DEVELOPMENT OF QUALITY OF LIFE QUESTIONNAIRE IN ENGLISH AND KANNADA FOR CHILDREN USING HEARING DEVICES

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CERTIFICATE

This is to certify that this dissertation entitled **"Development of Quality of Life Questionnaire in English and Kannada for Children Using Hearing Devices"** is a bonafide work submitted in part fulfillment for degree of Master of Science (Audiology) of the student Registration Number: 19AUD040. This has been carried out under the guidance of a faculty of this institute and has not been submitted earlier to any other University for award of any other Diploma or Degree.

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CERTIFICATE

This is to certify that this dissertation entitled "**Development of Quality of Life Questionnaire in English and Kannada for Children Using Hearing Devices**" has been prepared under my supervision and guidance. It is also being certified that this dissertation has not been submitted earlier to any other University for the award of any other Diploma or Degree.

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DECLARATION

This is to certify that this dissertation entitled **"Development of Quality of Life Questionnaire in English and Kannada for Children Using Hearing Devices"** is the result of my own study under the guidance of Dr. Geetha. C, Reader in Audiology, Department of Audiology, All India Institute of Speech and Hearing, Manasagangothri, Mysuru and has not been submitted earlier to any other University for award of any other Diploma or Degree.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

This

Dissertation is

dedicated to my

dearest Nani,

Syeda

Akhtarunnisa.

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Abstract

Aim and objectives: *The goal of the present study was to develop a detailed condition-specific quality of life questionnaire in English and Kannada for children in India (aged 3 to 16 years) who use hearing devices.* ***Method:*** *The questionnaire was developed using two phases. The questionnaire was divided into three main domains: physical functioning, psychological functioning, and social functioning. Then questions were finalized in English after content validation by experts and parents of children with hearing impairment. It was translated in Kannada using the widely acknowledged American Association of Orthopedic Surgeons (AAOS) guidelines.* ***Results:*** *The results of the content validation revealed that the developed questionnaire was contextually relevant. With the help of experts, a 29-item English questionnaire was developed, which was then translated to obtain a Kannada version.* ***Conclusion:*** *In conclusion, a clinician would be able to effectively evaluate how a child's quality of life is affected by their hearing loss with the help of the questionnaire developed oin the current study.*

Chapter 1

Introduction

There are almost 34 million children affected by hearing loss worldwide (World Health Organization, 2020). Most children suffer from congenital hearing loss of a severe to profound degree (Sanderson et al., 2014). Congenital hearing loss significantly affects their oral language development, experiential learning, behavioral and social development (Carney & Moeller, 1998; Holt, 1994; Lin & Niparko, 2006). Difficulty in communication can significantly impact everyday life, causing feelings of loneliness, isolation, and frustration. These problems may continue to occur in adolescence and adulthood. Thus, work prospects, relationships, and long-term quality of life (QoL) may be impaired if hearing loss is not managed appropriately at an early age (Looi et al., 2016).

Early auditory rehabilitation provided through hearing devices enables children to substantially improve their verbal language learning and integrate (Holt,1994; Carney & Moeller,1998; Lin & Niparko, 2006) into the hearing world (World Health Organization, 2020). There are many reports on improvement in auditory, speech, and language skills when managed early in life. While these skills are commonly assessed to monitor the progress after fitting hearing device/s, other domains such as self-esteem, cognitive, psychological, psycho-social, and educational and vocational performance domains are not routinely evaluated (Looi et al., 2016).

In addition, a thorough investigation of these other facets of life is not only crucial for parents and doctors but also for the establishment of health policies (Matza et al., 2004), enabling proper resource allocations to meet the various social needs, service systems and specific interventions of this community (Bess et al., 1998). Hence, it is important to include quality of life (QoL) measurements to obtain a holistic view on the outcome (Looi et al., 2016)

QoL is a multi-dimensional construct that focuses on the impact of a health condition and associated rehabilitation on their health, well-being, or functioning concerning physical, psychological, and social aspects of life (Eiser & Morse., 2001). QoL is a subjective measurement that is influenced by cultural, social, and environmental factors (WHO, 1998; Looi et al., 2016).

It is possible to measure the quality of life using either generic or condition-specific instruments. The former assesses general health and well-being and can be administered for 'normal' populations and different health conditions (Edwards et al., 2012). Condition-specific (or disease-specific) tools are administered to a population with a specific condition. Generic tests may lack the sensitivity and specificity to recognize changes that are unique to a specific condition or intervention in a person's QOL. For example, hearing-specific measures can help track and understand clinically significant changes due to hearing loss or hearing intervention (Looi et al., 2016)

The tools that have been widely used in literature for measuring the QoL outcomes in individuals with hearing impairment include Paediatric quality of life inventory (PedsQoL) (Varni et al., 1999), Glasgow children's benefit inventory (Kubba et al., 2004), KINDLr (Bullinger, 1994), Nijmegen Cochlear Implantation Questionnaire (NCIQ) (Hinderink et al., 2000), Hearing Environments and Reflection on Quality of Life (HEAR-QL) (Umansky, 2011) and Children using Hearing Devices Quality of Life (CuHDQOL) (Looi et al., 2016; Sanderson et al., 2014).

There are a few studies on QoL in individuals using cochlear implants (Archbold et al., 2002; Incesulu et al., 2003; O'Neill et al., 2004; Damen et al., 2007; Archbold et al, 2008, Huttunten et.al, 2009; Edwards et al., 2012). Using generic HRQL measures such as the KINDLR, it was found that the self-ratings of HRQL in 8 to 12 year old children with cochlear implants were significantly lower than hearing children's scores. Parent-proxy ratings of HRQL were significantly higher than their child's self-ratings (Lin & Niparko, 2006) in this age group. There was no difference between self-ratings, parent ratings, and hearing children's scores in older cochlear implant users (aged between 13 to 16 years) (Huber, 2005).

Studies have specifically explored QoL in children with cochlear implants since Lin and Niparko's study in 2006. A cochlear-implant-specific questionnaire with 13 items covering communication, social, academic, and friendship realms was used by Schorr et al. (2009). They found that children aged between 5-14 years showed high levels of benefit from their cochlear implant, resulting in a very high QoL level (Edwards et al., 2012).

Another study compared the child reported PedsQL generic core scales (GCS) and well-being scale (WBS) scores the CI and HA groups, significant differences were observed for the physical functioning subscale as well as the total scores, with the children using CIs giving lower scores than the children using HAs. One possible reason for significantly lower physical functioning scores from the former group may be that children with implants are less likely to participate in sporting activities than their HA peers (Looi et al., 2016).

There were no significant differences when the parent-report GCS and WBS scores were compared between the HA and CI groups. However, for the family impact module (FIM), parents of children using HAs provided higher scores than parents of children using CIs across all subscales and the total score, with the difference for the parental functioning subscale being statistically significant (Looi et al., 2016).

1.1 Need for the study

Quality of life assessment in children using hearing devices is of utmost importance, as it has already been established that hearing loss affects the child's overall well-being (Carney & Moeller, 1998; Holt, 1994; Lin & Niparko, 2006). Initial delays in speech and language development lead to poorer communication, resulting in lower levels of social interaction, poorer academic performance, feelings of isolation, and low self-esteem, which may subsequently manifest into behavioural, socio-emotional, or learning difficulties. When unaddressed, these issues may continue well into adulthood and cause more significant problems in the daily lives of individuals with hearing impairment. It is imperative that a measure such as QoL questionnaire is administered along with routine clinical speech, language, and audiological evaluations to prevent this (Looi et al., 2016).

Various studies assess the quality of life in children using hearing devices (Almeida et al., 2015; Amonoo-Kuofi et al., 2015; Dev et al., 2019; Huber, 2005b; Lin & Niparko, 2006; Warner-Czyz et al., 2011). However, most QoL assessments are designed for children over eight years of age due to restricted language and cognitive abilities in younger children (Cremeens et al., 2006; Hendriksma et al, 2020).

In addition, a vast majority of these studies have been carried out using generic QoL questionnaires like 'The Pediatric Quality of life inventory '(PedsQL), Glasgow children's benefit inventory, KINDLR, instead of condition-specific questionnaires. These generic questionnaires may fail to tap into condition-specific changes in the quality of life of children using hearing devices, and hence a condition specific questionnaire is necessary to obtain accurate data on the quality of life of these individuals. Generic instruments are more broad in scope and application, whereas disease-specific instruments are more focused on a single ailment and aim to describe its consequences on daily functioning and well-being. From a clinical standpoint, evaluating the advantages of hearing device use using illness-specific HRQoL instruments is appealing since they are highly responsive to interventions tailored to manage a specific disease or problem (Deyo & Patrick, 1989). Meanwhile, evaluating the benefits of hearing devices with generic HRQoL instruments is a timely endeavor, because there is increased emphasis on their use across a broad range of health-related disciplines..(Chisolm et al., 2015).

There are currently very few hearing-specific QOL interventions for children in the clinical setting and, in particular, for children using hearing aids or cochlear implants (CIs) (Looi et al., 2016). A small number of studies in India have focused on assessing the quality of life of children using hearing devices. One such study was carried in Bangalore, where the researchers administered Glasgow children's benefit inventory on children using CI. It was found that cochlear implantation led to improved QoL among Indian children. More significant improvements were associated with earlier implantation, supporting early intervention in children with profound hearing loss (Dev et al., 2019). The results were in accordance with previous studies conducted in Western populations, including the US and UK (Dev et al., 2019; Loy et al., 2010). However, Glasgow children's benefit inventory does not consider various influencing factors such as cultural diversity, language diversity, poor socio-economic conditions etc., that play a role in India but are not relevant to the UK, USA, and other western countries.

The few condition-specific questionnaires that are available in literature like the HEAR-QL (Umansky, 2011; Streufert, 2008), CuHDQOL (Looi et al., 2016; Sanderson et al., 2014) cannot be directly used or translated in the Indian population as previous research indicates a strong influence of cultural, social and environmental factors on the QoL outcomes.

India is a land of diverse languages and culture, which varies from one region to the other, this presents us with several socio-cultural factors which can affect rehabilitation outcomes. Standardized hearing-related QoL questionnaires are rarely available in India. In addition, there is a dearth of studies in literature that have explored the QoL of life of children with hearing impairment post rehabilitation in the south Indian region. There are currently no systematically developed questionnaires for assessing Quality of Life outcomes in Kannada that may be used in clinical or research settings. Hence, there arises a definite need to develop a questionnaire to determine the QOL of children using hearing devices in the Indian context.

1.2 Aim of the Study

Hence, the present study aimed to develop a detailed condition-specific quality of life questionnaire for children (aged 3 to 16 years) using hearing devices in the Indian context in English and in Kannada.

1.3 Objectives of the Study

- To develop a quantifiable QoL instrument for children using hearing devices in English.
- To translate the developed QoL questionnaire in Kannada.

Chapter 2

Review of Literature

Hearing loss is a major health problem and is associated with several negative outcomes such as difficulties in communicating and poor quality of life (Brodie et al., 2018). In recent times, there has been an increased interest in understanding the impact of hearing device usage on the quality of life of children with hearing impairment (HI). This chapter focuses on studies that have attempted to understand the impact of hearing device use on the physical, psychological, and social well-being of children with HI.

Both hearing aids (HAs) and cochlear implants (CIs) are well-established treatment methods for children with different levels of hearing loss (HL) (Spahn et al., 2003; Lejeune & Demanez, 2006; Kraaijenga et al., 2016). Multiple studies show that children benefit substantially from bilateral HAs, bilateral CIs, and bimodal stimulation (CI and contralateral HA) and improve in speech recognition in noisy environments and in sound localization (Ching et al., 2006; Firszt et al., 2008; Pérez-Mora et al., 2012)

However, most earlier studies focused primarily on measuring the clinical efficacy of these treatments, and their results thus represent only a small portion of the effects that HAs and CIs have on the lives of children and their families(Incesulu et al., 2003; Nicholas & Geers, 2003). The evaluation of treatment success includes not only objective measures of speech perception and production, but also subjective changes in auditory, language, and educational skills, as well as in quality of life (QOL) (Kelsay & Tyler, 1996).

2.1 Quality of life of children using hearing devices

There are few reports on the QOL or health-related quality of life (HRQL, a medical definition of QOL) of children with HL; these reports are usually based on poorly validated questionnaires (Lassaletta et al., 2005) and only occasionally refer to normal-hearing (NH) children (Huber, 2005).

Chmiel et al. (2000) conducted a research study with 11 parent-child dyads to describe the quality of life changes of children with cochlear implant. The children's ages ranged from 6 to 20 years. The authors employed a self-made instrument that included questions about the benefits and drawbacks of cochlear implantation, as well as items about the child's social activities and behavior. The instrument hasn't been validated, and there aren't any normative data to compare the results to. A modified version of the parent questionnaire was used to assess the youngsters. According to the authors, the children reported great increases in their quality of life and only minor side effects from the cochlear implant. When compared to the responses of the parents, it was discovered that the children and parents had extremely comparable responses. There were differences in the assessments of two items: the children rated "making new friends" more favorably than their parents and "peer acceptance" less positively.

Nicholas and Geers (2003) published the results of a study including 181 children with cochlear implants and their parents. The impact of cochlear implants on family life and child development was investigated, and the children were asked about their perceptions of self-competence. The children perceived themselves as competent and well-adjusted in many facets of daily life in this regard. There was a significant level of agreement between children's and parents' assessments of the child's social adjustment. It's worth noting that parents' judgments of social adjustment for children in private schools were higher than those for children in public schools. The authors conclude that children who have had their cochlear implants for 4 to 6 years have shown effective coping with social and school challenges. The authors also state that the role of the cochlear implant in these findings is unknown, and that more research with control groups is needed.

Huber (2005) assessed QoL of 29 cochlear-implanted children aged 8–16 years, by interviewing the children and their parents using a general HRQoL instrument that is well validated for hearing children (KINDL). The author also compared the results to those of a normative hearing sample available at these ages. The clinical younger group (8 to 12 years) had a significantly lower self-perceived HRQoL than the hearing children. The findings for the parents of this younger group differed from those of the children because the parents rated their children's HRQoL higher. As a result, there was little agreement between the ratings of parents and children. The results for the elder group (13 to 16 years) were comparable to the hearing normative group's results. The small sample size and the lack of verification as to whether the youngsters actually understood the survey items are the study's weaknesses.

Schorr et al. (2009) investigated the relation between HRQoL and speech perception and emotional understanding in 37 cochlear-implanted children aged between 5 and 14 years. The results showed that a high level of benefit from their cochlear implant and few major difficulties in their cohort of implanted children, however only on a descriptive level. There are no associations between HRQoL and children's speech perception, however, there is a strong correlation with the emotional identification test, according to the findings. The authors also demonstrated that improvement in life quality is dependent on the age of amplification with hearing aids and the time since cochlear implantation, rather than the age at implantation. This viewpoint is backed by a study by Szagun (2008) on the language results of a large group of German cochlear implanted children, which clearly demonstrates the impact of the length of time the cochlear implant has been in place rather than the age at implantation.

Research on HRQoL was undertaken by Warner-Czyz et al. (2009) with a group of very young cochlear-implanted children. They used a well-validated HRQoL measure to assess 50 cochlear-implanted children aged 4 to 7 years in their case-control research (Kiddy KINDL). The study had two control groups: one with 45 parents of the implanted children and the other with 25 normal hearing children in the same age range as the implanted children. As previously indicated, the implanted children evaluated their HRQoL higher than their parents, but there were no differences in HRQoL between these children and their hearing peers. The HRQoL of the implanted children did not correspond with implantation age, while the length of time since the cochlear implant linked strongly with chronological age. The authors believe that the young age of the children in this study contributed to this outcome, as the children may not have fully comprehended all of the survey items.

Keilmann et al. (2007) describe a study including 131 hearing impaired students aged 6 to 11 years old who attended either a mainstream (N = 53) or a special school for the deaf (N = 78) school, with 17 of the students having a cochlear implant. When the hearing-impaired group's data was compared to the normative hearing sample as a whole, there were essentially no significant variations in the overall score for the self-concept scales or the subscales. Students in mainstream classrooms and students in special classes both scored lower on the assertiveness subscale, while the special classes group also scored lower on the cognitive ability subscale. When the two groups of hearing-impaired pupils were compared, further significant disparities emerged. Total happiness, mood, sensation of fear, assertiveness, and manners were all considerably higher in mainstreamed pupils, with comparable patterns in the recognized by others and cognitive ability categories. recently no clear and complete picture of hearing-impaired students' quality of life. This could be due to the numerous elements that play a role in the development of quality of life and present in varied degrees in study designs (or have yet to be accounted for). As a result, more research on this topic is essential.

To summarize, the above literature emphasizes on the importance of assessing the quality of life of children who use hearing devices. Most QoL assessments are designed for children over eight years of age. The literature review also shows different studies have used different QoL tools. The next section focuses on the existing QoL tools and their pros and cons.

2.2 Questionnaires available for assessing quality of life of individuals with hearing impairment

Measuring HRQL in children is complicated due to conceptual, methodological, and developmental issues: on the one hand, an appropriate instrument for measuring all domains of HRQL that are relevant to the target population is required(Pérez-Mora et al., 2012). Table 2.1 gives a summary of the available, generic and condition specific questionnaires that are commonly used to measure the QoL of children with hearing impairment.

Table 2.1

Questionnaires available for assessing quality of life of individuals with hearing impairment

Sl. No	Questionnaire	Target Population	Respondents	Age Range	Authors
1.	Pediatric Quality of Life Inventory (PedsQL)	For chronically ill children	Parent and child	2 to 18 years	Varni et al., 1999
2.	Glasgow children's benefit inventory	Children who have undergone otolaryngologic surgical intervention	Parent	< 18 years	Kubba et al., 2004
3.	Children Using Hearing Implants Quality of Life Questionnaire	Children using hearing devices	Parent	2 to 18 years	Sanderson et al., 2014
4.	KINDLR	For chronically ill children	Parent and child	3 to 18 years	Bullinger, 1994
5.	Hearing Environments and Reflection on Quality of Life (HEAR-QL)	Children using cochlear implant	Child	7 to 12 years	Umansky, 2011
6.	Hearing Related Qol Measurement For Children and Adolescents	For children and adolescents using hearing aids and FM systems	Child	7 to 17 years	Streufert, 2008

7.	Nijmegen Cochlear Implant Questionnaire	Adults using cochlear Implant	CI recipient	>18 years	Hinderink et al., 2000

2.3 Summary and critical analysis of questionnaires available in literature

2.3.1 Generic Questionnaires

2.3.1.1 Pediatric Quality of Life Inventory (PedsQL). This questionnaire was developed by Varni et al., 1999. It is a validated 23 item, generic, child-report, health related QoL questionnaire, which has four subscales namely, i) Physical (8 items), ii) Emotional (5 things), iii) Social (5 items), and School (5 items).

This scale is used to evaluate a child's performance across physical, emotional, social and academic domains. It makes use of a 5 point Likert rating scale, ranging from "never" (1) to always" (5). Using the response options "never", “almost never”, “sometimes”, “often”, or “always”, children are asked to rate how frequently each item has been a problem for them in the last month. The PedsQL questionnaire is available for parents and children across different age groups (from 5 to 7 years, 8 to 12 years, and 13 to 18 years). Scores are converted with 1=100, 2=75, 3=50, 4=25, and 5=0 points. Higher scores indicate higher perceived QOL.

Advantages: It is a multidimensional, valid and reliable, parent and self -report of children’s health related quality of life (Varni et al., 1999).

Disadvantages: It is a generic health related quality of life measure which was primarily developed for chronically ill children, and hence, does not cover QoL domains that are specific to children using hearing devices.

2.3.1.2 Glasgow children’s benefit inventory. This questionnaire was developed by Kubba et al., 2004. It is a validated assessment tool that was developed to measure the generic, health related benefit for children after an otorhinolaryngological intervention. This questionnaire was designed to be filled by either parents or caregivers on behalf of children. It retrospectively evaluates the subjective effects of an otorhinolaryngological intervention on a child's day-to-day life. The GCBI is a 24-item inventory which assesses 4 domains, namely, i) Emotion, ii) Physical health, iii) Learning, and iv) Vitality.

Each item is graded on a 5-point Likert scale ranging from –2 to + 2, where: –2 = much worse; –1 = a little worse; 0 = no change; +1 = a little better; and + 2 = much better. Following that, the scores are transformed to a summary score ranging from –100 to +100, with a negative number indicating poorer QoL and a positive number indicating improved QoL.

Advantages: It is a valid and reliable tool to assess QoL changes in the pediatric population after surgical otorhinolaryngological intervention.

Disadvantages:

i. This questionnaire does not account for changes in QoL after non-surgical interventions.
ii. This questionnaire only gives a basic idea about the child's QoL but fails to tap into condition specific factors that could affect changes in the QoL of children using hearing devices.

2.3.1.3 KINDLR. This questionnaire was developed by Bullinger, 1994, for children in the age range of 4 to 16 years. Three self-reporting questionnaires for children and two proxy (someone authorized to act on behalf of someone else) questionnaires for parents are included in this questionnaire.

The Kiddy-KINDL for children in the age range of 4 to 7 years, the Kid-KINDL for children aged between 8 to 12 years, and the Kiddo-KINDL for teenagers in the age range of 13 to 16 years are the self-reporting questionnaires. The Kiddy-KINDL for parents of children aged between 4 to 7 years and the Kid/Kiddo-KINDL for parents of children aged between 8 to 16 years are the two proxy questionnaires for parents. Physical well-being, emotional well-being, self-esteem, family, friends, and everyday functioning are among the six dimensions included under the KINDLr questionnaires (school).

There are 24 items on a five-point Likert scale in the Kid and Kiddo surveys for parents and children. To adapt the questionnaire to younger children, the version for 4 to7-year-old children comprises of 12 items based on a three-point Likert scale. Each dimension was given a score, as well as a total score for the complete questionnaire (KINDL-total QOL). The results were converted to a 0-100 scale, with 0 being the lowest and 100 being the highest HRQL score.

Advantages: It is a widely accepted, reliable and comprehensive QoL tool that can measure the changes in the quality of life of children across different age groups, through self -report and parent proxy questionnaires.

Disadvantages:

> It is a generic health-related quality-of-life measure that was designed primarily for chronically ill children and hence does not include QoL domains that are unique to children who use hearing devices.

2.3.2 Hearing specific questionnaires

2.3.2.1 Children Using Hearing Devices Quality of Life Questionnaire. This questionnaire was developed by Cochlear, in collaboration with Sanderson et al., 2014. It is a 25 item, parent report hearing specific quality of life questionnaire, which was developed as part of a registry based study (Sanderson et al., 2014).

The questionnaire is divided into three sections, namely, i) Parental Expectations, ii) Impact on the Family, and iii) Quality of Life of the Child. Self–reliance, well-being and happiness, social functioning, general functioning, parental stress, and family cohesion are the domains covered by this questionnaire.

Each item is graded on a 5-point Likert scale ranging from 0 to 40 = strongly disagree, 1 = disagree, 2 = unsure, 3 = agree, and 4 = strongly agree. The option N/A (i.e., not applicable) was available for situations that did not apply to the HI child (e.g., questions on schooling which were not applicable for children who had not started attending school).The scores were later transformed into a 0-100 scale, similar to PedsQL (Valerie Looi et al., 2016). Negative voiced questions were assessed in the reverse order, with a higher score indicating a more positive answer.

Advantages:

i. It is a reliable, validated and hearing specific measure available for Hearing impaired children using hearing devices.
ii. CuHDQOL provides a comprehensive yet clinically realistic assessment of both HI children and their parents' well-being (Valerie Looi et al., 2016).

Disadvantages:

The questionnaire does not assess the changes in QoL across different situations like at school, with friends, in the neighborhood, public places.

2.3.2.2 Hearing Related QoL Measurement for Children and Adolescents. This questionnaire was developed by Streufert, 2008. It is a condition specific, self–report questionnaire, developed for children and adolescents using hearing aids and FM systems. This questionnaire is available in 2 different versions, one for children (7 to 12 years) and one for adolescents (> 12 to 17 years). The children's version of the questionnaire consists of 35 items whereas the adolescent version is comprised of 47 questions. The questions were include under the following domains, i) Physical, ii) Emotional, iii) Social, iv) School/Education, and v) Overall well-being/ Future. A three-point Likert rating scale was provided for each question in both the versions.

Advantages:

i. This questionnaire considered age appropriate focus groups for the development of the questionnaire.
ii. It is a comprehensive questionnaire, which covers all domains that affect the QoL of children and adolescents using hearing aid and cochlear implants.

Disadvantages: The questionnaire cannot be used to assess the QoL of children using other devices such as cochlear implants, bone anchored hearing aids and middle ear implants.

2.3.2.3 Hearing Environments and Reflection on Quality of Life (HEAR-QL). This questionnaire was developed by Umansky, 2011. It is a self-report, hearing specific quality of life instrument, developed for children using cochlear implants. The number of items varies based on the different versions of the questionnaire; the original HEAR-QL consists of 45 items. Shorter versions of the questionnaire are also available, namely, HEAR-QL35 and HEAR-QL28, consisting of 35 and 28 items respectively.

Children were asked to rate how often each item was a problem in the previous month using the following response options: "never" (1), "nearly never" (2), "occasionally" (3), "often" (4), or "often" (5).Scores are converted as1=100, 2=75, 3=50, 4=25, and 5=0 points, with higher scores indicating higher perceived QOL. The Critical analysis of this questionnaire could not be carried out due to unavailability of required data.

2.3.2.4 Nijmegen Cochlear Implant Questionnaire (NCIQ). This questionnaire was developed by Hinderink et al., 2000. This is a self-report, hearing specific QoL instruments developed for adults using cochlear implants. This questionnaire consists of 60 items, divided into 3 sections: i) Physical, ii) Psychological, and iii) Social.

The three sections are further sub divided into 6 domains. In the physical domain, basic sound perception, advanced sound perception, and speech production are defined. In the social domain, activity and social functioning are defined. There is only one subdomain in the psychological functioning domain: self-esteem.

Each item was presented as a statement with a 5-point response scale to indicate how true the statement was for the participant. For 55 of the 60 items, the five response groups were never (1), sometimes (2), often (3), mostly (4), and always (5). The remaining five questions were answered based on the CI user's ability to complete the action in question. No (1), poorly (2), moderate (3), adequate (4), and good (5) were the response categories for these 5 items (5). Respondents were given a sixth response category throughout the questionnaire to address items that were irrelevant to them. The answer categories (1-5) for all items were transformed: 1 = 0, 2 = 25, 3 = 50, 4 = 75, and 5 = 100. Scores for the subdomains were computed by adding together the 10-item scores of each subdomain and dividing by the number of completed items. Higher the score indicated higher QoL.

Advantages:

i. It is a comprehensive tool to measure changes in the QoL of adults using CI, post device usage.
ii. For 4 of the 6 domains, the NCIQ exhibited high levels of internal consistency.
iii. Lower, although generally acceptable, reliability estimates were found for the domains speech production and self-esteem (Hinderink et al., 2000).

Disadvantages:

i. The administration of this 60 item questionnaire is highly time consuming.
ii. Responses might be affected by patient’s lack of attention and concentration.
iii. The scoring of the questionnaire is complex.
iv. The questionnaire has both negative and positive statements, that are rated differently, which might lead to confusion among the participants.

To conclude, the importance of assessing the quality of life of children who use hearing devices cannot be overstated. Most QoL assessments are designed for children over eight years of age. Evaluating the advantages of hearing device use using illness-specific HRQoL instruments is appealing since they are responsive to interventions tailored to manage a specific disease. Through this review of literature, it is clear that there is an apparent lacuna in the assessment of hearing specific QoL of children using hearing devices in India. Therefore, there arises a strong need to develop a relevant instrument which can measure the QoL of children using hearing devices in the Indian context.

CHAPTER 3

Method

The present study aimed to develop a detailed parent-report, condition-specific quality of life questionnaire in English and Kannada for children aged 3 to 16 years using hearing devices. For this purpose, the method of the study was divided into two phases:

3.1 Phase I: Development of the questionnaire.

3.2 Phase II: Translation of the questionnaire into Kannada.

3.1 Phase I: Development of the questionnaire

3.1.1 Formulating relevant domains for the questionnaire

A thorough literature review of previous studies using quality-of-life questionnaires was conducted to develop a comprehensive, close-ended English questionnaire. The first step in creating the questionnaire was the formulation of relevant domains for children using hearing devices. The questionnaire was divided into three main domains: physical functioning, psychological functioning, and social functioning.

3.1.2 Formulating questions under each domain

The questions under each domain were chosen based on the following:

i. Different listening situations faced by a child using hearing devices in the Indian context.
ii. The factors influencing the quality of life of children using hearing devices in India.

iii. From few existing questionnaires like Paediatric quality of life inventory (PedsQoL) (Varni et al., 1999), Glasgow children's benefit inventory (GCBI) (Kubba et al., 2004), KINDLr (Bullinger, 1994), Nijmegen Cochlear Implantation Questionnaire (NCIQ) (Hinderink et al., 2000), and Children using Hearing Devices Quality of Life (CuHDQOL) (Looi et al., 2016; Sanderson et al., 2014).

iv. Appropriate suggestions from the subject experts.

Initially, 26 questions were formed based on the above steps, which were divided across the three subscales: i) physical functioning, ii) psychological functioning, and iii) social functioning, as shown in Table 3.1.

Table 3.1

Initial list of questions generated during Phase 1

I. Physical
1. Do you feel that your child’s life has improved overall with the use of the device?
2. Do you feel that your child is able to participate in sports with the device?
3. Do you think your child can contribute to the household chores with the device?
4. Do you feel that your child’s hearing has improved significantly?
5. Do you feel that your child can understand you better in a noisy environment with the device on?
6. Do you feel that your child is missing out on important cues/ Information even with the device?
7. Do you feel the family is burdened by the financial strain placed by the device?

8. Do you feel your child's learning ability has improved after the use of the device?

9. Do you think your family members have had to change their working patterns since your child received their hearing device(s)?

II. Psychological

1. Do you feel that your child is embarrassed with the use of device?

2. Do you feel embarrassed with your child's device?

3. Do you feel your child's behavior has improved after the use of device?

4. Do you feel your child is happier after the use of the device?

5. Do you think your child's teachers and classmates/friends are empathetic towards his/her condition?

6. Do you feel your child's self-confidence has improved after the use of the device?

7. Do you feel your child's concentration has improved after the use of the device?

8. Do you feel your child has become more frustrated/ irritable after the use of the device?

III. Social

1. Do you think your child gets along well with all the family members?

2. Do you think your child gets adequate support and encouragement from all the family members?

3. Do you think your child can easily make friends with normal peers?

4. Do you think your child feels detached from his peers?

5. Do you think your child faces discrimination from his peers at school?

6. Do you think your child faces discrimination from his peers while playing?

7. Do you think your child gets adequate support from his/her teachers and classmates?

8. Do you think your child feels comfortable in large gatherings (Eg; Fairs, religious gatherings)?

9. Do you think you devote more time to your child than other members of my family?

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i. **Physical:** This subscale consisted of nine questions to assess the level of overall physical functioning of the child in different situations after using a hearing device. For example, 'is the child able to participate in sports like running, kho-kho, etc., after using the hearing device?'.

ii. **Psychological:** This subscale consisted of eight questions to assess the child's emotional and psychological well-being in different settings, like at school, in the neighborhood, and at home, after using a hearing device. For example, 'Do you feel your child is happier after the use of the device?**.'**

iii. **Social:** This subscale consisted of nine questions to assess the child's social functioning across various settings. For example, 'Do you think your child can easily make friends with typically developing peers?.'

3.1.3 Formulating a rating scale for the questionnaire

Each question was provided with a five-point Likert rating scale to indicate the response. The response categories were as follows: 1) Strongly Disagree 2) Disagree 3) Unsure 4) Agree 5) Strongly agree. Throughout the questionnaire, the respondents were given a sixth response category (not applicable (N/A)) to indicate the items that did not apply to them.

3.1.4 Content validation by Audiologists and Parents

After the formulation of the questionnaire was completed, it was sent to five audiologists to provide qualitative and quantitative feedback on the questionnaire. They were given a content validation questionnaire and were asked to rate each question based on its relevance, clarity, and comprehensiveness on a five-point Likert scale; the response categories are as follows: 1 = Strongly disagree; 2 = Disagree; 3 = Unsure; 4 = Agree; 5 = Strongly Agree.

The questionnaire was also given to Ten bilingual parents of children (five males and five females, Mean age = 5.7 years, range = 3.4 to 12 years) using hearing devices to check for clarity and contextual relevance. Ten bilingual parents of children using The parents were given a simple Yes/No questionnaire and were asked to respond yes or no to each question based on its relevance and clarity.

3.1.5 Preparation of the final questionnaire

Based on the feedback and suggestions received, the questionnaire was modified to make it more comprehensive and contextually relevant. The finalized English questionnaire is given in Appendix I. The next phase was to translate the developed English questionnaire into Kannada.

3.2 Phase II: Translation of the questionnaire

The questionnaire was translated using the widely acknowledged American Association of Orthopedic Surgeons (AAOS) (Beaton et al., 2000) guidelines, which include a forward-backward translation process. The following five steps were included in the procedure:

1. Forward Translation
2. Synthesizing Popular Translation
3. Backward Translation
4. Analysis By The Expert Committee
5. Pre-Final Checking.

3.2.1 Forward translation

The first step in translation and adaptation is to generate multiple forward translations (Hambleton, 1993; Thammaiah et al., 2016). It is recommended to have at least two bilingual translators for this step (Medical Outcomes Trust, 1997). It is also necessary to use a team of translators with additional talents such as familiarity with local culture, in-depth understanding of the area, and knowledge of research methods and translation processes (Beauford et al., 2009). Further, this step is necessary as multiple translators and, as a result, multiple forward translations make it easier to detect semantic differences in ambiguous statements (Wild et al., 2005).

Hence, the questionnaire was given to two adult bilingual translators from the field of speech and hearing who were proficient in both English and Kannada. Each of the translators independently produced a forward translation copy.

3.2.2 Synthesizing popular translation

Following the multiple forward translation step, a single combined approved version of the forward translations is generated. This approach involves all translators and researchers. Certain methodological principles, such as the AAOS (Beaton et al., 2000) guidelines, define common version synthesis as a separate phase in the translation process (Thammaiah et al., 2016).

A single combined approved version of the forward translations was produced following the forward translation stage. All the translators and primary researchers participated in this process to reach a consensus for framing the consolidated version of the translations.

3.2.3 Backward translation

As a means of confirming effective original-to-target language translation, the second key phase in the translation-adaptation process is suggested. It serves as a quality check, highlighting major inconsistencies and conceptual flaws and aids in mapping the semantic equivalence of the translated measure's original and target versions (Beck et al., 2003).

Outsourced bilingual translators who are not affiliated with the study group and are unfamiliar with the research concept should perform the backward translation (Baeza et al., 2010). Hence, the consolidated approved version was independently translated into English by an adult bilingual translator with a non-medical background.

3.2.4 Analysis by the expert committee

In the next step, an expert committee will compare and examine the forward and back translations. In most cases, a panel of content specialists, translators, and researchers are involved in reviewing and analyzing translated measures (Kristjansson et al., 2003). Their responsibility is to determine if the translation is appropriate and if it adheres to the original intent of the items.

In this study, an expert committee comprising audiologists proficient in both languages along with the researchers reviewed and compared the forward and back translation versions to compile a pre-final version of the translated questionnaire.

3.2.5 Pre-final checking

Cognitive interviewing/debriefing is another term for pre-final testing. In this stage, the pre-final version of the questionnaire was used to perform interviews with a sample of the target population and obtain their opinion/feedback on the questions' acceptance and interpretation. The questionnaire was sent to five parents of children using hearing devices, which allowed researchers to ensure that the interventions are concise, straightforward, comprehensible, and contextually relevant. In addition, it helped to check the use of proficient language in the translation and for culturally inoffensive products (Thammaiah et al., 2016).

Apart from this, the parents were given the translated questionnaire along with a simple Yes/No form and were asked to respond yes or no to each question based on its relevance and clarity. Based on the responses and suggestions received from the expert committee as well as the parents, necessary changes were made to the translated Kannada questionnaire to make it more comprehensive and relevant. The final questionnaire is given in Appendix II.

Chapter 4

Results

The present study aimed to develop a detailed, parent-report, condition-specific quality of life questionnaire in English and Kannada for hearing-impaired children aged 3 to 16 using hearing devices. The results of different stages involved in the development of the questionnaire are given in this chapter.

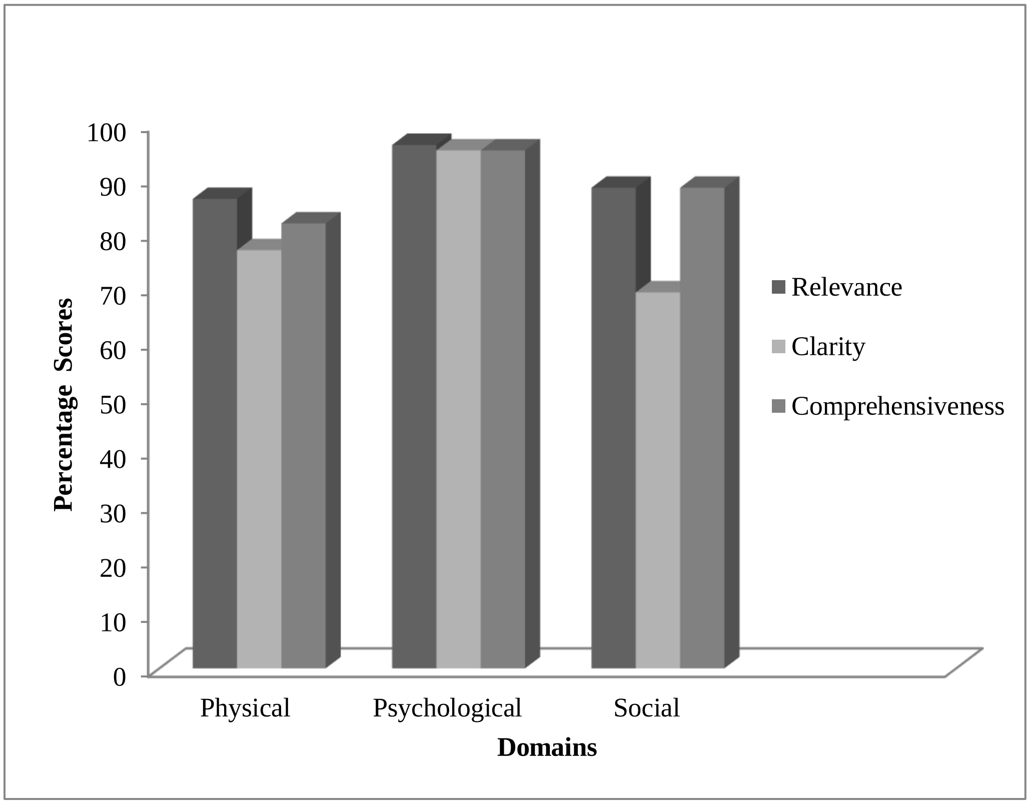
4.1 Phase 1: Development of the questionnaire in English

4.1.1 Content validation by Audiologists

In this step, an initial 26-item close-ended questionnaire under three sub-scales was generated using an extensive review of the literature, inputs from subject experts, and taking into account the diverse socio-cultural factors of the South Indian region of Karnataka. The questionnaires were given to five highly experienced audiologists closely involved in rehabilitating children with hearing impairment. These experts rated all three subscales based on their relevance, clarity, and comprehensiveness on a five-point Likert rating scale, ranging from strongly disagree (1) to strongly agree (5). The maximum possible score for each section of the questionnaire was 45 for the physical domain, 40 for the psychological domain, and 45 for the social domain. The scores given by five experts were then added and the percentage of each domain was calculated. The ratings given by the audiologists are displayed in and Figure 4.1.

Figure 4.1

Percentage of content validation ratings given by the experts for the English questionnaire



It can be seen from the above figure that the reviewers rated the physical subsection as 86.12% on relevance, 76.73% on clarity, and 81.63% on comprehensiveness. For the psychological subsection, the ratings given were 96% on relevance, 95% each on both clarity and comprehensiveness. Finally, the social domain was rated as 88.16% on relevance, 69% on clarity, and 88.16 % on comprehensiveness.

The experts also provided valuable suggestions to modify the questionnaire to suit the needs of Indian children using hearing devices better. Based on the suggestions of the audiologists, three new questions, one to each subscale, were added to the existing questionnaire, as shown in Table 4.1.

Table 4.1

Details about the new questions added to the questionnaire.

Sl. No	Domain	New Questions
1.	Physical	Do you think your child gets adequate support from his/her classmates?
2.	Psychological	Do you think your child's classmates/friends are empathetic towards his/her condition?
3.	Social	Do you feel that your child is missing out on important environmental sounds even with the device?

Hence, the final corrected version of the English questionnaire consisted of 29 questions under three subscales. The 'physical functioning' subscale had ten questions, the 'psychological functioning' subscale had nine questions, and the 'social functioning subscale had ten questions, as shown in Table 4.2.

Table 4.2

Distribution of questions across different domains.

Sl. No.	Domain	No. of questions
1.	Physical	10
2.	Psychological	09
3.	Social	10

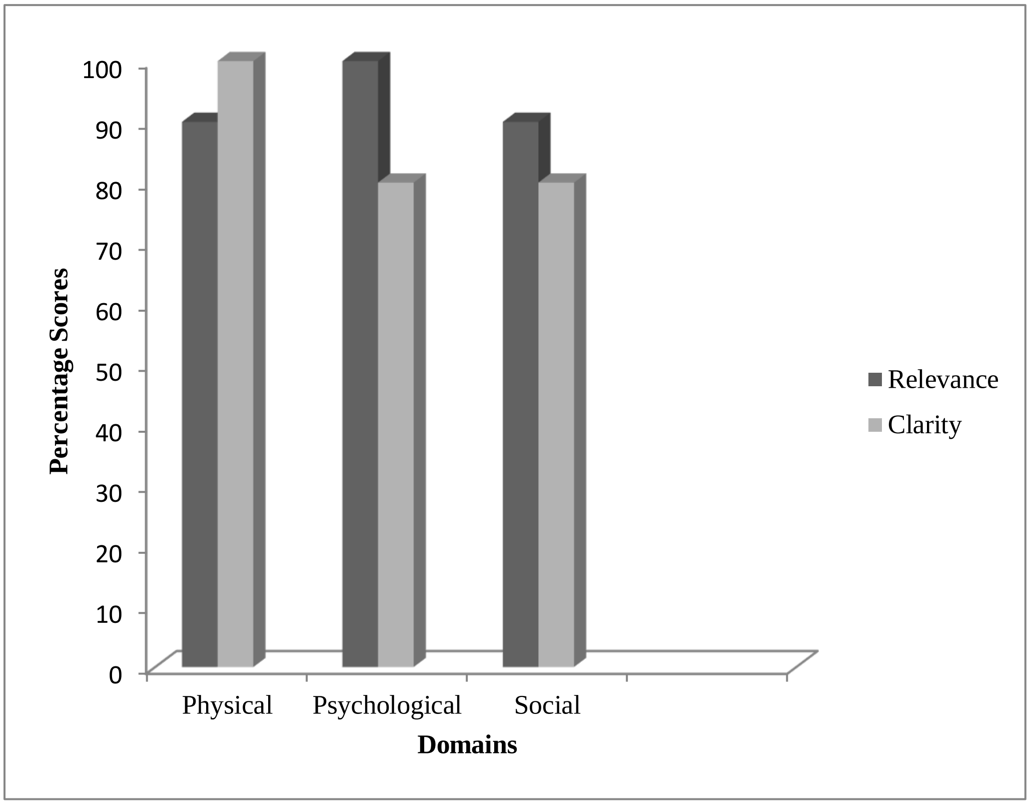
In addition to this, the phrase "with the device" was added at the end of a few questions under physical and psychological subscales, as per the suggestions. Apart from this, a few questions were reworded to provide better clarity and understanding to the participants. Examples of changes suggested by the experts are: a) the word ‘life’ was too broad in scope, and hence it was replaced by the phrase 'quality of life' in question no. 1 under the physical subscale; b) the question "Do you feel the family is burdened by the financial strain placed by the device?" was reframed to "Do you feel the family is financially burdened because of the child's device?", for better understanding of the participants.

4.1.2 Content validation by parents

Ten bilingual parents of children (five males and five females, Mean age = 5.7 years, range = 3.4 to 12 years) using hearing devices who were fluent in English were given a simple yes/no form and were asked to respond whether the questions in the questionnaire were relevant to their child and were clear to understand. Each question had two possible answers: yes = 1 and n = 0. The maximum possible score for each section of the questionnaire was 10 for the physical domain, 9 for the psychological domain, and 10 for the social domain. Percentage of each domain was calculated. Based on previous literature (Aithal & Aithal, 2020; Polit & Beck, 2006), the authors set a criteria of > 50% scores to consider a question as being relevant and clear. The ratings given by the parents are shown in Figure 4.2.

Figure 4.2

Percentage of content validation ratings given by the Parents for the English version of the questionnaire



It can be seen in the above figure that the parents rated the physical domain as 90% on relevance and 80% on clarity, the psychological domain was rated as 100% on relevance and 80% on clarity. Similarly, the social domain was rated as 90% on relevance and 80% on clarity. Based on the ratings and feedback provided by the parents, necessary modifications were made to the questionnaire.

4.2 Phase II: Translation of the questionnaire into Kannada

4.2.1 Step 1: Forward translation

Two bilingual adult translators, whose native language was Kannada, produced independent translations. Both translators had more than five years of expertise in speech and hearing and were well-versed in the region's culture. Both translators offered individual remarks on difficult terms, questions, or any other doubts during the translation. There were additional translations of the demographic details, questions, participant instructions, and response alternatives.

Aside from the simple translation of questionnaire material, translators incorporated various contextual adjustments at this step. The following are two major modifications: i) keeping a few words in English (only altering the script to Kannada), as colloquial Kannada use includes several English words rather than the original (pedantic) Kannada form, for e.g., keeping hearing aid, cochlear implant, bone-anchored hearing aid, and middle ear implant in English itself; and ii) examining words with similar meaning in Kannada as a few words could not be translated, for e.g., peers, typically developing, mode of listening, and discrimination.

4.2.2 Step 2: Synthesizing a common translation

The primary author and the two forward translators compared the two translated versions obtained in Step 1 and generated a single reconciled translation in this step. The easier, clearer, and more colloquial form of the two versions was chosen since translators have their own linguistic style and word preferences. The common synthesis procedure was summarized in a written report. There were attempts to reach a consensus on issues. Each issue was documented in detail, along with how it was rectified.

4.2.3 Step 3: Back-translation

An adult bilingual translator with a non-medical background and proficiency in both languages independently translated the common synthesized Kannada translations back to English. This aided in the detection of errors in forward translations. The detection of such mistakes was carried out by an expert panel (described below).

4.2.4 Step 4: Expert committee review

Forward and back translators, five expert audiologists, and the key researchers made up this committee. This panel consisted of adult Kannada-English bilinguals. During this time, the researchers maintained regular contact with the expert committee. To develop the pre-final version of each questionnaire, the committee combined all of the versions.

Each committee member went over all of the translations, identified the inconsistencies, and compiled a report on the judgments made to achieve equivalency. The most common errors were: i) missing parts of translations, which were recognized and added; and ii) incorrect words/items, which did not adequately express the concept and were modified.

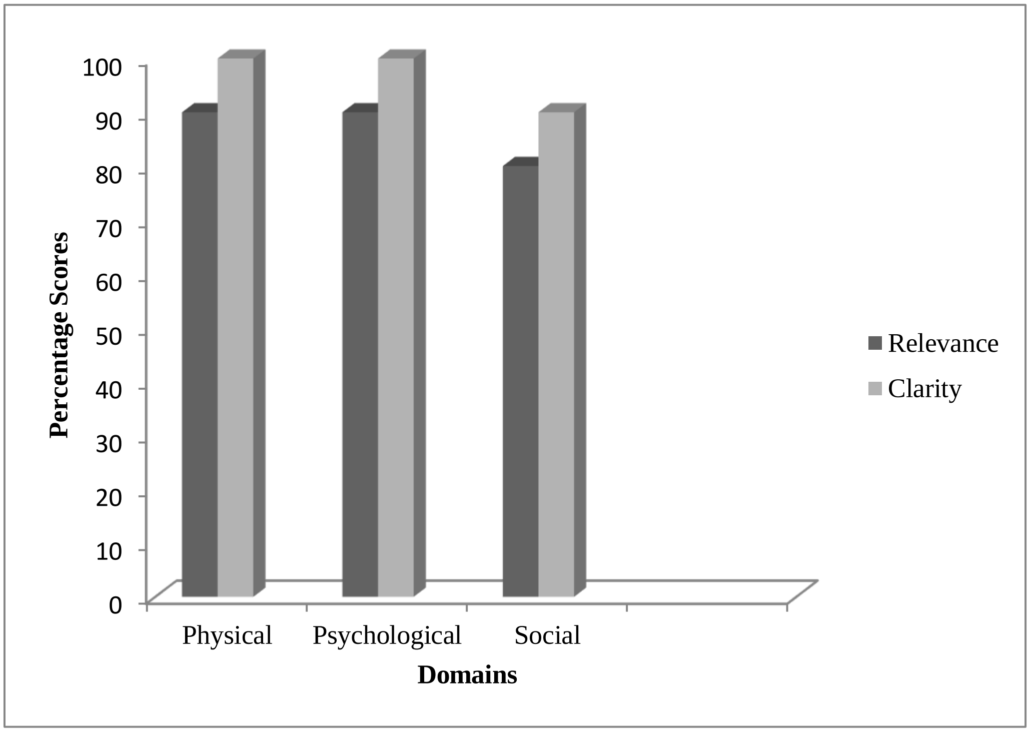
4.2.5 Step 5: Field testing of pre-final version

This was the final step before creating the translated questionnaire's final edition. The pre-final version of the questionnaire was used to interview the same ten parents of children using hearing devices, who were native speakers Kannada language. Participants' opinions on how they interpret the question and their responses to those questions were collected for each item. If a participant did not understand or misinterpreted a word, phrase, or topic, the researcher clarified it for them.

Participants were also asked if any of the questions made them feel uncomfortable or if any items were irrelevant to them. Opinions and responses were reviewed to ensure that the translation was correct, and any necessary modifications were made before preparing the final edition of the questionnaire. In addition to the above steps, the participants were also asked to fill a Yes/no content validation form to obtain quantitative data on the relevance and clarity of the questions in the questionnaire (as discussed in section 4.1) The ratings given by the parents are shown in the Figure 4.3.

Figure 4.3

Percentage of content validation ratings given by the Parents for the Kannada version of the questionnaire



As seen in the above figure, parents rated the physical domain as 90% on relevance and 100% on clarity. The psychological domain was rated as 90% on relevance and 100% on clarity, and the social domain was as rated 80% on relevance and 90% on clarity.

A few word/phrase adjustments were made since the participants deemed them to be unclear or misunderstood. Some parents claimed that a couple of the questions were irrelevant, for example, the question, “Do you think you devote more time to your child than other members of your family?” was rated as irrelevant. However, because the questions were deemed relevant to the majority of other participants in the hearing impaired cohort, they were included. Furthermore, none of the items were deemed uncomfortable or inappropriate; thus, all questions were included.

Chapter 5

Discussion

For children and adolescents with hearing loss, quality of life (QOL) is a significant outcome of interest. Educational achievement and hearing function are the focus of available questionnaires for children with hearing loss. While many hearing devices may enhance audibility, it's equally vital to see if these interventions improve the quality of life of children with hearing loss. Healthcare practitioners require age- and disease-specific tools to appropriately measure the effectiveness of therapies (Rachakonda et al., 2014). To address this, the present study aimed to develop a hearing-specific quality of life instrument, in English and Kannada for children from 3 to 16 years of age. This chapter discusses the challenges faced in developing the said questionnaire.

5.1 Development and translation of the questionnaire

Previous studies have employed various methods while developing a new hearing-specific quality of life questionnaire. Some of the methods that have been widely used include, use of focus groups comprising of the target population and eliciting the problems faced by them through multiple interviews, which in turn led to the formation of questions coded under relevant domains (Streufert, 2008)

Another method that has been widely used, is the review of old questionnaires paired with a pilot interview of the target population, which helped the researchers to formulate and adapt the questionnaires in a contextually relevant manner (Hinderink et al., 2000; Kubba et al., 2004).

In the present study, a thorough review of the already available questionnaires was done; the relevant domains were formulated, and questions that were relevant to the study were adapted. In addition to this, more questions were added, keeping in mind the listening conditions faced by the target population in the Indian context. Questions were also added based on suggestions from subject experts. The use of technical terms was kept to a minimum to ensure better understandability for the target population.

After the formulation of the initial questionnaire, it was given to Audiologists and parents of children using hearing devices for content validation. We gave equal weightage to suggestions from both the groups, as Audiologists are the professionals who are involved in the in the diagnosis, fitting and post fit rehabilitation of children using hearing devices and parents were considered because they were the target population of the study and also are most capable of providing firsthand information regarding the child's behavior across all domains (Irum Maqbool, 2016) . This step was carried out to ensure that the developed instrument was relevant and easy to comprehend for the target population. The results of content validation showed a very good rating by both experts and parents on all the parameters (Polit & Beck, 2006). Post the content validation, there were still few issues with the questionnaire that needed to be addressed. Major issues encountered were the use of ambiguous words, missing questions, which were promptly rectified to obtain a finalized version of the questionnaire.

During the second phase of the study, the questionnaire was translated to Kannada by following the AAOS (Beaton et al., 2000) guidelines. During this phase there were issues while synthesizing the consolidated version of the forward translations, due to linguistic variability among the translators. The personal and cultural factors of the translators could have directly or indirectly influenced the translation process (Chaume, 2004; Donald L. Patrick and Richard A. Deyo, 1989; Hinderink et al., 2000).

During this process, the most accurate translations of certain English words into Kannada, proved to be difficult to understand for the target population. Hence, simpler words conveying the intended meaning of English words were used instead. Following this step back translation was carried out by a non-medical professional (Baeza et al., 2010). In our study, the non-medical professional considered was an English lecturer. This lead to a few inaccurate translations, owing to the direct English translations employed by the translator, which did not convey the intended meaning of the questions. This highlighted discrepancies between the perception of the questions with respect to the translator and the researcher's point of view. This can be attributed to the translator's lack of knowledge about the field of speech and hearing (Colina et al., 2017; Hanson et al., 1997).

The inaccuracies were rectified during the expert review, it was observed that the opinions of the experts varied to a certain extent, owing to their personal experiences, views and language competence (Thammaiah et al., 2016). Any conflicts which were raised during the formation of the pre- final version, were resolved by taking into account the majority experts' opinions (Thammaiah et al., 2016).

In the final step, the questionnaire was administered to 10 participants, and they were also asked to validate the content of the questionnaire. The results obtained after this step indicated that the developed questionnaire was contextually relevant, clear, and easily understandable. A few word/phrase changes were made as a result of participant feedback. A few of the questions were deemed irrelevant by some parents (Thammaiah et al., 2016). The questions were included because they were thought to be relevant to the majority of the other individuals in the hearing impaired cohort.

5.2 Strengths of the questionnaire.

The first strength of the questionnaire is the condition-specific nature of the questionnaire. Generic instruments have a broader scope and application than disease-specific instruments, which are more focused on a single ailment and try to explain its effects on daily functioning and well-being. Clinically, assessing the benefits of hearing device use using illness-specific HRQoL instruments is intriguing since they are extremely responsive to interventions customized to address a specific condition or problem (Patrick and Deyo, 1989).

Wider age range considered for the questionnaire, is the next strength of this developed questionnaire. This questionnaire has been developed for children aged 3 to 16 years which is a wider age range compared to the other questionnaires; hence it can be used for both children and adolescents using hearing devices. Only a few studies have examined HRQoL of cochlear-implanted children, with findings differing from one study to another based on sample factors such as individuals' age and technical support. Warner-Czyz et al. (2009) compared 45 parent-child pairs in their research of children aged 4 to 7 years to Huber's (2005) study of 8–16-year-olds. They found that the overall HRQOL was substantially lower than their parents in children in the younger group (8–11 years). This may be because these youngsters might regard the implant as more of a part of themselves.

Most of the time, Quality of life measurements are not carried out in regular clinical settings because of their extensive nature and longer administration time. Hence, this study focused on developing a concise and comprehensive questionnaire that could collect all the relevant information quickly.

In addition to this, quality of life measurements are not carried out routinely because the condition-specific measures focus only on assessing the quality of life of children using cochlear implants. This questionnaire is not specific to cochlear implants, unlike the other questionnaire available in literature like HEARQL (Streufert, 2008) and CUHDQOL (Looi et al., 2016; Sanderson et al., 2014). It can be used for children using all types of hearing devices and hence, is a good assessment tool that can be used after audiological intervention. In case of both surgical and audiological interventions, this questionnaire can be used in conjunction with generic health-related quality of life measurements like GCBI (Kubba et al., 2004) to obtain a comprehensive view of the patient's overall well-being.

The present questionnaire was developed by taking into account the socio- cultural and socio-economic factors of the South Indian region. This step was necessary, as India is a land which varies widely from one region to another in terms of its language and culture. As seen in the previous studies, quality of life is vastly influenced by cultural, social, and environmental factors (Looi et al., 2016). Hence, it is imperative to have a region-specific questionnaire, which will provide accurate information about the child's QoL when compared to non-specific questionnaire.

In addition to this, inputs from subject experts and the target population were taken into account before compiling the final version of the questionnaire (Hendriksma et al., 2020;

Hintermair, 2011; Sach & Barton, 2007; Warner-Czyz et al., 2009). This step helped ensure that the information collected from the questionnaire is clinically and culturally relevant to the target population.

To conclude, it was observed that development and translation of quality of life instrument follows a similar trend across literature, despite the fact that there are no universally accepted guidelines for the same. The content of the questionnaire plays an important role in determining its utility. Hence the above-mentioned factors were considered while constructing the questionnaire for the present study. However, there were a few unavoidable factors that came up, which posed as the limitations of this study. The following section discusses the weakness of the questionnaire:

5.3 Weakness of the questionnaire

The number of parents who were considered for content validation was relatively limited. The questionnaire was developed primarily based on previously published questionnaires (Umansky, 2011; Bullinger, 1994; Hinderink et al., 2000; Kubba et al., 2004; Valerie Looi et al., 2016; Sanderson et al., 2014) surveys and did not take into account focus groups (Streufert, 2008).

Validating a questionnaire is a procedure that helps in determining intricate aspects that might influence the dependability of a question in a questionnaire (Aithal & Aithal, 2020). A questionnaire's validity is determined by the number of responses it receives. Knowing what it's supposed to measure will assist us in determining the validity (Ghauri, Grønhaug, & Strange, 2020). The *reliability and validity* of the developed questionnaire were not assessed in this study due to the pandemic.

Chapter 6

Summary and Conclusion

Quality of Life (QoL) is a multi-dimensional construct that examines the influence of a health condition and subsequent rehabilitation on a person's health, well-being, or functioning in other elements of life. Early auditory rehabilitation with hearing devices allows children to significantly increase their verbal language learning and adapt to the hearing environment. There is a clear need to develop a questionnaire to assess the quality of life of children who use hearing devices in India (Rachakonda et al., 2014). Thus, the present study aimed to develop a comprehensive parent-reported, condition-specific quality of life questionnaire in English and Kannada for hearing-impaired children in the age range of 3 to 16 years. The study was divided into two phases.

The first phase involved a review of previous quality-of-life questionnaires in developing a comprehensive, close-ended English questionnaire. The questionnaire was divided into three main domains: physical functioning, psychological functioning, and social functioning. Audiologists and parents were asked to provide qualitative and quantitative feedback on the questionnaire.

An initial 26 item close-ended questionnaire under three sub-scales was generated using an extensive review of the literature and subject experts' input. Based on the suggestions of the audiologists, three new questions were added to the existing questionnaire. The final corrected version of the English questionnaire consisted of 29 questions under three subscales.

In the second phase, the questionnaire was translated using the widely acknowledged American Association of Orthopedic Surgeons (AAOS) (Beaton et al., 2000) guidelines, including a forward-backward translation process. The questionnaire was given to two adult bilingual translators who were proficient in both English and Kannada. In addition, an expert committee reviewed and compared the forward and back translation versions to compile a pre-final version of the translated questionnaire.

Two bilingual adult translators, whose native language is Kannada, each produced independent translations of questionnaire material. The easier, clearer, and more colloquial of the two versions was chosen since translators have their own linguistic style and word preferences. Expert panel review aided in detecting errors in forward translations, and each issue was documented in detail, along with how it was rectified. The pre-final version of the questionnaire was used to interview ten parents of children using hearing devices, who were native speakers of Kannada language. This allowed the researchers to ensure that the questions were concise, comprehensible, and contextually relevant.

To conclude, the questionnaire was developed and translated using widely accepted guidelines (Aithal & Aithal, 2020; Beaton et al., 2000), and the developed questionnaire to assess the quality of life of children using hearing devices will help assess the benefit from the hearing devices holistically. It can also serve as a prognostic indicator during therapy and help the clinicians understand the difficulties faced by the child across the physical, psychological, and social domains. Therefore, enabling them to provide appropriate guidance to parents to ensure the overall well-being of the child. However, it is to be noted that this questionnaire is yet to be validated and will serve its purpose only after appropriate reliability and validity measurements have been carried out.

6.1 Clinical implications:

The questionnaire developed as part of the current study will help determine how a child perceives hearing loss across different domains. It will also aid the clinicians in determining the areas in which intervention is warranted to improve the child's overall well-being.

6.2 Future directions:

- To assess the reliability and validity of the developed questionnaires.
- To develop self-report questionnaires for older children, in addition to parent-proxy reports.
- To study the impact of different hearing devices on the quality of life of children with hearing impairment, using the developed questionnaire.
- To translate and adapt the developed questionnaire to other Indian languages.

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Appendix I

QUALITY OF LIFE QUESTIONNAIRE FOR CHILDREN USING HEARING DEVICES

Case Name:	Case no.:	Age/Gender:	Date:
Informant: Mother/Father/Guardian	Provisional Diagnosis:		

1. Device Type: HA/CI/BAHA/MEI/Any other (Please specify):

   If the child is using CI, please specify in which ear:
2. Please specify duration of HA use in the opposite ear:
3. Age at which device was fitted:
4. Mode of listening: HA in both ears/ HA in one ear & CI in the other ear/ CI in both ears/Any Other (Please specify)
5. Mode of communication: Verbal/ Verbal + Sign language/ Sign language only/ Any other (Please Specify)
6. Hearing device was procured through: Self finance/ Govt. Scheme

   If procured through Govt. scheme, please specify:
7. Duration of hearing Device use in a day: < 2hours/2 to 4 hours/ 4 to 8 hours/>8 hours
8. Duration of therapy (in months):
9. Did the device ever stop working? Yes/No
10. Duration of device malfunction (If applicable):
11. Cause of device malfunction:
12. Language age as on: Comprehension: Expression:
13. Child is attending Preschool/ Special school/ Regular school:

If attending regular school, Class & Medium of instruction:

14. Educational qualification of mother: Primary education/ secondary education/Graduate/ Post Graduate/ PhD/ Diploma/ any other
15. Educational qualification of father: : Primary education/ secondary education/Graduate/ Post Graduate/ PhD/ Diploma/ any other
16. How far do you live from AIISH: <5 km/5 to 15 km/ 15 to 30 km/ > 30 km

Instructions for respondents:

This questionnaire aims to assess the impact of your child's hearing device on their quality of life in terms of physical, psychological and social aspects. The questionnaire is to be completed by you as the parent/ care giver, reporting on your own observations, and feelings about your child's development and everyday life.

This is a 29 item questionnaire. Please read each question carefully. For each question, please select one answer that best describes your experience with your child. It is mandatory to respond to all the questions. Where a situation does not apply to you please select the 'not applicable' (N/A) option.

All information you provide is confidential.

I. Physical	**Strongly Disagree**	**Disagree**	**Unsure**	**Agree**	**Strongly agree**	**N/A**
1. Do you feel that your child's quality of life has improved overall with the use of the device?						
2. Do you feel that your child is able to participate in sports (For example, running, jumping, cricket, Kho- kho etc.,) with the device?						
3. Do you think your child can contribute to the household chores (For example, cleaning, filling water etc.,) with the device?						
4. Do you feel that your child's hearing has improved significantly with the use of the device?						
5. Do you feel that your child can understand you better in a noisy environment with the device on?						
6. Do you feel that your child is missing out on a part of speech even with the device?						
7. Do you feel that your child is missing out on important environmental sounds even with the device?						
8. Do you feel the family is financially burdened because of the child's device?						

9. Do you feel your child’s learning ability has improved after the use of the device?						
10. Do you think your family members have had to change their working patterns since your child received their hearing device(s)?						

II. Psychological	**Strongly Disagree**	**Disagree**	**Unsure**	**Agree**	**Strongly agree**	**N/A**
1. Do you feel that your child is embarrassed with the use of device?						
2. Do you feel embarrassed with your child’s device?						
3. Do you feel your child’s behavior has improved after the use of device?						
4. Do you feel your child is happier after the use of the device?						
5. Do you think your child’s teachers are empathetic towards his/her condition (hearing impairment)?						
6. Do you think your child’s classmates/friends are empathetic towards his/her condition?						

7. Do you feel your child’s self-confidence has improved after the use of the device?						
8. Do you feel your child’s concentration has improved after the use of the device?						
9. Do you feel your child has become more frustrated/ irritable after the use of the device?						

III. Social	**Strongly Disagree**	**Disagree**	**Unsure**	**Agree**	**Strongly agree**	**N/A**
1. Do you think your child gets along well with all the family members?						
2. Do you think your child gets adequate support and encouragement from all the family members?						
3. Do you think your child can easily make friends with typically developing peers?						
4. Do you think your child feels detached/ isolated from his peers?						
5. Do you think your child faces discrimination from his peers at school?						
6. Do you think your child faces discrimination from his peers while playing in the neighborhood?						

7. Do you think your child gets adequate support from his/her teachers?						
8. Do you think your child gets adequate support from his/her classmates?						
9. Do you think your child feels comfortable in large gatherings (Eg., Fairs, religious gatherings)?						
10. Do you think you devote more time to your child than other members of your family?						

Appendix II

ಶ್ರವಣ ಸಾಧನವನ್ನು ಉಪಯೋಗಿಸುತ್ತಿರುವ ಮಕ್ಕಳಿಗಾಗಿ ಜೀವನ ಗುಣಮಟ್ಟದ ಪ್ರಶ್ನಾವಳಿ

Case Name:	Case no.:	Age/Gender:	Date:
Informant: Mother/Father/Guardian	Provisional Diagnosis:		

1. ಸಾಧನದ ಮಾದರಿ: ಶ್ರವಣಯಂತ್ರ(Hearing aid)/ಕಾಕ್ಲಿಯಾರ್ ಇಂಪ್ಲಾಂಟ್(Cochlear Implant)/ಬೋನ್ ಆಂಕರ್ಡ್ ಹಿಯರಿಂಗ್ ಏಡ್(BAHA)/ಮಿಡ್ಲ್ ಇಯರ್ ಇಂಪ್ಲಾಂಟ್/ಇನ್ನಿತರ ಬೇರೆ ಯಾವುದೇ ಆಗಿದ್ದಲ್ಲಿ ದಯವಿಟ್ಟು ನಿರ್ದಿಷ್ಟಿಸಿ :

   ಮಗು ಕಾಕ್ಲಿಯಾರ್ ಇಂಪ್ಲಾಂಟ್ ಅನ್ನು ಬಳಸುತ್ತಿದ್ದರೆ, ದಯವಿಟ್ಟು ಯಾವ ಕಿವಿಯಲ್ಲಿ ಸೂಚಿಸಿ:

2. ಎದುರು ಕಿವಿಯಲ್ಲಿ ಶ್ರವಣಯಂತ್ರ ಬಳಕೆಯ ಅವಧಿಯನ್ನು ದಯವಿಟ್ಟು ಸೂಚಿಸಿ:

ಸಾಧನವನ್ನು ಅಳವಡಿಸಿದ ವಯಸ್ಸು:

3. ಆಲಿಸುವ ವಿಧಾನ: ಎರಡೂ ಕಿವಿಗಳಲ್ಲಿ ಶ್ರವಣಯಂತ್ರ / ಒಂದು ಕಿವಿಯಲ್ಲಿ ಶ್ರವಣಯಂತ್ರ ಮತ್ತು ಇನ್ನೊಂದು ಕಿವಿಯಲ್ಲಿ ಕಾಕ್ಲಿಯಾರ್ ಇಂಪ್ಲಾಂಟ್ / ಎರಡೂ ಕಿವಿಯಲ್ಲಿ ಕಾಕ್ಲಿಯಾರ್ ಇಂಪ್ಲಾಂಟ್ / ಇನ್ನಿತರೆ ದಯವಿಟ್ಟು ನಿರ್ಧಿಷ್ಟಿಸಿ:
4. ಸಂವಹನ ವಿಧಾನ: ಮೌಖಿಕ/ ಮೌಖಿಕ + ಸಂಕೇತ ಭಾಷೆ/ ಸಂಕೇತ ಭಾಷೆ ಮಾತ್ರ/ ಇನ್ನಾವುದೇ (ದಯವಿಟ್ಟು ಸೂಚಿಸಿ):
5. ಶ್ರವಣ ಸಾಧನವನ್ನು ಇದರ ಮೂಲಕ ಖರೀದಿಸಲಾಗಿದೆ: ಸ್ವಂತ ಖರ್ಚು / ಸರ್ಕಾರದ. ಯೋಜನೆ:

ಸರ್ಕಾರದ ಯೋಜನೆ ಮೂಲಕ ಖರೀದಿಸಿದರೆ, ದಯವಿಟ್ಟು ಸೂಚಿಸಿ:

6. ಸಾಧನವನ್ನು ಬಳಸುತ್ತಿರುವ ಅವಧಿ: <2 ಗಂಟೆ/2 ರಿಂದ 4 ಗಂಟೆ/4 ರಿಂದ 8 ಗಂಟೆ/> 8 ಗಂಟೆ
7. ತರಬೇತಿಯ ಅವಧಿ:
8. ಸಾಧನವು ಎಂದಾದರೂ ಕೆಲಸ ಮಾಡುವುದನ್ನು ನಿಲ್ಲಿಸಿದೆಯೇ? ಹೌದು/ ಅಲ್ಲ
9. ಸಾಧನವನ್ನು ಸಕ್ರಿಯವಾಗಿ ಬಳಸುತ್ತಿರುವ ಅವಧಿ:
10. ಸಾಧನವು ಕೆಟ್ಟು ಹೋದ ಅವಧಿ(ಸಂಬಂಧ ಪಟ್ಟಿದ್ದಲ್ಲಿ):
11. ಸಾಧನವು ಕೆಡುವುದಕ್ಕೆ ಕಾರಣ:
12. ಭಾಷಾವಯಸ್ಸು(ದಿನಾಂಕದೊಂದಿಗೆ ಸೂಚಿಸಿ):

ಅಧ್ಯೆಸಿಕೊಳ್ಳುವ ವಯಸ್ಸು:   ವ್ಯಕ್ತಪಡಿಸುವವಯಸ್ಸು:

13. ಪೂರ್ವಶಾಲೆ(ಪ್ರೀಸ್ಕೂಲ್)/ವಿಶೇಷ ಶಾಲೆ/ಸಾಧಾರಣ ಶಾಲೆ ಹಾಜರಾಗುತ್ತಿರುವನೇ/ಳೇ ?:

    ಸಾಧಾರಣ ಶಾಲೆಗೆ ಹೋಗುತಿರುವಲ್ಲಿ ,ತರಬೇತಿ ಹಗೂ ಸೂಚನಾ ಮಾಧ್ಯಮ:

14. ತಾಯಿಯ ಶೈಕ್ಷಣಿಕ ಅರ್ಹತೆ: ಪ್ರಾಥಮಿಕ ಶಿಕ್ಷಣ/ ಪ್ರೌಢ ಶಿಕ್ಷಣ / ಪದವಿ/ ಸ್ನಾತಕೋತ್ತರ/ ಪಿಎಚ್ ಡಿ/ ಡಿಪ್ಲೊಮಾ/ ಇನ್ನಿತರೆ :
15. ತಂದೆಯ ಶೈಕ್ಷಣಿಕ ಅರ್ಹತೆ:: ಪ್ರಾಥಮಿಕ ಶಿಕ್ಷಣ/ ಪ್ರೌಢ ಶಿಕ್ಷಣ / ಪದವಿ/ ಸ್ನಾತಕೋತ್ತರ/ ಪಿಎಚ್ ಡಿ/ ಡಿಪ್ಲೋಮಾ/ ಇನ್ನಿತರೆ :
16. ನೀವು AIISH ನಿಂದ ಎಷ್ಟು ದೂರ ವಾಸಿಸುತ್ತೀರಿ: <5 km/ 5 ರಿಂದ 15 km / 15 ರಿಂದ 30 km /> 30 km

ಸೂಚನೆಗಳು:

ಈ ಪ್ರಶ್ನಾವಳಿಯು ನಿಮ್ಮ ಮಗುವಿನ ಶ್ರವನ ಸಾದನವು ಅವನ/ಳ ಭೌತಿಕ, ಮಾನಸಿಕ ಹಾಗೂ ಸಾಮಾಜಿಕ ಅಂಶಗಲ ಮೇಲೆ ಬೀರಿರುವ ಪ್ರಭಾವಗಳನ್ನು ತಿಳಿಯುವ ಉದ್ದೇಶ ಹೂಂದಿರುತ್ತದೆ. ಪೋಶಕರಾಗಿ ನೀವು ಗಮನಿಸಿರುವ ಹಾಗೂ ಮಗುವಿನ ಪ್ರತಿನಿತ್ಯದ ಬೆಳವಣಿಗೆಗಳ ಆಧಾರದ ಮೇಲೆ ನೀವು ಈ ಪ್ರಶ್ನಾವಳಿಯನ್ನು ಪೂರೈಸಬೇಕು.

ಇದರಲ್ಲಿ ೨೯ ಪ್ರಶ್ನೆಗಳಿದ್ದು ಪ್ರತಿಯೊಂದನ್ನು ಗಮನವಿಟ್ಟು ಓದಬೇಕಾಗಿ ವಿನಂತಿ ಪ್ರತಿ ಪ್ರಶ್ನೆಗೂ ನಿಮ್ಮ ಮಗುವಿಗೆ ಸೂಕ್ತವೆನಿಸುವ ಒಂದು ಉತ್ತರವನ್ನು ಆಯ್ಕೆ ಮಾಡಿರಿ .ಎಲ್ಲಾ ಪ್ರಶ್ನೆಗಳಿಗೂ ಉತ್ತರ ನೀಡುವುದು ಕಡ್ಡಾಯವಾಗಿರುತ್ತದೆ. ಯಾವುದಾದರೂ ಸನ್ನಿವೇಶ ನಿಮಗೆ ಹೊಂದದಿದ್ದಲ್ಲಿ ಆ ಪ್ರಶ್ನೆಗೆ ನೀವು 'ಸಂಬಂಧ ಪಟ್ಟಿರುವುದಿಲ್ಲ' ವೆಂಬ ಆಯ್ಕೆಯನ್ನು ಸೂಚಿಸಬಹುದು.

ನೀವು ನೀಡಿರುವ ಎಲ್ಲಾ ಮಾಹಿತಿಗಳನ್ನು ಗೌಪ್ಯವಾಗಿಡಲಾಗುವುದು.

I. ಭೌತಿಕ	ಖಂಡಿತವಾಗಿಯೂ ಒಪ್ಪುವುದಿಲ್ಲ	ಒಪ್ಪುವುದಿಲ್ಲ	ಸರೆಯಾದ ಮಾಹಿತಿ ಇಲ್ಲ	ಒಪ್ಪುತ್ತೇನೆ	ಧೃಡವಾಗಿ ಒಪ್ಪುತ್ತೇನೆ	ಸಂಬಂಧ ಪಟ್ಟಿರುವುದಿಲ್ಲ
1. ನಿಮ್ಮ ಮಗುವಿನ ಒಟ್ಟಾರೆ ಜೀವನದ ಗುಣಮಟ್ಟ ಶ್ರವಣ ಸಾಧನದ ಉಪಯೋಗದೊಂದಿಗೆ ಉತ್ತಮಗೊಂಡಿದೆ ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						
2. ನಿಮ್ಮ ಮಗು ಶ್ರವಣ ಸಾಧನ ಧರಿಸಿ ಕ್ರೀಡೆಗಳಲ್ಲಿ (ಉದಾ: ಓಡುವುದು, ಜಗಿಯುವುದು ,ಕ್ರಿಕೆಟ್ ,ಖೋ -ಖೋ ಇನ್ನಿತರೆ)ಭಾಗವಹಿಸಬಹುದು ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						
3. ನಿಮ್ಮ ಮಗು ಶ್ರವಣ ಸಾಧನ ಧರಿಸಿ ಮನೆ ಕೆಲಸಗಳಲ್ಲಿ(ಉದಾ: ಮನೆ ಸ್ವಚ್ಚಗೊಲಿಯುವುದು ,ನೀರು ತುಂಬಿಸುವುದು ಇನ್ನಿತರೆ) ಪಾಲ್ಗೊಳ್ಳಬಹುದು ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						
4. ನಿಮ್ಮ ಮಗುವಿನ ಕೇಳಿಸಿಕೊಳ್ಳುವ ಶಕ್ತಿಯು ಶ್ರವಣ ಸಾಧನದೊಂದಿಗೆ ಉತ್ತಮವಾಗಿದೆ ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						

5. ನಿಮ್ಮ ಮಗುವು ನಿಮ್ಮ ಮಾತನ್ನು ಗದ್ದಲದ ನಡುವೆಯೂ ಶ್ರವಣ ಸಾಧನದೊಂದಿಗೆ ಚೆನ್ನಾಗಿ ಅರ್ಥೈಸಿಕೊಳ್ಳಬಹುದು ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						
6. ಶ್ರವಣ ಸಾಧಾದೊಂದಿಗೂ ನಿಮ್ಮ ಮಗುವು ಮಾತಿನ ಕೆಲವು ಅಂಶಗಳನ್ನು ಕೇಳಿಸಿಕೊಳ್ಳಲಾಗುತ್ತಿಲ್ಲ ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						
7. ಶ್ರವಣ ಸಾಧನದೊಂದಿಗೂ ನಿಮ್ಮ ಮಗುವು ಸುತ್ತಮುತ್ತಲಿನ ಅಗತ್ಯದ ಶಬ್ದಗಳನ್ನು ಕೇಳಿಸಿಕೊಳ್ಳಲಾಗುತ್ತಿಲ್ಲ ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						
8. ನಿಮ್ಮ ಮಗುವಿನ ಶ್ರವಣ ಸಾಧನವು ಕುಟುಂಬದ ಮೇಲೆ ಆರ್ಥಿಕ ಹೊರೆಯನ್ನು ಉಂಟು ಮಾಡುತ್ತಿದೆಯೇ ?						
9. ನಿಮ್ಮ ಮಗುವಿನ ಕಲಿಕಾ ಸಾಮರ್ಥ್ಯವು ಸಾಧನದ ಬಳಕೆಯ ನಂತರ ಉತ್ತಮವಾಗಿದೆ ಎಂದು ಅನಿಸುತ್ತದೆಯೇ?						

10 ನಿಮ್ಮ ಮಗುವು ಶ್ರವಣ ಸಾಧನ ಬಳಸಲು ಶುರು ಮಾಡಿದ ನಂತರ ನಿಮ್ಮ ಕುಟುಂಬದ ಸದಸ್ಯರು ಅವರ ದಿನ ನಿತ್ಯದ ಕಾರ್ಯಗಳನ್ನು ಮಾಡುವ ರೀತಿಯನ್ನು ಬದಲಾಯಿಸಿಕೊಳ್ಳಬೇಕಾಯಿತು ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						

II. ಮಾನಸಿಕ	ಖಂಡಿತವಾಗಿಯೂ ಒಪ್ಪುವುದಿಲ್ಲ	ಒಪ್ಪುವುದಿಲ್ಲ	ಸರಿಯಾದ ಮಾಹಿತಿ ಇಲ್ಲ	ಒಪ್ಪುತ್ತೇನೆ	ಧೃಡವಾಗಿ ಒಪ್ಪುತ್ತೇನೆ	ಸಂಬಂಧ ಪಟ್ಟಿರು-ವುದಿಲ್ಲ
1. ನಿಮ್ಮ ಮಗುವು ಶ್ರವಣ ಸಾಧನದ ಬಳಕೆಯಿಂದ ಮುಜುಗರಕ್ಕೆ ಒಳಗಾಗಿದೆ ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						
2. ನಿಮ್ಮ ಮಗುವವಿನ ಶ್ರವಣ ಸಾಧನವು ನಿಮಗೆ ಮುಜುಗರವನ್ನುಂಟು ಮಾಡಿದೆಯೇ ?						
3. ಶ್ರವಣ ಸಾಧನದ ಉಪಯೋಗದ ನಂತರನಿಮ್ಮ ಮಗುವಿನ ವರ್ತನೆಯು ಉತ್ತಮವಾಗಿದೆ ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						

4 ನಿಮ್ಮ ಮಗುವು ಶ್ರವಣ ಸಾಧನವನ್ನು ಉಪಯೋಗಿಸುತ್ತಿರುವುದರಿಂದ, ಹೆಚ್ಚು ಸಂತೋಶವಾಗಿದ್ದಾನೆ/ಳೆ ಎಂಡು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ?						
5 ನಿಮ್ಮ ಮಗುವಿನ ಶಿಕ್ಷಕರು ಅವನ/ಅವಳ ಸ್ಥಿತಿಯ(ಶ್ರವನ ದೋಷ) ಬಗ್ಗೆ ಹೆಚ್ಚು ಕಾಳಜಿ ತೋರಿಸುತ್ತಾರೆ ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						
6. ನಿಮ್ಮ ಮಗುವಿನ ಸಹಪಾಠಿಗಳು /ಸ್ನೇಹಿತರು ಅವನ/ಳ ಸ್ಥಿತಿಯ(ಶ್ರವನ ದೋಷ) ಬಗ್ಗೆ ಹೆಚ್ಚು ಕಾಳಜಿ ತೋರಿಸುತ್ತಾರೆ ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						
7. ನಿಮ್ಮ ಮಗುವಿನ ಆತ್ಮವಿಶ್ವಾಸವು ಶ್ರವಣ ಸಾಧನದ ಉಪಯೋಗದೊಂದಿಗೆ ಹೆಚ್ಚಿದೆ ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						
8. ನಿಮ್ಮ ಮಗುವಿನ ಏಕಾಗ್ರತೆಯು ಶ್ರವಣ ಸಾಧನದ ಉಪಯೋಗದೊಂದಿಗೆ ಹೆಚ್ಚಿದೆ ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						

9. ಶ್ರವಣ ಸಾಧನವನ್ನು ಬಳಿಸಲು ಶುರುಮಾಡಿದ ನಂತರ ನಿಮ್ಮ ಮಗುವಿನಲ್ಲಿ ಬೇಸರ ಮಾಡಿಕೊಳ್ಳುವಂತಹ/ಸಿಟ್ಟುಗೊಳಿಸುವಂತಹ ವರ್ತನೆಗಳನ್ನು ಗಮನಿಸಿದ್ದೀರ ?						

III. ಸಾಮಾಜಿಕ	ಖಂಡಿತವಾಗಿಯೂ ಒಪ್ಪುವುದಿಲ್ಲ	ಒಪ್ಪುವುದಿಲ್ಲ	ಸರೆಯಾದ ಮಾಹಿತಿ ಇಲ್ಲ	ಒಪ್ಪುತ್ತೇನೆ	ಧೃಡವಾಗಿ ಒಪ್ಪುತ್ತೇನೆ	ಸಂಬಂಧ ಪಟ್ಟಿರುವುದಿಲ್ಲ
1. ನಿಮ್ಮ ಮಗುವು ಕುಟುಂಬದ ಎಲ್ಲಾ ಸದಸ್ಯರೊಡನೆ ಚೆನ್ನಾಗಿ ಹೊಂದಿಕೊಂಡಿದ್ದಾನೆ /ಳೆ ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						
2. ಕುಟುಂಬದ ಎಲ್ಲಾ ಸದಸ್ಯರು ನಿಮ್ಮ ಮಗುವಿಗೆ ಅಗತ್ಯವಾದ ಬೆಂಬಲ ಮತ್ತು ಪ್ರೋತ್ಸಾಹನೆ ನೀಡುತ್ತಾರೆ ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						
3. ನಿಮ್ಮ ಮಗುವು ಸಾಮಾನ್ಯವಾಗಿ ಬೆಳೆಯುತ್ತಿರುವ ಇತರೆ ಮಕ್ಕಳೊಡನೆ ಸುಲಭವಾಗಿ ಸ್ನೇಹ ಬೆಳೆಸಬಹುದು ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						

4. ನಿಮ್ಮ ಮಗುವು ಅವನ/ಳ ವಯಸ್ಸಿನ ಇತರೆ ಮಕ್ಕಳಿಂದ ಬೇರ್ಪಟ್ಟಿದ್ದಾನೆ/ಳೆ ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						
5. ಶಾಲೆಯಲ್ಲಿ ನಿಮ್ಮ ಮಗುವಿನ ವಯಸ್ಸಿನ ಇತರೆ ಮಕ್ಕಳು ಅವನನ್ನು/ಅವಳನ್ನು ತಾರತಮ್ಯದಿನ್ದ ಕಾಣುವರು ಎಂಡು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						
6. ನೆರೆಹೊರೆಯಲ್ಲಿನ ನಿಮ್ಮ ಮಗುವಿನ ವಯಸ್ಸಿನ ಇತರೆ ಮಕ್ಕಳು ಅವನನ್ನು/ಅವಳನ್ನು ತಾರತಮ್ಯದಿನ್ದ ಕಾಣುವರು ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ?						
7. ನಿಮ್ಮ ಮಗುವಿನ ಶಿಕ್ಷಕರು ಅಗತ್ಯವಿರುವ ಬೆಂಬಲವನ್ನು ಅವನಿಗೆ/ಳಿಗೆ ನೀಡುವರು ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						
8. ನಿಮ್ಮ ಮಗುವಿನ ಸಹಪಾಠಿಗಳು ಅವನಿಗೆ/ಳಿಗೆ ಅಗತ್ಯವಿರುವ ಬೆಂಬಲವನ್ನು ನೀಡುತ್ತಾರೆ ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						

9. ನಿಮ್ಮ ಮಗುವಿಗೆ ಹೆಚ್ಚು ಜನರಿರುವ ಸನ್ನಿವೇಶಗಳಲ್ಲಿ (ಉದಾ ,ಜಾತ್ರೆ/ಹಬ್ಬ)ಭಾಗಿಯಾಗಲು ಸುಲಭವಾಗುತ್ತದೆ ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						
10.ನೀವು ನಿಮ್ಮ ಕುಟುಂಬದ ಇತರೆ ಸದಸ್ಯರಿಗಿಂತ ನಿಮ್ಮ ಮಗುವಿನೊಡನೆ ಹೆಚ್ಚು ಕಾಲ ಕಳೆಯುತ್ತೀರಿ/ಸಮಯ ವಿನಿಯೋಗಿಸುತ್ತೀರಿ ಎಂದು ನಿಮಗೆ ಅನಿಸುತ್ತದೆಯೇ ?						