Assessment of Parental Self-Efficacy in Caring for Children with Hearing Impairment

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Abstract

Background: Parental self-efficacy (PSE) refers to the confidence in a parent's own competence to nurture and assist the development of their child. Higher parental self-efficacy is associated with better language and social interactions in their children. **Aim of the Study:** To assess parental self-efficacy in caring for children with hearing impairment **Subjects and Methods: Research design:** A descriptive cross-sectional design was applied. **Setting:** The study was implemented in phoniatrics, audio-vestibular units, and ENT outpatient clinic at Zagazig University Hospitals. **Subjects:** A purposive sample composed of 110 parents of hearing-impaired children. **Tools of data collection:** Two tools were relied on to collect the study data: an organized interview questionnaire and the Scale of Parental Involvement and Self-Efficacy Revised (SPISE-R). **Results:** The study presented that 84.5% of studied parents displayed relatively high self-efficacy with a total mean score of 4.71±0.64. Along with a highly statistically positive association between knowledge, confidence, and actions subdomains ($P < 0.001$). **Conclusion:** Parents of hearing-impaired children had high levels of knowledge, confidence, and actions. **Recommendation:** It is essential to provide parents with adequate education and training on hearing impairment, communication strategies, and the ling Six Sound Test with regular guidance and professional support to enhance parental confidence.

Keywords: *Parental Self-efficacy, Hearing impairment, Parents, Children*

Introduction

Parenting self-efficacy (PSE) describes a parent's belief or confidence in their ability to perform the parenting role successfully and cope with challenges to achieve desired goals **(Calicchio, 2023; Wittkowski et al., 2017).** According to **Ambrose et al. (2019),** parenting self-efficacy in caring for their hearing-impaired children refers to the beliefs, knowledge, confidence of parents, and actions pertaining to supporting their children's language development and managing the use of sensory devices.

A self-efficacy belief is defined as a personal conviction that one can successfully execute a course of action to produce the desired outcome in each situation **(Buckworth, 2017).** Beliefs are largely formed by an individual's learning through direct experience, observational learning, or information acquired from others **(Turk and Murphy, 2023).** Confidence in one's ability to perform behaviors seems to be a critical mechanism in intentional behavior change **(DiClemente et al., 2020).**

Knowledge is defined as the possession of information or the possession of the ability to locate desired information **(Millraney, 2018).** While the actions refer to any physical or mental steps taken to achieve a goal or complete a task. Knowledge is considered the fuel of confidence: the more knowledge one possesses, the more confident are likely to feel in abilities. A strong knowledge base helps dispel uncertainty and fear **(Abu Khalaf, 2024).**

As regards **Nair, Pillai and Demirbag (2021),** acting frequently results in experiential learning, which improves knowledge. By working on activities and projects, one can acquire knowledge and insights that cannot be obtained solely through theoretical comprehension. Action also boosts confidence: accomplishing tasks successfully can boost confidence **(Eisend and Tarrahi, 2022).**

The parents' beliefs regarding their capacity to assist their child's spoken language development, their ability to employ communication techniques, and their active participation in intervention have been proven to positively correlate with their child's language skills **(Williams, 2019).**

Positive self-efficacy beliefs are linked to certain parental practices that support their children's skills **(Eisenberg, 2016).** A self-inefficacious parent may possess the information but be unable to persevere because of self-doubt or family circumstances like parental depression or a lack of financial resources, whereas self-efficacious parents can apply the knowledge they have gained to a particular parental responsibility **(Glatz and Trifan, 2019).**

It could be difficult for children with hearing loss to understand and communicate in a language. Poor academic performance and social isolation are frequent consequences of disability. Accordingly, rather than ignoring their children's auditory level, parents should try to administer screening exams utilizing the Ling Six Sound Test to them daily **(Bhopal and Senan, 2022).**

The Ling six Sound Test is a quick check of a child's cochlear implant and/or hearing aid functioning, developed by Dr. Daniel Ling is based on the principle of using a range of speech sounds that spans the speech spectrum from 250 to 8000 Hz **(Crouse, 2019).** It provides a series of six card images with corresponding sounds that span the whole speech frequency spectrum. The child selects the card that corresponds to each sound **(Ondáš et al., 2022).** This test used to assess ear ability for detection (recognizing the presence or absence of sound), discrimination (determining if two or more sounds are the same or different) and identification (reproducing a sound or pointing to a picture of the sound heard), according to child age group **(Morrison, 2020).** When providing intervention services, early intervention specialists should ensure that the coaching model they employ promotes parental self-efficacy, encourages parents to be involved in their child's development, and helps parents understand their ability to influence their child's outcomes and monitor change in PSE over time **(Pellecchia et al., 2020).** By using family-centered early intervention (FCEI), evidence-based practices that provide parents with opportunities to observe, practice, and get feedback on language-development-promoting strategies through expansion and open-ended questions **(Meadan et al., 2018).**

Significance of the study

Parents of hearing-impaired children have a crucial role in facilitating their children's use of hearing aids and supporting their linguistic development. Parents who have high self-efficacy are more likely to put their knowledge and skills into action that support their children's communication during daily activities **(Eisenberg, 2016).** Higher levels of PSE have consistently been shown to be linked to a wide range of parenting and child outcomes, such as increased quality of parent-child interaction and increased parental warmth and responsiveness **(Glatz et al., 2024).** As a result of the added stress and the sensation of helplessness in caring for their disabled children, parents' self-efficacy declines **(Özdemir and Elmaoğlu, 2024).** So, the present study was implemented to assess parental self-efficacy in caring for children with hearing impairment.

Aim of the study: to assess parental self-efficacy in caring for children with hearing impairment.

Research Question:

1. What is the level of parents' self-efficacy in caring for their hearing-impaired children?
2. Is there an association between the main elements of self-efficacy?
3. What are the factors detecting a level of self-efficacy in parents of hearing-impaired children?

Research design: A descriptive cross-sectional design was applied in the present study.

Setting: The study was implemented in the phoniatrics, audio-vestibular units, and ENT outpatient clinic at Zagazig University Hospitals, Egypt.

Subjects: A total of 110 parents of hearing-impaired children who attended the prior settings made up the intentional sample. **According to the following inclusion criteria:**

Ages 4–12 years, all sexes, children with cochlear implants or hearing aids, and children without any other physical or mental disabilities.

Tools of data collection

Tool (I): An organized interview questionnaire, which was developed by the authors and includes characteristics of studied parents, hearing-impaired children, and disease history, such as consanguinity between the parents, educational level of the mother, child gender, number of siblings, type of assistive device, etc.

Tool (II) Scale of Parental Involvement and Self-Efficacy—Revised (SPISE-R):

The SPISE-R scale was adopted from **Ambrose, Appenzeller and DesJardin (2019)** which is the revised version of the SPISE **(Desjardin, 2003).** It is used to assess parents' beliefs, knowledge, confidence, and actions related to supporting their hearing-impaired children's language development and managing their use of sensory devices. The scale comprises the following subscales: the beliefs subscale (7 items), the knowledge subscale (10 items), the confidence subscale (10 items), and the actions subscale (15 items). The knowledge, confidence, and actions sections include items specific to auditory access and to facilitating spoken language development. The Actions section also includes items related to parental involvement in intervention. In the final section, parents are asked about the duration of hearing devices used by their child (e.g., number of hours used during waking hours).

Scoring system: The first four subscales (beliefs, knowledge, confidence, and actions) responses are scored on a 7-point Likert scale from 1 "not at all" to 7 "a great deal," with a midpoint of 4. In the beliefs subscale, three items (1, 2, and 4) are positively keyed, indicating higher scores are desirable. Four items (3, 5, 6, and 7) are negatively keyed, indicating that disagreement is more desirable. The negatively keyed items are reverse scored upon completion of the section. For item scores, calculate the mean score for each item based on the responses (1-7). The knowledge and confidence sections each yield three summary scores: average score for auditory access items, language development items, and the entire section. While the action section yields four summary scores: average score for auditory access items, language development items, involvement in intervention items, and for the entire section. Subscale scores were calculated by adding the item scores for

each subscale, the higher scores denoting higher self-efficacy within a domain. The total score of SPISE-R was calculated by summing the subscale scores. Higher scores indicate higher levels of parental self-efficacy, while lower scores indicate lower levels of parental self-efficacy.

Administrative and ethical considerations:

The Research Ethics Committee, Faculty of Nursing, Zagazig University (M.D. ZU NUR/229/10–6/2024), provided ethical consent. The dean of Zagazig University's faculty of nursing also issued official authorization letters, which were delivered to the directors of the hospital's ENT outpatient clinic, phoniatrics unit, and audio-vestibular unit to ask for institutional approval to collect data. Subjects' participation in the study was entirely voluntary. Prior to participation and informed consent, each participant was given an explanation of the study's purpose. At any point during the data collection process, participants were informed that they might withdraw. Participants were guaranteed that the information collected during the study would only be used for research, and the researchers maintained complete anonymity and confidentiality of the subject's data.

Pilot study

After the tools were developed and before data collection began, a pilot study was conducted on 10% of the parents under research to assess the instruments' practicality, consistency, clarity, and application as well as to ascertain how long it would take to complete them. The instruments were not altered.

Field work

As soon as the approval was obtained, data collection started from the beginning of August 2024 to the end of September 2024. Four days a week, the data was gathered between 9:00 am and 2:00 pm. Every parent was questioned separately. In order to get the parents' informed oral agreement, the researchers began by introducing themselves, outlining the goal of the study, and assuring them that the information gathered would be kept private and utilized exclusively for that purpose. The researchers read the questionnaires, explained them, and noted the responses. Each sheet took from 20 to 30 minutes to complete.

Content Validity & Reliability

The tools were assessed and revised for content validity by a team of three experts (one professor of pediatric nursing, one assistant professor of community nursing at the faculty of nursing - Zagazig University, and one professor of biostatistics at the faculty of medicine - Zagazig University). The recommended modifications were done, and the final form was ready for use. Reliability examined by Cronbach Alpha test for the SPISE-R scale was 0.89.

Statistical analysis:

Data was collected, tabulated, and statistically analyzed using the Statistical Package for the Social Sciences (SPSS), 20.0 for Windows (SPSS Inc., Chicago, IL, USA, 2011). Quantitative data were expressed as the mean ± SD, and qualitative data were expressed as absolute frequencies (number) & relative frequencies (percentage). The Pearson correlation coefficient (r) was used to evaluate the nature and strength of the association between the study variables. The sign of the coefficient indicates the nature of the relation (positive /negative), while the value indicates the strength of relation, (+) sign indicates a direct correlation, and (-) sign indicates an inverse correlation. Also values near 1 indicate a strong correlation, and values near 0 indicate a weak correlation. P-value < 0.05 was considered statistically significant, p-value < 0.01 was considered highly statistically significant. Multiple linear regression (stepwise) was also used to predict factors that affect total self-efficacy. Cronbach's alpha coefficient was calculated to assess the reliability of the scale through their internal consistency.

Results:

Table 1 revealed that 81.8% of the participating parents were mothers, the mean age of them was 33.91 ± 6.21 years, 60.9% of them finished secondary education, and 58.2% of the children' parents studied had positive consanguinity. The same table also showed that 58.2% of studied children were males compared to 41.8% who were females, and 46.4% of them had two siblings.

Figure (1) presented that 50% of the children studied used hearing aids compared to 48.2% had cochlear implants.

Table 2 clarified that 84.5% of studied parents of hearing-impaired children had relatively high total parental self-efficacy with total main scores across beliefs, knowledge, confidence, actions, and device use total sections with means (4.79, 4.68, 4.31, 4.32, and 6.25).

Table 3 illustrated how much parents share beliefs concerning auditory development/ auditory access and supporting spoken language development in their hearing-impaired children. As displayed, high mean scores of parental beliefs concerning items B1, B2, B3, B4, and B6 (6.07±1.7, 5.37±2.13, 4.67±2.25, 6.55±1.15, and 4.91±2.18, respectively), while low mean scores were demonstrated across items B5 and B7 (3.78±1.92 and 2.22±0.817, respectively).

The distribution of studied parents according to the knowledge domain was clarified in **Table 4.** As shown, the mean scores for auditory access items ranged from 2.75 to 6.52, in which the average scores for the first 4 items of knowledge (K1, K2, K3, K4) were 6.44, 6.52, 4.79, and 5.19, respectively, which refers to high knowledge scores, but the item with the lowest score was the item pertaining to how to do the Ling 6-Sound test (2.75±1.65). On the other hand, the average mean score for language development items ranged from 3.14 to 4.85. The average scores for items K6 and K9 were low (3.78 ± 1.69 and 3.14 ±1.66, respectively), while for items K7, K8, and K10, they were relatively high (4.87 ± 1.46, 4.85 ± 2.01, and 4.56 ± 2.01, respectively).

The degree to which the studied parents' confidence in their actions to develop auditory access and language development in their hearing-impaired children is demonstrated in **Table 5**. As regards auditory access items, the mean average score ranged from 2.48 to 6.34, where the mean average scores for items (C3, C4, C5) were 3.11, 3.05, and 2.48, respectively, which refer to low confidence scores. On the contrary, the mean average score was high for items C1 and C2 (5.72 ± 2.03 and 6.34 ± 1.32, respectively). In relation to language development, the mean average score ranged from 2.95 to 5.51. While the mean scores for items C6, C7, C8, and C10 were 4.78, 4.79, 5.51, and 4.38, respectively, which indicates those parents high confidence in their actions, the mean score was low for the item of sharing the books with their children in a way that helps them to communicate (2.95±1.35).

Table 6 showed the range of the mean average score for auditory access was 2.35 – 6.12, in which the mean scores for items A2, A3, A4, and A6 were 4.08, 5.52, 6.12, and 4.75, respectively, indicating that the studied parents of hearing-impaired children highly implemented these actions, but the mean scores were low for items A1, A5, and A7 (3.59, 2.93, and 2.35, respectively). On the other hand, the average mean score of language development items ranged from 2.80 to 4.49. where the average mean scores for items A8, A9, and A12 were 4.02, 4.49 and 4.22, respectively, which refer to the studied parents relatively highly implementing these actions. The mean score was low for items A10 and A11 (3.85±1.96 and 2.80±1.11, respectively). Moreover, the average mean score was relatively high for all 3 items of involvement in intervention A13, A14, and A15 (4.72, 5.76, and 5.65, respectively).

Table 7 highlighted the association between the sub-section total scores of SPISE-R, a highly significant positive association between total knowledge, total confidence, total action, and language development scores, with a highly statistically positive association between total confidence and total action, hearing device use, and language development scores ($p < 0.001$). Additionally, there is a significantly positive association between hearing device use and total knowledge ($p = 0.045$), total action ($p = 0.023$), and language development score ($p = 0.026$).

As shown in **table (8),** mother educational level and the cochlear implant type of assistive listening devices were highly statistically significant independent positive predictors of parent self-efficacy ($p = 0.001$) and ($p = 0.003$), respectively. While consanguinity between the parents, number of siblings, children's difficulties, and male child were statistically significant independent negative predictors of parents' self-efficacy.

Discussion:

The present study found that the majority of participants were mothers. Three-fifths of them finished secondary education, and over half of the children's parents studied were consanguineously married.

These findings agreed with a study performed in Kazakhstan by **Zhumabayev et al. (2022),** who found that the majority of participants were mothers. Similarly, **Gross (2022),** in his study in New York, found that approximately half of the studied mothers were between 26 and 35 years old. **Hamad, Elghmrawy and Elsharkawy (2022),** also noted that nearly three-fifths of hearing-impaired mothers had finished secondary education. Besides **khalaf et al. (2024),** in their study in Minia. found that more than half of hearing-impaired children's parents had positive consanguinity.

Concerning child gender, this research found that nearly three fifth of studied children were male. This can be explained by the fact that the mutated gene is located on the X chromosome. Since males have only one X chromosome (XY), they are more likely to be affected. **Byčkova et al. (2018); Hamad, Elghmrawy, and Elsharkawy (2022)** stated the same result.

In relation to the number of siblings, the current study found that more than two- fifths of hearing-impaired children had two siblings. This can decrease the time of parental care for hearing impaired child. This finding is in harmony with **Gross (2022),** who found that more than one third of studied children had two siblings.

Regarding the type of assistive listening devices, half of the children used hearing aids, while nearly half had cochlear implants. This can be related to lower parental levels of education, awareness and limited financial resources. These can result in delayed diagnosis, which leads to progress in severity that increases the need for advanced interventions such as cochlear implants and specialized hearing aids.

In the same vein, **Sealy, McMahon and Sweller (2023),** in their study on Australian hearing-impaired children parents, found that half of children used hearing aids.

The result of the present study clarified that more than three-quarters of participants' parents had higher levels of self-efficacy in managing their hearing-impaired children, with an overall mean average score of 4.71. This included average mean scores across the subscales of knowledge (4.68 ± 0.90), confidence (4.31 ± 0.79), actions (4.32 ± 0.85), and device use (6.25 ± 0.69). Notably, parents showed higher self-efficacy in items related to auditory access than in items related to language development.

These results can be supported by **Davenport et al. (2021)**, who demonstrated that average scores of parental self-efficacy fell on the high end of the 7-point Likert scale. Similarly, **Balakrishnan and Thangaraj (2023)**, who conducted a study to evaluate parents perceptions of self-efficacy in caring for their cochlear-implanted children, reported that most parents were able to attend therapy sessions and were aware of the goals their children were receiving and confident that they could help improve their child's listening skills development.

These findings were in harmony with **Davenport et al. (2024); Jung et al. (2023),** who found that the majority of parents had high self-efficacy across the knowledge, confidence, and actions subscale items, with parenting presented higher self-efficacy in items related to auditory access than in items related to language development.

As regards parental beliefs, the present study found that the majority of studied parents had average mean scores above the midpoint for all belief items except for items B5 and B7, which include people's judgment of the child and his family when they see him wearing their hearing aids and depending on hearing devices if they still wear them all the time. These findings suggest that, while overall parental beliefs are generally positive, some stigma and uncertainty still persist in relation to the social visibility and long-term use of hearing devices.

In contrast, **Ambrose et al. (2020); Davenport et al. (2024); Jung et al. (2023)** found that most HI children's parents showed highly efficacious beliefs for all belief items. The discrepancy may be attributed to the difference in cultural norms, parental level of education, and the degree of involvement in rehabilitation programs, which can significantly influence parental perceptions and confidence in managing their child's hearing needs.

Moreover, the results of the current study showed high variability among participants. The majority of participant parents had lower self-efficacy in areas of knowledge, confidence, and actions related to the "ling 6-sound test" item used to monitor auditory access, sharing books with their children, and making sure that the environment makes it as easy as possible to hear. This suggests that many parents may either lack sufficient guidance on how to implement the Ling 6-sound test as a daily monitoring tool for their child's hearing devices or that they may not be adequately informed about its importance and lower parental awareness about their children's requirements, which highlights the pressing need for targeted rehabilitation programs and family fostering systems.

On the contrary, previous studies found that parents of HI children demonstrated high self-efficacy related to these items scored well **(Ambrose et al., 2020; Davenport et al., 2024; Jung et al., 2023).** This might result from variation in race, socioeconomic status, educational level of parents, and availability of rehabilitation programs and social support among different countries.

The results of the present research found statistically significant relationships among all subscales of the self-efficacy scale. Specifically, total knowledge demonstrated a highly statistically significant positive association with total confidence, total actions, and language development subsection ($p<0.001$). Also, total confidence presented a strong, significant association with both total actions and language development ($p<0.001$). In addition, significant associations were observed between hearing device use and total knowledge, confidence, actions, and language development ($p=0.045$, $p=<0.001$, $p=0.023$, and $p=0.026$, respectively). These findings suggest that parents who perceive themselves as knowledgeable and confident in a particular skill, such as maintaining their child's device, are more likely to believe in their ability to effectively apply these skills at home and believe these traits are related to positive results like regular device use.

These results are supported by **García-Ventura et al. (2023)**, who showed that a high sense of competence and confidence in suggested practices is correlated with increased parental involvement in active child participation in learning and development of everyday activities.

In correspondence with this result, **Ambrose, Appenzeller and DesJardin (2020)** found that the knowledge and confidence scores were significantly correlated with action scores and hearing device use, whereas only confidence scores were significantly correlated with language scores. Along with **Jung et al. (2023)**, they showed a highly statistically significant relation among total knowledge, confidence, and actions subsections ($p < 0.001$).

The results of the current study highlighted that parental self-efficacy was significantly positively associated with higher mother educational level and the use of cochlear implants as the assistive listening device ($p=0.001$ and $p=0.003$, respectively). Conversely, PSE demonstrated statistically significant negative associations with consanguinity between parents, number of siblings, children's difficulties, and child male gender ($p=0.010$, $p=0.013$, $p=0.010$, and $p=0.048$, respectively). These findings suggest that sociodemographic and familial factors may play a critical role in shaping parents' confidence and efficacy to support their children with hearing impairments.

As supporting evidence, **Yildirim et al. (2024)**, who conducted a study on the relationship between parenting self-efficacy levels of mothers and their awareness of child abuse, revealed self-efficacy was higher among mothers who had fewer children and higher educational levels. Along with **Davenport et al. (2021),** who found that children with cochlear implant parents had higher self-efficacy than those with HA children ($p<0.001$).

Additionally, **Bingöl et al. (2023)** found that emotional and behavioral problems in children showed a strong negative correlation with parental self-efficacy. Moreover, **Glatz et al. (2024)** showed that the child's gender can predict parental self-efficacy.

In relation to consanguinity and parental self-efficacy, the observed association may be explained by the increased genetic risk for certain disorders in offspring associated with consanguinity between parents, which can indirectly influence parenting styles, potentially leading to increased stress and anxiety for parents that can impact their interactions with their children negatively.

In contrast, **Joulaie et al. (2019)** showed no difference in self-efficacy between parents of HA children and those of CI children. This can result from variation in the age at which cochlear implants and hearing devices are used and the availability of social and healthcare support across countries.

Conclusion:

Based on the results of the current study, it was concluded that the hearing-impaired children's parents had a relatively high level of parental self-efficacy, with a high level of knowledge, confidence, and actions.

Recommendations:

Providing parents with adequate education and training on HI, communication strategies, and ling Six Sound Test in addition to regular guidance and support from professionals to help parents feel more confident

Table (1): Characteristics of studied parents, and their children.

Characteristics	No.	%
Participant parent		
Mother	90	81.8
Father	16	14.5
Both	4	3.6
Mothers' age in years		
≤30	32	29.1
>30	78	70.9
Mean± SD	**33.91± 6.21**	
Educational level of mother		
Illiterate	17	15.5
Basic education	11	10.0
Secondary / diploma education	67	60.9
University education	15	13.6
Other (not work or retired)	2	1.8
Consanguinity between the parents		
Yes	64	58.2
No	46	41.8
Child gender		
Male	64	58.2
Female	46	41.8
Number of siblings		
0	2	1.8
One	32	29.1
Two	51	46.4
Three	18	16.4
Four or more	7	6.4

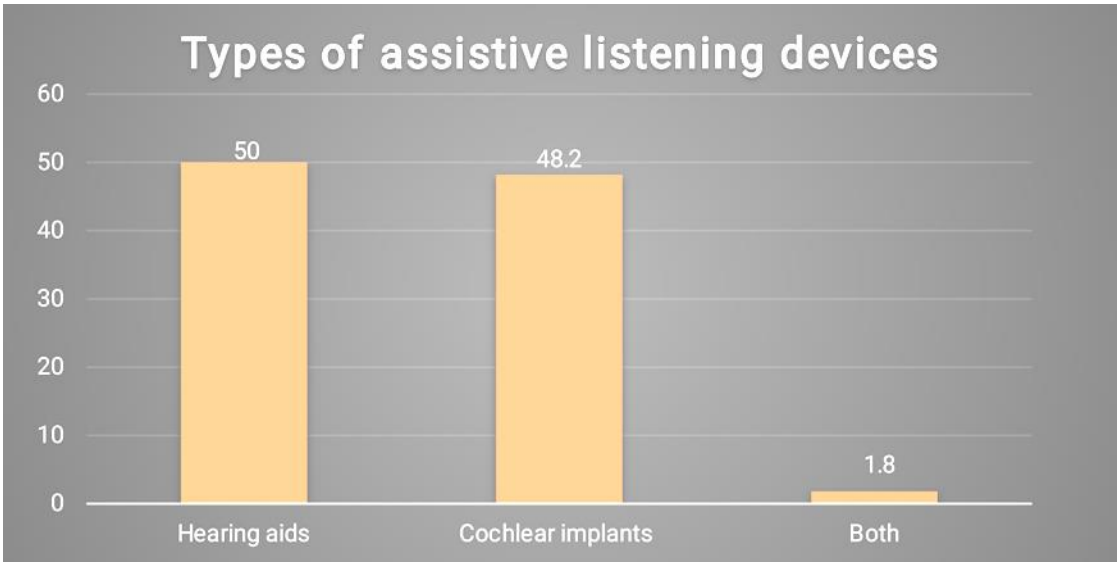

Fig 1: Types of assistive listening devices among studied children.

Table (2): Total scores of self- efficacy and its domains as reported by studied parents (n=110).

	Low		High		Mean± SD
	No.	%	No.	%	
Beliefs	19	17.3	91	82.7	4.79±0.79
Knowledge					
Auditory access	25	22.7	85	77.3	5.13±1.02
Language development	54	49.1	56	50.9	4.24±1.11
Total knowledge	30	27.3	80	72.7	4.68±0.90
Confidence					
Auditory access	60	54.5	50	45.5	4.13±0.93
Language development	40	36.4	70	63.6	4.48±0.95
Total confidence	39	35.5	71	64.5	4.31±0.79
Actions					
Auditory access	54	49.1	56	50.9	4.19±0.95
Language development	71	64.5	39	35.5	3.87±0.78
Involvement	25	22.7	85	77.3	5.37±1.43
Total actions	41	37.3	69	62.7	4.32±0.85
Device use	6	5.5	104	94.5	6.25±0.69
Total score of self-efficacy	17	15.5	93	84.5	4.71±0.64

Table (3): Distribution of the parents studied according to Beliefs domain of SPISE-R (n=110)

code	Beliefs	Not at all		Somewhat		A great deal		Mean± SD
		No.	**%**	**No.**	**%**	**No.**	**%**	
B1	If children are given the right support, they canovercome the effects of hearing loss."	12	10.9	14	12.7	84	76.4	6.07±1.7
B2	How my family talks to and interacts with my child will have a big impact on how my child develops."	25	22.7	18	16.4	67	60.9	5.37±2.13
B3	No matter what we do as a family, my child's development will be delayed compared to children with normal hearing®.	50	45.5	22	20.0	38	34.5	4.67±2.25
B4	My child's hearing devices help him/her learn to communicate	2	1.8	13	11.8	95	86.4	6.55±1.15
B5	If people see my child wearing his/her hearing device(s), they will judge my child or family®.	24	21.8	38	34.5	48	43.6	**3.78±1.92**
B6	If I keep my home too quiet, my child won't learn to listen in noise®.	54	49.1	25	22.7	31	28.2	4.91±2.18
B7	If children wear their hearing device(s) all the time, they will become overly dependent on them®.	2	1.8	7	6.4	101	91.8	**2.22±0.817**

® reversed items, indicating that disagreement is more desirable.

Table (4): Distribution of the studied parents according to knowledge domain of SPISE-R (n=110).

code	Knowledge	Not at all		Some		A great knowledge		Mean± SD
		No.	%	No.	%	No.	%	
Auditory access items								
K1	How to manage my child's hearing device(s)	4	3.6	14	12.7	92	83.6	6.44±1.32
K2	Strategies to use to keep my child's hearing device(s) on him/her	1	0.9	16	14.5	93	84.5	6.52±1.14
K3	What my child can and cannot hear without his/her hearing device(s)	30	27.3	31	28.2	49	44.5	4.79±2.12
K4	What my child can and cannot hear with his/her hearing device(s)	26	23.6	23	20.9	61	55.5	5.19±2.13
K5	How to do the Ling 6-Sound test (ah, ee, oo, m, sh, s)	88	80.0	9	8.2	13	11.8	**2.75±1.65**
Language development items								
K6	The sounds, words, or sentence types my child should be learning to say	39	35.5	53	48.2	18	16.4	**3.78±1.69**
K7	How to help my child learn to communicate	3	2.7	73	66.4	34	30.9	4.87±1.46
K8	How my child's learning is affected by his/her hearing loss	24	21.8	39	35.5	47	42.7	4.85±2.01
K9	How to share a book with my child in a way that helps him/her learn to communicate	67	60.9	30	27.3	13	11.8	**3.14±1.66**
K10	Strategies the interventionist recommends using to help my child learn to communicate	29	26.4	41	37.3	40	36.4	4.56±2.01

Table (5): Distribution of studied parents according to Confidence domain of SPISE-R (n=110).

code	Confidence	Not at all		Somewhat		Very		Mean± SD
		No.	%	No.	%	No.	%	
Auditory access items								
C1	Determine if my child's hearing device(s) are working okay	21	19.1	12	10.9	77	70.0	5.72±2.03
C2	Put and keep my child's hearing device(s) on him/her	2	1.8	21	19.1	87	79.1	6.34±1.32
C3	Help my child hear by making changes in his/her environment	64	58.2	36	32.7	10	9.1	3.11±1.54
C4	Help my child hear and understand new speech sounds or sounds in his/her environment	63	57.3	40	36.4	7	6.4	3.05±1.40
C5	Find out if my child is hearing okay by using the Ling 6-Sound test (ah, ee, oo, m, sh, s)	91	82.7	14	12.7	5	4.5	2.48±1.19
Language development items								
C6	Help my child learn to say new sounds, words, or sentences	5	4.5	73	66.4	32	29.1	4.78±1.48
C7	Help my child communicate what he/she wants and needs	3	2.7	76	69.1	31	28.2	4.79±1.42
C8	Communicate with my child in a way that is appropriate to address his/her hearing needs	1	0.9	53	48.2	56	50.9	5.51±1.53
C9	Share books with my child in a way that helps him/her learn to communicate	67	60.9	37	33.6	6	5.5	2.95±1.35
C10	Do the things I learned during intervention sessions when the professional is not there to help me	21	19.1	61	55.5	28	25.5	4.38±1.71

Table (6): Distribution of studied parents according to Actions domain of SPISE-R (n=110).

code	Actions	Never		Sometimes		Always		Mean± SD
		No.	%	No.	%	No.	%	
Auditory access items								
A1	Daily listening checks on my child's hearing device(s)	51	46.4	40	36.4	19	17.3	3.59±1.80
A2	Make sure other people caring for my child know how to manage my child's hearing devices	42	38.2	37	33.6	31	28.2	4.08±2.02
A3	Make sure I, or someone else, puts my child's hearing device(s) on immediately after he/she wakes up	5	4.5	46	41.8	59	53.6	5.52±1.65
A4	Make sure I, or someone else, puts my child's hearing device(s) on immediately if they fall off or my childtakes them off	2	1.8	29	26.4	79	71.8	6.12±1.43
A5	Make sure my child's environment makes it as easy as possible for him/her to hear	62	56.4	46	41.8	2	1.8	2.93±1.13
A6	Draw my child's attention to sounds in speech or the environment that he/she is still learning or might nothave heard	20	18.2	49	44.5	41	37.3	4.75±1.88
A7	Daily check of my child's listening with the Ling 6- Sound test (ah, ee, oo, m, sh, s)	94	85.5	14	12.7	2	1.8	2.35±0.92
Language development items								
A8	Use strategies during our daily activities to help my child learn to say new sounds, words, or sentences.	8	7.3	96	87.3	6	5.5	4.02±0.88
A9	Use strategies to help my child communicate his/her wants and needs	0	0.0	92	83.6	18	16.4	4.49±1.11
A10	Make sure other people caring for my child know how to help my child learn to communicate	47	42.7	37	33.6	26	23.6	3.85±1.96
A11	Share books with my child at least one time a day	69	62.7	39	35.5	2	1.8	2.80±1.11
A12	Use the strategies I learned during intervention sessions to help my child learn to communicate	18	16.4	72	65.5	20	18.2	4.22±1.50
Involvement in intervention items								
A13	Advocate for my child's needs in intervention sessions	28	25.5	37	33.6	45	40.9	4.72±2.05
A14	Get my child to the audiologist as soon as a visit is needed	2	1.8	42	38.2	66	60.0	5.76±1.54
A15	Attend and be involved in my child's intervention sessions (instead of having to do other things during that time, such as prepare meals or take care of siblings)	19	17.3	18	16.4	73	66.4	5.65±1.99

Table 7: Association between sub-section total scores of SPISE-R.

Scores	Total knowledge		Total confidence		Total actions		Hearing device use	
	R	P	R	P	R	P	R	P
Total knowledge								
Total confidence	0.708	<0.001**						
Total actions	0.647	<0.001**	0.731	<0.001**				
Hearing device use	0.191	0.045*	0.277	<0.001**	0.217	0.023*		
Language development Score	0 .824	<0.001**	0 .810	<0.001**	0.724	<0.001**	0 .212	0.026*

Table (8): Step wise multiple linear regression for predicting factors which affect Parental Self-efficacy.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	186.638	11.410		16.358	.000	164.020	209.256
Mother educational level	6.968	2.122	.293	3.284	0.001**	2.762	11.175
Consanguinity between the parents	-13.537	5.170	-.234	-2.618	0.010**	-23.786	-3.287
Number of siblings	-9.024	3.537	-.262	-2.551	0.013*	-16.065	-1.982
Children's difficulties	-1.320	.501	-.272	-2.636	0.010**	-2.317	-.323
Child gender	-12.504	6.212	-.208	-2.013	0.048*	-24.870	-.137
the type of assistive listening devices	28.238	8.855	.480	3.189	0.003**	10.242	46.234

*: significant (p<0.05), **: statistically highly significant (p<0.001).

References

Abu Khalaf, T. (2024) "Action," "knowledge," and "confidence". Retrieved from: https://www.linkedin.com/posts/talal-abu-khalaf-5253943a_action-knowledge-and-confidence-are-activity-7270110811522519040-CD1v (Accessed: 20 January 2025).

Ambrose, S., Appenzeller, M. and DesJardin, J. (2019) 'Scale of Parental Involvement and Self-Efficacy–Revised [Assessment Instrument]', Omaha, NE: Boys Town National Research Hospital.

Ambrose, S. E., Appenzeller, M. and DesJardin, J. L. (2020) 'Evaluating self-efficacy in parents of children with hearing loss', The Hearing Journal, 73(9), pp. 35-36.

Ambrose, S. E., Appenzeller, M., Mai, A. and DesJardin, J. L. (2020) 'Beliefs and self-efficacy of parents of young children with hearing loss', Journal of early hearing detection and intervention, 5(1), p. 73.

Balakrishnan, S. and Thangaraj, M. (2023) 'Parental Perception of Self-Efficacy for the Rehabilitation of Children with Cochlear Implantation', Indian Journal of Otolaryngology and Head & Neck Surgery,

75(3), pp. 2112-2117
Bhopal, P. K. R. S. and Senan, N. (2022) 'Hearing Screening Test Mobile Games Application for Kids', Applied Information Technology and Computer Science, 3(1), pp. 33-46.
Bingöl, H., Taşar, N., Bümen, Ş. and Günel, M. K. (2023) 'The relationship between emotional and behavioral problems, and parent-child interaction and parental self-efficacy in children and adolescents with cerebral palsy', Medical Science and Discovery, 10(6), pp. 385-392.
Buckworth, J. (2017) 'Promoting Self-Efficacy for Healthy Behaviors', ACSM's Health & Fitness Journal, 21(5).
Byčkova, J., Simonavičienė, J., Mickevičienė, V. and Lesinskas, E. (2018) 'Evaluation of quality of life after paediatric cochlear implantation', Acta Medica Lituanica, 25(3), p. 173.
Calicchio, S. (2023) Albert Bandura and the Self-efficacy Factor: A Journey into the Psychology of Human Potential Through the Understanding and Development of Self-efficacy and Self-esteem. Italy: Stefano Calicchio.
Crouse, S. (2019) Using the Ling 6 Sounds with Children with Hearing Loss. Retrieved from: https://www.stacycrouse.com/post/using-the-ling-six-sound-test-with-children-with-hearing-loss (Accessed: 10 October 2024).
Davenport, C., Houston, D., Bowdrie, K. and Frush Holt, R. (2021) 'The role of early intervention in parental self-efficacy for parents of deaf and hard-of-hearing children', Journal of Early Hearing Detection and Intervention, 6(1), pp. 38-47.
Davenport, C. A., Smolen, E., Castellanos, I., Dirks, E. and Houston, D. M. (2024) 'Parental self-efficacy and early language development in deaf and hard-of-hearing children', The Journal of Deaf Studies and Deaf Education, 30(1), pp. 31-40.
Desjardin, J. L. (2003) 'Assessing parental perceptions of self-efficacy and involvement in families of young children with hearing loss', Volta Review, 103(4).
DiClemente, C. C., Holmgren, M. A., Rounsaville, D., Corno, C., Graydon, M., Knoblach, D. and Wiprovnick, A. (2020) Relapse Prevention and Recycling in Addiction, in Johnson, R. A. (ed.) Addiction Medicine: Science and Practice. 2nd edn. Elsevier Inc. pp. 553-565.
Eisenberg, L.S. (2016) Empowering Families of Children with Cochlear Implants: Implications for Early Intervention and Language Development. In: Clinical Management of Children with Cochlear Implants. Plural Publishing, Incorporated., USA.P. 519.
Eisend, M. and Tarrahi, F. (2022) 'Persuasion knowledge in the marketplace: A meta-analysis', Journal of Consumer Psychology, 32(1), pp. 3-22.
García-Ventura, S., Mas, J., Balcells-Balcells, A., Dunst, C. J. and Cañadas, M. (2023) 'Early childhood intervention practitioners' competence and confidence appraisals using recommended practices and relationship with parent involvement', Anales de Psicología/Annals of Psychology, 39(3), pp. 415-424.
Glatz, T., Lippold, M., Chung, G. and Jensen, T. M. (2024) 'A systematic review of parental self-efficacy among parents of school-age children and adolescents', Adolescent Research Review, 9(1), pp. 75-91.
Glatz, T. and Trifan, T. A. (2019) 'Examination of parental self-efficacy and their beliefs about the outcomes of their parenting practices', Journal of Family Issues, 40(10), pp. 1321-1345.
Gross, O. (2022) The Relationship Among Birth Order, Parenting Stress, and Perceived Social Support in Mothers of Young Children with Hearing Loss. Hofstra University.
Hamad, N. I., Elghmrawy, L. E. and Elsharkawy, A. A. (2022) 'Living with children having hearing impairment: correlation between obstacles experienced by mothers and their coping strategies', Egyptian Journal of Health Care, 13(1), pp. 1117-1141.

Joulaie, M., Zamiri Abdollahi, F., Darouie, A., Ahmadi, T. and Desjardin, J. (2019) 'Maternal perception of self-efficacy and involvement in young children with prelingual hearing loss', Indian Journal of Otolaryngology and Head & Neck Surgery, 71(1), pp. 48-53.
Jung, J., Jeon, E. K., Kim-Lee, Y. and Pae, S. (2023) 'Parental Self-Efficacy and Involvement in Early Intervention for Young Children with Hearing Loss', Communication Sciences & Disorders, 28(2), pp. 354-371.

Khalaf, Z., El-Badry, M. M., Zaki, E. A., Ali, D. M., Shahin, F. W., Taha, A. M. and Abd El Wahab, M. M. (2024) 'Language development in sensorineural hearing loss children using hearing aids', Minia Journal of Medical Research, 35(2), pp. 1-8.

Meadan, H., Douglas, S. N., Kammes, R. and Schraml-Block, K. (2018) "'I'm a Different Coach with Every Family": Early Interventionists' Beliefs and Practices', Infants & Young Children, 31(3).

Millraney, L. (2018) Differentiating Between Learning, Knowledge, Performance, Memory & Cognition. Retrieved from: https://study.com/academy/lesson/differentiating-between-learning-knowledge-performance-memory-cognition.html (Accessed: 20 January 2025).

Morrison, H. M. (2020) Speech acoustics and auditory verbal therapy, in Morrison, H. M., MacIver-Lux, K. and Estabrooks, W. (eds.) Auditory-verbal therapy. United states: Plural publishing, incorporated. pp. 269- 302.

Nair, S. R., Pillai, K. G. and Demirbag, M. (2021) 'Reaping benefits from knowledge transfer–the role of confidence in knowledge', Journal of Knowledge Management, 25(5), pp. 1059-1080.

Ondáš, S., Pleva, M., Juhár, J., Kiktová, E., Zimmermann, J. and Šoltésová, V. (2022) 2022 12th International Conference on Advanced Computer Information Technologies (ACIT). 26-28 Sept. 2022.

Özdemir, S. and Elmaoğlu, E. (2024) 'The correlation between self-efficacy, care burden, and hopelessness of mothers with medical technology-dependent children: Medical Technology-Dependent Children', Journal of Medical Science, 93(3), pp. e1099-e1099.

Pellecchia, M., Beidas, R. S., Mandell, D. S., Cannuscio, C. C., Dunst, C. J. and Stahmer, A. C. (2020) 'Parent empowerment and coaching in early intervention: study protocol for a feasibility study', Pilot Feasibility Stud, 6, p. 22.

Sealy, J., McMahon, C. and Sweller, N. (2023) 'Parenting deaf children: exploring relationships between resolution of diagnosis, parenting styles and morale, and perceived child vulnerability', Journal of Child and Family Studies, 32(9), pp. 2761-2775.

Turk, D. C. and Murphy, T. B. (2023) Psychosocial and Psychiatric Aspects of Chronic Pain, in Benzon, H. T., Rathmell, J. P., Wu, C. L., Turk, D. C., Argoff, C. E., Hurley, R. W. and Chadwick, A. L. (eds.) Practical Management of Pain. 6th edn. Elsevier Inc., pp. 159-172.

Williams, A. A. (2019) 'Parents' Perspectives on Early Intervention for Children with Speech and Language Delays'. Retrieved from: https://egrove.olemiss.edu/cgi/viewcontent.cgi?article=2064&context=hon_thesis (Accessed: 10 January 2025).

Wittkowski, A., Garrett, C., Calam, R. and Weisberg, D. (2017) 'Self-report measures of parental self-efficacy: A systematic review of the current literature', Journal of child and family studies, 26, pp. 2960-2978.

Yildirim, O. O., Hendekti, A., Eren, D. C. and Avci, I. A. (2024) 'The Relationship Between Parenting Self-Efficacy Levels of Mothers and their Awareness of Child Abuse: A Descriptive Study', International Journal of Caring Sciences, 17(3), pp. 1811-1819.

Zhumabayev, R., Zhumabayeva, G., Kapanova, G., Tulepbekova, N., Akhmetzhan, A. and Grjibovski, A. (2022) 'Quality of life in children with cochlear implants in Kazakhstan', BMC pediatrics, 22(1), p. 194.