16.7%
Acquired	(9) 30.0%	(10) 33.3%	(5) 16.7%	(6) 20.0%
Total (both groups)	(19) 31.7%	(20) 33.3%	(10) 16.7%	(1) 18.3%

**Table 1:** Percentage of various hearing aid companies used by both the groups.

\* (N) represents no. of children.

**Graph 1:** Represents the percentage of various HAs used by both the group children.

**Percentage of the hearing aid use time in both the groups during the early years**

Hearing aid usage time was divided into six categories based on the duration of the children wore in both groups. The minimum duration was 3 hours and Maximum duration was 7 hours considered.

**Congenital hearing loss**

Out of 30 children 6.7% were used HAs for 3 hrs, 20% were used HAs for 4 hours, 30% were used HAs for 5 hours. 33% were used for 6 hours, 6.7% were used HAs for 6.30 hours and only 3.3% of the children were used HAs for 7 hours.

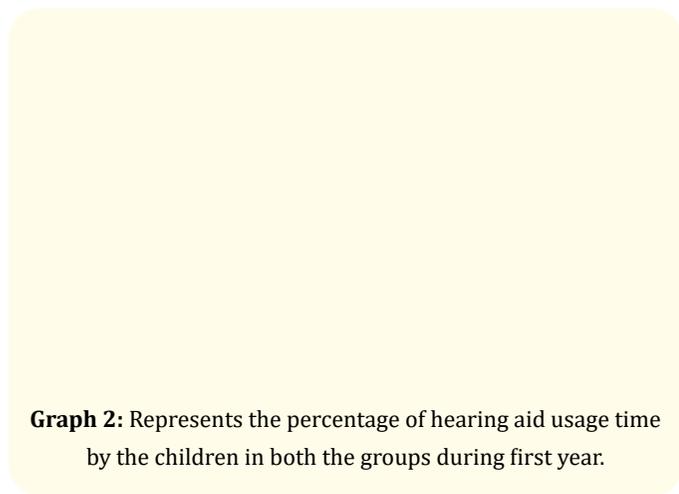
**Acquired hearing loss**

Out of 30 children 26.7% were used HAs for 3 hrs, 33.3% were used HAs for 4 hours, 26.6% were used HAs for 5 hours, 13.3% were used for 6 hours and only 0.1% of the children was used HAs for 7 hours.

From the above data it was observed that most of the children showed interest in wearing hearing aids for 5 to 6 hours duration in congenital group whereas in acquired group children mostly wore hearing aids for lesser duration i.e. 3 to 4 hours. The whole data was given in table 2 and depicted in graph 2.

Group	3 hours	4 hours	5 hours	6 hours	6.30 hrs	7 hours
Congenital	6.7%	20%	30%	33%	6.7%	3.3%
Acquired	26.7%	33.3%	26.6%	13.3%	0%	0.1%

**Table 2:** Percentage of hearing aid usage time by the children in both the groups during first year.



**Graph 2:** Represents the percentage of hearing aid usage time by the children in both the groups during first year.

**Percentage of the hearing aid use time in both the groups during current usage time**

Hearing aid usage time was divided into six categories based on the duration of the children wore in both groups. The minimum

duration was 8 hours and Maximum duration was 12 hours considered.

**Congenital hearing loss**

Out of 30 children 13% were used HAs for 8 hrs, 6.7% were used HAs for 9 hours, 33.3% were used HAs for 10 hours. 30.3% were used for 11 hours, 16.7% were used HAs for 12 hours.

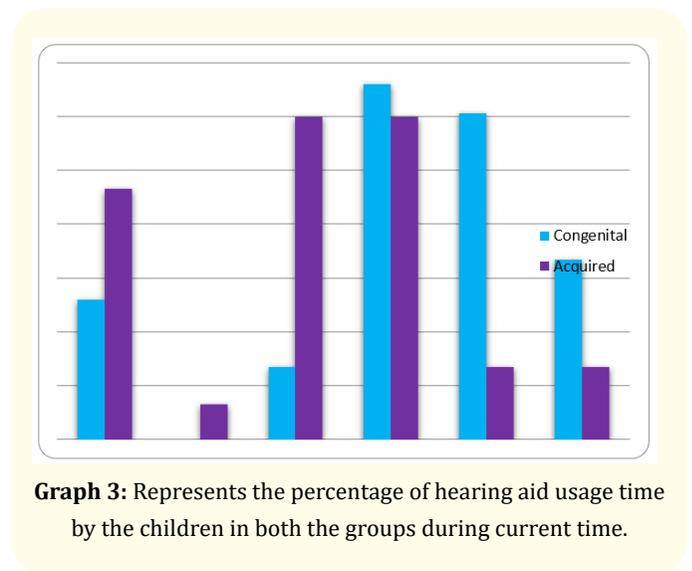
**Acquired hearing loss**

Out of 30 children 23.3% were used HAs for 8 hrs, 3.3% were used HAs for 8.30 hours, 30% were used HAs for 9 hours, 30% were used for 10 hours, 6.7% were used was for 11hours and 6.7% of the children were used HAs for 12 hours.

From the above data it was observed that most of the children showed interest in wearing hearing aids for 10 to11 hour’s duration in congenital group whereas in acquired group children mostly wore hearing aids for lesser duration i.e., 9 to 10 hours. The whole data was given in table 3 and depicted in graph 3.

Group	8 hours	8.30 hours	9 hours	10 hours	11 hrs	12 hours
Congenital	13%	0%	6.7%	33%	30.3%	16.7%
Acquired	23.3%	3.3%	30.0%	30.0%	6.7%	6.7%

**Table 3:** Percentage of hearing aid usage time by the children in both the groups during current time.



**Graph 3:** Represents the percentage of hearing aid usage time by the children in both the groups during current time.

**Percentage of the hearing aid use time in both the groups during weekdays and weekend**

This is similar to the current time of hearing aid use time, but the timing was changed during weekends. It is also divided into 11 categories i. e from 5 hours to 11 hours based on the children’s usage.

**Congenital**

3.3% were used HAs for 5 hours, 6.7% were used HAs for 6 hours, 13.3% were used HAs for 7 hours, 10% were used HAs for 8 hours, 30% were used HAs for 9 hours, 16.7% were used HAs for 9.30 hours, 13.3% were used HAs for 10 hours, and 6.7% were used HAs for 10.30 hours.

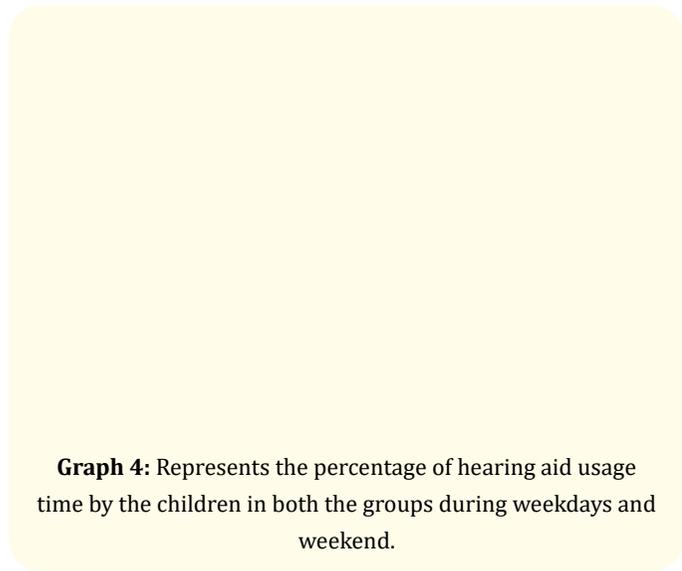
**Acquired**

6.7% were used HAs for 6 hours, 33.3% were used HAs for 7 hours, 26.7% were used HAs for 8 hours, 3.3% were used HAs for 8.30 hours, 13.3% were used HAs for 9 hours, 5% were used HAs for 9.30 hours, 10% were used HAs for 10 hours, 5% were used HAs for 10.30 hours and 3.3% were used HAs for 11 hours.

Maximum time utilized by congenital group is 7 hrs, 9.30hrs and 10 hrs respectively whereas 7 hrs, 8 hrs and 10 hrs were the maximum time used by acquired group. The whole data was given in table 4 and depicted in graph 4.

Group (hrs)	5	6	7	8	8.30	9	9.30	10	10.30	11
Congenital (%)	3.3	6.7	13.3	10	0	30	16.7	13.3	6.7	0
Acquired (%)	0	6.7	33.3	26.7	3.3	6.7	5	10	5	3.3

**Table 4:** Percentage of hearing aid usage time by the children in both the groups during weekdays and weekend.



**Graph 4:** Represents the percentage of hearing aid usage time by the children in both the groups during weekdays and weekend.

**Percentage of the hearing aid use time required before HA goes on in both the groups**

This section was mainly done by measuring how much time a child can manage without using hearing aid after waking up and it was divided into four categories (from 30 minutes to 2 hours).

**Congenital**

63.3% were able to manage without HAs for 30 mins, 23.3% were able to manage without HAs for 1 hr, and 13.4% were able to manage without HAs for 1.30 hrs after waking up.

**Acquired**

10% were able to manage without HAs for 30 mins, 63.3% were able to manage without HAs for 1 hr, 16.6% were able to manage without HAs for 1.30 hrs and 10% were able to manage without HAs for 2 hrs after waking up.

Majority of the children in acquired group were able to manage without HAs after waking up for 30 mins whereas in congenital group can be able to manage for 1 hr. The whole data was given in table 5 and depicted in graph 5.

Group	30 mins	1 hr	1.30 hrs	2 hrs
Congenital	63.3%	23.3%	13.4%	0%
Acquired	10%	63.3%	16.6%	10%

**Table 5:** Percentage of time managed by children in both the groups without hearing aids after waking up.

**Graph 5:** Represents the percentage of time managed by children in both the groups without hearing aids after waking up.

**Percentage of the hearing aid use time based on the consistency of use**

The following questions were rated by using Never, Rare, Sometimes, often and always options which were rated by the parents of both the groups.

Children in the congenital group wore HAs in various situations which includes; during transport (Q10) 23.4% (often) and 76.6% (always), during play school/school (Q11) 100% (always), but none of them reported using them in daycare (Q12), during meal time (Q13) 10% (often) and 90% (always), during play alone (Q14) 20% (often) and 80% (always), during book sharing (Q15) 6.7% (often) and 93.3% (always), during playground (Q16) 20% (often) and 80% (always) and during public places like store, zoo, restaurants etc (Q17) 10% (often) and 90% (always). The data are summarized in table 6 and graph 6.

Situations (Questions)	Often	Always
Transport (Q10)	23.4%	76.6%
Play School (Q11)	0%	100%
Day Care (Q12)	0%	0%
Mealtime (Q 13)	10%	90%
Play Alone (Q 14)	20%	80%
Book Sharing (Q 15)	6.7%	93.3%
Playground (Q16)	20%	80%
Public Places (Q 17)	10%	90%

**Table 6:** Percentage of time managed by children in both the groups without hearing aids after waking up.

**Graph 6:** Represents the percentage of various situations reported by the parents of both the groups.

Children in the acquired group wore HAs in various situations which includes; during transport (Q10) 83.3% (often) and 16.7% (always), during play school/school (Q11) 100% (always), but none of them reported using them in daycare (Q12), during meal time (Q13) 76.7% (often), 13.3% (always) and 10% (Sometimes), during play alone (Q14) 63.3% (often), 13.4% (always) and 23.3% (Sometimes); during book sharing (Q15) 73.3% (often), 16.7% (always), and 10% (sometimes); during playground (Q16) 70% (often), 13.3% (always) and 16.7% (sometimes) and during public places like store, zoo, restaurants etc (Q17) 66.7% (often) and 33.3% (always). The data are summarized in table 7 and graph 7.

Situations (Questions)	Often	Always	Sometimes
Transport (Q10)	83.3%	16.7%	0%
Play School (Q11)	0%	100%	0%
Day Care (Q12)	0%	0%	0%
Mealtime (Q 13)	76.7%	13.3%	10%
Play Alone (Q 14)	63.3%	13.4%	23.3%
Book Sharing (Q 15)	73.3%	16.7%	10%
Playground (Q16)	70%	13.3%	16.7%
Public Places (Q 17)	66.7%	33.3%	0%

**Table 7:** Percentage of time managed by children in both the groups without hearing aids after waking up.

**Graph 7:** Represents the percentage of various questions reported by the parents of both the groups.

In general, neither group utilized hearing aids in the daycare setting; however, all the children used hearing aids during school hours. The congenital group wore hearing aids frequently than acquired group. This suggests that the congenital group has adapted to HA.

**Percentage of the hearing aid use time by open ended responses in both the groups**

**Open ended responses: specific challenges to HA use**

Parents were asked during the interview to describe situations or environments that presented challenges to consistent HA use. Responses were classified into four categories: loud events (e.g., movie theatre, church) equipment noises (e.g., feedback from HA, discomfort from ear mold), breaks in routine (e.g., different care provider, at home on weekends, after bath time) and child state (e.g., mood illness, fatigue temperament).

**Congenital**

The hearing aid use time percentage of the children’s responses were varied in different situations like loud events (26.6%), equipment issues (23.3%), breaks in routine (13.4%), child state (26.7%) and no difficult time or situation in wearing hearing aids (10%) respectively.

**Acquired**

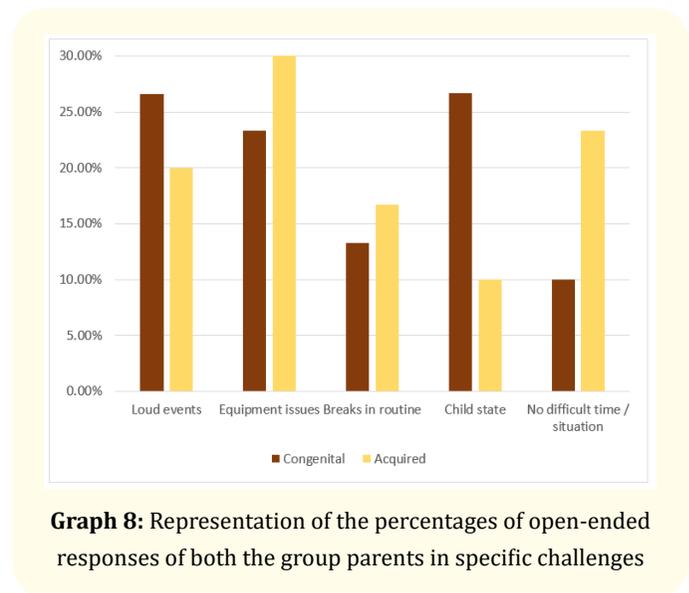
The hearing aid use time percentage of the children’s responses were varied in different situations like loud events (20%),

equipment issues (30%), breaks in routine (16.7%), child state (10%) and no difficult time or situation in wearing hearing aids (23.3%) respectively.

Overall results indicated that most of the congenital groups facing problems in loud events and child state categories where most of the acquired children facing problem in equipment issues and breaks in routine categories. The whole data was incorporated in table 8 and graph 8.

Groups	Loud events	Equip-ment issues	Breaks in routine	Child state	No difficult time/situation
Congenital	26.6%	23.3%	13.4%	26.7%	10%
Acquired	20%	30%	16.7%	10%	23.3%

**Table 8:** Percentage of open - ended responses of both the group parents in specific challenges.



**Graph 8:** Representation of the percentages of open-ended responses of both the group parents in specific challenges

The current study results are in support with [13], where authors stated that hearing aid usage was in consistent early in life and became more consistent in life.

**Discussion**

The current research is a preliminary step in determining standards and benefits of hearing aid usage time, especially in

developing children. According to the authors, the benchmark for hearing aid usage time changes depending on the situation and context. When compared to the acquired group, the congenital group had higher benchmarks. This suggests that the congenital group has become accustomed to wearing amplification.

Benchmarks in various situation and the amount of duration that children used hearing aids reveals such an interesting point as; there are various hearing aid models available in the market but in this study, we used four models (Starkey, Siemens, Oticon and Resound) among these, majority of the children used Starkey and Siemens hearing aids in both the groups. Out of 60 children, 19 (31.7%) children used Starkey hearing aids, 20 (33.3%) children used Siemens, 10 (16.7%) children used Oticon, and 11 (18.3%) children used Resound hearing aids.

During the early years of life, it is crucial to use amplification by the HI children. The linguistic behaviour will also depend on the time of amplification given such as pre and post lingual deaf. In this study authors have divided duration into six categories based on the duration of the children wore in both groups. The minimum duration was 3 hours and Maximum duration was 7 hours considered. Most of the children showed interest in wearing hearing aids for 5 to 6 hours duration in congenital group whereas in acquired group children mostly wore hearing aids for lesser duration i.e. 3 to 4 hours. This indicates that the congenital group wore HA's for longer duration than acquired group which indicates that the congenital group has adapted for hearing aid usage and are convenient for using it for longer durations.

Current hearing aid usage time was divided into six categories based on the duration of the children wore in both groups. The minimum duration was 8 hours and Maximum duration was 12 hours considered. Most of the children showed interest in wearing hearing aids for 10 (33.3%) and 11 (30.3%) hour's durations in congenital group whereas in acquired group children mostly wore hearing aids for lesser duration i.e., 9 (30%) and 10 (30%) hours.

Similarly, the hearing aid use time changes during weekdays and weekends. The duration was divided into 11 categories i. e from 5 hours to 11 hours based on the children's usage. Maximum time utilized by congenital group is 7 hrs (13.3%), 9.30hrs (16.7%) and 10 hrs (13.3%) respectively whereas 7 hrs (33.3%), 8 hrs (26.7%) and 10 hrs (10%) were the maximum time used by acquired group.

The present study results showed that the duration of how much time a child can manage without using hearing aid after waking up and it was divided into four categories (from 30 minutes to 2 hours). Interestingly it reveals that 63.3% were able to manage without HAs for 30 mins, 23.3% were able to manage without HAs for 1 hr, and 13.4% were able to manage without HAs for 1.30 hrs after waking up in congenital group. Similarly in the acquired group showed 10% were able to manage without HAs for 30 mins, 63.3% Were able to manage without HAs for 1 hr, 16.6% were able to manage without HAs for 1.30 hrs and 10% were able to manage without HAs for 2 hrs after waking up. This indicates that many of the children in acquired group were able to manage without HAs after waking up for 30 mins whereas in acquired group can be able to manage for 1 hr.

The circumstances influenced the use of hearing aids, especially in children, where few are interested in wearing or refuse to wear hearing aids. The authors of the current study identified that the children in the congenital group wore HAs in a various situation such as during transport 76.6% (always), during play school/school (Q11) 100% (always), during meal time 90% (always), during play 80% (always), during book sharing 93.3% (always), during playground 80% (always) and during public places like store, zoo, restaurants etc 90% (always). This suggests that children with congenital hearing loss spend the most time wearing hearing aids during their regular activities. Whereas percentage of HA's usage time of the acquired group showed in various situations such as 16.7% (always), during play school/school (Q11) 100% (always), during meal time 13.3% (always), during play alone 13.4% (always), during book sharing 16.7% (always), during playground 13.3% (always) and during public places like store, zoo, restaurants etc. 33.3% (always).

Eventually the acquired group has reported less percentage in wearing hearing aids in different contexts which is an indicative of poor adaptability of hearing aids.

In general, neither group utilized hearing aids in the daycare setting; however, all the children used hearing aids during school hours. The congenital group wore hearing aids frequently than acquired group. This suggests that the congenital group has adapted to HA's.

During the interview, parents were asked to explain conditions or environments that made continuous HA usage difficult. Loud

events (e.g., movie theatre, church), equipment noises (e.g., feedback from HA, discomfort from ear mould), interruptions in routine (e.g., different care provider, at home on weekends, after bath time), and child state were the four types of responses (e.g., mood illness, fatigue temperament). Problems with noisy events (26.6%), equipment concerns (23.3%), breaks in routine (13.4%), child state (26.7%), and no difficult time or situation using hearing aids (10%) were reported by the congenital categories, respectively. Loud events (20%), equipment issues (30%), breaks in routine (16.7%), kid state (10%), and no difficult time or situation in wearing hearing aids (23.3%) are shown in the acquired group, accordingly.

### Conclusions

HA's utilized by CG are longer durations and HA goes time are less when compared to the AG. According to the findings of the current study, congenital children are adapted to HA's and are more accustomed to wear them at all situations. HA's used less consistently by the AG than CG. Parents reported that the problems related to equipment issues are frequently seen. The findings of the study also provided as a benchmark for the hearing aid use time. Authors stated that the usage of hearing aid time and adapting HA is critical in a child's overall development.

### Limitations

Limited sample size, compared only few hearing aids (BTE), parent rated questionnaire and restricted to qualitative analysis.

### Future Directions

Study can extend to other hearing aid models/amplification, can extend on large size population.

### Author Contribution

- Lakshmi Prasanna P: Designed, interpretation of data and drafting the paper.
- Srividya S: Reviewed data from all sites and provided interpretive analysis, provided the Supplementary Digital Content
- Naveen Mone: Collected and analysed data.

All authors contributed equally to this work. All authors discussed the results and implications and commented on the manuscript at all stages.

### Conflict of Interest

The authors declare that they have no conflict of interest

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