Informed Decision Making on Assistive Listening Devices in Early Years

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Abbreviations

ALD(s)	Assistive Listening Devise(s)
ALTWG	Assistive Listening Technology Working Group
BAA	British Audiology Association
BAEA	British Association of Educational Audiologists
BATOD	British Association of Teachers of the Deaf
BCIG	British Cochlear Implant Group
BERA	British Education Research Association
CI(s)	Cochlear Implant(s)
dB	Decibels
DLA	Disability Living Allowance
DoE	Department for Education
Ed Aud	Educational Audiologist
EHDI	Early Hearing Detection and Intervention
EY	Early Years
FCC	Family Centred Care
FM	Frequency Modulation
ICToD	Implant Centre Teacher of the Deaf
KPIs	Key Performance Indicators
MCHAS	Modernising Children's Hearing Aid Services
MDT	Multidisciplinary Team
NDCS	National Deaf Children's Society
NHSP	Newborn Hearing Screen Programme
OHID	Office for Heath Improvement and Disparities
QS	Quality Standards
QToD	Qualified Teacher of the Deaf
RT	Reverberation Time
SLT	Speech and Language Therapy/Therapist
SNR	Signal-to-Noise Ratio
UH	University of Hertfordshire

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Abstract

NDCS QS1 (2017) considers Assistive Listening Devices (ALDs) to be part of the initial hearing aid fitting, to support language development opportunities. Despite this, children are usually nursery age before accessing such devices unless they receive a proprietary microphone from their implant provider. This study intends to establish what information professionals provide to parents and the timing of such information. It also seeks to understand professionals' views on ALD provision at first fit with young children.

A mixed-method approach was used to collect both quantitative and qualitative data. JISC Online Surveys was used to collect the quantitative data with further analysis through Excel. To provide comprehensive qualitative data, follow-up interviews were conducted. NVivo14 was used to code, assist in managing, and analysing the data.

The survey was completed by 106 professionals from a variety of backgrounds from across the UK, except Northern Ireland. Ten of these respondents were chosen, based on their responses, to be interviewed to proportionally represent the survey respondents' demographics and opinions.

The findings of this study suggest that whilst professionals do provide information to parents, the timing and provision vary across the country, with one professional providing information about ALDs at the initial hearing aid fitting. The study revealed that the type of information offered differed between professionals. On occasions, provision was different within the same service. It also uncovered professionals' concerns about fitting ALDs to young children, including safety, reporting, consistent amplification, and financial implications. These issues were the basis for caveats about when information should be shared with parents. The study revealed that most professionals agree with early fitting, however, what was considered early by professionals in this study (prior to starting school) contrasted with seminal research findings that early intervention needed to be within three to six months to reach optimal outcomes for children with hearing loss.

This study highlights that the lack of information relating to ALDs provided to parents currently, does not enable them to make an informed decision about the provision of ALDs for their deaf child.

1. Introduction

Language development is critical in the first few years of life (Allen et al., 2017a), facilitated by clear access to speech (Flexer, 2002). To accomplish this, young children need a higher Signal-to-Noise-Ratio (SNR) than older children (Bradley and Sato, 2008), with deaf children requiring this greater still (DfES, 2015; Gheller et al., 2020; Northern and Downs, 2014: Smaldino and Crandell, 2000; Yoshinaga-Itano et al., 2017). Therefore, it is imperative that young deaf children are given access to quality speech sounds through Assistive Listening Devices (ALDs), to achieve better outcomes (Yoshinaga-Itano et al., 1998).

Various researchers have examined the value of ALDs with young children (Mulla, 2011; Mulla and McCracken, 2014; Allen et al., 2017b). To date, there has not been any research to establish the impact and rollout of the NDCS 'Quality Standards for the use of personal radio aids' (2017; NDCS, 2019; Mulla, 2011).

A literature review follows in the next chapter, detailing previous research and highlighting the gap in knowledge. Chapter 3 explains and justifies the methodology used in this research. Chapter 4 presents both the quantitative and qualitative results in various tables and figures. A discussion occupies Chapter 5, which analyses and draws comparisons between this and previous research, exploring its limitations and suggesting further areas of investigation. Finally, Chapter 6 will conclude by summing up the research.

2. Literature Review

2.1. Early Identification

An undiagnosed hearing loss can lead to permanent speech and cognitive delays (Yoshinaga-Itano et al., 1998; Anthony, 2016), meaning that early identification of hearing loss is vital to improving outcomes for deaf children (Davis, 2001).

A foetus begins to hear from the gestational age of 18 weeks, experiencing their mother's voice (Robinshaw, 2007; Graven, and Browne, 2008; Northern and Downs, 2014; Anthony, 2016; Timmons, 2018). By birth, they can understand emotions and moods through listening (Graven, and Browne, 2008). By one year, the infant has had sixteen months of exposure to language and is producing words (Robinshaw, 2007). This, therefore, already puts babies, who are born deaf, at a disadvantage. Consequently, the first few months of a child's life are fundamental in developing listening and language. Early identification ensures that the critical period of neuroplasticity is harnessed, hence the need to identify babies as early as possible (Robinshaw, 2007; Anthony, 2016), thus preventing cochlear hair cell depletion (Graven and Browne, 2008). With the dedication of Modernising Children's Hearing Aid Services (MCHA) (2023) in 2005, The Newborn Hearing Screen Programme for England (NHSP-England) came to fruition in 2006 (Wood et al., 2015). This has significantly reduced the time for identification to weeks (McCracken et al., 2005; Storbeck and Calvert-Evans, 2008; Anthony, 2016).

Children who are identified early have considerably better outcomes than those identified later (Yoshinaga-Itano, 2014). The NHSP-England's targets are screened by four weeks and identified in a further four weeks, these are monitored by two Key Performance Indicators (KPIs) which audiology departments must report on each year (Office for Health Improvement and Disparities, (OHID) 2022). The American Early Hearing Detection and Intervention (EHDI) guidelines advocates 'hearing screening by 1 month, diagnosis of hearing loss by 3 months, and intervention by 6 months of age' (Yoshinaga-Itano et al., 2017). Whilst six months has a huge impact (Yoshinaga-Itano et al., 1998), and is better than twelve, Vohr et al. (2011) argue that three months is significantly better and should be the new standard. An argument validated when the EHDI guidelines were examined, as 58% of children who met the 1-3-6 criteria also met the stricter 1-2-3 and showed significantly better vocabulary scores (Yoshinaga-Itano et al., 2017).

Early detection alone is not enough to guarantee better outcomes for deaf children; early intervention is also fundamental (Storbeck and Calvert-Evans, 2008; Yoshinaga-Itano et al., 2020). Early detection and intervention can enable deaf children to compete alongside their hearing peers, enabling them to reach their potential and diminish the issues of deafness (Moeller, 2000; Pipp-Siegel et al., 2002; Anthony, 2016).

2.2. Early Intervention

Language development is vital in the first few years of life, with a ‘critical’ period of around twelve months in which the neuroplasticity of the brain, the pruning, and strengthening of pathways occur, conditional on the use of the pathway (Sharma and Nash, 2009; Marschark and Hauser, 2011; Northern and Downs, 2014; Allen et al., 2017a). Although this continues throughout childhood, language acquisition is significantly reduced by seven years (Kuhl, 2010; Cole and Flexer, 2011). Without adequate stimulation of the neural cortex, this pathway too will become pruned, leading to other senses becoming more dominant (Northern and Downs, 2014). Early intervention is recognised as a key factor in improving outcomes for children (DfE, 2022). Without targeted intervention and support, early identification is considered pointless (Yoshinaga-Itano, 2014). Therefore, early access to speech, and providing opportunities to acquire language is imperative (Allen et al., 2017b). Desired outcomes are only achieved through consistent, early usage of hearing technologies, highlighting the need for a parental support package to help maintain and ensure that hearing instruments are providing the optimal benefit (Moeller et al., 2009; Yoshinaga-Itano, 2014; Tomblin et al., 2015; Webster, 2019). The benefits of early intervention are enhanced when supported by a complete, competent multidisciplinary team (MDT) (Storbeck and Calvert-Evans, 2008; RCSLT/BATOD, 2019; Yoshinaga-Itano et al., 2020; DfE, 2022). Parents may feel overwhelmed and possibly grieving but early intervention is crucial and should not be delayed for a perfect time, professionals should be empathetic and value parental feelings in this difficult time (Cole and Flexer, 2011). Timely diagnosis also contributes to engagement in early intervention (McLean et al., 2019).

2.2.1. Effects of Early Language Support on Deaf Children

Deaf children need lots of communication opportunities to increase their early language development, thus reducing the need for support in later years (Smith and Wolfe, 2016; Yoshinaga-Itano et al., 2020; AVT, 2023). Early language support is also important for mental wellbeing and social development, as the two are intertwined (Marschark and Hauser, 2011; Northern and Downs, 2014; Allen et al., 2017b).

To optimise the critical period, Yoshinaga-Itano (2014) argues children should be provided with the highest quality of provision including technologies, which should not be restricted to location, a view echoed by NDCS (2017). Access to clear speech so that the child can replicate it is paramount (Flexer, 2002). Deaf children can experience listening fatigue which may hinder building the foundations for listening and communication (Hornsby et al., 2016; Phonak, 2021; Willis, 2021). Young children do not have the experience or ability to ‘fill the gaps’, lipread, understand the pragmatics and vocabulary, and compensate for what they have missed. Using an ALD (including FM System/radio aid/remote mic) can assist to minimise the effort required to make sense of poor acoustic information (Robinshaw, 2007). Children are then exposed to more language, supporting higher levels of language development (Benitez-Barrera et al., 2019; Curran et al., 2019). ALDs are increasingly suggested as an option for pre-schoolers to negate these issues (Mulla and McCracken, 2014; Allen et al., 2017b; NDCS, 2017; Curran et al., 2019; Walker et al., 2019).

2.2.2. Improvements in Technology

Whilst hearing technologies have improved considerably, giving greater access to speech and features which help in poor SNR, they do not restore hearing, and deaf children are at a disadvantage to their hearing peers. Hearing technologies have limitations in poor acoustic conditions; distance, when the speaker is more than 1-2m away, noise and reverberation, not providing adequate access to sound (Mulla, 2011; Webster, 2015; Wolfe et al., 2015; Spratford et al., 2017; Statham and Cooper, 2017; Benitez-Barrera et al., 2019; Chen et al., 2021).

The higher the SNR, the ratio between the noise and the speaker's voice, the better speech intelligibility there is (Robinshaw, 2007). Children need greater SNR than adults. Evidence suggests that the younger the child, the greater SNR is required (Bradley and Sato, 2008). Hearing children need a SNR of +6dB, while deaf children require more to access clear good quality speech, especially young deaf children in noisy environments (Crandell and Smaldino, 2000; Picard and Bradley, 2001; Valente et al., 2012; Northern and Downs, 2014; DfE, 2015; Yoshinaga-Itano et al., 2017; Bacic, 2019; Gheller et al., 2020). Therefore, young deaf children must be given access to clear speech, overcoming acoustic barriers through an ALD, achieving better outcomes (Yoshinaga-Itano et al., 1998; Moeller et al., 2009; Cole and Flexer, 2011; Allen et al., 2017b; Spratford et al., 2017; NDCS, 2019).

An ALD works by transmitting the speakers' voice via a transmitter directly to the child's hearing instrument via attached receivers (Allen et al., 2017b; NDCS, 2019; Chen et al., 2021). The SNR will be significantly improved by having a direct signal to the hearing technolgy.

2.3. Challenges to Listening

2.3.1. Acoustic Barriers

Noise, distance, and reverberation are the acoustic barriers to accessing speech (Robinshaw, 2007; Spratford, et al., 2017; DeConde Johnson and Seaton, 2021). Educational settings are regulated by Building Bulletin 93 (DfE, 2015) and have a duty to make reasonable adjustments to ensure a child is not disadvantaged (Equality Act 2010). However, these regulations do not apply in homes, although they too have acoustic flaws (Mulla, 2011). Everyday acoustically challenging situations include facing away in a pushchair/car, noisy parent groups, and shopping centres, which could compromise safety when instructing an independent toddler at a distance (Moeller et al., 2009; Mulla and McCracken, 2014; Allen et al., 2017b; Walker et al., 2019).

2.3.1.1. Noise

Due to the many types and sources of noise, it is the most frequent and difficult acoustic barrier. Even in the home, a child is contending with noise (fridge, washing machine, TV, siblings). Noise masks speech signals, often making speech inaudible (McCreery et al., 2015: Spratford et al., 2017). Whilst hearing aids have features to assist in noisy environments, these are often not suitable and activated for young children (McCreery and Walker, 2015).

In most environments with young children, there is background noise. This can be exacerbated by the Lombard Effect, with everyone raising their voice to be heard. (Whitlock and Dodd, 2008 in Spratford, et al., 2017). When the speaker raises their voice, it distorts speech, highlighting the vowels, which do not carry the information required to understand what is said, masking the consonants (Robinshaw, 2007).

An SNR of +20 dB is recommended for prelingual deaf children (Keen, 2013). An ALD would provide this enhanced SNR, assisting with listening and incidental language (Moeller et al., 2009; Cole and Flexer, 2011; Spratford et al., 2017; Chen et al., 2021). Studies showed with an ALD and hearing technologies at the same SNR, the ALD provides a +6dB gain in children, important as children find it difficult to maintain attention in poor acoustic conditions (Chen et al., 2021). ALDs increase the SNR and thus help to improve listening conditions and language acquisition (Moeller et al., 1996; Statham & Cooper, 2009; Mulla, 2011; Mulla and McCracken, 2014; Webster, 2015; Sunderland, 2016; Allen et al., 2017b; Spratford, 2017).

2.3.1.2. Distance

Distance also impacts the quality of sound. Each time the distance is doubled, a reduction of 6dB occurs, evoking the inverse square law (Spratford, et al., 2017; DeConde Johnson and Seaton, 2021). Hearing technologies work best at 1m, as a child develops and begins to crawl, this distance becomes greater (Mulla, 2011; Spratford, et al., 2017). This developmental stage of crawling and exploring should not be restricted by the need for hearing technologies, nor should the child’s ability to hear its caregiver.

2.3.1.3. Reverberation

Reverberation occurs from the repeated reflection of sound from surfaces (Spratford et al., 2017; DeConde Johnson and Seaton, 2021). Although homes have soft furnishings in most rooms which help to reduce reverberation time, this is not always the case, especially in kitchens.

2.3.2. Barriers to Accessing Equipment

There are many perceived barriers to the provision of ALDs as recognised by various studies of provision of ALD to young children (Table 2.1) (Moeller et al., 2013; Mulla and McCracken, 2014; Bevington, 2016; Allen et al., 2017b; Spratford, et al., 2017; Kecman, 2019; NHS England, 2019a; Yoshinaga-Itano et al., 2020; Shafer, 2021; Stone et al., 2022). Many of the practical constraints of previous studies such as batteries and cost, are not as problematic as they used to be (Spratford, et al., 2017; Chen et al., 2021). Many researchers acknowledge the need for training; for parents to establish the use of ALDs and for professionals to keep abreast of developing technology (Statham and Cooper, 2009; Mulla and McCracken, 2014; Allen et al., 2017b; Boddy and Datta, 2018; Walker et al., 2019; Shannan and O’Neill, 2022). Families should not be denied access to ALDs due to barriers (NDCS, 2018).

Table 2.1: Barriers to ALD provision from recent studies (references above).

Barriers to the Provision of ALDs	
Acquiring Listening Skills	Maternal Education
Adequate Amplification	**Parental Knowledge**
Aesthetics – Size, Weight, Wires	Parental Engagement
Safety – Batteries, Receivers	Professionals’ Beliefs / Knowledge
Cost	Quality Interactions
Hearing Loss	Reliability
Insurance	Reporting
Interference	Socioeconomic Status

Barriers considered by parents in italics, by professional beliefs in normal font, by **both in bold**.

2.4. Family-Centred Care

Within Family-Centred Care (FCC), decisions are based on what would fit with the core family values and characteristics of parents and their deaf child, with an equal partnership between parents and the professionals involved (Moeller et al., 2013). FCC advocates a holistic approach, in which parents make informed choices (Storbeck and Calvert-Evans, 2008; Boddy and Datta, 2018). Professionals should understand the dynamics of the family to provide best practice and interventions, facilitating good relationships with professionals (Young 2002; Scarinci et al., 2018). Family values and the child’s individual needs are multifactorial and should be seen as an evolving process in meeting the needs of the family (Young, 2002; Scarinci et al., 2018; Tachtsisa and Dettman, 2018). Moeller et al. (2013) set out ‘Ten Principles’ to achieve best practices in FCC. Two significant principles are 1) a partnership between parents and professionals and 2) informed decision-making, in which decisions are made together (Storbeck and Calvert-Evans, 2008; BAA, 2022; Shannon and Neill, 2022).

Whilst it can be overwhelming initially for parents, multidisciplinary working has many benefits, resulting in more confident, motivated parents, with better outcomes for their children (Young 2002; McCracken et al., 2005; Ofsted, 2012; Sass-Lehrer et al., 2015; Spratford, et al., 2017; Haddad et al., 2019; Kecman, 2019; NHS England, 2019b; RCSLT/BATOD, 2019). The relationship between professionals and the family can also affect decision-making (Young 2002; Scarinci et al., 2018).

2.5. Informed Choice as a Strategy

Parents make numerous decisions for their children, based on their child's best interests, and want to have all the relevant information (Boddy and Datta, 2018; Scarinci et al., 2018; Tachtsisa and Dettman, 2018; Elliot, 2022). The NHSP-England foundations lie within an informed choice ethos, with information being provided and collaboration between professionals being paramount to 'seamless' provision (Davis et al., 2001; BAA, 2022). If the family agrees, a referral to local Educational Support should be made. For an NHSP-England baby, the family should be contacted within five days of diagnosis (NDCS, 2016). The QToD can answer parental questions about deafness, audiology investigations, communication choices, and technology including ALDs (Yoshinaga-Itano, 2014; Elliot, 2022).

Parents should be provided with thorough information about hearing technologies at the time of diagnosis, detailing both pros and cons, providing an honest, balanced perspective to reflect the research (Young, 2002; Gabbard and Schryer, 2003; American Speech-Language-Hearing Association, 2007; NDCS, 2018; Kecman, 2019). Parents are told to avoid 'Dr. Google', but if little or no information is given then parents will consult search engines, finding lots of information to sift through, without the assurance that it is legitimate, relevant, avoiding testimonials, is up-to-date, and does not reflecting trends (Porter and Edirippulige, 2007; Tachtsisa and Dettman, 2018; Haddad, 2019; Kecman, 2019). Information should be provided in the parent's preferred format, and language, using the Plain Language Summary approach (Kecman, 2019; OpenPharma, 2021).

Research suggested that parents would like to use the technology when the child receives their hearing technologies (Allen et al., 2017b). The timing of the introduction of the use of ALD should be 'right for the family', therefore they need to be equipped with the knowledge to make this timely decision (Statham and Cooper, 2009; Allen et al., 2017b). DeConde Johnson and Seaton, (2021) explain that professionals must not act as gatekeepers. Hearing technologies should be revisited with the family regularly, as the needs of the child and family change (Young, 2002; Spratford, et al., 2017). Professionals can get caught in the 'expert' model, being selective of what information they provide, leaving parents of deaf children having to make decisions without knowing all of what is available (Young, 2002). Parents need to be empowered to question professionals to gain an understanding to make an 'informed choice' (Young, 2002).

2.6. The Gap in the Research

With around 95% of deaf children born to hearing parents (Young, 2002; Mitchell and Karchmer, 2004; Cole and Flexer, 2011), it could be reasonably argued that they have limited exposure and knowledge of deafness and the associated issues and technology. Allen et al. (2017b) recommended that parents of deaf babies should be informed of the possible benefits of the use of ALD at home. As Kecman (2019:14) explains 'parents do not know what they do not know', there is little evidence of parents being provided with information early. Ten-month delays have been documented, for parents being told the benefits of early intervention. Resulting in parents not knowing hearing technologies' limitations, being unsure of what an ALD was, and others believing ALD are only available once their child is in full-time education (Young, 2002; Storbeck and Calvert-Evans, 2008; Allen et al., 2017b; Gabova et al., 2022). The NDCS 'New to Hearing Loss' course does seek to address this by highlighting ALD (NDCS, 2023).

Despite the recommendations of the studies which focus on ALD with young children, there has been no research to validate NDCS Quality Standard (QS)1 (2017) (NDCS, 2019: Mulla, 2011; Mulla and McCracken, 2014; Bevington, 2016; Allen et al., 2017b). Although it is recognised that audiology departments and local authorities are co-working to provide ALDs, albeit in small numbers (NDCS, 2021).

The benefits of using ALDs with young children have been established, including social and emotional development (Mulla, 2011; Mulla and McCracken, 2014; Allen et al., 2017b; NDCS, 2017; NDCS, 2019), with many of the obstacles in the previous research void (Spratford et al., 2017). What is not apparent is how previous research and NDCS QS (2017) recommendations for all parents being given this information are being implemented. To date, no research has established the impact and rollout of the NDCS RAQS (Mulla, 2011; Mulla and McCracken, 2014; Allen et al., 2017b; NDCS, 2017; NDCS, 2019). It is vital that there is transparency and equitable provision across the country and that professionals must not act as gatekeepers (DeConde Johnson and Seaton, 2021).

2.7. Justification for the Current Study

There have been many studies looking at the benefits of ALDs provision with young children (Mulla, 2011; Allen et al., 2017b), however, there seems to be a missing link to getting this into practice. As parents are the child's first advocate (McCammon et al., 2008), parents must be informed of the equipment and its benefits. Previous research has found that parents who have been made aware of this technology have embraced it and found it beneficial for their children (Mulla and McCracken, 2014). Therefore, this research will examine what information professionals are sharing with parents and when it is being shared. It will also explore professionals' opinions and practices on fitting ALDs to young children and the rationale behind these decisions. It is hoped that this research will enhance the current understanding of ALD provision with young children and in turn, shape the future practice of professionals working with deaf children.

3. Methodology

3.1. Review of Different Methods

Professionals conduct research to fill an identified gap in knowledge (Walliman, 2017; Tracy, 2019). To achieve this, it is imperative to understand which design frame and methods will achieve the data that the research demands, as they will each elicit something different (Thomas, 2017). Cohen et al. (2017) cite various paradigms, referring to the way that research is considered and conducted. Thomas (2017) highlights two main approaches; positivism and interpretivism. Choosing a specific design is key to successful research (Cohen et al., 2017). The options for design frames, methods, data collection, and analysis are vast, each one having its specific strengths and weaknesses (Thomas, 2017; Ward and Delamont, 2020). Quantitative data is concerned with statistical data collection which includes surveys and experiments, whilst qualitative data is more language-based (Cohen et al., 2017; Thomas, 2017; Tracy, 2019). These include observation, case studies, diaries, questionnaires, interviews, documentaries, and discourse analysis using existing data (Thomas, 2017; Tracy, 2019). Surveys are often inexpensive and can quickly generate lots of data. However, they can contain incomplete answers which may be misunderstood, often have low response rates, and are not good at revealing feelings (Miller and Couper, 2008; Burnett, 2009). Qualitative research can create a bond between participant and researcher leading to deeper, more honest information and disclosure, but this needs to be weighed up, with the often-onerous task of transcribing, leading to large, time-consuming transcripts to analyse (Burnett, 2009; Smith and Sparkes 2016; Tracy, 2019; Bishop, 2020). Interviews are the main contributor to qualitative data collection, with the era of Covid-19, various online platforms have increased this further (James and Busher, 2009; Delamont, 2020; Marvasti and Tanner, 2020; Robson, 2020). However, online interviews can prevent anonymity and make it difficult to build the desired relationship due to difficulties in reading body language and non-verbal cues (James and Busher, 2009; Robson, 2020).

3.2. Research Design

Psychologist Kurt Lewin founded ‘action research’ in 1946, with the ideology that research needed to inspire action/change through a cyclical process (Thomas, 2017; Tracy, 2019). Also known as ‘participatory action research’ due to its collaborative nature. It is suitable for small-scale research completed whilst working in the field to develop current practices (Thomas, 2017; Tracy, 2019). This topic lends itself to qualitative research, establishing current practices and opinions (Tracy, 2019). However, once all methodologies were explored as advised by Cohen et al. (2017), a mixed methods approach was decided upon as endorsed by Burnett (2009) and Cohen et al., (2017). This research is considered a pragmatic paradigm, (Lukenchuk and Kolcch; 2013), also known as the ‘third research paradigm’ (Denscombe, 2008).

The quantitative data was achieved through an online survey, achieving a wealth of data from across the UK (Burnett, 2009). This was explored more deeply through semi-structured interviews, as Tracy (2019) explains, qualitative data can explain quantitative data and provide a vehicle for change. Using this combination harnessed the positives and decreased the weaknesses of each method enhancing each other (Creswell, 2003; Thomas, 2017). A flexible semi-structured interview was used to enable the interviewee to lead the direction, encouraging dialogue, and allowing for more content and emotion producing more complex qualitative data to analyse (Tracy, 2019; Marvasti and Tanner, 2020).

3.2.1. Triangulation

Integrity is fundamental in data collection but especially in qualitative data collection, as the data gleaned tends to be subjective (James and Busher, 2009). Choosing the correct research method can demonstrate validity (Walliman, 2017). Utilising both questionnaires and interviews produced information from different professions, ensuring several viewpoints were obtained and achieving triangulation ensuring reliability and validity (Burnett, 2009; Thomas, 2017; Tracy, 2019).

3.3. Research Questions

The approach and method used should correspond to the research questions (Cohen et al., 2017; Thomas 2017), although research questions can evolve during research (Tracy, 2019). Choosing methods, especially mixed methods, should be a result of the research questions requiring both quantitative and qualitative data to answer them sufficiently (Cohen et al., 2017). Therefore, the research questions (below) were re-examined to ensure they were fit for purpose and the methods chosen were appropriate.

- Are parents aware of ALDs and empowered to make an informed choice about their provision?
- What information is given to parents, about ALDs, and when?
- How confident do professionals feel in advising parents on ALDs?

3.4. Ethics

Ethics can be daunting, but it is an important and necessary part of any research involving human participants to ensure it is conducted with integrity and no harm is done (Walliman, 2017; Tracy, 2019; Calder 2020). If applied correctly, ethics should run through each stage of the research (Burnett, 2009; Walliman, 2017; British Education Research Association (BERA), 2018; Tracy 2019; Calder 2020). Robson (2020) notes online ethical considerations explaining the potential pitfalls and the lack of guidance, however, The Association of Internet Researchers (2019) has produced guidelines to account for this.

Whilst it may seem that a small-scale research project is benign, Cohen et al. (2017) explain that questionnaires are intrusive, therefore ethical considerations must be explored. The University of Hertfordshire (UH) adheres to the BERA (2018) guidelines. For this study, three ethics forms were required to ensure that the data was collected, stored, and presented responsibly ensuring anonymity. Approval was granted, via the use of form EC1, Ethics Protocol Number: SHE/PGT/UH/05744 (Appendix A). Prior to the commencement of data collection, informed consent was sought using form EC3 (Appendix B). Securing consent for both the survey and interview fulfilled UH (2022) guidelines. Explaining the purpose, risks, and benefits are also important (Tracy, 2019) and part of UH (2022) guidelines, achieved using form EC6, participation information sheet (Appendix C). To collect and store data, albeit temporarily and comply with BERA (2018) and the UH guidelines (2022), the author was directed to use the UH One Drive JISC, Online Surveys, and NVivo14 to collate, store and analyse data.

3.5. Participants

It is important to consider both elements of the research and what sampling was needed (Cohen et al., 2017). This survey was targeted at professionals working with deaf children in both education and audiology.

3.5.1. Sampling (Survey/Quantitative)

Participants were recruited from professional bodies (BATOD/BAEA/BAA/BCIG) and HoSS across the country who work with young deaf children to get an overall view of the provision. This included clinical audiologists, who diagnose and fit hearing technologies, QToDs, and Educational Audiologists who work with young deaf children or who are responsible for the issuing of ALDs. This was to provide a broad base of responses with varying demographics. Whilst ethics approval was sought, each professional body was contacted via email with a cover letter (Appendix D) to see if they would be prepared to send out the link to the survey. This is an important aspect of the survey as it allows the researcher to justify the research and ensure ethical considerations are met. Two organisations requested a copy of the Ethics approval, and all but one group sent the link to their members.

3.5.2. Sampling (Semi-structured Interview/Qualitative)

Dependent on the type of study, between four to ten people are often interviewed, although saturation is more important to strengthening validity and is key in qualitative research (Smith and Sparkes, 2016; Tracy, 2019). A purposeful, representative sampling method was chosen to represent all viewpoints within the interviews (Tracy, 2019).

Table 3.1: Interviewee demographics according to the survey.

Interview Identifier	**Survey Identifier**	**Profession**	**Area**	**Provision of information**	**Age of issuing ALD**	**ALD Fitting**	
						First Fit	Early Fit
A	54	QToD – Peri	West Midlands	No	3yrs	No	No
B	8	HoSS	Yorks & Humber	Yes	All	No	Yes
C	85	SLT	East Midlands	Yes	N/A	No	Yes
D	39	Ed Aud	East Midlands	Yes	<2yrs	No	Yes
E	20	Ed Aud QToD – Peri & CI	London	Yes	All	No	Yes
F	84	Clinical Paediatric Audiologist	Northwest	Yes	N/A	No	Yes
G	69	QToD – Peri	Southeast	Yes	School Age +	No	No
H	42	QToD – Peri	Wales	Yes	All	No	Yes
J	4	Ed Aud	London	Yes	All	No	Yes
K	92	QToD – Peri	Southwest	Yes	N age +	Yes	Yes

3.6. Data Collection

3.6.1. Data Collection Survey (Quantitative)

Online survey response rates seem to be decreasing, which may be attributed to the increase in surveys completed online, with the average being 31% (Sheehan, 2001). Unsolicited emails have lower response rates possibly due to being from an unknown sender, questioning their safety (Sheehan, 2001). Therefore, a pre-email was sent from the professional body for authentication and dissemination. Respondents were given two weeks to respond, with a follow-up reminder to increase response rates just before the survey was about to close (Sheehan, 2001).

Designing the questionnaire was an important part of the research process, ensuring the questions were not ambiguous, difficult, or too long. Surveys should also be plain in colour (Burnett, 2009). The questionnaire consisted of a mixture of open/rateable and closed questions to facilitate comparable quantitative data (Appendix E). The questions were grouped into themes, after the demographic questions. Burnett

(2009) suggests putting significant questions first to compensate for uncompleted returns. Fortunately, this was not the case.

Numerous factors should be considered when choosing the timing to send out a survey, including the audience, length, cover letter, and subject (Medallia, 2015; Mahmutovic, 2020 Cleave, 2022). Consideration was given to how long the survey would take to complete to encourage more participants, which was highlighted in the accompanying email. There is conflicting evidence that the length of the survey affects response rates (Sheehan, 2001) but the recommendation is that surveys are short, approximately 10-15 minutes (Revilla and Höhne, 2020). Choosing when to send out a survey based on the best day/time/year is imperative to maximise responses (Mahmutovic, 2020). Short surveys are deemed fractionally better to distribute on Mondays or Tuesdays, either in the morning or after 3pm (Medallia, 2015). Therefore, this survey was circulated on a Tuesday, and at a time convenient to the professional organisations disseminating it.

Each participant was assigned an identifier to facilitate anonymity. The participants were able to indicate that they would be happy to be contacted for a follow-up interview on the questionnaire, of which 53 consented.

3.6.1.1. Piloting

Piloting the survey was crucial to its success, ensuring questions were neither ambiguous nor suggestive, discovering grammatical errors, and nonsensical questions. Also identifying any issues with the survey's directionality/functions and ensuring the data being sought was obtained (Burnett, 2009; Cohen et al., 2017; Hammond and Wellington, 2021). It was piloted several times, by a range of volunteers with experience in the technicalities of software, subject terminology, and grammar, to ensure questions were fit for purpose (Cohen et al., 2017). Piloting the survey uncovered a few issues, including navigation of the survey, and terminology.

Terminology was a consideration for this research (Bishop, 2020), as education and audiology often use different terminology with the Educational Audiologist providing the link between the two disciplines (Rosenberg, 2017), through careful piloting, these issues were eliminated. Within the professional field, there are many terms used for the same technology dependent on the professionals' background and country of training (Moeller et al., 2013). ALDs were previously known as FM (Frequency Modulation) systems, but the transmission mode is different now, so this is technically not accurate. This was reflected in the name change from FMWG (FM Working Group) to ALTWG (Assistive Listening Technology Working Group). Therefore, throughout this research, the term Assistive Listening Device/s (ALD/s) will be used to refer to radio aids/remote microphones and streamers.

3.6.2. Data Collection (Semi-Structured Interview/Qualitative)

Ten respondents were selected and invited by email based on their survey responses to cover all demographics. This covered all regions, professions, and beliefs: focusing on providing information to parents, age of provision of ALD, criteria/policy, and their stance on NDCS's QS1(Table 3.1). To achieve ten interviews, a total of thirteen respondents were invited. This provided the coverage of answers required, achieving a proportional representation of nearly 10% of survey respondents and achieving saturation (Tracy, 2019). Unfortunately, Scotland is not represented in the interviews, nor is a technician's perspective, having tried, but being unsuccessful in recruiting. Microsoft Teams was used for interviews, including the recording and transcribing functions (with participants' consent). This enabled the researcher to give their full attention to the participant. Providing a replica of a face-to-face interview, thus ensuring the natural flow of conversation was maintained, and any nuances were observed so the participant felt valued (James and Busher, 2009). This enabled respondents from across the UK to be interviewed, obtaining a more diverse representation of the population (Robson, 2020). This was a good alternative to face-to-face meetings and telephone interviews, which can increase participation due to its flexibility to personal needs (Smith and Sparkes 2016; Tracy, 2019; Robson, 2020).

An interview schedule was created (Appendix F) to ensure that each interview flowed and was kept punctual (Cohen et al., 2017), and was conducted in the same manner (Burnett, 2009). The questions were carefully crafted to elicit the data required (Cohen et al., 2017) finishing with a 'catch-all' question to close the interview (Denscombe, 2008; Tracy, 2019). Individualised schedules were created in response to participants' survey answers and profession, all with the same outline and themes (Denscombe, 2008).

3.7. Data Analysis

It is important to consider how to analyse the data and present the findings. This is dependent upon how interconnected the results are, as they may contradict each other (Cohen et al., 2017).

3.7.1. Survey (Quantitative)

JISC Online Surveys was used, which provided both quantitative and qualitative data, in a range of formats to help with the analysis (Singh et al., 2009; Shermis and Lombard, 1999). Once the survey was closed the data was carefully examined and statistics were drawn out, linking to the research questions. Microsoft Excel was used for further analysis and to create graphs to present the data clearly.

3.7.2. Semi-structured Interview (Qualitative)

The first stage of analysing the data was transcribing and checking transcripts. This was a lengthy and involved process, although time was allowed for this to ensure accuracy and to avoid 'cleaning up data' (Williman, 2017; Tracy, 2019; Hammersley, 2020). Whilst validity was not confirmed with interview participants, the use of video recordings and transcripts helped to ensure they were accurate. Coding is a common way to analyse the data into themes, which can be achieved through a variety of methods each with its own merits (Tracy, 2019; Bishop, 2020; Ward and Delamont, 2020).

NVivo14 was chosen as a tool to support the researcher in data analysis, by organising it into manageable chunks and allowing cross-referencing, although it cannot analyse the data (Tracy, 2019). The codes were created from several read-throughs of the transcripts during the process of editing and proofreading to produce six overarching themes and twenty-two additional subthemes which can be seen in Table 3.2.

Table 3.2: Codes identified from interviewee responses.

Theme / Code Name	**Sub Theme**	
Early Intervention		
Factors Affecting First/Early Fit	Additional Needs	
	ALD Policy	Beliefs / past Experiences / Technical Limitations
		Criteria
		Equitable
		Under 3 years Candidacy
	Budgets / Provision	Brand
	Consistency of Personal Amplification	
	Knowledge of Technology	Negatives
		Positives
	Parental Engagement	
	Socio-Economic factors	
	Safety	
	Training	
First Fit	Agree	
	Disagree	
Information Provision	Not Provide Information	
	Provide information	ALD Benefits
		ALD Disadvantages
Informed Choice		
Joint Working		

3.8. Reflexivity

Recognising and addressing reflexivity is critical (Cohen et al., 2017). The researcher is a QToD and Educational Audiologist who is involved with the provision of ALDs. Therefore, it is imperative that results were interpreted accurately avoiding any unintended bias by analysing the results on what is expected through experience and beliefs (Thomas, 2017). Using the ‘Socrates Method’, employing critical thinking throughout the process, questioning sources, and interpretations, and recognising any preconceived thoughts will prevent a bias on the researcher’s part (Thomas, 2017). Participants also had a vested interest in the area due to their professional and personal interests too, so reliability was increased by using a mixed methods approach (Cohen et al., 2017; Tracy, 2019).

3.9. Conclusion

This Action Research uses a mixed-method approach to produce a robust study. All ethical guidelines were adhered to, including the data collection and analysis methods using JISC Online surveys and NVivo14.

4. Results

This chapter presents both the quantitative and qualitative data from the surveys and interviews. The analysis is done through JISC Online Surveys software and thematic coding via NVivo14. Together this data enables the research hypothesis, ‘Informed Decision Making on ALDs in Early Years’, to be explored/addressed.

The initial section will examine the survey results including the demographic of the respondents and response rate. The subsequent sections will examine the data relating to the research hypothesis. Whilst the first part is focusing solely on the surveys, the second section is primarily on the interviews, with the addition of any significant qualitative responses from the surveys.

Quantitative Data Results

4.1. Demographic of Respondents

The survey was distributed via professional forums across the UK, with 106 responses, each UK region is represented, apart from Northern Ireland (Figure 4.1).

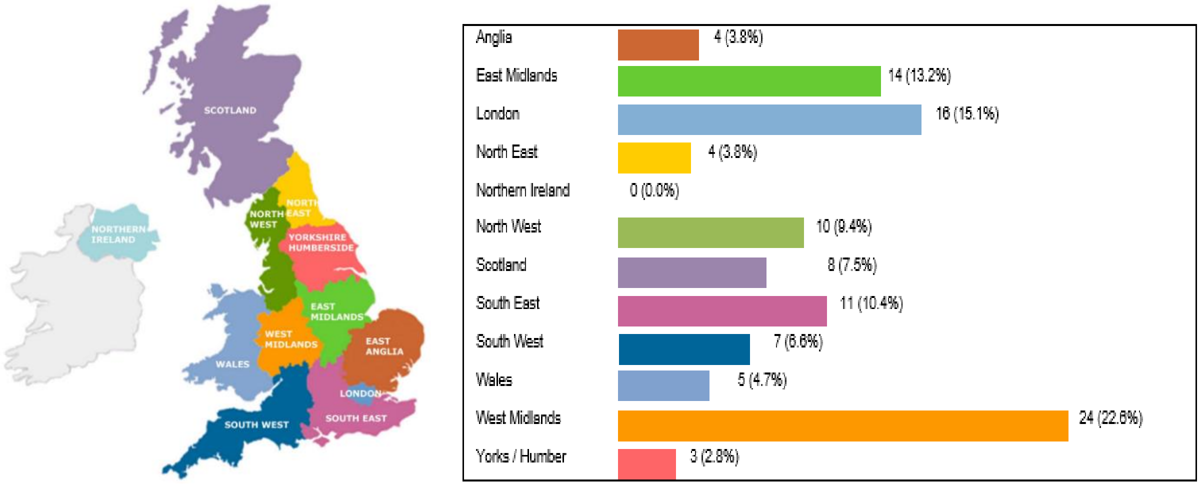

Figure 4.1: Demographics of respondents (image of UK map from Microsoft Bing, 2022).

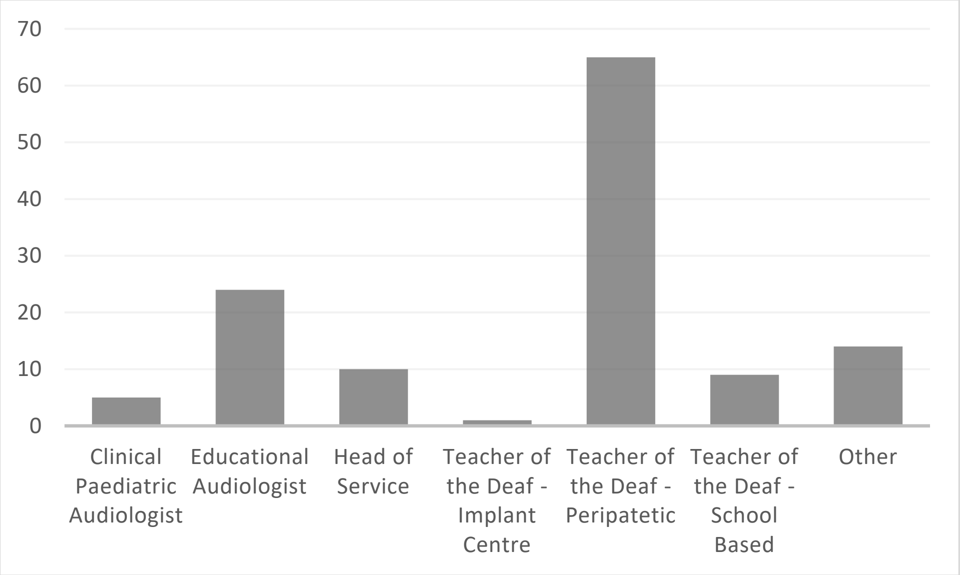

Figure 4.2: Professional background of respondents.

Respondents were able to choose multiple answers for their profession but often they chose their most recent/senior one, respondents may also be a member of more than one professional body (Figure 4.2). The ‘other’ option included various professional groups (Table 4.1).

Table 4.1: Professions represented within the ‘other’ category.

Profession	Number of Respondents
Speech and Language Therapists	4
Audiology Technicians	3
MSI Peripatetic Intervenor	1
Manufacturer of Hearing Aids and ALD	1
NDCS Officer	1
Audiologist in Education	1
Hearing Therapist	1
Team Lead	1
Interpreter	1

Table 4.2 highlights the response rates from the different professional groups.

Table 4.2: Response rate for the various professions.

Respondent	Potential Response	Actual Response	% of Returns
Clinical Paediatric Audiologist	529 (NDCS, 2021)	5	0.9%
Educational Audiologist	82 (email confirmation from BAEA)	24	29%
Head of Service	120 (Email from HoSS)	11	9%
ToD	1350 (BATOD, 2022)	75	5.6%

The respondents had a wealth of experience with 47% having 15 or more years' experience in their chosen profession (Figure: 4.3).

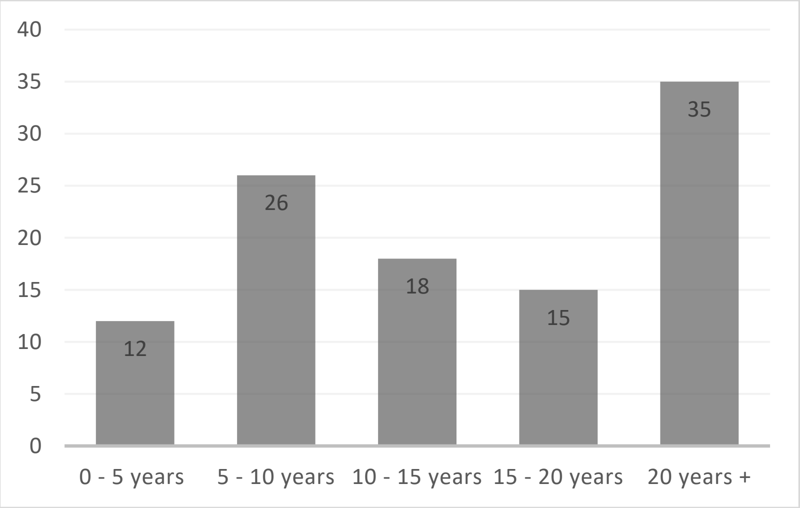

Figure 4.3: Length of time (in years) worked in their current profession.

4.2. Provision of Information

4.2.1. Distribution of ALD Information

Nearly 90% of respondents provide information about ALDs to parents (Figure 4.4). Of the remaining 10% who do not provide information to parents, half do not issue ALDs in their current role. 93% of respondents who issue ALDs, provide information to parents.

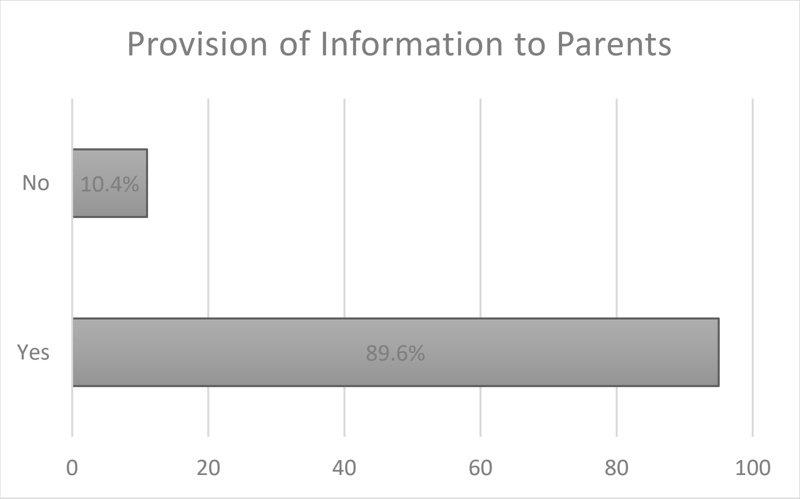

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Figure 4.4: Respondents who provide information about ALD to parents.

From the survey, 21% gave timescales ranging from 2 months to a year (Figure 4.5). Whilst 20% stated they provided information at first contact/initial fitting, less than 1% informed parents about ALDs at the initial fitting (R89) (Table 4.13). Information about ALDs is provided at various stages, 31% were able to provide an estimate of when the information was provided (Figure 4.5).

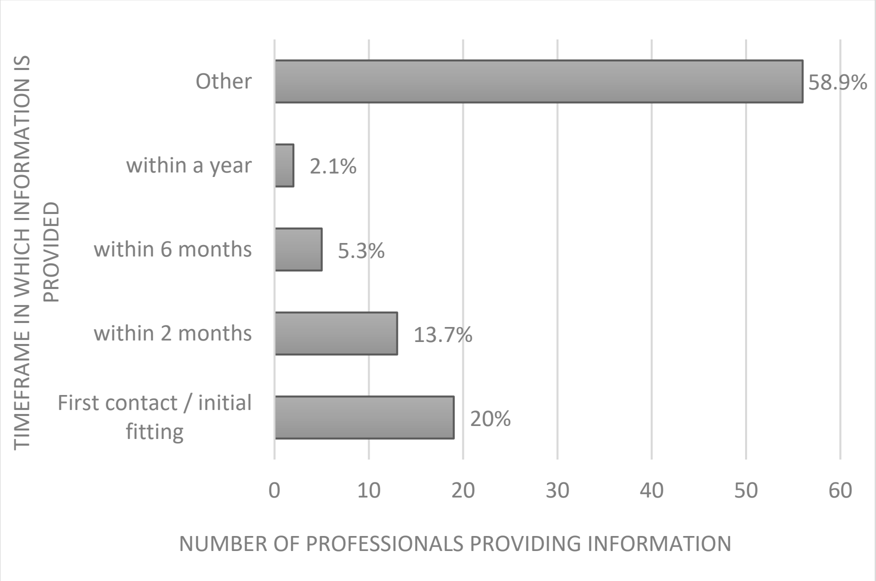


Figure 4.5: Timing of provision of information about ALD.

A further 59% of respondents did not give a timescale when information is given but provided a rationale (Table 4.3). Case-by-case was the commonest reason followed by establishing personal hearing technologies, 4% said that information is provided ‘on request’. Generally, these reasons provided no specific timescales, although two respondents explained that it would be over 2 years old or once an EHCP has been obtained. Of the 41% who did provide a timescale, 67% mentioned caveats to when this information is given including when criteria are met, degree or type of hearing loss when parents are ready, established hearing aid use, and if there are specific funding issues within the service (Table 4.3).

Table 4.3: Non-time-specific reasons for when information is provided to parents.

When information is provided	Number of respondents
Individual basis	26%
When personal hearing equipment is established	24%
When Parents are ready / considered appropriate by ToD	15%
Level of deafness / additional needs	16%
Assessments show benefit	13%
Requested by parent	4%
Over 2 years old due to limited budgets	2%
When they have an EHCP - budget	2%

4.2.2. Professional Role in the Provision of Information about ALDs

Most respondents felt that the QToD was in the best position to provide information to parents about ALDs, 17% considered that the QToD alone is the best professional to provide information, 39% chose all professions and one respondent thought that it should be the Educational Audiologist only (Figure 4.6).

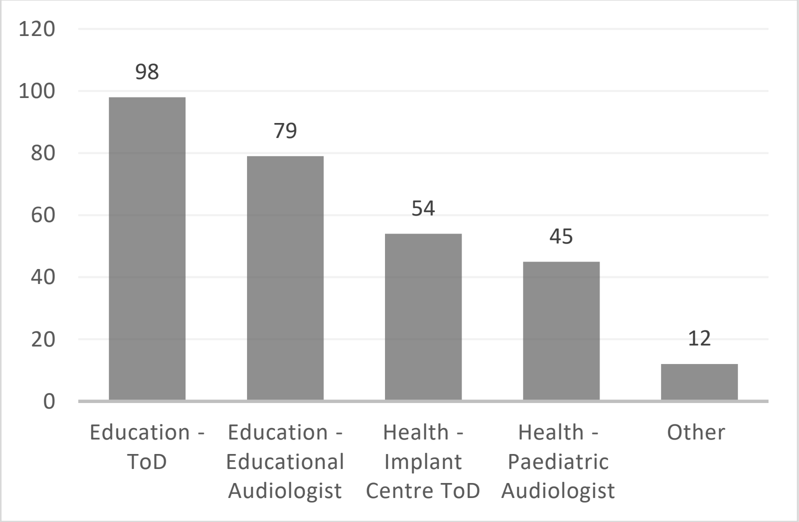
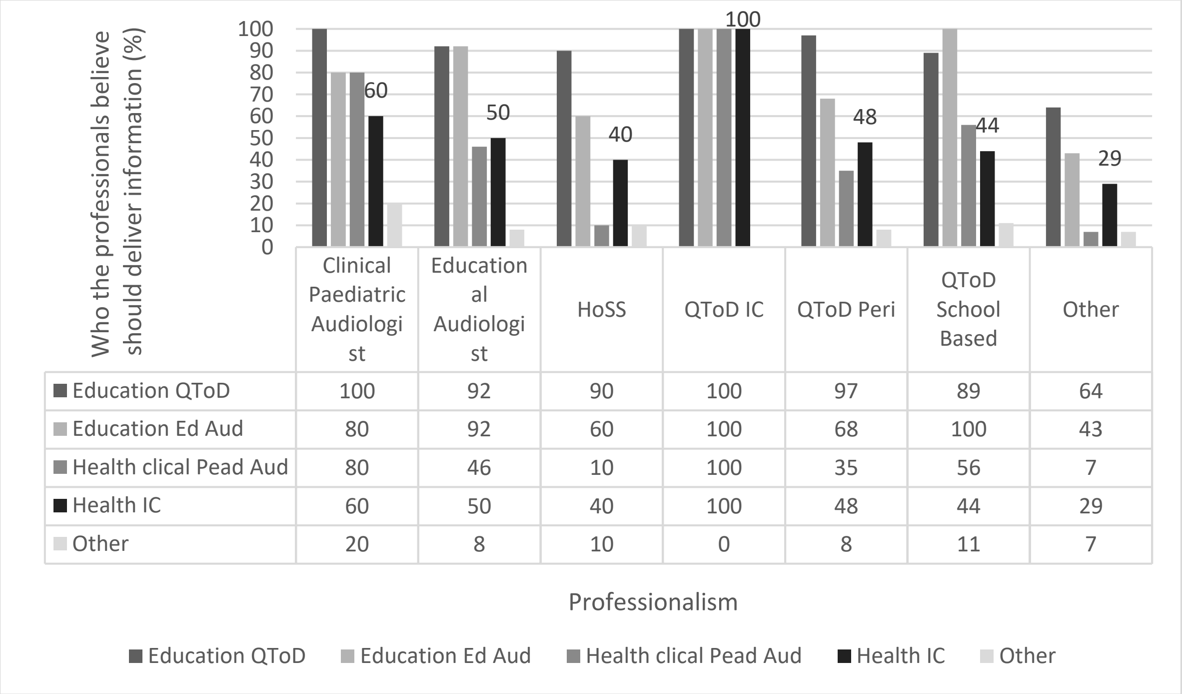


Figure 4.6: Who professionals think should have conversations with parents.

Twelve respondents from various demographics chose the ‘other’ option. Six chose this option in conjunction with all four named options. Their explanation expands the professionals to include deaf role models and supportive services such as NDCS. The remaining six chose the ‘other’ option only, their answers focused on funding, with education leading discussions in conjunction with other professionals.



	Clinical Paediatric Audiologist	Educational Audiologist	HoSS	QToD IC	QToD Peri	QToD School Based	Other
▪ Education QToD	100	92	90	100	97	89	64
▪ Education Ed Aud	80	92	60	100	68	100	43
▪ Health clical Pead Aud	80	46	10	100	35	56	7
▪ Health IC	60	50	40	100	48	44	29
▪ Other	20	8	10	0	8	11	7

Figure 4.7: Who professionals think should discuss ALD provision (by professionalism).

4.2.3. Confidence Levels in Advising Parents on ALDs.

Nearly 60% of the respondents stated that they were very confident to advise parents about ALDs with a further 32% being quite confident. No one responded that they were not confident to provide advice to parents (Figure 4.8).

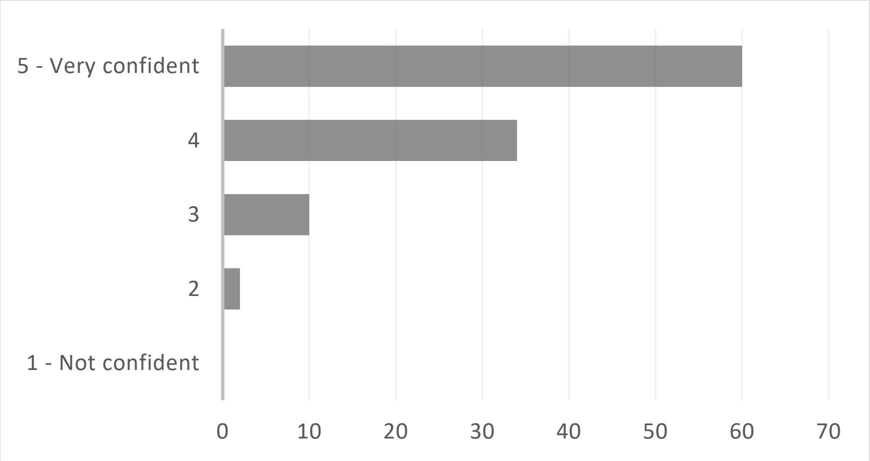
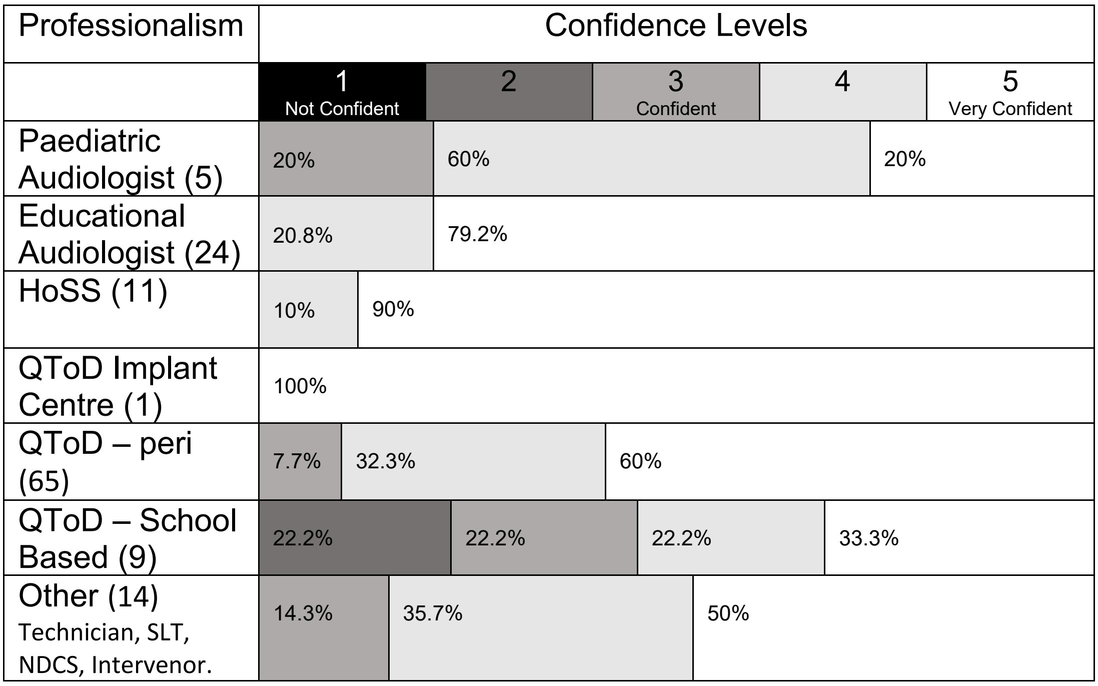


Figure 4.8: Respondent's confidence in advising parents about ALDs.

These figures can be broken down further into the different demographics and confidence levels in providing the information (Figure 4.9).



Professionalism	Confidence Levels				
	1 Not Confident	2	3 Confident	4	5 Very Confident
Paediatric Audiologist (5)			20%	60%	20%
Educational Audiologist (24)				20.8%	79.2%
HoSS (11)				10%	90%
QToD Implant Centre (1)					100%
QToD – peri (65)			7.7%	32.3%	60%
QToD – School Based (9)		22.2%	22.2%	22.2%	33.3%
Other (14) Technician, SLT, NDCS, Intervenor.			14.3%	35.7%	50%

Figure 4.9: Confidence levels of providing information by professionalism.

4.2.4. Content of ALD Information Provided

From the survey, the type of information, which is provided to parents varies greatly; nearly 70% is through discussion, 50% provide written information and 15% provide practical demonstrations. 36% is through discussion alone and 11% is solely through written information, whilst 20% provide website links, of which 4% are websites alone. Respondents who provide two forms of information, usually provide written and verbal (Table 4.4). Those providing practical demonstrations often provide a comprehensive package of written and verbal information too. Practical demonstrations of equipment accounted for 10% of the respondents who provided information. Of these, nearly 70% of the demonstrations were delivered by either an Educational Audiologist or a technician (Table 4.4).

Table 4.4: Types of Information Provided.

Type of Information		**Number of respondents who provide it**				
		Total	**On its own**	**Alongside other information**		
				Written	**Verbal**	**Practical**
Discussion 73	General use	52	22	15	5	10
	Benefits	16	9	4	3	
	Procedure of issuing ALD	2	1		1	
	Maintenance	7	1	3	3	
Written information 53	Local Leaflet	13	4	3	3	3
	NDCS Info/ links	19	4	9	5	1
	Manufacturer	5		4	1	
	Local policy	3		3		
	Price / NDCS Loan info	8	1	1	6	
	Research	3		1	2	
	Starter pack which includes what why troubleshooting	2	1	1		
Practical 16	demonstration	9	1	4	4	
	Meeting other families who use ALD	7		5	2	
Total		147	45	53	35	14

4.2.5. Benefits of ALDs

91% of the respondents believe that the timing of ALDs influences language development and attainment. Their reasons vary (Table 4.5), but importantly, a proportion cautioned that language development is not ‘a given outcome’, ALDs need to be used effectively alongside personal hearing amplification, training, and other strategies.

Table 4.5: The reason that ALDs impact on language attainment and outcomes.

Benefit	**Number of respondents who cite this benefit**
Clearer or improve access to speech/language	49
Improve SNR	20
Distance between caregiver and child	8
Reverberation	2
Listening fatigue	1
Dual /attention	3
Increase vocabulary/access to incidental language	1
Confidence	2
Feeling included / social development	2

4.3. Provision of Equipment

4.3.1. ALD Policy

90% of respondents state they provide ALDs, guided by an ALD policy, ALD criteria, NDCS QS1 (2017), or professional judgment (Figure 4.10).

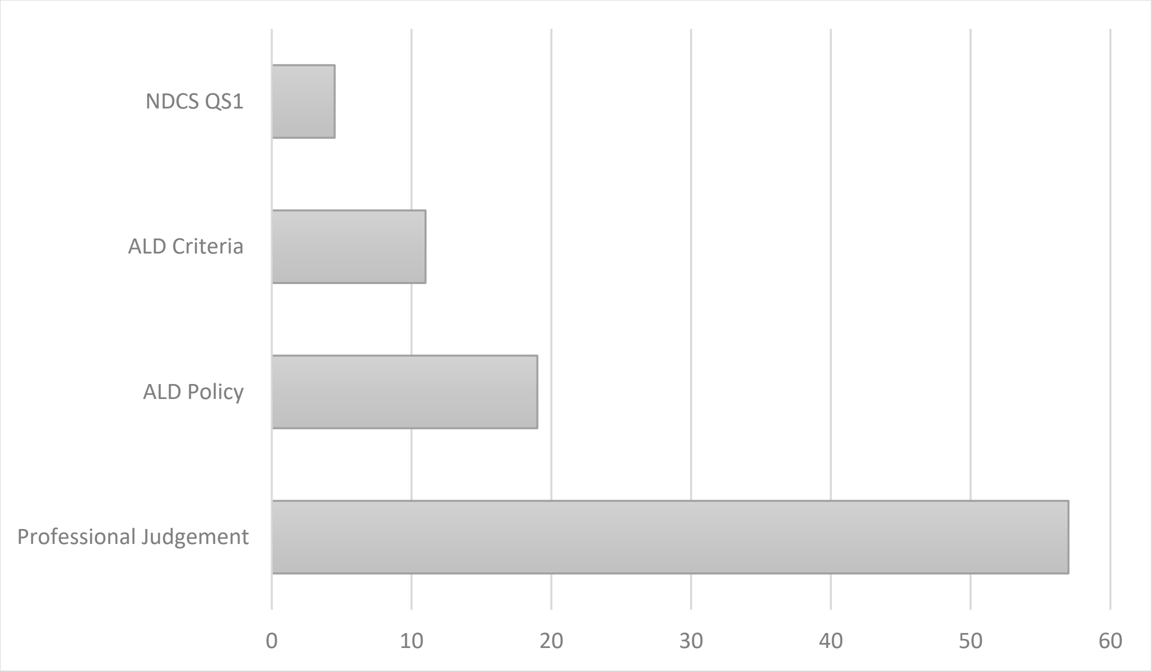


Figure 4.10: How a child is deemed a candidate for an ALD / issuing of ALD guidelines.

4.3.2. Age of Provision

Nearly 50% of respondents said that ALDs were available to all children in their area, 20% explained that ALDs are available to children who are nursery age+ (3 years+), and a further 14% fit school age+ (Figure 4.11).

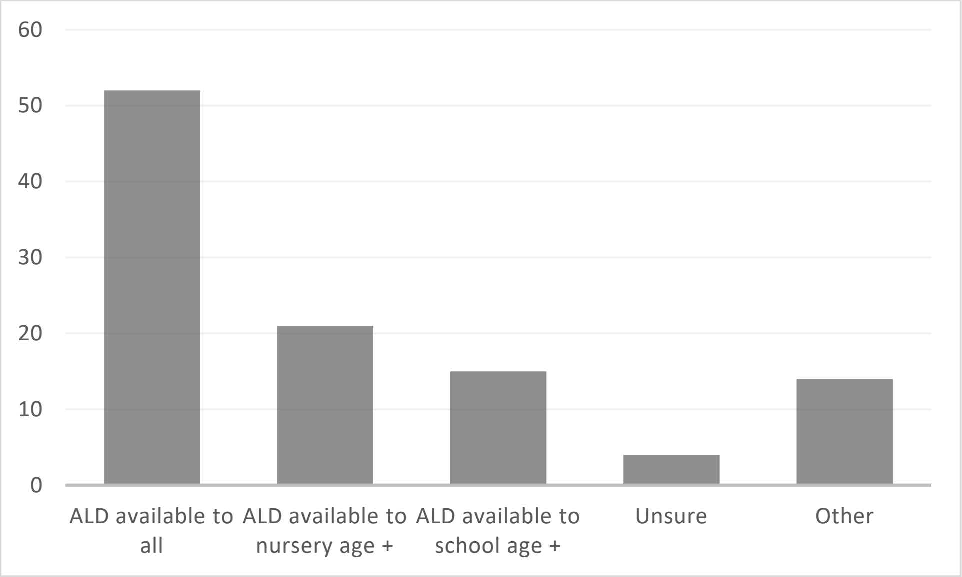


Figure 4.11: Age of provision of ALD

Within the ‘other’ category respondents clarified their answers, with a further 4 respondents providing ALDs to all, 3 provided for nursery age +, 1 for school age. The remaining six respondents’ comments included dependent on hearing levels and hearing aid use, council policies, and budgets.

Nearly 37% of respondents stated that they are not aware of any child under 3 years fitted with an ALD in the first year of diagnosis, however 18% reported multiple figures of children fitted in the first year with an ALD (Figure 4.12).

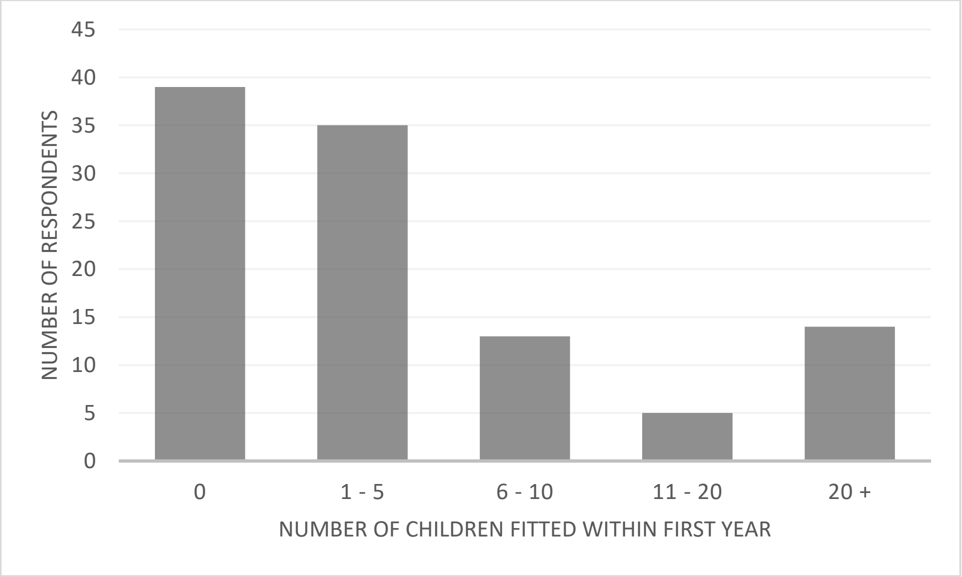


Figure 4.12: Number of Children fitted with an ALD within the first year of diagnosis.

4.3.3. Timing of Fitting

Whilst 86% of respondents were aware of NDCS QS1 (2017), referring to ALD at first hearing aid fit, 83% of professionals disagreed with this policy, their reasons are found in Table 4.6.

Table 4.6: Reason of respondents who disagreed with the NDCS (2017) first fit policy.

The rationale against 'First Fit'	Number of respondents
Personal amplification established first	49
Too much / Overwhelming for parents	31
Distance is not an issue for babies	9
Learn to listen to localise sounds	7
Training/understanding of ALDs	7
Unable to check for distortion/report /feedback/troubleshooting	6
Budget / lost equipment	6
Health HA / ALDs education	6
Batteries	4
Not every child needs a radio aid	2
Extended appointment times would be needed	2
Shortage of ToD to manage equipment	2
Independence	1
Issues around who would purchase equipment	1
Verification each time	1
Too stressful for the child unexpected noise	1

The remaining 17% agreed with first fitting, providing their reasons (Table 4.7). Although caveats of establishing hearing aid use first and concerns about the parents being overloaded were mentioned, in addition to questioning how this would work between health and education services.

Table 4.7: Reasons of respondents who agreed with NDCS QS1 (2017).

Rationale to fit at Initial Hearing Aid Fitting	Number of respondents
Yes, to BAHA and HA, no to CI	1
Very important as audiology would know which aids are compatible	1
Catch up with peers / better outcomes	4
Installation would be done at hospital	1
Easier if they did	1
If established ALD with HA moving to CI	1

4.3.4. Funding of Equipment

The subject of who funds the equipment is a common theme throughout the responses, with most being funded by education through a variety of streams (Table 4.8).

Table 4.8: Funding streams for ALDs.

Funding Source	Count
Early Years Funding	7
Education (Sensory Support Service)	91
Education EHCP	16
Education (School)	16
Health	5
Other	12

Whilst ‘other’ responses primarily details funding depending on age/setting, it also expands to include other avenues of funding, including charities, grants, and NDCS. Six respondents also suggest purchasing or loaning the equipment privately.

4.3.5. Factors Affecting Provision

Respondents mentioned various factors which affected the provision of ALDs to under 3-year-olds (Table 4.9).

Table 4.9: Factors affecting provision.

	Raw Score/number of respondents
Funding issues	23
Not within criteria	27
Distance is not an issue	11
Inability to reliably report	6
Safety concerns	6

4.3.6. Who Makes the Decision

Respondents were asked who made the decision for a child to receive an ALD in their area, of the 93 respondents, who issue ALDs, parents only accounted for 34% (Table 4.10).

Table 4.10: Who makes the decision for a child to receive an ALD.

	Raw Score/ number of respondents	Rank
QToD	85	1
Educational Audiologist	50	2
Parents	32	3
Other	11	4
Clinical paediatric Audiologist	8	5

Respondents were asked if they believe their parents are empowered to make an informed choice about the provision of ALDs (Figure 4.13).

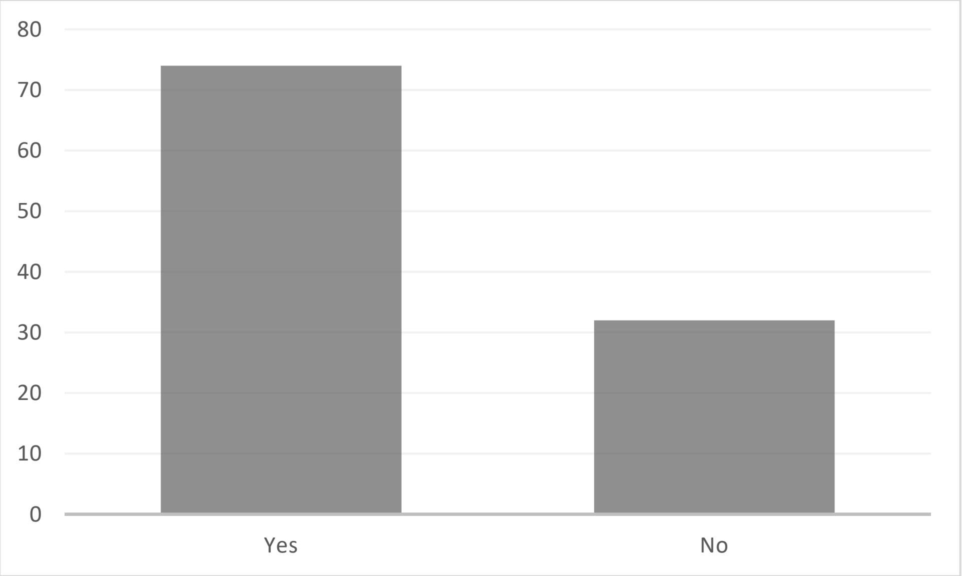


Figure 4.13: Are parents empowered to make an informed choice about ALDs.

4.4. Qualitative Data Results (Semi-Structured Interviews)

Ten respondents from the survey were interviewed, and from the transcripts six overarching themes were extracted:

- Informed Choice
- Information Provision
- Opinions on First Fitting
- Factors Affecting First Fitting
- Early Intervention
- Joint Working

These themes were further categorised into a total of twenty-two additional subthemes. Some of the themes were predictable given the nature of the research, others, including socioeconomic status, were not.

Each respondent was assigned an identifier to facilitate anonymity. In addition to their survey number, interview responses are signified by their interview letter identifier, distributed in the order of being interviewed. Survey responses are numerated, preceded by R (respondent) when referred to in the text.

4.4.1. Informed Choice

Respondents were asked if they believed parents are empowered to make an informed choice on having an ALD in their organisation and what their rationale was for their answer. Respondents E20 and H42 acknowledge that this is their aim, but they are not at the point where parents are empowered to make an informed choice (Table 4.11). Where an informed choice was made, respondents questioned if the parents made the right choice.

Table 4.11: Parents are able to make an informed choice on ALDs in their service.

27	Parents are included in the decision and have the opportunity to speak through questions/queries with their ToD (data the from survey).
33	They are equal partners in any person-centred decision making around their child - they are provided with information and supported in whatever choice they choose (data from the survey).
44	They do have an influence, but it is difficult to know if the decision is made appropriately (data from the survey).
55	Full information is given … parents are then able to make an informed choice (data from the survey).
63	Parents have a lot of influence and can persist (data from the survey).
94	Parental empowerment is key working with audiological advice re readiness (data from the survey).
E20	I wouldn't say we're 100% there, but we're aiming for informed choice… we can give people all the information, and their decision will still be made, not on the basis of what we've said, but on the basis of other aspects of their lives and culture.
H42	It is a ‘work in progress’ and we are trying to make this the case and there is always the caveat that ‘panel’ may refuse the request (data from the survey).

From the interviews, there were an equal number of respondents who felt their parents were not empowered to make an informed choice about ALD provision (Table 4.12).

Table 4.12: Parents are unable to make an informed choice on ALDs in their service.

23	To be honest, parents don’t make the choice unless they are self-funding. We trial our recommendations and explain each stage as we go along (data from the survey).
29	Parents aren’t really asked about whether their child should have an ALD (data from the survey).
34	They're just not (data from the survey).
36	If we recommend one, it is up to the parents to accept it (data from the survey).
45	It’s part of our EY+RA process to involve parents in decision-making. However, as professionals, we make the decision as to whether the family environment is ready (data from the survey).
52	Unlikely parents have any say in this let alone feel empowered (data from the survey).
57	They don't know about it (data from the survey).
66	Our service is not able to financially support all children within the service to have access to an ALD, so requests are based on need and assessments. For parents of children whose hearing may not fall into an area of great concern by the ToD or Ed Aud, information regarding ALDs is not generally shared specifically, so these parents will be less empowered to make informed choice (data from the survey).
73	Not yet - this is something we need to work on. I am aware of limited budget, too (data from the survey).
81	Parents within our service have the opportunity to be empowered. However, I feel many of the parents that I currently support are not (data from the survey).
83	Parents are not given enough information about ALD (data from the survey).
89	This is because ALD provision is driven by budget considerations and we are unable to give parents the choice (data from the survey).
97	Decision making is in the hands of the TOD and Ed Aud depending on need and circumstances (data from the survey).
A54	I suppose because we never asked really by parents, and I think just generally our parents … don't know what their child is entitled to.
D39	It isn't in their power to decide if they get one.
G69	There's not enough information, I don't think. I think a lot of the stuff out there is sometimes biased.
J4	It's not going to be them that sort of influences your decision, it's not about the parents, one might say that you want the parents to be informed as possible, but there are quite a lot of things to complicate it… it's not as straightforward as you would like...it is a very complex area and there's a lot, lots of factors that play into talking about informed choice you have to consider.
K92	I don’t think they get enough information early enough (data from the survey) … I probably made that mistake myself, not bringing it up all the time, really.

4.5. Information Provision

Respondents were given the opportunity to expand on their survey response, providing information to parents about ALDs, and explaining what information was provided, and how and when they provided it.

4.5.1. When Information is Provided

The timing of the provision of information varies greatly, between and within organisations. Many respondents state that they provide information when the parents are ‘ready’. In none of the responses in which when ‘ready’ was mentioned, was a timeframe given. One professional is currently informing parents of ALDs at the initial fitting appointment (Table 4.13). Although most audiologists, explain that the decision on fitting an ALD is an educational decision (Table 4.15).

Table 4.13: Details of when information is provided.

12	We will gauge to see how receptive parents are but information on ALDs is included in our Parent Handbook that we go through on a first visit (data from the survey).
18	We provide info to parents whose children have a loss of 40dB or greater. This is usually provided when good hearing aid use has been established or when the child enters a setting (data from the survey).
26	When I think it is appropriate – that depends on the individual child and family (data from the survey).
49	When requested (data from the survey).
62	Usually discuss it soon after the child has been fitted (data from survey)
71	On case-by-case basis, information is given when deemed appropriate. ALDs are not generally available for pre-school aged children in our borough (data from the survey).
77	I use my professional opinion as to when parents are ready for this information – for some, it is too much, too soon … may decide to delay information, for example, if the child has very complex needs or medical needs (data from the survey).
89	I inform them about Radio aids and seek consent for referral to Education services (data from the survey).
105	Information tends to be provided as the child enters school/nursery setting as our service does not provide equipment for home (data from the survey).
D38	It isn't necessarily part of our thing that we would always discuss right at the beginning.
E20	Often, we're talking to them about radio aids before they're talking to us… before they're mobile. I think the most important thing we do is to provide the time to actually talk things through with parents.
K92	If parents are interested, then of course we would have that discussion.

Although answering ‘yes’ to providing information, R70, clarified in a later question, that parents were not empowered to make an informed choice about ALD provision in their organisation, with the reason: -

“We don't make the information readily available as funds are not readily available. If we did, we would have to disappoint a lot of parents due to lack of funding” (R70 data from the survey).

4.5.2. Type of Information Provided

Respondents explained that information is often given to parents through verbal discussion, demonstrations, or utilising the information produced by NDCS (Table 4.14). Parent groups and social media groups are also featured in information dissemination.

Table 4.14: Type of information shared with parents about ALDs.

5	ToDs explain how ALD can be useful. They use their own resources and online simulations (data from the survey).
9	Verbal, written and actual examples of the Phonak Touch and the Oticon Edumic (data from the survey).
10	Inform them that we firstly train the child to identify interference, crackling, etc. Secondly, we will fit ALD with parent. Child is allowed to take home as appropriate (data from the survey).
17	Written information, NDCS links and introducing them to other families at peer groups (data from the survey).
46	Lots of information is given to families to take responsibility for this expensive equipment (data from the survey).
55	What the function is, what they look like, possible ways to use them in setting and at home, implications for insurance/cost of replacement (data from the survey).
71	What they are, what the benefits are, how to borrow them from NCDS if they wish to explore purchasing a system for home (data from the survey).
76	Showing and demonstrating equipment and using video clips in noise so families can hear for themselves the difference it makes. Signposting to NDCS (data from the survey).
81	Verbal information is initially shared but I also include written information. However, the most beneficial is when the equipment is demonstrated with parents (data from the survey).
B8	That they (ALD) are available should they be needed (data from the survey). It's all verbal, we don't send any information out.
D39	We've produced and it has a guideline of all the documents that you must share, everything that you must get filled in with, and a timeline. So there's an initial pack so they'd get all the DLA, all the NDCS stuff and I suppose we could put something in there, but at the minute that isn't included in that. I think it's been useful for me because your questions have made me think about what we do with pre-schoolers and that I think it's that sharing of information, isn't it? And it goes back to what something that was said at university, there was that interview with the family with the lady and she said that the ToD had decided that her preschool child didn't need a radio, so she wasn't made aware that they're out there because they felt they weren't ready, and I feel that's something we need to be mindful of. I think it needs to be, open, and everybody needs to have the information. It's like sharing, we share the DLA information. Not every child may qualify or be awarded DLA, but they're all given that information, so I suppose in a similar way.
E20	Where their parents, who have shown an interest in research…often refer them to The Ear Foundation, NDCS paper … or shorter kind of summaries that other people have produced … by and large it's us trying to meet the parent where they are and explain to them.
G69	Predominantly, it's like the NDCS and then we've got our [local] Deaf Children's Society website as well… I think it's very limited, it's NDCS or Phonak…we give them the policy that explains what it is and what we do.
K92	If parents are interested, then of course we would have that discussion show them the equipment that is available and talk it through with them and we do have information leaflets on how they work and how to check them.

Some respondents explained that providing information has its difficulties. The reasons include not having the equipment or knowing if the personal amplification is compatible with an ALD. Therefore, information is not provided as they do not want to raise hope and potentially damage the relationship with the family (Table 4.15).

Table 4.15: Barriers to sharing information about ALDs with parents.

89	Budget considerations have restricted our local education services from providing ALD to children. It would be less constrictive to be allowed as an Audiologist to discuss this freely with parents. I always have to add the caveat - "Education will advise if the ALD can be issued to your child"
A54	No, we don't provide information because it's difficult … we've got children waiting in mainstream, in primary and secondary who are waiting to be fitted, who definitely needs an FM system, so they end up being the priority really, over younger children and as it's getting harder and harder to get equipment so that I guess that that is why really.
D39	That's probably something that we need to develop, I would always mention it, but I don't think Teacher of the Deaf would. I think there's so much new equipment isn't there? I think some of them might not feel 100% confident to answer questions. I think they might be wary of doing that in case they referred to panel and then they didn't get it…
F84	It's not our decision that they would have that anyway, it would be our education colleagues. It's finding that kind of balance and having the information there that you could give out, and I suppose it's knowing whether there is any funding generally that parents could access or not. Knowing the limitations of as an audiologist as to how much I could mention about assistive devices, when they're not something that the hospital provides or even if they did provide it, wouldn't be free, like the hearing aids are but it's also it's getting the balance.
J4	I think that it's quite difficult to give information to families because you've got to be very, it's got to be very specific to that, that family because it would say if they happen to have a band that is not compatible with any radio aid …You can't talk to families and raise their hopes…It's quite a complicated, complex area, you know, because you've got to be very specific with each family, so I wouldn't give any information, like a leaflet.

4.6. First Fitting

The NDCS's (2017) QS1 states, 'A full amplification package, including a radio aid, should therefore be put in place for each deaf child at their first hearing aid fitting.' (NDCS, 2017:11).

4.6.1. Disagree with First Fit

Of the ten respondents interviewed, nine did not agree with first fit, their reasons for this vary but include consistent amplification, parents being overwhelmed, safety, budgets, losses/damage, technical knowledge, additional needs and distance not being an issue for babies (Table 4.16). Although in favour, through the interview, K92 acknowledged difficulties with first fit (Table 4.16).

Table 4.16: Comments of people who disagree with NDCS QS1 (2017).

1	In our experience, ALDs are most effective when children are in noise or at distance from the person speaking and when transmitters are used well. This is not necessary during the baby stage (data from the survey).
9	More evidence is needed before this becomes standard practice. What is the evidence the NDCS are using for this assertion? (data from the survey).
55	This seems rather premature; many children will not need ALD despite being fitted with hearing aids (data from the survey).
64	I feel that the majority would feel overwhelmed if their child was also fitted with an ALD at their initial HA fitting (data from the survey).
75	I understand that they want children to have the best outcomes but then they would be reliant on ALD. On first fitting the brain needs time to process their new listening experiences first then when adjusted ALD can be fitted (data from the survey).
80	Our local CI centre sometimes recommends starting children with CIs with ALDs only after 1 year of listening through the processors. However, there is some flexibility (data from the survey).
B8	Need to establish good aid use first. not every child needs a radio (data from the survey). I disagree with it
C85	I'm going to say three months for young children, I don't think it's a good idea to attach another layer certainly with cochlear implants, I would not agree.
E20	I think we would feel disappointed if it wasn't in by the time the child is able to be away from the parent.
F84	I didn't know the specifics that they suggested that FM system would be at first fit, why? It just doesn't seem kind of practical initially, that you throw in an extra piece of kit in there
G69	When they're ready … you need to look at how they do it in school
H42	Guided by the audiologist…they're feeling is quite strong that listening with the hearing aids should come first, that needs to be established… more towards the 18-month mark
K92	ALD isn't really a consideration initially, it's more to do with keeping the devices on, getting them access to language. I think maybe that's why we don't emphasise it …as much as we could with preschool children is because we think well, you know that those are in education or are a priority for this. So we do put our emphasis in that in that area really

4.6.2. Agree with First Fit

From the survey, 17% agreed with 'First Fit', although no professionals were currently able to provide this provision (Table 4.17).

Table 4.17: Comments of people who agree with NDCS QS1 (2017).

44	This is commonplace in most countries, but it may depend on individual circumstances (data from the survey).
32	Excellent idea but some families it's too much, it's a case-by-case assessment (data from the survey).
49	Very important - so much time is lost when we have to find which ones are compatible with their aids (data from the survey).
50	I agree as it will allow the child to catch up and minimise the gap between them and their hearing peers (data from the survey).
53	I feel that the earlier a child is fitted the better the outcome for the child (data from the survey).

K92	It needs to be coordinated between health and education funding and their needs to be mandatory guidelines for initial clinics where both services are present (data from the survey)…Parents should be given information about the hearing aids, the accessories that can be used alongside that, so assistive listening devices. I just feel it should be a whole package really and I think parents should have the option to try it now … joint clinic that provision the really that's stopping this to be come to fruition really.

4.6.3. The Ideal Time to Fit an ALD

All interviewees felt that earlier fitting of ALDs would be advantageous but that there are many factors that need to be considered and navigated through first. Respondents were asked if not at 'first fit' when did they feel was the right time to introduce an ALD (Table 4.18). Respondent C85 explained children who receive cochlear implants, either new or upgraded, receive a choice of gift, with a voucher to claim it within six months. C85 explained that the latest implant device will not have a choice of gift, it will be an ALD and will be provided alongside the implants (Table 4.18).

Table 4.18: Professionals' view on when the right time to fit an ALD.

5	My advice is to delay ALD fitting until the child is using their aids/CI consistently. We would fit ALD to a very young child once they start to move away from adult/carer (data from the survey).
19	We decided to fit ALDs for early years children (once they became mobile - because then some communication was happening at a greater distance) (data from the survey).
86	Fitting the ALD between 9-12 months post-implant is optimal for a child who is using their devices well (data from the survey).
A54	For me personally in school, so once they're at nursery or in reception. Where teacher or a TA who can take some responsibility for it, get it established and then hopefully maybe use it a little at home.
B8	We would look at two is when we would seriously start looking at it for every child.
C85	In our opinion, they need to have a stable map. We would steer most people towards the Mini Mic…with advice and reasons … The N8, I believe, is going to have no choice, it's only going to be a Mini Mic 2+… They might just chuck it in the kit anyway, so it might not be around It might not be a conscious thing about delaying starting to use it.
D39	We're bringing the age down … so we've got that 15 month old
E20	We go in very early with radio aids … we would want to in place by the time the child is mobile … individual decision. Our aim is to provide an ALD as soon as we can but hearing aid use needs to be established (data from the survey).
F84	By follow up, once they've had time to let the hearing aids get bedded in, they've grown their confidence. They're more happy with physically handling the hearing aids and how to look after them … could still introduce it quite early on.
G69	When they're ready…you need to look at how they doing in school.
H42	Routinely 12 to 18 months mark I would say.
J4	Well established so that they can move on to the next stage and I would imagine that would be several months.

Respondents were asked what would make an under-3-year-old a candidate for an ALD (Table 4.19).

Table 4.19: Prerequisites for provision of an ALD in Early Years.

B8	Level of hearing loss, definitely. How speech was developed, how language was developing, and if there were in accessing a setting early on. For the noise levels in the nurseries, so we want to give them optimal listening conditions if possible. We would look at two is when we think we would seriously start looking at it for every child.
D39	If they are within a metre and 1/2 really of the parent, there's no benefit to the radio even in noise, so unless they're a distance there isn't a benefit, and for a parent using it within the home. … because most of that interaction would be up close.
G69	If you had a cochlear implanted 3 1/2 year old in a quiet environment doing really well, but in a noisy environment, struggling a little bit perhaps a trial one then...we can look at each case as it comes up. Some authorities have an ALD panel once a term …we'll just have a conversation…how they do it in school … have they settled? What progress are they making? … What's their speech like? What's the access to the curriculum? Like what school environment are they in? If you're in an old Victorian class school with, the acoustics are absolutely shocking. Of course, you're going to need it.
H42	We've managed to push hard to get that a little bit more routinely now. So most of our sensorineural children have radio aids going into school, they go into school at three here. It tends to be those who are going into earlier settings and depending on those types of earlier settings that we would probably prioritize terms of how those acoustics are.
J4	I'm sure we have got them in nurseries, I think it's more it being the case of either we, you know, we've observed that it's really difficult or there's … a teacher said it would be good, you know during story time or you know carpet time…I think we should probably look at that a bit more often actually...for nurseries.
K92	It's either parental request and we're quite happy to give it go, or if they're in a preschool setting. We might be looking at the environment they're in, whether there's a lot of background noise. Also, if they've got a key worker, key worker is quite important, so that they take on board responsibility for muting the device and thinking about the activity they're doing as to whether that would be suitable for using the ALD for that activity.

4.7. Factors Affecting First Fitting

There were several subthemes that were raised as considerations as to when to fit an ALD, some which were universal and others which were a representation of the population of their county.

4.7.1. Consistency of Amplification

This was a primary subtheme, with several issues being highlighted. The main concern was establishing good personal amplification use (Table 4.20).

Table 4.20: Establishing good personal amplification.

24	Unsure - should they become accustomed to HA/CI/BAHA first? (data from the survey).
28	I think the idea of the discussion at first fitting should happen, but the ALD should be when the HA use has been constant and proven to be effective (data from the survey).
58	Whether it would be of benefit- less likely for instance if aids not regularly worn (data from the survey).
A54	My priority is always to get the hearing aids established and to introduce something else at a very early age I think is very counterproductive…I personally wouldn't want to fit an FM system until … all the mapping was done, that there were reliably wearing, their speech processes, and that we were happy with everything.
B8	I just feel that initially they have to get used to wearing the hearing aids and that’s really important … and see how to get on with that before you then introduce an extra…with cochlear implants, our cochlear implants team wouldn't let us do it initially.
C85	It just would add a layer of complexity that they don't need to have, a mini mic layered on as well. The child needs to be to have a stable map.
E20	We know that we're going to get them optimised within three months …hopefully what they're hearing is meaningful, there's no point doing it when the map is changing on a weekly basis, I don't think.
F84	Get used to the hearing aids and they're nervous about trying to put the earmoulds in
K92	Consistency of use is a key one, so if it's a hearing aid, then we'll do like them to have, about three, I think it's about 3 months of consistent use with the hearing aids.

4.7.2. Safety

The issue of safety was mentioned multiple times, with concerns of batteries and receivers getting swallowed, although many did reference the options of lockable or integrated receivers as a solution (Table 4.21).

Table 4.21: Safety concerns.

32	For babies if they have Sky Marvel or Oticon for safety reasons (data from the survey).
46	It is expensive to have integrated receivers with tamperproof locks (on Phonak aids) that could easily be lost and education doesn't have endless budgets (data from the survey).
93	Our service currently needs a safe solution to ensure tamper-proofing for hearing aid users under 5s. This prevents us from being able to cater to this group of children. However, cochlear-implanted children can receive a streamer as their 'add-on' accessory at fitting. (data from the survey).
A54	I don't think you could get a lockable battery draw, there was an issue with one aid and there was a worry that one child ingested one button battery. It was terrible, you know, they spent the day and A&E - X-rays.
C85	The buttons on the processor which we have tend to try to avoid because of we want those locked really and not fiddled with
D39	We've always issued the Roger with the tamper proofing and a clip-on MIC, but we're trying to get away from that Roger Tamper proofing because it's just so difficult.
F84	We were planning on upgrading to the latest version of Phonak which allows the integrated receivers.
G69	It's possibly a bit better now I up until this point, it's really been a health and safety thing. The receiver was a really small, the battery compartments were not always locked.
J4	It was worrying for parents to think ‘ohh I could so easily lose that or could come off, it could be eaten’,… rechargeable hearing aids is another thing that has helped a great deal.

4.7.3. Budgets/Provision

All interviewees contributed to this theme, whilst 70% explained that their budgets had a negative impact on the provision of ALDs in Early Years (EY), 30% explained that budgets were not a consideration at present (Table 4.22). Out-of-County provision was also highlighted as a challenge (Table 4.23), with the type of hearing aid provision (Table 4.26) or providing the ALD (Table 4.27) additional considerations.

Table 4.22: Negative impact on the provision of ALDs.

11	Who would purchase each ALD system? Education or Health? (data from the survey).
13	Schools are expected to fund them for school aged…we have challenged with our LEA. They are not always supportive (data from the survey).
16	Putting pressure on hearing aid and CI companies who sell equipment already loaded with receivers to audiology services and then charge Education another load of money to' unlock' them. If it was only an issue of buying a microphone, then we could run an experiment and for everyone and get proper data on ALD benefits. Companies would likely not lose any money as more microphones would be bought (data from the survey).
22	The only reason we wait until nursery is due to funding. The nursery or school part funds (data from the survey).
30	We do not provide ALDs for home use. Budgets do not stretch that far and we cannot trust that the ALD will arrive at school every day. If after discussions with parents who feel they need one for home use, we will help them to gain funding to secure one or trial one from the NDCS loan service first (data from the survey).
67	Due to funding restraints, I don't offer ALD to as many families as in previous years. I tend to prioritise the children with most significant deafness rather than all children who may benefit (data from the survey).
70	We don't make the information readily available as funds are not readily available. if we did, we would have to disappoint a lot of parents due to lack of funding (data from the survey).
71	ALD provision ultimately comes down to budget. We have plenty of children who would benefit from them, but they have to wait until one becomes available, and then their case needs to be argued by their ToD (data from the survey).
91	We can only buy radio aids for nursery age and/or when children get an EHCP (data from the survey).
99	We will access any means including grants from charities to provide ALD's. Health are currently providing the receivers (unknowingly) in children fitted with Oticon hearing aids using the EduMic (data from the survey).
105	Within our service ALD are not given to children out with nursery and so not to under 3s although research suggests the benefit that they can have in the home. Comes down to funding again and issues surrounding insurance in home environment rather than educational setting (data from the survey).
A54	That's getting definitely tighter, [Ed Aud], does an order, and if I'm being honest, it's getting hard to get that order through... definitely has an impact on provision.
D39	Limited budget so not all children can have ALD. We don't generally issue ALDs until children are 2 years or over (data from the survey). Is it affecting my choice of what type of equipment they get? obviously… we've issued a few sound field systems which in the past we wouldn't have done.

E20	There is an amount of money for radio aids and similar equipment … I order equipment in bulk as and when it looks like our stock is running low … I have been told previously to push it forward to the next financial year
F84	The hearing aid is health, the FM is education, but now you're put in two bits together and then how does that work and who funds it? … where would funding come from? You know whether it was something that NDCS could support with… If there is any potential funding that those families could tap into that they could use. So a bit like I suppose their PIP.
G69	I've regular meetings with the finance people and they say, do you really need that much on equipment?
H42	I managed to tap into some early years funding and persuade the early years kind of within the authority to support with funding … the power of that was that we'd set a precedent then, because we've given some to some, so we couldn't then say no to others for equality. So it was it was incredibly useful and powerful way to manipulate it.
K92	We don't have many preschool children on radio aids and it tends to be those that are starting and approved school setting or a nursery. we probably don't push it enough because if we were to issue all of our preschool children with assistive listening devices and we would probably run out of devices for those that we feel, we would really benefit in their educational setting.

Table 4.23: Out Of County (OOC) provision.

89	There are some variables including which council the child belongs to (budget variations), nature of hearing loss (data from the survey).
D39	It only works with our NHS, because we've got that relationship when we get children that are seen out of county then that we don't have that relationship. So we find that they pretty much come with Marvels in.
G69	When you've got out of county child because they have different policies, frequencies, visits and all sorts

Table 4.24: Budgets are not an issue.

B8	We're funded from the high-needs block, and within our budget, there is an equipment budget. All parents do is just sign to say they'll look after it, it's free from us as well, without charge and I'm hoping that it'll continue despite the financial and economic climate.
C85	it's a one-off gift from the company when the child first has that cochlear implant
J4	Do have a generous budget to do that and we can… work around

4.7.4. Replacing Equipment

4.7.4.1. Losses

A frequent theme in the provision of ALDs to young children was the replacement of equipment if it gets lost or damaged (Table 4.25), this was replicated in the parental concerns too (Table 4.36). There was a census that if there were repeat offenders losing equipment, their equipment would be downgraded. This also seemed to be a key reason why services would rather issue ALDs to children who are in an educational setting, as the setting would take financial responsibility for the equipment.

Table 4.25: Issues with loss of equipment.

A54	I think as budgets have become tighter, it's hard to introduce expensive bits of kit for home when you don't know if it's going to be looked after. They probably don't have home insurance, so you're getting off on a difficult footing, aren't you, really?
B8	We do just replace but if it gets to a certain point, then then we have a little word and say if you lose any more, you will be getting this radio aid and I'll produce like an Inspiro or something, the threat of having something naff!
D39	We don't really get many losses now…we did have a real problem with it about 5-6 years ago. Now the policy is if they've got an ear level receiver and they lose one, and we're shrink wrap the next one on… service absorbs the cost of that that new receiver.
E20	It financially made more sense to just accept loss and damage as it happens, and thus far that's worked…we've just given the child another one and that has still worked out cheaper than insurance.
F84	It's not just a case of us replacing the hearing aid and Teachers of the Deaf having to replace their bits and pieces if they've lost a hearing aid or it's damaged that receiver is in the hearing aid.
J4	There were certain families that we wouldn't encourage it because you know that they're losing the hearing aids.
K92	When we issue an ALD, if it's at home… show the parents the cost of the equipment and say if you have home insurance, you might be able to just add it. Some schools have been great … other schools just say we haven't got the budget, we weren't able to take the insurance.

4.7.4.2. Breakages/Repairs

Another consideration when providing ALDs was how to manage any damages or repairs which may result from either ‘wear and tear’, or the equipment not being adequately looked after (Table 4.26).

Table 4.26: How breakages are managed.

A54	Got a good relationship with Phonak … send quite a few back for repairs.
C85	If the local authority wants to use their mini mic in school, the one they've been given, we make sure that parents are aware that that school aren't going to replace it.
D39	We were able to do a lot of in-house repairs if they're out of warranty.
G69	We say to schools if it is lost, broken deliberately, chucked across the room, the school have to buy… wear and tear, we will cover the cost.
H42	We impress upon how important is how expensive the equipment is … they very quickly learn how to take care of their precious equipment that's going to help them.
J4	We actually have a logistical problem in getting the Phonak equipment repaired. We write them off basically…so you get a two-year warranty it on the equipment, we keep them going… with the lanyards, the plastic breaking it seems to have happened quite a lot recently which I think is a really bad design fault for something that's quite a lot of money.

4.7.5. Brands

Respondents reference the developments in technology, which impacts their decision on ALD provision. Many respondents are currently examining the proprietary ALD which does not require additional receivers (Table 4.27).

Table 4.27: Model advantages.

14	We do have to manage expectations on the transmitters the child may be provided with…ask for a radio aid but do not see a Minimic as such. It is difficult to manage expectations when parents are told they must have Roger systems (data from the survey).
25	CI users often have access to an ALD at issue because they were free gifts from manufacturers. Now that Oticon aids are more ubiquitous, Edumic issue could be easier than previous ALD issue. The tamperproof needs of little ones often hampered ALD issue in past (data from the survey).
A54	We are going to explore the Edumic.
B8	We're now using the Oticon Edumics with the kids that have got Oticons because the software is already in there and it and obviously the plus side it is cheaper for us to provide. I know research has shown that they're not as good as a touchscreen, but if the kids like them and the kids are happy with them, we're going with it … for some reason only known to themselves, [hospital name] have swapped from Phonak to Oticon.
D39	The hearing aid decision is a joint one, but it's led by me, because I'm the one that's restricted budget wise, not them… to be honest it's the hearing aids that make the difference. So hearing aid alone they score a lot better with the Marvel or the Opn play and then how they respond with the Edumic or Roger's comparable. I'm gonna lean a little bit heavily on the Edumic because it's meaning that a lot more children could get radios. So the conversation has been that they're happy either way with the Marvel or the Opn play is because the outcomes are good for both, they're happy with both. The only advantage that they see is that the Marvels more compatible with Android devices, so that's their preference. That way management wise because of the code issue, Opn play and the Edumic easier for both parties, but obviously it's our budget.
E20	We don't provide a mini mic to people who have, Nuclear 7's, they get a Roger Touch.
F84	We were planning on upgrading to the latest version of Phonak which allows the integrated receivers.
G69	We had one that we thought we might try it with, but by the time they got their Marvel hearing aids, they were beginning to start year R.
H42	Phonak marvels now just being going to paediatrics, and it does seem to be a better access to speech.
J4	Roger Touch screens and Roger X's we and mimics. We don't have hardly any or none at the moment, children that are on Oticon, which is helpful because… I think you need a streamer, so that's not straightforward. I don't like edumics, they're difficult.

Another consideration is the age of the child, to which ALD they receive (Table 4.28).

Table 4.28: Specific manufacturer considerations.

K92	The Inspiro, which we tend to use with preschool/ primary age…robust piece of equipment. It tends to stand up to most things really, and it it's nice and simple to use, quite intuitive… then coming towards the end of primary age will introduce a touchscreen and obviously there are more facilities there with using it as a conference mic for group discussions linking in. The multimedia hub and pass around mics and things linking with that. We feel the older students are more able to manage that sort of equipment. We are looking at introducing the Roger On for the older students.

4.7.6. Technology

The technical aspects of ALDs were mentioned on several occasions in differing contexts. These include issues with the equipment and knowledge of the technology (Table 4.29).

Table 4.29: Technical Considerations.

17	How would you know if it was the ALD or initial technology that was causing the issue (data from the survey).
23	I don't agree. Particularly with implants, pupils need to be able to give accurate feedback as there is no accurate way of knowing what they are hearing (data from the survey).
A54	It always worries me when you get an implanted child that doesn't like it and they're and they're older and they can tell you that they don't like it and then potentially fitting a very young child to implanted and we can't tell you that it's not a good listening experience.
B8	We had issues with the Roger 14’s with the Nucleus and then…cochlear admitted that there was a fault, and they produced those funny little hugging things…not all of the little hearing aids that are given out you can stick radio aids onto.
C85	We do talk to parents about the difference in cost reflects the difference in the technology inside so obviously a radio aid is better technology. With Kanzo twos, we're not providing those to young children and but if they want to use a radio aid, then it's much more clunky than it would be with an N7.
D39	Work in progress with how we manage those codes and luckily, we don't have too many.
E20	We've got a couple of Roger X’s that are behaving in strange ways after they've been uploaded and then download it again, the downloaded software is not what it should be. In one of them, we think there's something left in the hearing aid because it will still connect to a Roger Pen. And in the other one, the software that when I've put it back in the shell It won't connect to a touch screen, but it will connect to a Roger Pen…It's changed from being an 02 to an 03 receiver, which is apparently impossible…we struggle with wondering why the stupid things won’t connect.
F84	Might be a little bit easier now that they could potentially link their mobile phone to the MyPhonak Junior app to do a bit of remote control there rather than having to press the buttons on the hearing aid, but still you're relying on somebody changing that. But whereas a partner mic for mum or an FM system in at that point would be quite useful, so when they kind of getting more mobile and the starting to crawl and move away and the more in the buggies that are facing away and certainly for nursery just because of noise levels.
G69	We've got some children that previous to Marvels might have had an ALD they've been upgraded to Marvels, and we've let them see with and without use the use of the ALD and some of them are actually we don't need it anymore. It's better quality of sound anyway, so don't need the ALD and their progress is not changed.
H42	Touchscreens…the charging port is used to be a bit dodgy. So we've had an awful lot having to be returned for that, but we think they seem to be accepting that as a fault.
J4	It is linked with what we do provide, which is Roger Touch screens and Roger X's we and Mini Mics or, we don't have hardly any or none at the moment, children that are on Oticon, which is helpful because … I think you need a streamer, so that's not straight forward.

4.7.6.1. Technical Knowledge

Respondent’s knowledge of the equipment and training needs were also highlighted (Table 4.30).

Table 4.30: Professional technical difficulties.

D39	I think there's so much new equipment isn't there? I think some of them (QToD) might not feel 100% confident to answer questions.
H42	We'd love an educational audiologist
J4	I think that it's quite difficult to give information to families because you've got to be very specific to that, that family because it would say if they happen to have a band that is not compatible with any radio aid …You can't talk to families and raise their hopes…It's quite a complicated, complex area, so I wouldn't give any information, like a leaflet.

4.7.6.2. How ALDs are Fitted

Interview respondents were asked about their thoughts on how ALDs are fitted and what the practice is for fitting ALDs in their service (Table 4.31).

Table 4.31: Details of how ALDs are fitted.

A54	Through listening.
B8	Listening and observation. There's a lot of debate, isn't there, about whether you should put them in test box to balance them or not, we've decided to say that, well, if Phonak say we don't need to balance them, we're not going to balance them.
D39	Educational Audiologist and the technician.
G69	Do we always do them for the test box? Probably not, because we've still got a test box that came out with the arc. Probably when we've got the new test box will we do it more? Yeah, because it's hard, you can't do it with the old test box.
H42	Through observation.
J4	Ideally, we do it, we’d fit it through the test box, we certainly would do that for little ones, definitely. I think observation is key to anything you do in any case, because whatever it actually says in the test box, it's down to the child, but then that's why it's very important if they're little and they can't really tell you, you have to ensure that you you've got it right in terms of the FM advantage. The equipment these days it is so sophisticated that it's rare that it doesn't balance, or you know that it's not very transparent, so there is certainly a place for observation, always, hearing aids are so much more reliable.

4.7.7. Socioeconomic Status

This subtheme arose twice in different parts of the country, but both shared a similar socioeconomic demographic (Table 4.32).

Table 4.32: How socioeconomic status can affect ALD provision.

A54	Our children go to go into full-time school, full-time nursery, attached to a school at a very early age. A significant proportion of our families struggle … to use the hearing aids… they very much rely on us for help with DLA, help filling out forms, you know all that kind of guidance, that to give another piece of equipment to be used before you've got hearing aids established… counterproductive because the priority is to get hearing aids being used…keeping hearing aids working, making sure that the moulds are still a good fit. They probably don't have home insurance, so you're getting off on a difficult footing.
H42	Most of our sensorineural children have radio aids going into school at three here. I think that's partly because of the deprivation historically in our county. They've been vague attempts to get parents to cover them with insurance... but that is obviously problematic when you got deprivation as a fact and poverty. So, it's a risk we end up having to take and I think it we kind of accept that there may be losses and damages along the way and hope that we impress upon how important, how expensive the equipment is.

4.7.8. Parental Engagement

Parental engagement is a common concern shared by most respondents. This includes the professionals involved in their child's care, their views, and being 'on board' with managing the equipment.

4.7.8.1. Relationships

Respondents feel that developing good relationships is important to working with families (Table 4.33).

Table 4.33: Parental relationships.

A54	Families would rather the setting use the hearing aids, even though that's only 15 hours a week, even though that makes then the practitioners in the setting or me the bad guy who comes along with the hearing aids and hearing aids. And even though you might explain that it's gonna be consistent, it's got to be home and school that is a bit of a theme. if you say you can have this and they say yes, I'd like it and we say well it's going to take me a year to give it you. Then you're just setting yourself up for a bit of an unhappy relationship with that family. I have fitted quite a few FM systems over the last year and even though I've rung and told parents this is what I'm doing, there hasn't been much interest in it, most of the time I think you have to persuade families that this could be, helpful, good thing. I think some of our families feel very overwhelmed by the equipment, quite scared of it as well. A lot of our families have quite complicated, complex home lives but, parents have got a lot of their own needs as well, it's kind of navigating your way through all of that really. If somebody asks if they can take it home for guides or brownies or scouts, Beavers, or…going out on their bikes we always say yes, as long as it comes back into school, charged and ready to be used in school and but very few parents ask.
B8	During lockdown, we were contacting the parents directly and they really appreciated that. They're never get battered from pillar to post. They know they can come to us, they know we'll try and sort things out and I think as well the fact that we are perhaps the only professional that they regularly see, they'll come to us about anything. We've managed to build up these really strong relationships with parents. Last year the SEN department was Ofsted ed and with the county got written statement of action. Apart from the fact that a strength was the relationships that we have with parents for the HI team, they felt that the continued continuity that we give them was a strength.

D39	I think if they're pre-schoolers we would hope that the parents would want to sort of ‘buy into’ that and support it. We have got one family where actually the request has come from the childminder … which is quite a surprise.
E20	I was discussing radio aid with her she said, ‘oh, yeah, anything that would make hearing easier would be absolutely fantastic’. I phoned her mum up and her mum said ‘no, I don't want anything else. She's got private hearing aids much better than anything from the NHS and she doesn't need anything else’. Some parents are asking for radio aids because they've already been away and read about them, and some are very sceptical about them. It's important to kind of meet them where they are and try and move them forward rather than going in with a set of expectations. It's the management and how that makes some parents feel about their interaction with their children. It's just that difficulty, people find it very hard to accept that their child can't hear. If they can't hear at all, they can accept that they find mild high frequency hearing loss impossible to.
F84	I think because we're kind of open and honest in terms of the information that we've got and what that means and that there are options there. It is more of a discussion and a partnership rather than - this is what we've got, this is what you have to do.
G69	I just think as well as that some parents become very biased because it's your child. You want the best for your child, which is absolutely right, but then you become blinkered and that's why you need to have professionals to support that.
J4	Developing a relationship, knowing what their needs are.
K92	If parents are interested, I mean, sometimes you get families who technologies just, you know, having to put the hearing aid in a child is almost too much.

4.7.8.2. Concerns about looking after the Equipment

Respondents explained that parents also share concerns about looking after and maintaining the equipment provided, with cost being a factor (Table 4.34).

Table 4.34: Parental Concerns of having ALD equipment at home.

14	The expectation of families to charge, look after, report faults. How to use effectively (data from the survey).
A54	There's always concern about what happens if the hearing aids get broken. Will I have to pay for it and so if you're adding in some other equipment, then there's the concern about that.
B8	We've had a couple of people said they don't want to take it home and that's more they're worried about looking after it, which is fine.

4.7.8.3. Concerns about the Aesthetics

Aesthetics of the hearing aids, receivers and transmitters were mentioned as another contributing factor when getting parents to engage with the provision of an ALD (Table 4.35).

Table 4.35: Parental considerations on the aesthetics of equipment.

B8	She's got the massive hearing aids, the massive Skys and do you really want to stick another chunky bit on the bottom of it?
D39	Parents are really keen on keeping the hearing aids small.
E20	I think that parents don't like hearing aids in a way that they don't dislike glasses … Isn't it sweet? Look at his little glasses. I think it's a shame some parents don't feel as positive about hearing aids … having another piece of equipment to manage and to feel positive. I think it's a shame that they [ALD] are still quite noticeable.

Respondents also shared some positive experiences of using ALDs, demonstrating the relationship they have built with their families (Table 4.36).

Table 4.36: Reports of positive feedback from parents who use an ALD.

19	Families who have used ALDs with their children before they start school, have more confidence and knowledge about using ALDs. They are usually able to help teachers with the equipment, if needed between TOD visits. We had less ALD equipment getting lost because families wanted to use it at home which keeps schools looking after it with more care. Families are very quick to notify us if there's a problem with the equipment, and are good at checking the equipment, which helps us ensure the ALD is working well. There is more chatting between children and their carers/parents about their personal aids too. Not all families are good at this, but most do really well and it's positive for everyone. ALDs have helped families understand the limitations of personal aids better because they can see the difference an ALD makes. Generally, we have found it to be very positive for parents/carers as they feel more skilled and knowledgeable with the equipment - personal aids and ALDs. It is something they do rather than something that is done to them (data from the survey).
45	Feedback from a mother - (name) is really enjoying having the radio aid. It’s helped so much and I can see such a positive response and effect it’s having…I feel it’s helping not only with her speech, language confidence but it’s also helping me being able to communicate clearer to her especially in public busy places … I feel now she’s hearing my voice a lot clearer say in the car… Glad we have it. We’ve shown family how to use it … they also can see the pure benefit and delight it can bring (name) being able to have clear communication (data from the survey).
A54	Family were great to work with and they embraced it, every aspect … family really took on board when to use it.
F84	They were quite motivated to look into it because she is struggling in that environment.

4.7.9. Additional Needs

Whilst some respondents were happy to provide ALDs to children with additional needs, others felt they were not suitable candidates.

Table 4.37: Considerations for children with additional needs.

E20	I'll give them to people who are very complex.
G69	Children with additional special needs that can use a lot of technology … iPads and stuff that previously they wouldn't have had access to cause the quality of sound would have been shocking. If a child's got very special needs … is in a school with profound and severe learning … it's got lots of other stuff going on. You know, tube fed, in a wheelchair. Yeah, global delay, got one to one. Would an ALD be appropriate? Probably not, that's got other sensory issues. Possibly, too much is too much…Really, if it's just straightforward, HI severe hearing loss academically, doing well, absolutely, of course…but I have yet to meet a straightforward severe HI child with nothing else going on. You know, every single child got other additional factors, whether there's just generally hormones or whatever. A lot of it has got to do with cognition…what the children have got up there because you have two children with exactly the same hearing, one will need an ALD and one won't.
H42	We use professional judgement and may decide to delay information, for example, if the child has very complex needs or medical needs (data from the survey).
J4	Children have got other needs, additional needs, medical needs and tricky situations and we are spending a lot of time helping them to cope with that cope coping with that.

4.7.10. Training

Many professionals were concerned about the misuse of ALDs in EY settings. They explain how ALDs need to be used appropriately and effectively alongside personal hearing technologies, training, and other strategies. They emphasise that training parents and key workers is paramount to successful use and providing optimum learning conditions (Table 4.38).

Table 4.38: Training considerations.

5	'such as effective intervention, involvement of the family, favourable room acoustics, deaf-friendly strategies, SALT, etc. Room acoustics, family involvement effective intervention' (data from the survey).
7	Introduction in the Early Years can make a big difference to learning access, if used well (data from the survey).
31	Parents need careful coaching in using ALDs so that they are used correctly and the child also has time to learn to hear without them and learn to localise sound. Incorrect use can cause lots of problems because the child cannot report problems (data from the survey).
48	parents need to know how to use it and why, and remember that it can be detrimental if it is misused, and a baby/toddler is listening to something not relevant (data from the survey).
64	Parents often choose to have a mini mic when their child is fitted with a CI, but few parents use this to begin with despite ToDs talking to them about the benefits (data from the survey).
66	I have some concern for very young students having less opportunities to effectively learn to localise sound and voices if a radio aid is in constant use and the voice of the user is streamed to them in a way that does not enable them to locate the sound or anticipate the person traveling towards them, etc. (data from the survey).
76	The people using it are committed and well trained (data from the survey).
81	While I know a number of children that have been issued with an ALD when they were given their processors. None of the children have used the ALD equipment appropriately. It is not until good listening skills have been developed that the ALD has provided a benefit for the child. I have found that they tolerate a radio aid better than a mini-mic for instance,

	this could be due to a number of reasons. Most importantly, I think it is due to the fact that it is fitted properly, training is given and the ALD is managed with more confidence by the child and the adults involved (data from the survey).
86	Users are well trained and use the equipment only when appropriate (to talk to the child in the presence of a moderate level of background noise/over distance) (data from the survey).
A54	The family really took on board when to use it, so it wasn't just used all day long, in the house. It was used when they went out to the park.
C85	[It] has to be used really tactfully and strategically and as a skill, that the user, whoever it is … has to be really aware of the disadvantages of having it on all the time as well as maybe not using it… maybe in a in a park setting or walking along the road or in the car or so they are already modifying their language and to match the child's current, level of understanding. I would definitely be putting in some training around language promoting strategies…a massive impact on those staff and those children, not just the deaf ones in there… each time you get a change of staff…some webinars on language promotion…and then they understand the consequence of language pitched at too high a level. We try and steer parents towards the self-help videos. Sometimes people who are really struggling, can ask for an equipment support session with one of our audiology assistants.
E20	If they're in a setting and I have to have some confidence that the setting are going to use it properly because what I don't want is for that child to have to listen to whatever their care worker is saying in the staff room or but I have to say overwhelmingly we find that people are willing to do the right thing. I'm actually quite keen on having radio aids, if for no other reason than it reminds the people working with the children that they are having to communicate through technology and so it keeps it in mind that the child doesn't have perfect access to sound, and I think that's quite useful.
G69	We're relying on the adults in the preschool, which is not always a teacher…remembering to mute themselves while they went and looked after Bob over there and you're playing alongside your friend, but you don't actually know what they're saying to you. it is about social progress and peer interaction and learning from your positive peer pressure…they need to have some play time, listening to their friends.
K92	The training of using the ALD is really important as well because obviously if they've got it on all the time and then not they, you know they've gone off and they're not saying anything that's relevant to the child, but they're, what they're playing with and things at the time, then obviously it. It's more distracting it not focused on what they're doing, so they might not necessarily be making those links with the language. A key worker is quite important so that they take on board responsibility for muting the device, and thinking about the activity they're doing as to whether that would be suitable for using the ALD.

4.8. Guidance for Issuing ALDs

Respondents were asked how a child is considered a candidate for an ALD. Respondents C85 and F84 do not issue ALDs and therefore do not have an ALD policy, rather they are bound by the lead of the local sensory support service's policy and their issuing of ALDs (Table 4.39).

4.8.1. ALD Policy

An ALD policy was used by 18% of the survey, none had a separate EY ALD policy, it was embedded within the main policy (Table 4.39).

Table 4.39: Detailing the respondents' ALD policy.

45	From September 1st 2022, our criteria policy now matches that of School age: Automatic Criteria for an average loss of 40 dBHL in the better ear. All other cases will be considered on a case-by-case approach (data from the survey).
101	ALD are available to all ages depending on their level of deafness, communication and listening development, if it's written into their EHCP (data from the survey).
D39	We have a radio aid policy and early years is mentioned in that we don't have a specific one, it's part of it…at the point of birth when there can be weeks first come to us, their name will go on there. So, what happens is we have a panel, every half time where we look at referrals, ToD's of them for children for radio aids, but anyone that's a pre-schoolers are all considered at every panel. ALD to nursery + but only if fit criteria and agreed by panel. Not for every child, although all can be considered (data from the survey).
E20	The policy is based on the quality standards, that every child should be considered for one and we can't quite manage at first issue of things because things can sometimes change, but essentially once a child is identified we're prepared to consider it, but we often find that parents aren't ready at that point, but we would consider every child to be a candidate for a radio aid, provided they have a bilateral hearing loss… we don't have a separate one.
F84	Their policy, as far as I'm aware, is that it's school aged children and above, so whether they would be allowed to deviate from that in any special circumstances. I think initially it probably would have come from practicalities, especially when it was before integrated receivers and it was more obviously attaching shoes and who's responsible for what and which bits do you need to leave in school and ask whether insurance comes into it because it can go on the school insurance rather than home unless parents choose to take it home. So I think the general difficulties around loss and looking after the system and then the cost of putting it in place and having to replace it if it is damaged or lost.
G69	I think we've covered ourselves; I mean we need to review it. I think it's coming up for review, but I think we've worded it so that we covered ourselves that it was whatever age. We focus on it being individual to the child as opposed to individual to the age. ALD policy - usually 60 dB + (data from the survey).
H42	I'm not sure, not a formal one, I don't think.
J4	Actually, I think we have got one, I think we added in … quality standard of the NDCS which says you know that all children should be considered for an ALD.

4.8.2. ALD Criteria

Respondents explained the criteria for issuing an ALD to under-3-year-olds (Table 4.40).

Table 4.40: The criteria for issuing an ALD.

22	All children (nursery age plus) are considered, and the ToD puts forward their name when hearing aid use is established. The only reason we wait until nursery is due to funding. The nursery or school part funds (data from the survey).
25	Not yet established a clear pathway. It's a work in progress (data from the survey).
31	We have a protocol which considers their hearing loss, hearing device use, speech development, setting and parental opinion (data from the survey).
64	Decision for ALD provision form is completed by TOD and shared with educational audiologist. Criteria is based on level of hearing loss, use of hearing aids and speech in noise tests (data from the survey).
B8	We did develop criteria a few a good few years ago, and it's just to be honest, it's just fallen by the wayside because I think my staff were professional enough to know if they need one

	or not quite frankly. If you need one you can have [ONE]... it's more of a gut feeling that I know that it works. We wouldn't really consider a radio aid until they started in a setting
C85	A child needs to be able to report on what they're hearing and if there's a change to what they're hearing when you add another layer on.
D39	All children coming through the NHSP should be considered and are put onto our spreadsheet and then that's referred to half-termly to checked to see if they would need one. Any children that come later than that we have sort of guidance for the Teacher of the Deaf on what they should consider, and then we'd ask that they put in a referral to the panel. Now it's more about level of need so even some children with a mild loss or a mild loss and an additional need like a VI or ADHD would be considered.
G69	If they met the criteria of the hearing loss, but it only be in one area. I mean if they if they were struggling in school and we looked at all the different reasons and why and they were still struggling to hear, we might trial one.
K92	The Teaching of the Deaf will request a piece of equipment from me usually and we do have a sort of flow chart of why we're issuing. If it's not the right time, what to do next, so step by step. We don't have specific one for the early years. No, it is part and parcel really. I think we've concentrated on those who have accessed and early years educational setting…linked a little bit to…the CHIP Flow chart for cochlear implants. We do look at key workers and whether, we feel parents are able to take on the additional responsibility.

4.8.3. ALD provision based on NDCS QS (2017)

These respondents used the NDCS QS (2017) guidelines under the ethos that every child is a candidate (Table 4.41).

Table 4.41: ALD provision based on NDCS QS (2017).

14	Using the quality standards, every child is a candidate although professionals have to agree it is an appropriate time (data from the survey).
15	QS1- all children are a candidate for ALD consideration (data from the survey).
38	In line with NDCS quality standards for FM- usually establish hearing equipment use/tolerance first (data from the survey).
78	Every child is deemed a candidate the service will provide a radio aid for every deaf child in the service if they want one (data from the survey).
99	If they have hearing technology, they are a candidate (data from the survey).

4.8.4. ALD provision based on Professional Judgement

Other respondents explained that candidacy for the provision of ALDs was flexible with an element of professional judgment (Table 4.42).

Table 4.42: ALD provision based on judgments.

6	The TODS go through a checklist and assess and if they feel they are a candidate they refer to me (data from the survey).
33	If the child is using their personal hearing technology consistently and parents would like to try an ALD (data from the survey).
51	If we feel they would benefit from an ALD. This depends on many social, emotional and educational factors (data from the survey).
77	I usually fit them in the preschool year in preparation for p1 (Scotland) (data from the survey).

80	If children are good users of their hearing aids and don't lose them too regularly. Usually children have at least a moderate hearing loss although children are considered on an individual basis and some children with mild hearing losses have ALDs (data from the survey).
83	In discussion with implant team and/or audiology we receive advice as to whether a child is "FM ready". For Cochlear Implant users this is usually when they have had their device for long enough for the level of gain to be at the optimal level for their loss (data from the survey).
98	We look at level of loss, consistent use if HAs established (data from the survey).
104	Combination of info: level of hearing loss, speech discrimination ability, noise in classroom, views of the CYP/teacher/parents (data from the survey).
B8	If you need one you can have [ONE].
J4	The focus must be, on it being used in school because that's when they really need to listen, but we definitely would encourage them to take them home. It's basically ToD's coming to me and doing the FM toolkit, doing some listening, Ling sounds and saying you know they we've feel this would help them in class…to make sure that they can report back to you and say you know are clear on if it's working or not.

4.9. Early Intervention

Early intervention was mainly referred to as activities, although ALDs were mentioned as an early intervention in their own right (Table 4.43).

Table 4.43: ALD affects language development attainment positively.

3	Improving access to speech and feeling included (data from the survey).
13	Earlier the better as can impact access but depends on effective use and relationships with parents and setting. Above all actual effective use (data from the survey).
19	We trailed ALD use with some of our early years children … We found those children with ALD made faster progress with their language development and were more likely to reach early years attainment outcomes in line with their peer group (data from the survey).
35	Providing an ALD can give greater access to language input and therefore improve outcomes for the child (data from the survey).
40	Increased access to sound for those who already use amplification. However, they need to be used alongside good classroom strategies (data from the survey).
59	Early intervention with access to sound is positively effective to support receptive and expressive language (data from the survey).
62	We see benefit in fitting little ones at home (data from the survey).
70	Common sense. access to words improves language (data from the survey).
72	Earlier access to speech in noise in a variety of situations and particularly where lip patterns/facial cues are not accessible in a car/forward facing buggy (data from the survey).
100	Clear access to speech in 0—3 is critical. Clear access in early years when learning phonics is essential (data from the survey).
105	Research shows early intervention is vital for language development and this includes ALD (data from the survey).
B8	Noise levels in the nurseries, we want to give them optimal listening conditions if possible.
E20	I think language is developed through listening and through interaction…inevitably their language development is going to be better than those children who don't have access to what people around them are saying. Hearing what the most important people in their lives are saying and hearing language that isn't just about them…world around them… gives, a much wider range of language. I think it gives access not just to quantity of language but also quality and the different types the different uses we put language to, as adults.

G69	The role of the HI support worker is to do some of the interventions that we can't…the language and interventions or the listening interventions or to model some of the activities and stuff like that we would do.
K92	The main area of discussion really is language development as well and thinking about what they're accessing, with regards to the language they're being exposed to.

Other professionals felt strongly that the ALDs should not substitute early intervention activities and did not feel that language development and attainment can be attributed to the provision of an ALD (Table 4.44).

Table 4.44: Those who do not believe that ALDs affect language development attainment.

22	But in a negative way. As with any technology these can be badly used. If the technology is not checked daily, then the listening experience using ALD can be worse that just hearing aids alone (if a part is faulty) (data from the survey).
63	Could have ALD but not enough input with language/no communication with child is then unhelpful (data from the survey).
C85	I don't think the earlier the better ends up with better outcomes … modifying their language and to match the child's current level of understanding … I think it's adapting the environment … I don't think we need to hear everything because language has a lot of redundancy in it and also the language is so dynamic It's coming from so many different [sources]… I think something that is transmitted from one person has its limitations … I think hearing is one element… if all of that was managed, I would argue that the place of the assisted listening device is less important. I think they need to be used strategically and cleverly and that you need time when you haven't got assisted listening device on as well to develop other skills.
H42	…develop that independence and that ability from a very early age to differentiate what equipment is the most useful like that in that current situation. In simplistic terms and I'd like to think of it as like a toolbox for our kids and I want them to have all the tools in the box, whether that's some BSL or whether that's some ALD.
J4	play skills and listening skills…can be modelled for parents… strategies for how to engage with your children, how to play with them, how to your close up, how to develop their language by and through play.

4.10. Joint Working

MDT working was seen as paramount for first fitting to succeed. MDT and good communication also came across as fundamental in enabling the child to achieve and progress (Table 4.45).

Table 4.45: View on Multidisciplinary Working.

2	Decision making about ALD is collaborative (data from the survey).
25	Joint discussion with health and education (data from the survey).
68	be an MDT decision based upon the child's individual needs (data from the survey).
89	I inform them about Radio aids and seek consent for referral to Education services (data from the survey).
94	Information should be shared between professionals (data from the survey).
B8	We have incredibly good relations with audiology … we've now got the ENT consultant on our CHSWG, so fingers crossed. When we're considering giving a radio aid to an implant user, we obviously talk to the team first … to inform them out of professionalism.

C85	We always make sure the parents know that the Teachers of the Deaf are the key workers and that we are advising and supporting, but we're not taking over from you or we're not giving completely different advice. And if we had something that was different to what you were suggesting we talk to you about it first and why before.
D39	They're happy either way, with the Marvel or the Opn play because the outcomes are good for both… It only works with our NHS, because we've got that relationship.
F84	We work with Teachers of the Deaf in different areas, we could certainly discuss it with them, but whether they'd be able to go against their departmental or service policies, I don't know.
H42	Following newborn screen ... we have MDT meetings … I'm notified kind of very much immediately that they've been picked up and I would join audiology at the fitting usually at the fitting appointment… we've built very good and strong relationships with our audiology department. We discuss with the audiologist about provision of an ALD if it's appropriate or if it's something we should consider.
K92	I've worked on a couple of local authorities, in the previous local authority we had quite a good involvement, a Teacher for Deaf in the initial appointments at the hospitals … but I just feel, currently where I am, I don't have those joint sessions at the hospital.

In addition to MDT working with professionals, respondents also acknowledge the positive outcomes which come from peer support through parent groups and local NDCS (Table 4.46).

Table 4.46: Peer support.

58	We have opportunities for parents to meet - playgroup etc and they share experiences of benefits (data from the survey).
A54	A collaborative thing between, you know, the ToD and the family, often actually coming about because they were coming to our parent group at the resource base.
E20	Unfortunately, we don't have a local group which in other places where I've worked that local group has just been, you know, a life saver for people.
F84	we will offer to refer on to Sensory inclusion service as well, and then that can link them into the parent groups and they'll be able to meet other families…they'll also be signposted to NDCS and they'll be signposted to deafness Support Network…they've got different areas of support that they can tap into if they want to.
H42	We do playgroups, so they often see other children who've got ALD and we open up that conversation within the playgroup then to be able to talk about it. I think the parent peer group is helped gives them that sense of identity as a collective. One of our parents is also set up a Facebook group called [name] because she felt very passionately that there should be a way to connect with people in her situation, across the authority, she's working with the NDCS to build that group. We've got a fair few people, couple of deaf parents, we got good support. We use NDCS an awful lot, a lot of it's by peer to parent peer support… we set up a WhatsApp group for parents.
J4	We have a monthly coffee morning which we found a very good way of families getting together.

5. Discussion

This study aimed to investigate current practice, in the UK of informed decision-making for ALDs amongst parents of young deaf children. It examined the topic from the professionals' perspective, establishing the provision of information to parents, professionals' views on first/early fit, and associated considerations. This chapter will consider the quantitative and qualitative results under these themes and synthesise the findings in the context of research evidence and implications for practice. This section will conclude with the limitations of this study and theorise future research possibilities.

It is widely accepted that early identification and amplification are key to improving the outcomes of deaf children (Yoshinaga-Itano et al., 1998; Davis, 2001; Storbeck and Calvert-Evans, 2008; Anthony, 2016; Yoshinaga-Itano et al., 2017). Without the addition of early intervention, including technologies; early identification and amplification is considered futile (Yoshinaga-Itano, 2014). The importance of first/early fitting of ALDs, through research, is now recognised and recommended for practice (Mulla & McCracken, 2014; Allen et al., 2017b; NDCS, 2017; Curran et al., 2019; AVT, 2023). This research confirmed this view, with most respondents agreeing that outcomes are better with early ALD fitting (Table 4.43). Whilst some respondents see ALDs as part of the early intervention package, in line with recommendations, others felt it would inhibit language development (Table 4.44) but this contradicts current research (NDCS, 2017; Curran et al., 2019).

5.1. Information Provision

Key to informed choice is the provision of appropriate information shared between services (Davis, 2001). Within this research both the quantitative and qualitative data show that the practice of information sharing and joint working between professionals varies across the country, which may have an impact on ALD provision. Whilst most respondents said that they would provide information (Figure 4.4); barriers to providing information about ALDs were revealed (Table 4.6). It also exposed an expectation on the parents to raise the subject of ALDs, although professionals lamented that the decision was ultimately not for parents to make (Table 4.12). From the survey data, 93% of professionals who provided ALDs provided information. However, survey responses differed when clarified during the interview, with timing, type, and content of information challenging the difference between belief and practice. Essential to parents feeling empowered and making an informed choice is the provision of appropriate information, discussed and demonstrated in addition to the provision of hard copies (Gabbard and Schryer, 2003, NDCS, 2017). The survey data shows that nationally, current practice is not in-line with this recommendation, with very few respondents providing a comprehensive package with written information to refer to and opportunities to ask questions.

5.1.1. What is Stopping Information

From the survey, 20% of respondents said that they provided information about ALDs to parents at first contact (QToD) or initial fitting (audiologist) (Table 4.5). However, with careful analysis of the results, it revealed that only R89 informed parents about ALD at the initial fitting (Table 4.13) but reveal they felt restricted in what they could advise parents due to not issuing ALD (Table 4.15). This is concerning as over 90% of deaf children are born to hearing parents (Mitchell and Karchmer, 2004; Cole and Flexer, 2011). These parents possibly have not had the experience of raising a deaf child, consequently, without the provision of information they may not be aware of interventions, including ALDs. Whilst 7% of survey respondents who fit ALDs, stated they did not provide information, the remaining 93% stated they did. The interview process revealed that this information was provided selectively by 30% of interviewees. The survey did not have the scope to probe the reasons in-depth, however, interviewees were able to clarify their rationale. These included budget, safety, equitable service, and concern about damaging relationships with parents if the provision was unavailable (Table 4.15). Respondent A54 explained that they have never had a request for an ALD, they felt parents did not feel empowered to make an informed decision. This is understandable given that information was not provided.

The American system differs from the UK model, in which audiologists are responsible for the fitting of ALDs, and as such it is accepted that audiologists' input is important for their success (Gabbard and Schryer, 2003; Cole and Flexer, 2011; Northern and Downs, 2014). In the UK the fitting of ALDs falls to education services which explains the reluctance found in this survey from audiologists to provide information as they do not issue ALDs. They are consequently unsure of the availability/types of ALDs and are aware of the need to maintain professional relationships with educational services (Table 4.15). Obtaining reliable, up-to-date, unbiased, good quality information from various sources helps parents to make an ‘informed choice’ (Kecman, 2019).

5.1.2. When is Information Provided

The timing of the provision of information varied greatly, ranging from first contact/initial fitting right up to school age (Table 4.13). Often information is provided when the professional feels that the parents are ‘ready’ (Table 4.3). This is concerning as parents may be using other unreliable, unbalanced sources (Tachtsisa and Dettman, 2018; Kecman, 2019). This is in addition to missing the critical period for language acquisition (Allen et al., 2017a) and denying parental choice if they wish to independently pursue an ALD. The survey reported 20% of respondents provided information at the first contact/initial fitting, although there were caveats on when information was provided with only one respondent providing within this timescale (Table 4.3). Another finding was although information is given, it was after the ALD has been fitted. This is not an informed choice (Table 4.13).

5.1.3. Types of Information

The survey showed that the type of information varied greatly; discussion was the main format, with just over half providing additional written information (Table 4.4). Evidence shows that written information to ‘take away’ is valuable to consolidate understanding (Kecman, 2019). The survey also showed that practical demonstrations were primarily given by Educational Audiologists often in conjunction with written information (Table 4.14), possibly due to their role and having the equipment available.

5.2. Professionals’ Views and Barriers to First Fit

It seems, from this research, that past experiences are still shaping the future, with policies designed around old technology, past practices, misguided beliefs, and preferences toward specific ALDs (Shannan and O’Neill, 2022). Despite the QS (NDCS, 2017) and the expectation that ALDs should be part of the initial amplification package, this research shows that the professional views do not match these recommendations. Most respondents can see merits with earlier fitting, a change of stance from previous findings (Mulla, 2011), although limitations prevented this. This research produced a narrative, with concerns similar to earlier studies, including consistent amplification and reporting which were dismissed in later studies with advancing technology (Moeller et al., 2009; Mulla and McCracken, 2014; Allen et al., 2017b; Walker et al., 2019). The qualitative analysis provided insight into the reasoning behind professionals' views on why NDCS QS1 (2017) was not possible, and these are discussed below.

5.2.1. Consistent Amplification

Consistent use of amplification was cited by 49% of respondents as the main obstacle to first fitting (Table 4.6). Studies have found that using an ALD can assist in establishing consistent amplification (Moeller et al., 2009; Mulla 2011; Mulla and McCracken, 2014; Allen et al., 2017). If hearing technologies do not provide adequate amplification, or the acoustic conditions are challenging then children are more prone to rejecting them (Spratford, et al., 2017), an ALD would counteract this and possibly help encourage parents to persevere in replacing them.

Some respondents felt that ALD would be acceptable with hearing aids/BAHA users earlier but not with cochlear implants that require stable mapping (Table 4.7). Respondent C85 and E20, acknowledge stable mapping, suggesting three months to achieve this before adding another layer (Table 4.20). It is important that, given a child is at least 9-12 months before undergoing implant surgery, utilising the ALD should be a key objective to avoid any further delays in language development once stable mapping is achieved. The proprietary-gifted ALD is now included in the box with the processors, suggesting that initial fitting may become an accepted practice (Table 4.18).

5.2.2. Training

The research spotlighted training as essential across the MDT. This can be divided into two areas: training for parents/keyworkers on using the ALD and professional development.

5.2.2.1. Appropriate Use of ALD

Training for key adults on the use of ALD is imperative when using it with young children (NDCS, 2017). In the survey, professionals raised the misuse of ALDs among parents and keyworkers, being used too little or too much, with worries about localising sound, not hearing peers, and being unable to focus on their play (Table

4.6). Other concerns were using inappropriate language levels for the child's development and remembering to mute (Table 4.38). Constant use of ALDs is not advised. It should be used in specific difficult, listening situations (Moeller et al., 2009; Allen et al., 2017), although it is important to remember that children learn language incidentally, by 'over-hearing' (Mulla, 2011; Spratford, et al., 2017). Respondents both in the survey and interviews (Table 4.38) mentioned that early language development strategies are also vital, a theme echoed throughout early intervention research (Yoshinaga-Itano et al., 2017).

From the survey, R64 and R81 mentioned proprietary ALDs are not utilised due to a lack of instruction (Table 4.38). It is recognised that without instruction, parents have difficulty using the gifted proprietary microphones (Sunderland, 2016; Boddy and Datta, 2018; Walker et al., 2019; Shannan and O'Neill, 2022). Despite this, families are issued with a free proprietary microphone without instructions to use it effectively (Boddy and Datta, 2018). Due to the equipment being a gift, the implant centres do not provide training (Boddy and Datta, 2018), although C85 mentioned parents are directed to self-help videos and can request additional support (Table 4.38). Ensuring comprehensive training of significant personnel featured heavily in this research (Table 4.38). This agrees with previous research, warning that language can be reduced in nurseries with ALDs (Mulla, 2011; Allen et al., 2017b; Boddy and Datta, 2018). Hence, it is not an acceptable practice to deny responsibility for training parents as it is free.

Education is fundamental so that parents can understand the principles of ALDs, enabling them to make an informed choice. Ensuring that they know the benefits, and limitations, how to use the ALD effectively and confidently, perform daily checks, and can troubleshoot and detect problems (NDCS, 2017). Parents often advocate for their children and are invested in their development (McCammon et al., 2008). Mulla (2011) noted that parents, whilst using the ALD, identified the most beneficial times for use, thus taking autonomy of the equipment.

5.2.2.2. Professional Confidence/Competency

The research exposed a gap in knowledge of terminology and understanding of ALDs. Despite an explanation of ALDs within the context of this research (radio aids and remote microphones), doorbells, and smoke alarms were referred to several times. It is concerning if professionals, working with deaf children, are providing information, and advising parents on this equipment without understanding the purpose of each piece of technology. Many professionals were also not aware of the technical capabilities of hearing technologies, ALDs, accessories, and their compatibility. Interview responses showed that local professionals are not ‘100% confident’ with the equipment (Table 4.15), this tallies with previous research (Boddy and Datta, 2018). Professionals believed that ALDs are not necessary with newer technologies. However, this does not consider how poor acoustics affects hearing. The improvement in SNR with an ALD cannot be achieved by a hearing aid alone. (Spratford, et al., 2017; DeConde Johnson and Seaton, 2021). This research showed that 46% of respondents did not see the value in issuing ALD to under 3-year-olds, as evidenced in Boddy and Datta (2018). The NDCS needs to address this as a training need as this is a core value of QS (NDCS, 2017). From the research, clinical audiologists with additional educational qualifications were more confident to provide information about ALDs than their colleagues, highlighting the need for continuing professional development, and ensuring staff and practices are up to date (NDCS, 2017; Rosenberg, 2017; BAA, 2022).

5.2.3. Reporting

The inability to report was perceived to be a barrier by 6% of survey respondents to fitting ALDs to young children. Arguing that, due to interference, the child may be in a poorer acoustic environment with the ALD than without, affecting language development. Whilst previous ALDs encountered issues with interference, technology has improved greatly. ALDs now work on 2.4 GHz with no interference experienced (Wolfe et al., 2015: Shafer, 2021; Stone, et al., 2022). Despite the concern about the quality of sound and the child’s reaction, only one interviewee, who routinely fits ALDs to young children (2 years+) shared that ALDs were fitted electroacoustically (Table 4.31). Electroacoustic verification and daily checks are necessary (NDCS, 2017; Spratford, et al., 2017) and even more important when fitting younger children, who may be unable to report faults.

5.2.4. Finances

The survey showed that budgets were a low contributing factor (4%), as to why information was not provided. Finances were a contributing factor in 22% of equipment provision and feature in 12% of respondents' reason for disagreeing with first fit. However, 70% of interviewees revealed that budgets had a negative impact on their provision of ALDs to young children, exposing that parents are not informed about ALDs due to budget constraints. It might seem that the percentages may be elevated due to the number of interviews but because of the selection process, respondents were able to share limiting factors more freely. Many authorities overcome this issue by signposting parents to NDCS for (short-term) loans or providing details of where ALD can be purchased (Table 4.22). Financial considerations were raised in previous research (Bevington, 2015), but cost should not deny a child access to ALDs (NDCS, 2018). Especially with recent technological advances, hearing aids are complete with the ability to connect to a proprietary ALD, reducing the financial burden (Table 4.22) (Sunderland, 2016; Boddy and Datta, 2018; Chen et al., 2021; Stone, 2021).

Both the survey and interview data showed that this is beginning to be seen in practice (Table 4.27), with health and education services working in partnership to choose the most appropriate hearing technologies for the child's hearing loss and ALD provision.

5.2.5. Safety

Safety concerns, with batteries and receivers being swallowed, were mentioned in both survey and interview data (Table 4.21). This is no longer an issue, with the requirement for under 5's to have lockable battery compartments (NHS England, 2019a). Hearing technologies are all capable of having solutions, either tamperproof or integrated receivers (NDCS, 2018). Conversely, ALDs can help with safety issues, as parents can instruct the child when distance/noise is an issue (Mulla, 2011; Walker et al., 2019).

5.2.6. Acoustic Conditions

Respondents from both the survey and interviews (Tables 4.6, 4.16, 4.18, 4.19) identified that distance is not an issue with babies, identifying with Mulla and McCracken (2014) who accept that once a child is crawling distance is created. Whilst this is true, it could also be argued that the parent could themselves be responsible for creating distance, as they move around the room doing everyday activities.

However, distance is not the only acoustic issue that an ALD can help to resolve, noise and reverberation are also factors, for example in the car or supermarket, highlighting professionals' understanding and competency. Poor acoustic conditions will inhibit incidental hearing, crucial for language and vocabulary development (Cole and Flexer, 2011). Consequently, Spratford, et al. (2017) suggest fitting at 7-10 months but advocate fitting soon after hearing technologies are fitted before mobility becomes problematic.

5.2.7. Socioeconomic Status

From the research (Table 4.32) it seems that there is an unconscious bias that ALDs are not provided in low economic areas due to the potential lack of care and loss of equipment in the home environment. Respondent A54 explained that the priority is getting consistent amplification, with reliance on the setting to achieve this, as engagement with parents is low. Although survey data reported ALDs were available to school age+, clarification during the interview revealed that all children are offered a place in a setting from 3-years-old. Socioeconomic status is a contributing factor to language deprivation (Smith and Wolfe, 2016), so providing ALDs to this group, as an early intervention, with the right support, seems fundamental.

5.3. Discussion of First/Early Fit

It is recognised that early language intervention is crucial (Yoshinaga-Itano, 2014), 90% of survey respondents believe the timing of ALDs positively influences language development and attainment, but 87%, did not agree with first fit. This research shows that professionals now accept early fitting has recognised benefits, although not seen in practice. This is a change in mindset from previous studies (Mulla, 2011; Bevington, 2015). It is necessary to define what 'early' means in this context. If professionals understand primary school as the standard time to fit (Boddy and Datta, 2018), then early would be anything before this, hence why nursery is now understood as 'early', evidenced in this research (Table 4.19). However, this is not what was considered as early by previous researchers (Yoshinaga-Itano et al., 1998; Moeller, 2000) who discussed that hearing technologies need to be fitted by six months to target the critical language acquisition period, with eight months being late for language acquisition (Young et al., 2005). This being the case, early would be considered as three months or earlier (Vohr et al., 2011).

This study shows the earliest fitting of an ALD, from a proactive professional, was fifteen months, this is earlier than American studies have shown (Walker et al., 2019), however, this still does not cover the critical language acquisition period (Spratford, et al., 2017; DeConde Johnson and Seaton, 2021). R20 and R40 mentioned that first it is common in other countries due to less financial pressures with health insurance.

An MDT approach is imperative and considered the only way of achieving information provision at first fit, 20% of interviewees agreed, a view shared by many researchers (Young et al., 2002; Storbeck and Calvert-Evans, 2008; NHS-England, 2019b; Yoshinaga-Itano et al., 2020; DoE, 2022). From this research, the data shows that currently, no respondents fit collaboratively with their NHS/Education colleagues and that how information is shared between health and education varies greatly. This results in discrepancies in MDT practice across the country with some educational services invited to the initial fitting appointment and others receiving referrals afterward (Table 4.45).

From the survey, only 4% who issue ALDs, agree with first fit. Of these 75% do not offer ALDs to under 3-year-olds and none fit ALDs at the initial fitting. If information was provided at the follow-up appointment, with a QToD present to share information about ALDs, then the fitting could occur within the critical language period, this would overcome the barriers mentioned (Table 4.6). K92 who agreed with QS1, explained that excellent collaboration between health and education was needed to facilitate this. Although clarified later that ALDs are not a necessity until attending school, contradicting earlier responses.

5.4. Summary

Concerns highlighted by Bevington (2015) and Allen et al. (2017b), namely safety, reporting, cost, aesthetics, and distance not being an issue, were found to be concerns for professionals in this research. Technology has advanced considerably, negating some of these issues (Spratford, et al., 2017; Walker et al., 2019; Shafer, 2021). This is reflected in the changes to the NDCS guidance, the first edition of RAQS (NDCS, 2008) had caveats of established hearing aid use, stable map, and be able to report on sound for the candidacy of ALD provision. This was subsequently removed in the later version (NDCS, 2017).

Evidence is showing that mindset is changing to earlier fitting, with professionals more confident to provide information than in previous research (Bevington, 2015). Unfortunately, this research demonstrates that parents are not being informed about ALDs at first fit, let alone fitted and those who are fitted are twelve months+. To correspond to the research, early fit should be accepted as within months and referred to as timely. This is possible if the information is shared at a joint MDT follow-up appointment. If parents choose ALD provision, it can be fitted timely within six months. Families may possibly be more relaxed and able to discuss ALDs and funding sources, which can be revisited as often as parents wish, tailored to each family.

Funding for ALDs is from a variety of sources for young children (Table 4.8), which has always been problematic (Mulla, 2011; Bevington, 2015; NDCS, 2017). There is still no recognition of the value ALDs can bring to early intervention, with this provision not seen as cost-effective. A third (34%) of respondents stated that ALD were available to children over the age of 3 years, explaining that older children took priority (Table 4.15), missing the crucial language development window (Sharma and Nash, 2009; Marschark and Hauser, 2011). This is counterproductive and counterintuitive after all the research and funding which has gone into NHSP-England and early amplification. Access to clear speech is fundamental for language acquisition. Early intervention of an ALD during the critical period of language development would reduce the need (and cost) for later interventions, the rollout of equipment would just be earlier. Shannon and Neill (2022) highlight that stakeholders should work together to find solutions and ALDs should be available to purchase through the NHS.

Various professions state that they do not provide information to parents as they do not want to damage relationships with families or professionals by offering something that they cannot provide. Closer working partnerships would prevent this and help enhance relationships building better outcomes for the child (NHS-England, 2019b; RCSLT/BATOD, 2019).

This study shows that professionals are, either consciously or unconsciously ‘gatekeeping’ information, preventing parents from being able to make an informed choice towards ALD provision. Without the provision of information to parents the option of early fitting is not presented, and parents are unable to make an ‘informed choice’ on ALD Provision. A rationale was that an equitable service was advocated, recognising that some parents are not as proactive in requesting ALDs. Rather than denying parents information, we should strive for equitable provision.

The research shows that there are gaps in knowledge that need to be addressed, both with professionals’ understanding of technical capabilities and terminology and parents’ understanding of the equipment, its function, and how to use it.

5.5. Limitations of Research

By the nature of an MSc dissertation, it is limited as to what it can realistically achieve in the timeframe and word constraints given. Therefore, it is not feasible to focus on all findings from the data, nor interview representatives from all professions including manufacturers and NDCS.

The survey was distributed to a wider professional base than expected, possibly due to its publication on DeafEdUK. This produced a bank of professionals to interview with differing perspectives. It could be argued, that this may have diluted the data as not all these professionals are involved with the distribution of ALDs. The reverse could also be true, giving more breadth, highlighting the beliefs, and understanding of all professionals working with families of deaf children.

Only five responses came from paediatric audiologists, which could be due in part to the distribution or that they do not fit ALDs. There were also limited responses from ICToD as the survey could not be shared on their platform. It was also unfortunate that no data was available from Ireland or Scotland in the interviews.

Whilst interpretation of data must be carefully scrutinised when analysing data for bias (Thomas, 2017), using this theory, if you did agree with QS1 you would be passionate and complete the survey to get your voice heard. Therefore, as very few acknowledged fitting ALDs at initial fitting its robustness is substantiated.

5.6. Future Research

This study uncovered many areas for future research. Examining the best practice of information sharing and informed decision-making regarding ALDs would be invaluable. Expanding this to canvas parents’ views and experiences of informed choice with ALDs would be useful. Other areas to investigate include exploring professionals' understanding of technology and training needs to facilitate ALD fitting. The ambiguity of the term 'early fitting' was exposed, research to identify what is considered 'early' is and establish if practice matches this concept, exploring how many babies are fitted with an ALD within the first year of diagnosis.

The provision and practice of information sharing and joint working between professionals across the country is variable. As collaboration between health and education is the key to providing all families timely access to ALDs, this warrants investigation. Exploring a comprehensive package of amplification for deaf children, taking other countries' procedures, their results, and outcomes into account. This could also include investigating proprietary microphones and the health service's procurement procedures with the potential to provide these as standard as with CI, albeit a gift.

Larger comparative studies to examine early ALD use, and trialling various types of ALD to compare their suitability for the new era of candidates would be invaluable. It should focus on the barriers outlined in this research, including consistent amplification, and reporting, and seek to provide solutions, considering that the issues raised are repeated from previous research.

A longitudinal study of children supplied with ALDs from the first fit, monitoring their outcomes and exploring any difficulties or successes they have during the study, would add much needed data to the first fit discussion.

From this research, professionals fit ALDs using different approaches, including 'plug and play'. With movement toward younger children being fitted, research is required, to trial this method and establish recognised protocols for EY ALD fitting.

6. Conclusion

Fitting ALD at first hearing aid fitting is recommended by NDCS QS (2017), but the reality from this research is that less than 1% provide information, let alone fit ALDs. As a profession, these standards have been agreed and whilst the findings from this study highlight that professionals' understanding and mindset have shifted to early fit (Mulla, 2011), this does not correlate with practice. In the same way that NHSP-England is accountable through KPIs, which audiology departments must report on each year (OHID, 2022), should there not, as a profession, be accountability to QS? This and other challenges/barriers need to be examined as to how they can be addressed.

Since ALD provision is currently a lottery in the UK due to various factors, there is a need to ensure that there is an equitable service across the country. In the same way, NHSP-England and hearing aids were championed by McCracken et al. (2005), early ALD provision would also benefit from a platform. Professionals are 'gatekeeping' information, preventing parents from being able to make an informed choice about ALD provision. The reasons for not providing, and timing of sharing information vary but need to be addressed. Although it is argued parents should not be responsible for the provision of ALDs (NDCS, 2017), they also should have the right to make an informed choice. The consequence of not providing suitable information is that parents may purchase an ALD, which, without the support and guidance of educational services, is inappropriate and not monitored, as recommended (NDCS, 2017).

Whilst there are alternative funding streams through charities, there may be a concern that this could become a two-tier system, but this is an argument of why all children need to be issued with a free propriety microphone from audiology as part of the initial package (Equality Act 2010; McCracken et al., 2012). As part of NHS, audiology's procurement capabilities, providing all children with an ALD could be affordable, giving all deaf children the same opportunity. The result being that no child would be at a disadvantage to their deaf peers, mirroring the current provision that children with CI receive with a proprietary microphone. This would remove inequalities of location and circumstances, with families supported to use the equipment, in the same way that personal hearing technologies are by the MDT.

Working collaboratively is a key theme to come out of this research, one that is echoed by many authors (Young et al., 2005; Storbeck and Calvert-Evans, 2008; NHS England, 2019b; Yoshinaga-Itano et al., 2020; DoE, 2022) and is imperative to provide best practice and equality in provision to all children.

This issue has been ‘timely’ for many years. Improvements in technology can only strengthen the case for ALDs for young children (Mulla, 2011; Mulla and McCracken, 2014; Bevington, 2015; Walker et al., 2019). Together with the change in professionals’ attitudes, the research needs to be revisited and critically reviewed, with informed choice as part of the discussion, universally.

As D39 expresses: -

> “Your questions have made me think … everybody needs to have the information … we share the DLA information, not every child may qualify or be awarded DLA, but they're all given that information, so I suppose in a similar way.”

Now is the time to be timely.

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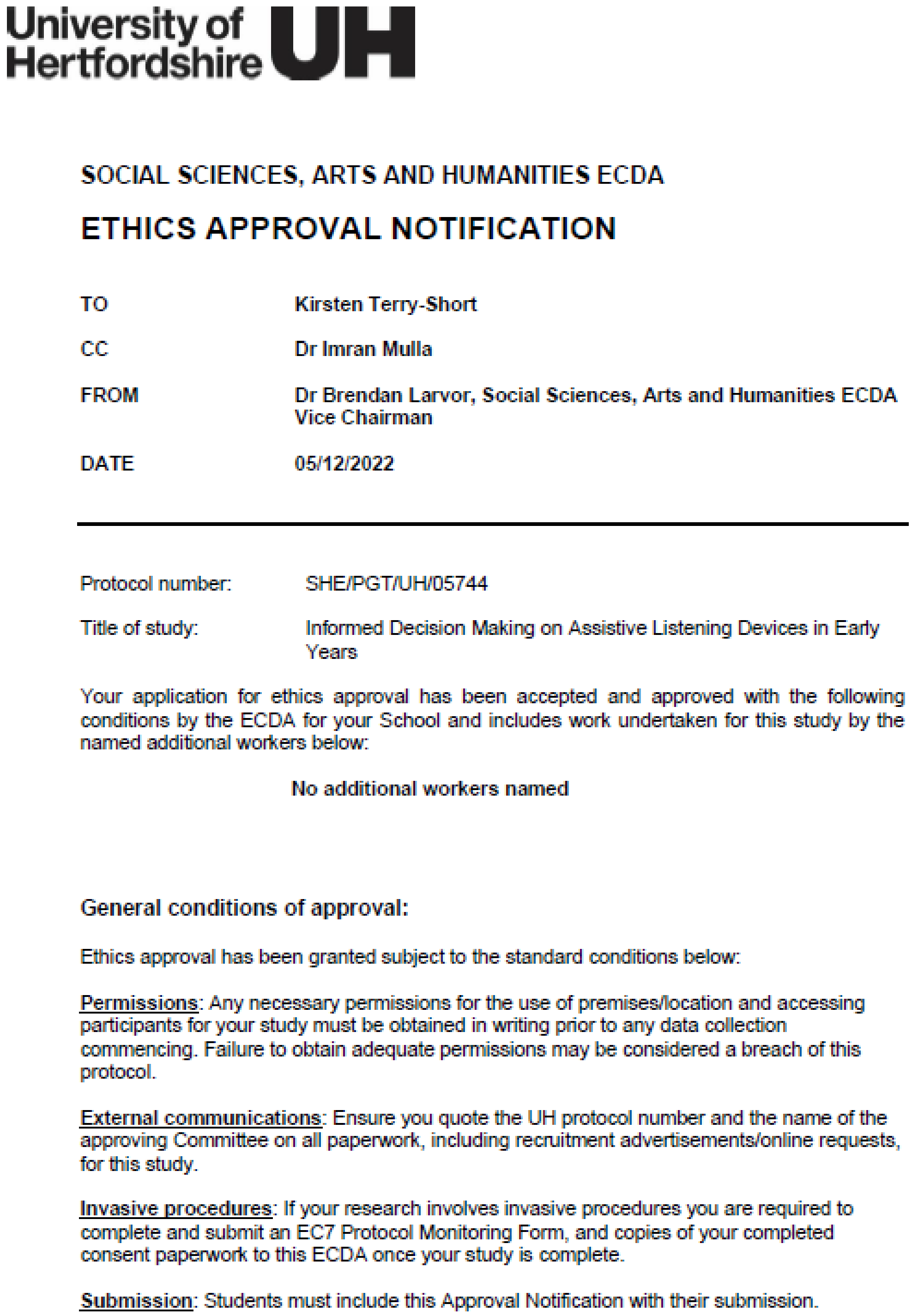
Appendices

Appendix A: EC1a Ethics Approval Notification.



University of Hertfordshire UH

SOCIAL SCIENCES, ARTS AND HUMANITIES ECDA

ETHICS APPROVAL NOTIFICATION

TO	**Kirsten Terry-Short**
CC	**Dr Imran Mulla**
FROM	**Dr Brendan Larvor, Social Sciences, Arts and Humanities ECDA Vice Chairman**
DATE	**05/12/2022**

Protocol number:	SHE/PGT/UH/05744
Title of study:	Informed Decision Making on Assistive Listening Devices in Early Years

Your application for ethics approval has been accepted and approved with the following conditions by the ECDA for your School and includes work undertaken for this study by the named additional workers below:

No additional workers named

General conditions of approval:

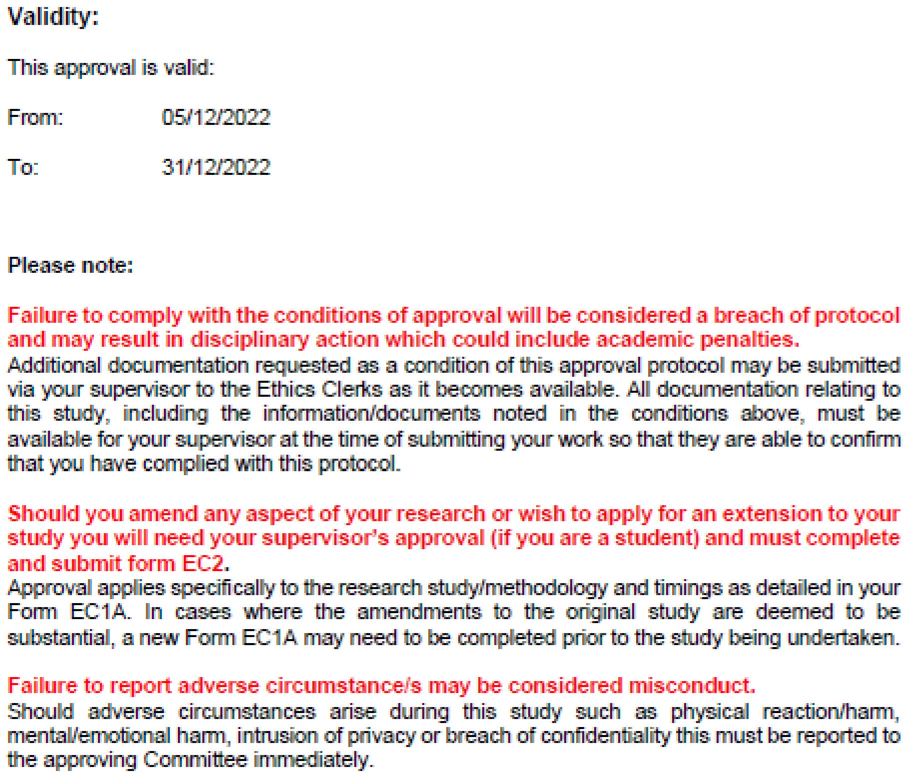
Ethics approval has been granted subject to the standard conditions below:

Permissions: Any necessary permissions for the use of premises/location and accessing participants for your study must be obtained in writing prior to any data collection commencing. Failure to obtain adequate permissions may be considered a breach of this protocol.

External communications: Ensure you quote the UH protocol number and the name of the approving Committee on all paperwork, including recruitment advertisements/online requests, for this study.

Invasive procedures: If your research involves invasive procedures you are required to complete and submit an EC7 Protocol Monitoring Form, and copies of your completed consent paperwork to this ECDA once your study is complete.

Submission: Students must include this Approval Notification with their submission.



Validity:

This approval is valid:

From: 05/12/2022

To: 31/12/2022

Please note:

Failure to comply with the conditions of approval will be considered a breach of protocol and may result in disciplinary action which could include academic penalties.
Additional documentation requested as a condition of this approval protocol may be submitted via your supervisor to the Ethics Clerks as it becomes available. All documentation relating to this study, including the information/documents noted in the conditions above, must be available for your supervisor at the time of submitting your work so that they are able to confirm that you have complied with this protocol.

Should you amend any aspect of your research or wish to apply for an extension to your study you will need your supervisor's approval (if you are a student) and must complete and submit form EC2.
Approval applies specifically to the research study/methodology and timings as detailed in your Form EC1A. In cases where the amendments to the original study are deemed to be substantial, a new Form EC1A may need to be completed prior to the study being undertaken.

Failure to report adverse circumstance/s may be considered misconduct.
Should adverse circumstances arise during this study such as physical reaction/harm, mental/emotional harm, intrusion of privacy or breach of confidentiality this must be reported to the approving Committee immediately.

Appendix B: EC3 Consent Form for Studies Involving Human Participants.

Consent Form

UNIVERSITY OF HERTFORDSHIRE ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS (‘ETHICS COMMITTEE’)

FORM EC3 CONSENT FORM FOR STUDIES INVOLVING HUMAN PARTICIPANTS

I, the undersigned [please give your name here, in BLOCK CAPITALS] ……………………………………………………………… of [please give contact details here, sufficient to enable the investigator to get in touch with you, such as a postal or email address] ….…………………………………………………………………………… hereby freely agree to take part in the study entitled Informed Decision Making on Assistive Listening Devices (ALD) use in Early Years. (UH Protocol number ………………………………………….)

1 I confirm that I have been given a Participant Information Sheet (a copy of which is attached below) giving particulars of the study, including its aim(s), methods and design, the names and contact details of key people and, as appropriate, the risks and potential benefits, how the information collected will be stored and for how long, and any plans for follow-up studies that might involve further approaches to participants. I have also been informed of how my personal information on this form will be stored and for how long. I have been given details of my involvement in the study. I have been told that in the event of any significant change to the aim(s) or design of the study I will be informed and asked to renew my consent to participate in it.

2 I have been assured that I may withdraw from the study at any time without disadvantage or having to give a reason.

3 In giving my consent to participate in this study, I understand that voice, video or photo-recording will take place and I have been informed of how/whether this recording will be transmitted/displayed.

4 I have been told how information relating to me (data obtained in the course of the study, and data provided by me about myself) will be handled: how it will be kept secure, who will have access to it, and how it will or may be used.

5 I understand that if there is any revelation of unlawful activity or any indication of non-medical circumstances that would or has put others at risk, the University may refer the matter to the appropriate authorities.

Signature of participant …..…………………………………………………….. Date………………

Signature of (principal) investigator…………………………………………….. Date………………

Name of (principal) investigator ………………………………………………….

Appendix C: EC6 Participation Information Sheet

Participant Information Sheet

UNIVERSITY OF HERTFORDSHIRE

ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS ('ETHICS COMMITTEE')

FORM EC6: PARTICIPANT INFORMATION SHEET

1 Title of study

Informed Decision Making on Assistive Listening Devices (ALD) use in Early Years.

2 Introduction

You are being invited to take part in a study. Before you decide whether to do so, it is important that you understand the study that is being undertaken and what your involvement will include. Please take the time to read the following information carefully and discuss it with others if you wish. Do not hesitate to ask anything that is not clear or for any further information you would like to help you make your decision. Please do take your time to decide whether or not you wish to take part. The University's regulation, UPR RE01, 'Studies Involving the Use of Human Participants' can be accessed via the address below:

https://www.herts.ac.uk/about-us/governance/university-policies-and-regulations-uprs/uprs

(after accessing this website, scroll down to Letter S where you will find the regulation)

Thank you for reading this.

3 What is the purpose of this study?

To establish current practice in providing information to parents about ALD and identify any gaps in the current system to ensure that all deaf children and their families are provided with timely, appropriate information ensuring equality of provision.

4 Do I have to take part?

It is completely up to you whether or not you decide to take part in this study. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. Agreeing to join the study does not mean that you have to complete it. You are free to withdraw at any stage without giving a reason.

5 Are there any age or other restrictions that may prevent me from participating?

There are no age restrictions in taking part, although you need to be employed in a role working with deaf children (e.g. a Teacher of the Deaf, Educational Audiologist or Clinical Audiologist, etc.).

6 How long will my part in the study take?

If you decide to take part in this study, you will be asked to complete a short survey of approximately 10 minutes. You may be invited to an optional follow-up interview which will last between 20 – 30 minutes.

7 What will happen to me if I take part?

You will have already accessed the link to the survey to complete. You may be invited to an optional interview. Please provide your contact details at the end of the survey if you're happy to be contacted.

8 What are the possible disadvantages, risks or side effects of taking part?

There are not any known risks from taking part in this study. Any information used in this survey will remain anonymous.

9 What are the possible benefits of taking part?

By taking part, your valuable information and opinions will be used to establish current practice in the provision of information to parents, identify any weaknesses, providing areas for improvement and further research.

10 How will my taking part in this study be kept confidential?

All personal data will be stored electronically in a secure, password protected file and destroyed at the end of the completed dissertation.

11 Audio-visual material

The interviews will be recorded. Once the interviews have been transcribed, the recordings will be destroyed. The transcriptions will be stored electronically until the completion on the research and then destroyed.

12 What will happen to the data collected within this study?

The data collected will be stored electronically, in a password-protected environment, for 6 months, after which time it will be destroyed under secure conditions.

The data will be anonymised prior to storage.

13 Will the data be required for use in further studies?

The data will not be used in any further studies.

14 Who has reviewed this study?

This study has been reviewed by:

The University of Hertfordshire Social Sciences, Arts and Humanities Ethics Committee with Delegated Authority

The UH protocol number is SHE/PGT/UH/05744

15 Factors that might put others at risk

Please note that if, during the study, any medical conditions or non-medical circumstances such as unlawful activity become apparent that might or had put others at risk, the University may refer the matter to the appropriate authorities and, under such circumstances, you will be withdrawn from the study.

16 Who can I contact if I have any questions?

If you would like further information or would like to discuss any details personally, please get in touch with me, by phone or by email: Kirsten Terry-Short – kirsten.terry-short@staffordshire.gov.uk or 07976 191353

Although I hope it is not the case, if you have any complaints or concerns about any aspect of the way you have been approached or treated during the course of this study, please write to the University's Secretary and Registrar at the following address:

Secretary and Registrar

University of Hertfordshire

College Lane

Hatfield

Herts

AL10 9AB

Thank you very much for reading this information and giving consideration to taking part in this study.

Appendix D: Covering Letter/ Email to Professional Bodies

Email to Professional Bodies

Hello

I'm conducting research for my MSc in Deaf Educational Studies, looking at parental informed choice with the use of radio aids in the early years. I wondered if it would be possible to put the link for the survey in the correspondence to your members. I'm awaiting the ethical consent but hope to have it shortly.

Looking forward to hearing from you.

Best wishes
Kirsten

Cover Letter to Participants

Hello

I'm currently studying MSc Deaf Education Studies (Educational Audiology) at the University of Hertfordshire through Mary Hare Courses. This survey contributes to my research within the 'Research Methods and Dissertation module'.

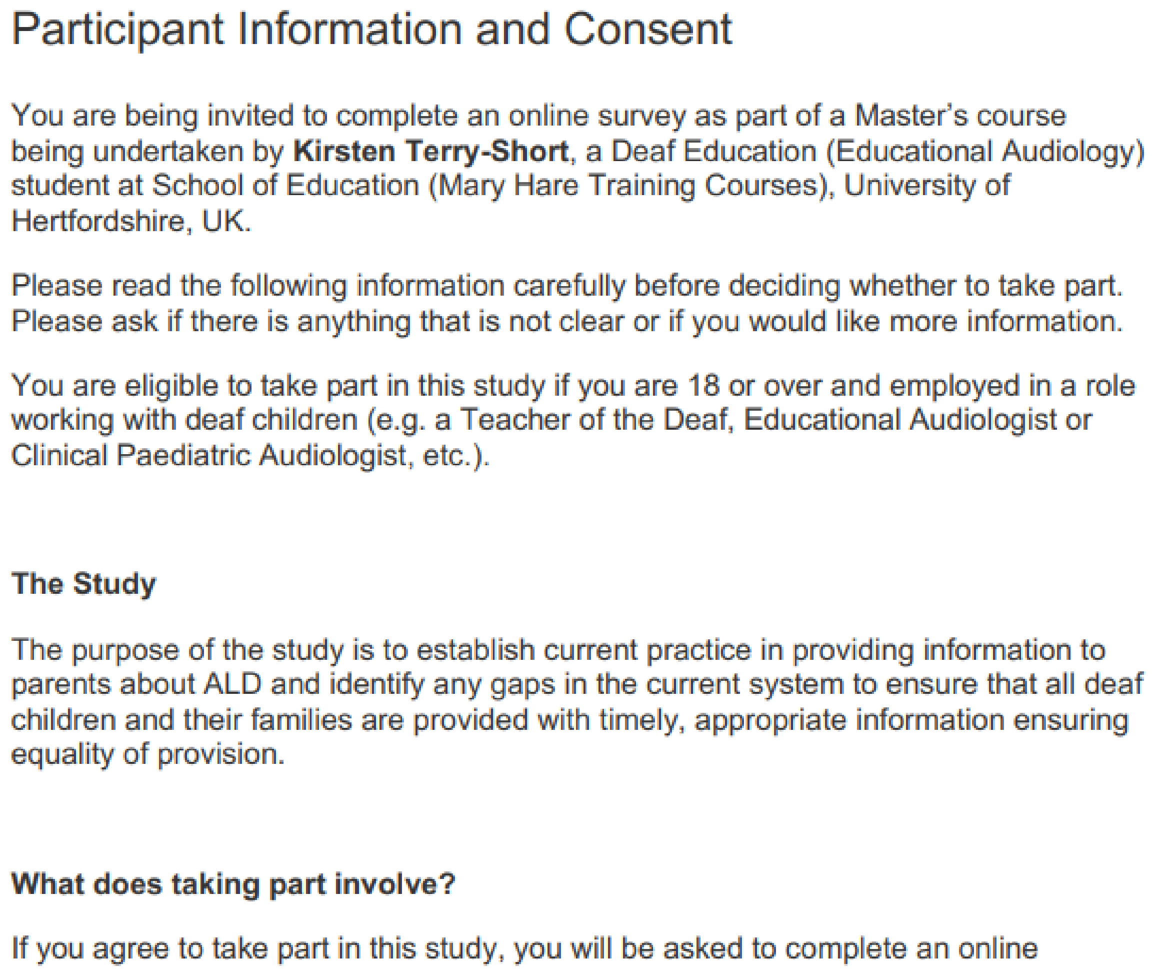
The purpose of this survey is to establish what is happening nationally, with the issuing of Assistive Listening Devices (ALD), (also known as Radio Aids or FM systems). Please answer honestly, there are no right or wrong answers.

Thank you for taking the time to complete the survey, I am very grateful.

Clicking the link below will lead you to the Participant Information, outlining the survey and research, followed by the consent page, the survey will commence afterwards.

https://herts.onlinesurveys.ac.uk/q5c3yqfgjt-11

Appendix E: Survey



Participant Information and Consent

You are being invited to complete an online survey as part of a Master's course being undertaken by **Kirsten Terry-Short**, a Deaf Education (Educational Audiology) student at School of Education (Mary Hare Training Courses), University of Hertfordshire, UK.

Please read the following information carefully before deciding whether to take part. Please ask if there is anything that is not clear or if you would like more information.

You are eligible to take part in this study if you are 18 or over and employed in a role working with deaf children (e.g. a Teacher of the Deaf, Educational Audiologist or Clinical Paediatric Audiologist, etc.).

The Study

The purpose of the study is to establish current practice in providing information to parents about ALD and identify any gaps in the current system to ensure that all deaf children and their families are provided with timely, appropriate information ensuring equality of provision.

What does taking part involve?

If you agree to take part in this study, you will be asked to complete an online

Are there any benefits or risks for me if I take part?

You may not directly benefit from this research; however, we hope that your participation in the study may will be used to establish current practice in the provision of information to parents, identify any weaknesses, providing areas for improvement and further research.

There are no expected risks for participants. Any data that you provide will be treated as confidential and the questionnaire is anonymous.

All data from the study will be stored securely on my university One Drive cloud storage system which only I have access to and will be deleted once the research has been completed, May 2023.

What will happen to the findings of this study?

The findings will be used to produce data to answer my research questions.

Has this study received ethical approval?

This study has been approved by the University of Hertfordshire Social Sciences, Arts and Humanities, Ethics Committee with Delegated Authority (SSAH ECDA). The Ethics Protocol number for this study is **SHE/PGT/UH/05744**.

If you would like to receive more information and for any other queries about this project you can contact me by email (kirsten.terry-short@staffordshire.gov.uk) or my Supervisor, Imran Mulla (i.mulla@herts.ac.uk)

Although we hope it is not the case, if you have any complaints or concerns about any aspect of the way you have been approached or treated during the course of this study, please write to the University's Secretary and Registrar at the following address:

Secretary and Registrar

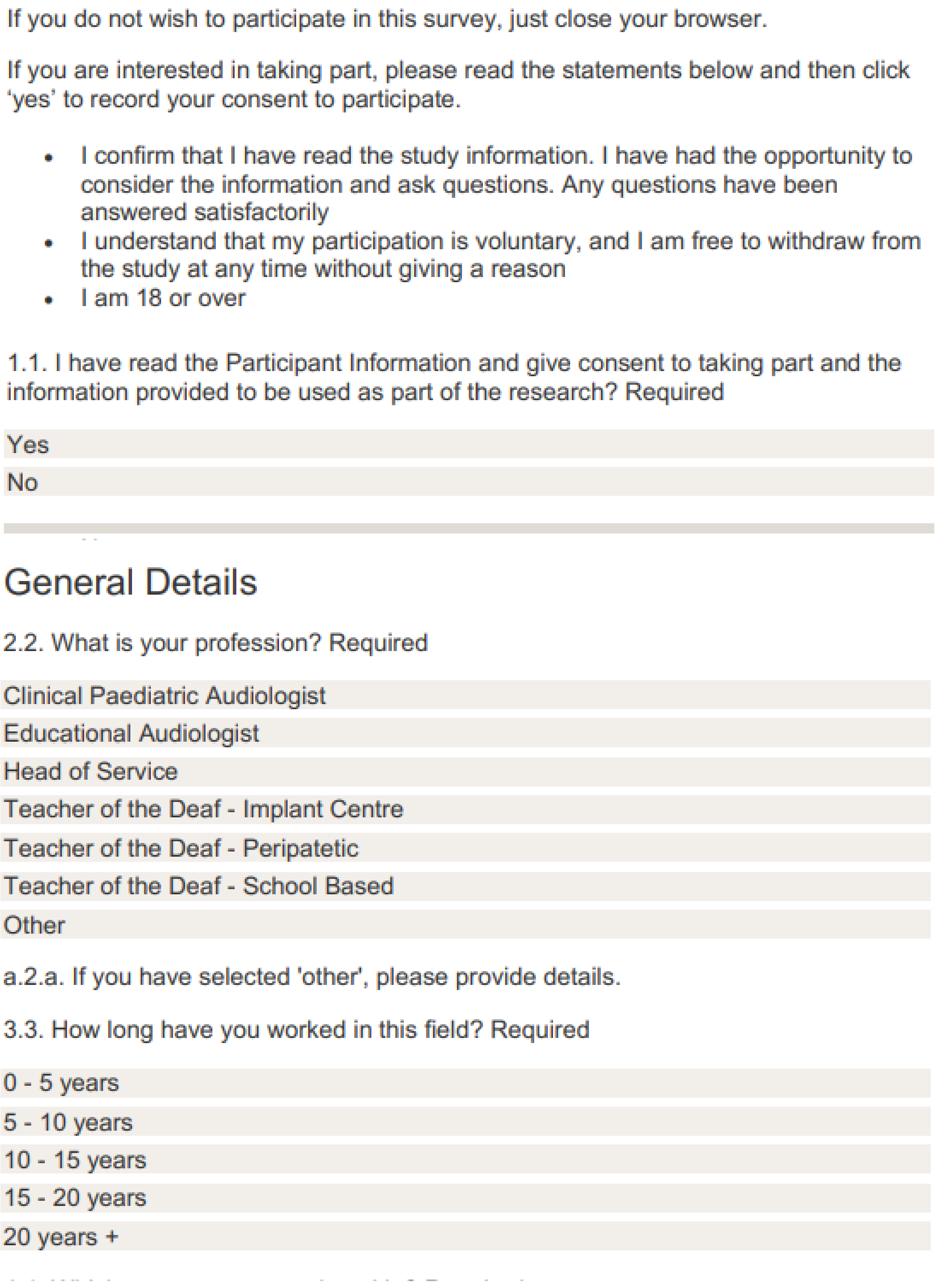
University of Hertfordshire

College Lane

Hatfield, Hertfordshire

AL10 9AB

United Kingdom



If you do not wish to participate in this survey, just close your browser.

If you are interested in taking part, please read the statements below and then click 'yes' to record your consent to participate.

- I confirm that I have read the study information. I have had the opportunity to consider the information and ask questions. Any questions have been answered satisfactorily
- I understand that my participation is voluntary, and I am free to withdraw from the study at any time without giving a reason
- I am 18 or over

1.1. I have read the Participant Information and give consent to taking part and the information provided to be used as part of the research? Required

Yes
No

General Details

2.2. What is your profession? Required

Clinical Paediatric Audiologist
Educational Audiologist
Head of Service
Teacher of the Deaf - Implant Centre
Teacher of the Deaf - Peripatetic
Teacher of the Deaf - School Based
Other

a.2.a. If you have selected 'other', please provide details.

3.3. How long have you worked in this field? Required

0 - 5 years
5 - 10 years
10 - 15 years
15 - 20 years
20 years +

4.4. Which area are you employed in? Required

Anglia
East Midlands
London
North East
Northern Ireland
North West
Scotland
South East

South West
Wales
West Midlands
Yorks / Humber

Assistive Listening Devices (ALD)

5.5. Do you provide information to parents about ALD? Required

Yes
No

a.5.a. When do you provide this information?

First contact / initial fitting
within 2 months
within 6 months
within a year
Other

i.5.a.i. If you answered 'other', please provide your reasons below.

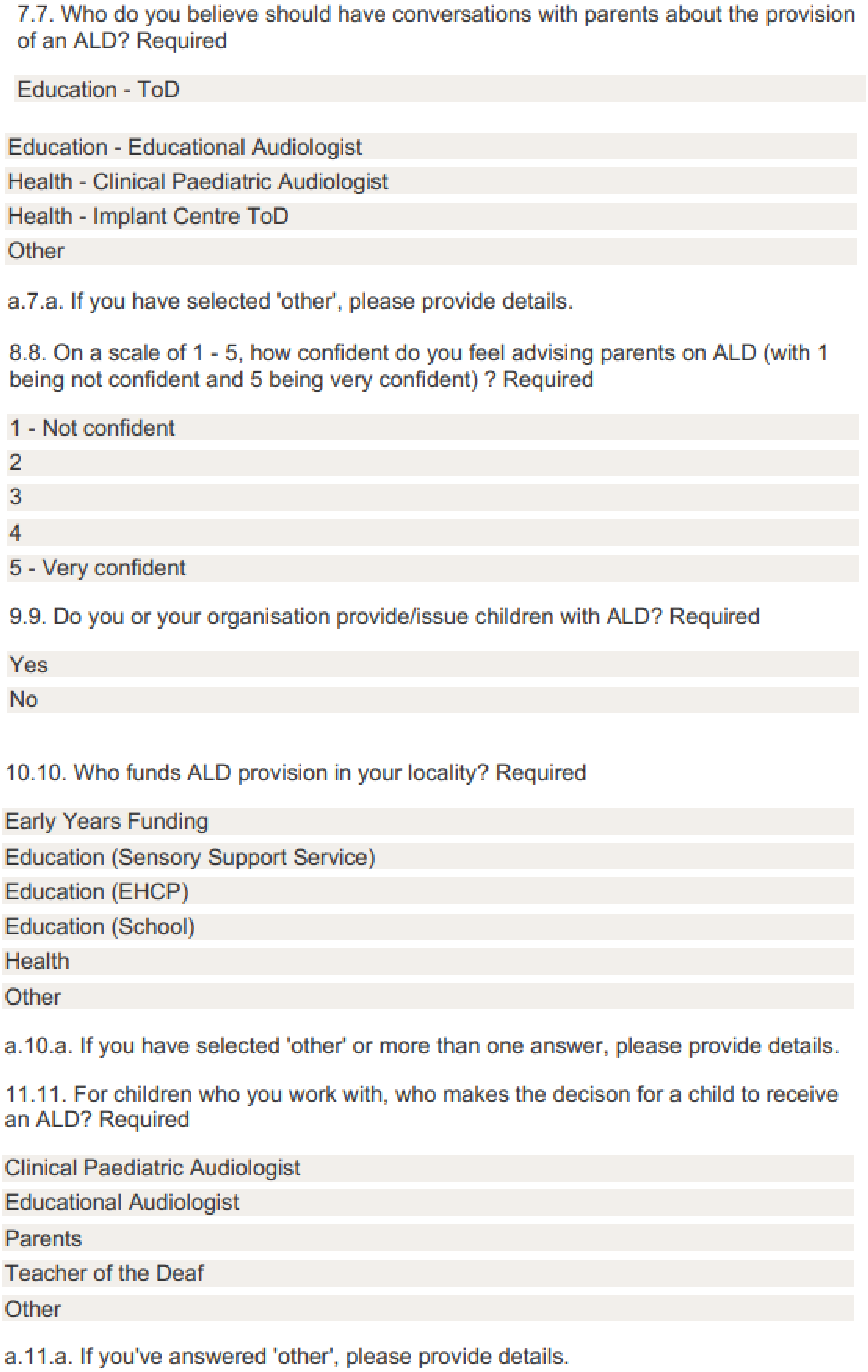
ii.5.a.ii. Are there any caveats as to when this information is provided?

iii.5.a.iii. What information do you provide parents about ALD?

6.6. What provision is available in your locality? Required

ALD available to all
ALD available to nursery age +
ALD available to school age +
Unsure
Other

a.6.a. If you have selected 'other', please provide details.



7.7. Who do you believe should have conversations with parents about the provision of an ALD? Required

Education - ToD

Education - Educational Audiologist
Health - Clinical Paediatric Audiologist
Health - Implant Centre ToD
Other

a.7.a. If you have selected 'other', please provide details.

8.8. On a scale of 1 - 5, how confident do you feel advising parents on ALD (with 1 being not confident and 5 being very confident) ? Required

1 - Not confident
2
3
4
5 - Very confident

9.9. Do you or your organisation provide/issue children with ALD? Required

Yes
No

10.10. Who funds ALD provision in your locality? Required

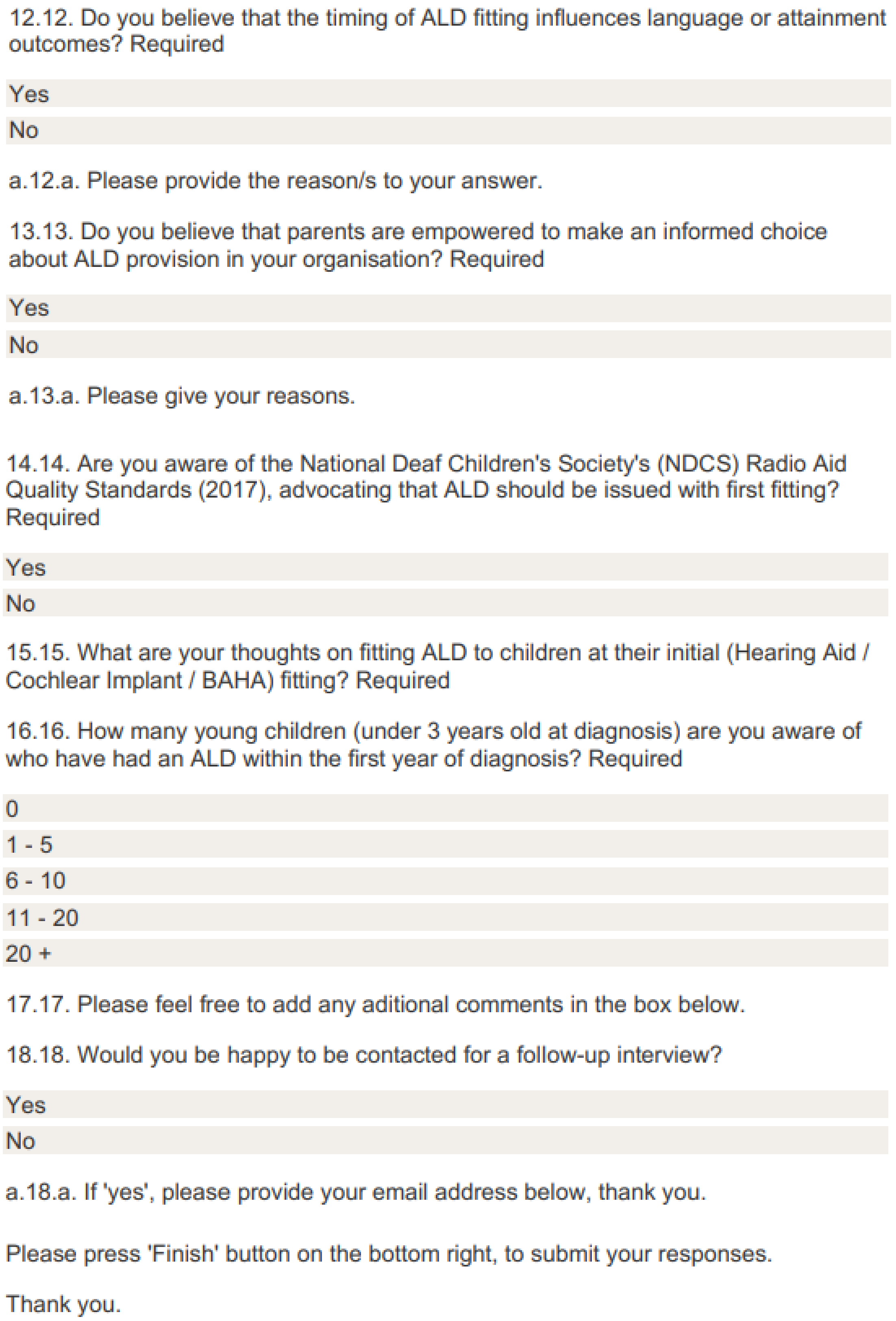
Early Years Funding
Education (Sensory Support Service)
Education (EHCP)
Education (School)
Health
Other

a.10.a. If you have selected 'other' or more than one answer, please provide details.

11.11. For children who you work with, who makes the decison for a child to receive an ALD? Required

Clinical Paediatric Audiologist
Educational Audiologist
Parents
Teacher of the Deaf
Other

a.11.a. If you've answered 'other', please provide details.



12.12. Do you believe that the timing of ALD fitting influences language or attainment outcomes? Required

Yes
No

a.12.a. Please provide the reason/s to your answer.

13.13. Do you believe that parents are empowered to make an informed choice about ALD provision in your organisation? Required

Yes
No

a.13.a. Please give your reasons.

14.14. Are you aware of the National Deaf Children's Society's (NDCS) Radio Aid Quality Standards (2017), advocating that ALD should be issued with first fitting? Required

Yes
No

15.15. What are your thoughts on fitting ALD to children at their initial (Hearing Aid / Cochlear Implant / BAHA) fitting? Required

16.16. How many young children (under 3 years old at diagnosis) are you aware of who have had an ALD within the first year of diagnosis? Required

0
1 - 5
6 - 10
11 - 20
20 +

17.17. Please feel free to add any aditional comments in the box below.

18.18. Would you be happy to be contacted for a follow-up interview?

Yes
No

a.18.a. If 'yes', please provide your email address below, thank you.

Please press 'Finish' button on the bottom right, to submit your responses.

Thank you.

Appendix F: Example of Semi-Structured Interview Schedule

Welcome, thank yous and intros

1. Tell me a little about your service,
2. You mentioned that you provide information to parents when they are ready – what does this look like / when are they ‘ready’?
3. What forms the information you provide to parents? (NDCS leaflets, SSS info, equipment, or demonstration)
    - Do the ToDs in your service provide the same (set) information.
4. In the survey you mentioned that ALD does influence language acquisition/attainment and should be issued in a timely manner,
    - Please expand on this answer regarding language acquisition
    - When do you believe a timely manner is?
5. It was lovely to hear that all children are eligible for an ALD.
    - I understand that you use NDCS’s standards and professional judgment, what does this look like
    - Do you have an EY ALD policy?
    - Is equipment available for home use?
    - does this include children with unilateral and conductive losses?
6. You mentioned that you haven’t fitted anyone under 3yrs old yet but would be happy to do so if appropriate, what would make an under 3yr old a candidate for an ALD?
7. You mentioned that you believe that parents do feel empowered to make an informed choice in your organisation.
    - Apart from the close relationship you mention are there any other reasons?
    - Do many parents choose not to opt for an ALD? – reasons / what happens?
8. I understand that your SSS service funds ALD
    - How does this work in your service
    - Do you find that this has an impact on provision?
    - Who sets up the ALD?
    - Do you fit different types of ALD? Which / why etc.
    - How do you cover repairs/losses?
    - Do you or your schools use insurance?
9. You mentioned that you are aware of NDCS’s ALD at first fitting but disagree with it. It would be great to explore your thoughts further.
    - If not first fit – when?
    - Is there anything that stops you from fitting earlier?
    - Discuss the benefits of early ALD fitting
10. Are there any further thoughts or considerations you would like to add?

Thank you and explanation of what happens next and when they can see outcomes.