



# Parenting Deaf Children: Exploring Relationships Between Resolution of Diagnosis, Parenting Styles and Morale, and Perceived Child Vulnerability

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## Abstract

Raising a deaf child can have significant impacts on parents' wellbeing, their relationship with the deaf child, and their ability to parent effectively. Using an online survey, this study explored two questions: First, to examine whether hearing parents treat and perceive their deaf and hearing children differently while controlling for parent characteristics (including resolution of diagnosis), specifically in terms of parenting styles and perceived vulnerability. Second, whether hearing parents' ability to resolve their feelings about their child's hearing loss diagnosis was related to their parenting morale, and whether they perceived their deaf child as vulnerable. A total of 84 parents with a deaf child aged 5–12 years completed the survey, with 32 of those also reported about a second child without hearing loss in the same age range. They were asked to answer questions from the Reaction to Diagnosis Interview, and to complete several questionnaires addressing parenting morale, child vulnerability, and parenting styles. Findings suggest that unresolved feelings of diagnosis were linked to lower parenting morale and greater perception of child vulnerability. Sibling comparisons indicated that parents also reported a higher perceived child vulnerability score for the deaf child compared to the hearing sibling. No sibling differences were found regarding parenting styles. These findings suggest that the experience of having a deaf child can have a negative impact on hearing parents' morale and perception of child vulnerability, particularly when parents remain unresolved about the diagnosis, highlighting the need for targeted supports and further research.

**Keywords** Deaf · Sibling-Comparison · Parent-Child Relationship · Resolution of Diagnosis · Vulnerability

## Highlights

- Experiences receiving their child's diagnosis of hearing loss has long-lasting impacts on parenting outcomes
- Unresolved parents are more likely to have lower parenting morale and view their deaf child as vulnerable
- Parents are more likely to view their deaf child as more vulnerable than their hearing sibling
- Deaf epistemology awareness and positive psychology may have beneficial outcomes for parents of deaf children.

Raising a child is a difficult and challenging task. The dynamics of parent-child relationships are multifaceted and complex, and influenced by risk and protective factors that

interact within varying family and social contexts (Belsky, 1980, 1984, 1993). Belsky outlined a classic model of the determinants of parenting based on parent characteristics (e.g., personality, education), child characteristics (e.g., temperament), and context (e.g., socioeconomic status). One particularly salient child factor that has received relatively little empirical attention is hearing loss disability. The current paper focuses on parenting for parents of children with hearing loss.

Hearing loss (i.e., deafness) is a sensory disability whereby sounds cannot be perceived, conducted, and/or interpreted normally by the person (Isaacson, 2010). This occurs when necessary components such as in the outer ear,

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middle ear, inner ear, or the pathways in the brain do not function typically. The resulting hearing loss can vary from mild to profound, affecting how different pitches and amplitude of sounds are perceived. Hearing loss affects 19.3% people internationally (Haile et al., 2021). A systematic review estimated the number of Australian primary school children with hearing loss to range between 3.4 and 12.8% (Choi et al., 2017). The sequelae to hearing loss often include challenges with language development and interpersonal communication in a predominantly auditory culture that does not compensate for the needs of deaf people (Hauser et al., 2010), which can have long term implications such as academic underachievement and isolation (Haile et al., 2021; World Health Organisation, 2016). While deaf people do experience ongoing challenges, the nature of these challenges are not exclusively due to the hearing loss per se, but also due to sociocultural practices and attitudes surrounding them. For example, disabled individuals may not have their basic needs met due to discrimination that may manifest as misallocation of resources, inappropriate interactions (Böttcher & Dammeier, 2013); or lack of proper social inclusion due to disabled people not receiving full recognition and valued as fully fledged persons compared to abled bodied individuals (Ikäheimo, 2009). As a result, disability is a complex risk factor to the extent that fully understanding the nature of the disability in question must also incorporate sociocultural practices in which the disability is situated (Toro et al., 2020). This also extends towards parents raising disabled children. While parents will likely experience ongoing challenges raising disabled children, the extent of these challenges and the parenting experiences of such challenges are invariably dependent on how disability is framed socially and culturally, and whether parents receive appropriate support during ongoing challenges. Often, parents of disabled children are negatively affected by ableism which can have consequences for the parenting process (Thomas, 2020). This is a very complex topic that requires extensive attention that goes beyond the scope of this paper. As such, we recommend readers to be mindful of these complexities while reading this paper and consider these parenting experiences as situated in sociocultural contexts that tend to frame disability negatively.

## Unique Challenges of Raising Deaf Children

The challenges of raising a deaf child can significantly influence the parent-child relationship. First, there is the grief reaction that is typical when parents receive the diagnosis (Scarinci et al., 2017), which involves a range of intense and negative emotions like shock, denial, anger, and feelings of grief, loss, and uncertainty (Barnett et al., 2003;

Flaherty, 2015; Huang et al., 2010; Scarinci et al., 2017; Zappella, 2015). Unresolved feelings about the child's diagnosis can have a lasting adverse impact on the parent-child relationship which, in turn, can compromise the developmental outcomes of children with hearing loss (Jean et al., 2018; Marvin & Pianta, 1996).

Parenting capacity and adaptation will vary in relation to parent characteristics, in particular whether the parents have hearing loss themselves. The majority of deaf babies (90%) are born to hearing parents who typically do not have experience with deafness as a disability (Jean et al., 2018). These parents therefore may struggle to know how to communicate with their deaf children, who are reliant on a specific mode of communication that is phenomenologically compatible with their deaf 'epistemology': a visual way of seeing and experiencing the world (Hauser et al., 2010; Paradis & Koester, 2015). Hauser and colleagues point out that parents of children with hearing loss need to work much harder to communicate with their children compared to parents with hearing children, where communication is frequently natural, intuitive, and spontaneous (Depowski et al., 2015; Morgan et al., 2014). As a result, parent-child interaction may be compromised from the outset. Deaf children, particularly those with hearing parents, generally experience developmental delays in areas such as language acquisition (Humphries et al., 2012), socioemotional development (Hintermair, 2006), prosocial behaviour (Sarant et al., 2018), theory of mind (Peterson et al., 2016) and may be more vulnerable to developing insecure attachment styles (Howe, 2006a; 2006b).

Marvin & Pianta, (1996) have studied the shock and impact of a diagnosis of child disability and how this may compromise parents' capacity to be sensitively responsive to their child. Their study on 70 mothers of children with cerebral palsy diagnoses found a relationship between unresolved feelings regarding their child's diagnosis and insecure child-parent attachment (Marvin & Pianta, 1996). A diagnosis of deafness presents unique challenges to hearing parents when it comes to reading and interpreting child cues, which is fundamental to adaptive responsive parenting behaviours such as authoritative parenting styles (Baumrind, 1971) and a secure attachment relationship (Ainsworth et al., 1978), which has been noted to be optimal for child development. To date, research findings on the nuances and implications of parent-deaf child relationships are inconsistent, underexplored, and not fully elucidated (see Jean et al., 2018). There is a need to better understand which factors may contribute to better relationships, leading to more targeted early intervention approaches that can support parents of deaf children.

The current research explores parents' resolution of their child's diagnosis and how it may affect their parenting experiences, parenting style, and perceptions of their child.

A review examining the development of psychopathology in children with disabilities found children with congenital hearing loss and cerebral palsy were at higher risk of emotional, behavioural and social problems than children without disabilities (Bøttcher & Dammeyer, 2013). Bøttcher and Dammeyer concluded that disability was not limited to the biological nature of the impairment; it was further complicated by any mismatch between the child's development and the surrounding environment including parents, medical professionals, and schools.

## Impact on Parenting Morale and Style

Parents negotiating with the ongoing challenges of raising disabled children can be vulnerable to suboptimal psychological wellbeing and parenting capacity (Resch et al., 2012). Numerous studies have found that parents of disabled children are more likely to experience mental health issues including depression (Giallo et al., 2014; Resch et al., 2012); unresolved feelings about their child's diagnosis (Howe, 2006b; Marvin & Pianta, 1996); and higher levels of stress and fatigue compared with parents of typically developing children (Giallo et al., 2014; Seymour et al., 2012; Woodman 2014). Parenting styles among parents of children with disability may also differ from those of parents with typically developing children (Hutchison et al., 2016; Phillips et al., 2017; Riany et al., 2017). Notably, they are less likely to display authoritative parenting (typically involving warmth, autonomy, healthy discipline based on reasoning, and sensitivity to their child's need), and are more likely to display authoritarian or permissive parenting. Authoritarian parenting is characterised by lower responsiveness, higher demandingness and more control. Permissive parenting similarly involves a lack of sensitivity to child's needs, but also lacks discipline and establishing limits, sometimes to the point of neglect (Baumrind, 1971). These two negative parenting styles can take the form of overprotectiveness (Pinquart, 2013), which is often associated with perceptions of child vulnerability (Carpentier et al., 2008; Hullmann et al., 2010; Thomasgard, 1998), or an increased likelihood of engaging in child maltreatment, such as abuse and neglect (Howe, 2006b). Such suboptimal parenting may be a product of inexperience and uncertainty of raising disabled children with different needs (Baumrind, 1994; Henderson et al., 2016; Reeder & Morris, 2021; Steiner & Dahlquist, 2022).

A meta-analysis of 325 studies concluded that parents of children with a chronic illness/disability (including deafness) had less positive parent-child relationships assessed through observation and self-report measures, although the effect sizes were small (Pinquart, 2013). Moreover, there were higher levels of negative parenting including more

demandingness and control as well as lower levels of parental responsiveness. Interestingly, and of relevance to the current study, the meta-analysis also found that *hearing* parents with deaf children – compared to children with other chronic illnesses/disabilities – struggled more with establishing healthy parental behaviours, including maintaining a healthy level of control, protection, and warmth as well as with maintaining a healthy parent-child relationship. While inexperience and uncertainty may explain this phenomenon, it may also be the case that parents are also affected by ableism (Johnson & West, 2020), particularly audism, the notion that people with hearing loss are inferior due to their inability to hear and speak (Hauser et al., 2010). Parents may embody these attitudes, feeling resentment, hopelessness, or guilt for having a deaf child, which may interfere with maintaining the parent-child relationship.

There are inconsistent findings regarding parenting styles in the context of child deafness. Taking one study as an example, Ekim & Ocakci, (2015) found lower mean scores for positive parenting dimensions ('authoritative' parenting characterised by warmth, structure, autonomy) and higher mean scores for negative parenting dimensions ('authoritarian' parenting characterised by rejection, coercion) when comparing hearing parents raising deaf children and hearing children. In contrast, a sibling comparison study found parents treated their deaf children more warmly, and with less coercive control compared with their hearing siblings (Antonopoulou et al., 2012), and Ketelaar et al., (2017) found no differences in parenting styles and dimensions, though it was suggested that this finding may have been attributable to the parents having participated in rehabilitation and support programs as part of the child obtaining cochlear implants.

## Perceived Child Vulnerability

A heightened perception of child vulnerability (specifically, vulnerability to illness) has consistently been observed among parents raising children with chronic illnesses (Thomasgard, 1998), which may be associated with higher parenting stress and more parental overprotection (Carpentier et al., 2008; Hullmann et al., 2010). Children perceived by their parents as highly vulnerable have also demonstrated academic underachievement as well as internalising and externalising behaviours. Levels of perceived child vulnerability vary across different illness and disability types related to the different demands on parents and families (Hullmann et al., 2010). Most studies on perceived child vulnerability are focused on medical problems and illnesses (e.g., Type 1 diabetes, asthma, cystic fibrosis, cancer) which may or may not co-occur with disability. Few studies have examined perceptions of vulnerability in

children with disability and the current study makes a novel contribution by addressing this gap in relation to parents of deaf children.

As noted above, perceptions of child vulnerability may contribute to low morale and parenting stress and there is evidence that parents raising children with a disability experience more parenting stress than parents of typically developing children (Hayes & Watson, 2012; Hintermair, 2006; Phillips et al., 2017; Seymour et al., 2012; Woodman, 2014). Higher parenting stress can compromise parent child relationship quality, while low parenting stress can be protective (McMahon & Meins, 2012). In their study of preschoolers, McMahon and Meins reported that elevated parenting stress was associated with lower observed parental emotional availability (responsiveness and support of child autonomy) in typically developing children. A study of parents of children with autism and/or attention deficit hyperactive disorder (ADHD) found that higher parenting stress was related to a more permissive or authoritarian parenting style and poorer child executive functioning (Hutchison et al., 2016). Few studies have examined parenting stress in parents of deaf children, but there is some recent evidence that they experience higher levels of stress on average compared to families with hearing children, with negative consequences for their parenting ability and the socioemotional wellbeing of their deaf children (Jean et al., 2018).

The second aim of the current study is to examine how parenting morale may interact with other parenting factors, including parenting styles, in relation to parents of children with hearing loss. Although distinct from each other, parenting morale has been found to be related to parenting stress (Benzies et al., 2010), and can be used as a proxy measurement that assesses the underlying psychological morale and energy of parents, that may be particularly appropriate to parents of children with disability (Trute & Hiebert-Murphy, 2005).

## Impact of Resolution of Diagnosis

Studies across a range of child disabilities have shown that lack of resolution of diagnosis has a negative impact on parenting behaviour in parents of children with intellectual disability (Feniger-Schaal & Oppenheim, 2013), and parental wellbeing in parents of children with autism (Milshstein et al., 2009) and children with cerebral palsy (Krstić et al., 2015). There are inconsistent findings regarding disability severity, with one study finding severity of autism symptoms was not related to resolution of diagnosis (Milshstein et al., 2009) while another reported that the rate of unresolved reactions was higher among parents of children with more severe motor disabilities (Schuengel et al.,

2009). While resolution of diagnosis clearly has an impact, it is not fully understood how it plays out in different disability contexts and in relation to different child factors. To date, only one study has explored hearing parents' resolution of diagnosis of deafness in their child. Adams (2011) found that contrary to expectation, stress and psychological adjustment in mothers were not associated with resolution of the diagnosis of deafness, but also found that mothers unresolved with regard to their child's diagnosis reported more child behavioural problems. Additionally, unresolved diagnosis was associated with higher anxiety. The study did not explore associations with parenting styles and parental perceptions of their child. The current study addresses these issues.

## Aims and Hypotheses

The current study uses a within-family sibling comparison design to explore the unique parenting experiences of hearing parents raising children with hearing loss and the influence of resolution of diagnosis of the child's hearing loss on parental adjustment. It is hypothesised that i) Parents, especially those who are unresolved, will report higher perceived child vulnerability and less optimal parenting styles with their deaf child, compared to a hearing sibling; specifically, parents will see the deaf child as more vulnerable and will report less authoritative parenting (and more permissive or authoritarian parenting); and ii) Non-resolution of diagnosis will be associated with lower parenting morale and greater perceived child vulnerability.

## Method

### Participants

Participants were recruited via distribution of survey links (through flyers, emails, word of mouth) with the help of Sydney Cochlear Implant Centre (SCIC), Next Sense (Formerly Royal Institute of Deaf and Blind Children at the time of study), and Parents of Deaf Children (PODC). Survey links were also posted and shared on Deaf Community Pages on Facebook.

Participants were 84 parents ( $M$  age = 39.05 years,  $SD$  = 5.52, age range 26–55 years) with at least one child with hearing loss aged between 5 and 12 years ( $M$  age = 7.77 years,  $SD$  = 2.21). A further 104 parents commenced the survey, but did not complete or submit. Ten parents (12%) reported having a hearing loss themselves, 42 parents also had a hearing child aged between 5 and 12 ( $M$  age = 8.38,  $SD$  = 2.34). A detailed description of parent and child demographic characteristics is presented in Table 1.

**Table 1** Demographic characteristics of parents, children with hearing loss, and siblings

| Variable   | Sub-Variable              | Count (%)  |
|--|---------------------------|------------|
| <i>Parent (n = 84)</i>                             |                           |            |
| Gender   | Female                    | 81 (96.4%) |
| Language/s to child with hearing loss <sup>c</sup> | Spoken English            | 76 (90.5%) |
|  | Auslan <sup>a</sup>       | 39 (46.4%) |
| Parent Education                                   | University                | 38 (45.2%) |
|  | Post-Secondary School     | 38 (45.2%) |
| Relationship Status                                | Married/Defacto           | 75 (89.3%) |
| Hearing Status                                     | Hearing Loss              | 10 (11.9%) |
| <i>Child with Hearing Loss (n = 84)</i>            |                           |            |
| Gender   | Male                      | 45 (53.6%) |
| Hearing Loss Level                                 | Mild                      | 7 (8.3%)   |
|  | Moderate                  | 24 (28.6%) |
|  | Severe                    | 16 (19.0%) |
|  | Profound                  | 37 (44.0%) |
| Wears Hearing Aids                                 | Hearing Aids              | 42 (50.0%) |
|  | Cochlear Implant          | 24 (28.6%) |
|  | Both                      | 10 (11.9%) |
|  | None                      | 8 (9.5%)   |
| Language/s used <sup>c</sup>                       | Spoken English            | 76 (90.5%) |
|  | Auslan                    | 37 (44.0%) |
|  | Arabic                    | 2 (2.4%)   |
|  | French                    | 1 (1.2%)   |
| Neurodevelopmental Disorders (n = 23)              | Autism                    | 7 (8.3%)   |
|  | ADHD/ADD <sup>b</sup>     | 5 (6.0%)   |
| Sibling Status                                     | Only child                | 10 (11.9%) |
|  | Sibling included          | 42 (50.0%) |
|  | Sibling outside age range | 32 (38.1%) |
| <i>Sibling aged 5–12 (n = 42)</i>                  |                           |            |
| Gender   | Male                      | 20 (47.6%) |
| Hearing Status                                     | Hearing Loss              | 7 (8.3%)   |
| Neurodevelopmental Disorders (n = 6)               | Autism                    | 3 (3.6%)   |
|  | ADHD                      | 2 (2.4%)   |

<sup>a</sup>Australian Sign Language<sup>b</sup>Attention Deficit Hyperactivity Disorder/Attention Deficit Disorder<sup>c</sup>Languages not mutually exclusive

## Measures

Parents completed validated questionnaires about their experience of parenting, their parenting style, and their perceptions of child vulnerability. They were also asked to respond to an online version of a narrative interview containing open-ended questions regarding their recalled feelings when their child was diagnosed with hearing problems.

## Demographics

Parents provided information about themselves, including age, gender, education, languages spoken at home, whether they have hearing loss themselves, and whether they had a second child in the same age-group (see Table 1). Questions about their child with hearing loss included age, sex, whether the child spoke or used sign language, and level of hearing loss (mild, moderate, severe, profound). Parents reported if the child with hearing loss had any additional neurodevelopmental difficulties or comorbid diagnoses, as hearing loss is commonly comorbid with other disabilities (Cupples et al., 2018). If parents had a second child in the same age-group, they were asked to complete the same details about that child.

## Parenting Morale Index (PMI, Trute and Hiebert-Murphy 2005)

Parenting morale (i.e., positive spirit, energy, enthusiasm) was measured using the PMI questionnaire. This 10-item measure is rated on a 5-point Likert scale, with responses ranging from 1 (*not at all*) to 5 (*very often*) where 6 items were reverse scored, higher scores indicating higher parenting morale. Items consisted of statements about how parents felt: either positive (e.g., ‘Contented’, ‘Optimistic’) or negative (e.g., ‘Stressed’, ‘Exhausted’). The PMI has demonstrated good reliability and validity in identifying those susceptible to experiencing higher stress levels and low parenting enthusiasm (Benzies et al., 2010). The current study found good internal consistency, Cronbach’s  $\alpha = 0.85$ .

## Child Vulnerability Scale (CVS, Forsyth et al., 1996)

The CVS consists of 8 items rated on a 4-point Likert scale ranging from 1 (*Strongly Disagree*) to 4 (*Strongly Agree*). Each item is a statement reflecting the parent’s perceived vulnerability of the child in terms of illness (e.g., ‘My child gets more colds than other children I know’ and ‘I often check on my child at night to make sure s/he is okay’). A total score of 10 or above, is considered indicative of a perception of child vulnerability. The measure has shown adequate internal reliability (Forsyth et al., 1996) and validity of the cut-off score in relation to clinical scores on the Child Behaviour Checklist (Achenbach & Edelbrock, 1986) and child visits to physicians (Horwitz et al., 1992). The current study found internal consistency to be good; Cronbach’s  $\alpha = 0.88$ .

## Parenting Styles Dimension Questionnaire (PSDQ, Robinson et al. 1995)

The PSDQ consists of 62 items (with 3 items reverse scored) rated on a 5-point scale ranging from 1 (*Never*) to 5 (*Always*). Items are classified into three global dimensions:

authoritative, authoritarian, and permissive, congruent with the theoretical work of Baumrind's parenting typology (Baumrind, 1971; Robinson et al., 1995). Within the authoritative dimension, there are 4 factors: warmth & involvement (11 items, e.g., knows the names of child's friends), reasoning/induction (7 items, e.g., explains the consequences of the child's behaviour), democratic participation (5 items, e.g., allows child to give input into family rules), and good natured/easy going (4 items, e.g., is easy going and relaxed with child). Within the authoritarian dimension, there are also 4 factors: verbal hostility (4 items, e.g., explodes in anger towards child), corporal punishment (6 items, e.g., uses physical punishment as a way of disciplining our child), non-reasoning/punitive strategies (6 items, e.g., punishes by taking privileges away from child with little if any explanations), and directiveness (4 items, e.g., scolds and criticizes to make child improve). Lastly, the permissive dimension has three factors: lack of follow through (6 items, e.g., states punishments to child and does not actually do them), ignoring misbehaviour (4 items, e.g., allows child to interrupt others), and self-confidence (5 items, e.g., appears confident about parenting abilities).

The measure has good internal consistency in large samples (Olivari et al., 2013) and in the current study; authoritative  $\alpha = 0.86$ , authoritarian  $\alpha = 0.85$ , and permissive  $\alpha = 0.78$ .

### Reaction to Diagnosis Interview (RDI, Marvin and Pianta 1996)

The RDI is a semi-structured, standardised interview that aims to examine the extent of parents' grief stemming from discovering their child's disability diagnosis. There are five questions designed to probe the parent's recollection of their past and current feelings and thoughts about the diagnosis at the time as well as their ideas regarding why their child has special needs. The RDI was originally designed to be conducted in a face-to-face interview; but adapted as an online questionnaire for this study. Slight modifications were made to some questions. Question 1 reads "When did you first realize that your child had problems with hearing?" (instead of 'a medical problem') and Questions 2 and 3 were combined into one (What were your feelings at the time of this realisation? How have these feelings changed over time?) to reduce the number of text boxes required to be filled in.

Classification of participant responses as either 'resolved' or 'non-resolved' was based on the reviews of two raters. The responses were coded as recommended by the manual (see Marvin & Pianta, 1996). The coding system is based on the approach to coding resolved and unresolved responses to loss and trauma in the Adult Attachment Interview (George et al., 1996). Particular elements in the responses were identified as either indicating resolution or

non-resolution of diagnosis. Due to the online nature of the interview, behavioural criteria were excluded. Indicators of resolution include: 1) understanding the moment of diagnosis as a time of difficulty and identifying change in feelings since that moment; 2) statements indicating "moving on" in life (e.g., life must go on; 3) reporting they had ceased searching for existential reasons to explain why the diagnosis occurred (e.g., why me?); 4) accurate representation of the child's abilities; and 5) balanced statements about the experience raising a child with special needs (e.g., there are upsides and downsides to raising the child). On the other hand, indicators of non-resolution include: 1) signs of cognitive distortions (e.g., distort reality through articulating unrealistic beliefs, magical thinking or expectations); 2) ongoing search for existential reasons for child's special needs (e.g., why did this happen to me?); 3) signs of being stuck in the past (e.g., focused on the past without showing an indication of change of feelings); 4) mental disorganisation and incoherence (e.g., unable to tell the story clearly); and 5) unable to report their experiences of the diagnosis (e.g., appearing to be cut off from the experience). The coding scheme was categorical, classifying each participant as either resolved or unresolved. All RDI responses were double-coded. The second coder (second author) has been trained and certified in the coding of the Adult Attachment Interview. Initial inter-rater agreement was 89%. Coding disagreements were resolved through discussion, with both coders reaching agreement for each response.

### Procedure

After gaining approval from the Human Research Ethics Committee (review reference no.5201951718200) organisations were sent details of the link to the online survey. The survey was designed with Qualtrics. All participants were presented with the Participant Information Sheet/ Consent Form at the start of the survey and were required to give consent before participating in the survey by selecting the 'I give consent' option. Participants were free to drop out any time. All participants were required to complete demographic, PMI and RDI questionnaires initially. Parents who also had another child in the age-range ( $n = 42$ ) were required to complete the CVS, and PSDQ questionnaires twice, allowing within family comparisons (note that 10 out of 42 were excluded from hypotheses testing since either the parents were deaf or both siblings were deaf). The first round of questionnaires was addressed towards the *younger* of the two siblings, and the second round towards the *elder* of the two siblings to ensure randomisation of the order of completing questionnaires. Participants were offered an opportunity of entering a prize draw of 3 x \$50 gift vouchers at the end of the survey. Informed consent was

**Table 2** Pearson's correlations for questionnaire measures ( $N = 84$ )

| Variable                 | 1      | 2       | 3       | 4       | 5       | 6      | 7     | 8      | 9     | 10 |
|--------------------------|--------|---------|---------|---------|---------|--------|-------|--------|-------|----|
| 1. PMI                   | –      |         |         |         |         |        |       |        |       |    |
| 2. Deaf CVS              | –0.25* | –       |         |         |         |        |       |        |       |    |
| 3. Sibling CVS           | –0.20  | 0.40**  | –       |         |         |        |       |        |       |    |
| 4. Deaf Authoritative    | 0.10   | –0.03   | –0.19   | –       |         |        |       |        |       |    |
| 5. Sibling Authoritative | 0.23   | –0.02   | –0.29   | 0.81**  | –       |        |       |        |       |    |
| 6. Deaf Authoritarian    | –0.22* | 0.08    | 0.05    | –0.40** | –0.29   | –      |       |        |       |    |
| 7. Sibling Authoritarian | –0.34* | –0.02   | 0.04    | –0.30*  | –0.23   | 0.83** | –     |        |       |    |
| 8. Deaf Permissive       | –0.19  | 0.16    | 0.39*   | –0.50** | –0.40** | 0.37** | 0.32* | –      |       |    |
| 9. Sibling Permissive    | –0.24  | 0.30    | 0.39*   | –0.31*  | –0.34*  | 0.2    | 0.31* | 0.88** | –     |    |
| 10. RDI (Resolved)       | 0.34** | –0.34** | –0.41** | 0.15    | 0.19    | –0.16  | 0.00  | –0.21  | –0.15 | –  |

\* $p < 0.05$ , \*\* $p < 0.01$

obtained from all individual participants included in the study. This included consent to both participate and have study data published provided they were made anonymised.

## Results

### Data Analysis

Data were inspected for normality. Bivariate correlations and t-tests/analyses of variance (ANOVA) were used to examine potential covariates among continuous and categorical variables, respectively. The first hypothesis examining within-parent differences between hearing and deaf siblings (in terms of perceived vulnerability and parenting style) was tested on the subsample of hearing parents (excluding deaf parents) who provided questionnaire responses for a deaf and a hearing child both aged 5–12 years old ( $n = 32$ ) using mixed effects analysis using restricted maximum likelihood estimation. The second hypothesis exploring possible associations among resolution of diagnosis of child deafness, parenting morale, and perceived vulnerability was tested for all parents (hearing) with a deaf child aged 5–12 years old ( $n = 74$ ) using univariate ANCOVA (comparing resolved and unresolved parents). Both parametric and non-parametric tests were conducted where outcome variables had non-normal distributions. Since both tests yielded the same results with respect to significance, parametric results are presented.

### Descriptive Statistics

Parenting morale (PMI) and PSDQ (Authoritative, Authoritarian, Permissive) scores were normally distributed. However, Child Vulnerability Scores (CVS) for the deaf children and siblings had strong positively skewed distributions; 23 deaf child (27%) and 3 hearing sibling (7%)

CVS scores were above the clinical score cut-off of 10 and categorised as “perceived vulnerable”. Outlier scores were identified with SPSS boxplots. The Winsorization procedure (see Dixon, 1960) was applied by changing 8 outlier values to match the next closest score. Regarding resolution of diagnosis (RDI), 30% of parents were classified unresolved ( $n = 25$ ) and 70% resolved ( $n = 59$ ).

### Bivariate Statistics

Correlations among study variables are presented in Table 2. Parental morale index scores (PMI: high scores are positive) were significantly negatively correlated with perceived vulnerability and authoritarian parenting style when parents reported on deaf children. The pattern of correlations was similar for hearing siblings. Additionally, PMI was also positively associated with RDI. Parents who were resolved on the RDI had higher PMI scores ( $t(72) = -2.95$ ,  $p = 0.004$ ) than unresolved parents. RDI was found to be negatively associated with the CVS scores of both deaf and hearing siblings.

Twenty-three deaf children had a neurodevelopmental diagnosis, but this was not related to other variables. Seven of the siblings were reported to also have hearing loss and were excluded from sibling comparison data analyses. Finally, age at the time of diagnosis (derived from answers to the RDI interview), age and gender of parent, child, and sibling were not significantly associated with any outcome variables. There were also no significant differences in age comparing deaf and hearing siblings. The number of deaf children older than their hearing siblings and vice versa were also not significantly different indicating order of sibling comparisons were sufficiently randomised.

Parent education was recoded into two categories: tertiary and non-tertiary education. Compared to parents who obtained tertiary education ( $n = 38$ ), parents in the non-tertiary group ( $n = 45$ ) had significantly higher child

vulnerability (CVS) scores relating to their deaf child ( $t(82) = 2.09, p = 0.039$ ), and lower authoritarian parenting scores ( $t(40) = -2.50, p = 0.017$ ) for the sibling. There were no other significant differences related to education.

Interestingly, there were some significant differences between deaf ( $n = 10$ ) and hearing parents ( $n = 74$ ). Deaf parents had higher parenting morale scores ( $t(82) = 2.92, p = 0.005$ ), but lower authoritative parenting scores relating to their deaf child ( $t(82) = -2.31, p = 0.031$ ). Ninety percent of deaf parents (9 of the 10) were classified resolved about their deaf child's diagnosis in contrast to 68% of hearing parents; however, this difference was not found to be significant,  $\chi^2(1) = 2.12, p = 0.15$ , likely due to statistical power issues from low numbers of deaf parents. However, since the research questions are concerned with hearing parents specifically, deaf parents were excluded from data analyses. Parents also reported on the severity of their child's hearing loss: 7 were classified mild, 24 moderate, 16 severe, and 37 profound. No significant associations were found between severity of hearing loss and outcome variables. Given these findings, parent's education was controlled for in analyses for CVS, and PSDQ authoritarian scores. Both parent morale scores (PMI) and resolution of diagnosis (RDI) were controlled for in the sibling comparison analyses.

## Hypothesis Testing

### Hypothesis 1

Hearing parents, especially those who are unresolved, will see the deaf child as more vulnerable and will report less authoritative parenting (and more permissive or authoritarian parenting) compared to the hearing sibling.

Testing hypothesis (i) involved mixed effects analyses using restricted maximum likelihood estimation. The repeated factor, (deaf and hearing) sibling, was nested within respondent. Education, parenting morale, and resolution of diagnosis were covariates for each dependent variable. Perceived vulnerability (CVS) and PSDQ (Authoritative, Authoritarian, and Permissive Styles) were the dependent variables. Due to the number of covariates and suboptimal power, only main effects were tested.

There was a significant difference between siblings ( $F(1, 54.79) = 4.25, p = 0.044$ ) on perceived child vulnerability, with parents reporting higher child vulnerability scores for

their deaf child (Estimate beta = 2.19,  $SE = 1.06$ ) than their hearing sibling. There was no significant difference between siblings ( $F(1, 58.74) = 0.19, p = 0.193$ ) on authoritative parenting style, but parenting morale was a significant between-parent factor ( $F(1, 58.68) = 8.76, p = 0.004$ ). Authoritarian parenting style was not found to be significantly different between siblings ( $F(1, 57.82) = 0.11, p = 0.736$ ), although both education ( $F(1, 57.56) = 4.61, p = 0.036$ ) and parenting morale ( $F(1, 57.56) = 6.96, p = 0.011$ ) were significant between-parents factors. Lastly, scores for permissive parenting styles were not significantly different between siblings ( $F(1, 58.47) = 0.36, p = 0.554$ ); however, education ( $F(1, 58.35) = 4.85, p = 0.032$ ) and resolution of diagnosis ( $F(1, 58.35) = 5.08, p = 0.028$ ) were significant between-parents factors.

### Hypothesis 2

Non-resolution of diagnosis will be associated with lower parenting morale and greater perceived child vulnerability.

For hypothesis (ii), univariate ANCOVA was used. Resolution of diagnosis (RDI) was included as the between subjects factor. Parenting morale (PMI) and perceived vulnerability (CVS) were dependent variables. Education was controlled for CVS analysis. As hypothesised, unresolved parents ( $n = 24$ ) had lower parenting morale ( $F(1, 70) = 9.34, p = 0.003, \eta^2 = 0.12$ ), and perceived their deaf child to be more vulnerable ( $F(1, 70) = 4.11, p = 0.047, \eta^2 = 0.06$ ), compared to resolved parents ( $n = 50$ ) (see Table 3). Education was also found to have a significant main effect on child vulnerability ( $F(1, 70) = 4.11, p = 0.047, \eta^2 = 0.06$ ), with non-tertiary parents ( $n = 17$ ) reporting higher child vulnerability scores ( $M = 10.94, SE = 1.11$ ) than tertiary parents ( $n = 7, M = 7.00, SE = 0.93$ ). There was no significant interaction between resolution of diagnosis and education ( $F(1, 74) = 1.52, p = 0.222, \eta^2 = 0.02$ ).

## Discussion

Hearing parents with deaf children may undergo considerable parenting challenges (Antonopoulou et al., 2012; Bosteels et al., 2012; Jean et al., 2018) and may experience salient feelings of grief when they first receive news of their child's hearing loss diagnosis (Scarinci et al., 2017). These

**Table 3** Estimated marginal means for questionnaire responses for resolved and unresolved parents ( $n = 74$ )

| Measures            | Unresolved Mean Score/SE | Resolved Mean Score/SE | Mean Difference | F    | p     | $\eta^2$ |
|---------------------|--------------------------|------------------------|-----------------|------|-------|----------|
| Parenting Morale    | 27.29 (1.16)             | 31.47 (0.73)           | -4.18           | 9.34 | 0.003 | 0.12     |
| Child Vulnerability | 8.97 (1.02)              | 6.52 (0.65)            | 2.45            | 4.12 | 0.047 | 0.06     |



feelings may remain unresolved, which has been shown to lead to insecure attachment styles and less optimal developmental outcomes in children with other disabilities (Marvin & Pianta, 1996). The current research explored parent morale, perceptions of child vulnerability, and parenting styles in the context of child hearing loss, with a particular focus on parent resolution of diagnosis.

There was partial support for hypothesised sibling differences in perceived vulnerability. As predicted, deaf children were perceived as more vulnerable than their hearing siblings. Although there were no sibling differences in authoritative, authoritarian, and permissive parenting style scores, there were significant effects of resolution of diagnosis, parenting morale, and education. Parenting styles, likely as a result of having a deaf child, may be significantly influenced by these factors, though the causal nature is unclear. As hypothesised, parents who were unresolved about their deaf child's diagnosis reported lower parenting morale and greater perceived child vulnerability.

### Comparing Parenting Perceptions Across Siblings

Previous findings have suggested that hearing parents are more likely to engage in suboptimal parenting with their deaf child compared to their hearing sibling (Ekim & Ocakci, 2015; Pinquart, 2013). One prior study utilising a sibling comparison design with a sample comprised of deaf and hearing siblings (aged between 11 and 18 years) found parents reported marginally less strict parenting (permissive) towards the deaf child compared to hearing siblings (Antonopoulou et al., 2012). The present study adopted the same sibling comparison design while controlling for parent characteristics, notably resolution of diagnosis, parent morale, and education. Contrary to prediction, however, there was no sibling difference in authoritative, authoritarian, and permissive parenting styles, although there were notable differences across parents in terms of parenting morale, resolution of diagnosis, and education. For instance, although there may not be significant differences between sibling scores, the scores per se may be either suboptimal or optimal. It is possible that the impact of raising deaf children simultaneously affects both deaf and hearing siblings. It is not clear why there are differences across parents. This suggests a complex interplay of factors within and between parental experiences of raising deaf children that cannot be wholly ascertained with sibling comparisons and warrants further investigation.

The current findings suggest that parents – particularly those with unresolved feelings about their child's diagnosis – are likely to perceive their deaf child as vulnerable. Although there were no differences in reported parenting styles related to deaf children and siblings, it is possible that perceived vulnerability also translates into undesirable parenting behaviours that were not measured by the survey.

It would be prudent in future research to utilise observational approaches to bypass the limitations inherent in parental self-report measures. Because resolution of diagnosis was related to all the adjustment measures, it may be useful to explore parent responses in more depth to get a better understanding of this phenomenon. Perceived child vulnerability was measured using the CVS scale that tapped parental fears of their child being susceptible to illnesses (see Forsyth et al., 1996). This scale was designed for parents of children with medical conditions. It is interesting, therefore, that although deafness is a sensory disability and not an illness, parents also perceived their deaf child to be more vulnerable to illnesses, compared with a sibling. There are several possible explanations. First it is possible that their deaf children were actually susceptible to illnesses, their vulnerability not necessarily related to their deafness; the survey did not account for this contingency. Second it may be that parents have a global attribution of vulnerability that extends more broadly to health even if the child has no health risks. The responses parents gave in the resolution of diagnosis interview provide some possible explanations for the higher perceived vulnerability scores. Parents expressed concerns about the unknown, intense and persistent worries about their deaf child's future, their access to education and social life, their ability to communicate, and their capacity to deal with bullying and/or exclusion. These concerns were prominent across all parent responses, suggesting most parents of deaf children experience some concern about these matters regardless of whether they are resolved about their child's diagnosis. It is plausible that these concerns, when more intense and pervasive, contributed to the propensity to perceive their deaf child as more vulnerable in general, including vulnerability to illnesses. Additionally, there may be more nuanced perceptions of vulnerability that go beyond susceptibility to illnesses. The RDI responses indicated a particular concern for their deaf child's social vulnerability, for example. Future studies could include a measure that targets parental perception of social vulnerability, such as the Social Vulnerability Scale originally constructed for children with Asperger's (Sofronoff et al., 2011).

Greater perceived vulnerability is also likely to be associated with suboptimal parenting behaviour (Carpentier et al., 2008; Thomasgard, 1998). It is possible that greater perceived vulnerability makes it difficult to achieve the balanced state of mind required to engage in sensitive and balanced caretaking and that this may have negative influences on parent-child relationship outcomes (Hullman et al., 2010). Additionally, communication issues may contribute to difficulties communicating and teaching deaf children about safety and wellbeing (Hauser et al., 2010) which then may likely heighten perceptions of deaf child vulnerability.

## Resolution of diagnosis, parenting morale, and perceived child vulnerability

Study findings indicate that compared to parents who were resolved about their child's diagnosis, parents who were unresolved had lower parenting morale, and perceived their deaf child to be more vulnerable. The resolution of diagnosis construct stems from attachment theory, particularly drawing on the notion that unresolved grief and trauma can adversely impact the caregiving relationship and attachment (Marvin & Pianta, 1996). Previous findings have suggested that parents of children with disabilities (cerebral palsy, autism, and intellectual disability), who were unresolved about the diagnosis had lower parent wellbeing including higher stress levels, and more negative feelings about parenting (Krstić et al., 2015; Milshtein et al., 2009). The present study lends further support to these studies and adds to just one published study that has examined resolution of diagnosis in relation to deafness (Adams, 2011). The study also makes a novel contribution by assessing the relationship between resolution of diagnosis, perceived child vulnerability, and parenting morale for the first time. These findings suggest non-resolution is linked to a negative state of mind in the context of parenting and compromised wellbeing, which in turn, may negatively affect parenting behaviour. This link may be exaggerated with the challenges of uncertainty raising a disabled child to the extent that parenting experiences are disrupted by a complex combination of overwhelming feelings and inexperience with disability (Reeder & Morris, 2021). For example, a recent study suggested that there is a link between maternal intolerance of uncertainty and increased protective parenting in context of children with food allergies (Steiner & Dahlquist, 2022). Future research could benefit from further exploring how inexperience, and cognitive and emotional uncertainty with raising disabled children can act as a risk factor for suboptimal parenting behaviour, including increased perceived vulnerability and protective parenting.

Parent level of education was found to have an effect on perceived child vulnerability scores among unresolved parents, those without tertiary education saw their deaf child as more vulnerable compared to parents of deaf children with tertiary education. A similar result was found by Thomasgard & Metz, (1997) in a study of 280 parents of children without disabilities. They found that parents with lower education reported more child vulnerability and parental overprotection. This is potentially due to more advanced education contributing to better parenting resources, knowledge, and strategies that may contribute to more positive parenting, parenting confidence, reflectivity, and understanding. Higher education may also influence perceptions and enable more realistic expectations of the child (see Fox et al., 1995; Neitzel & Stright, 2004; Woodward

et al., 2018). Although education was not found to be related to resolution of diagnosis, this was possibly due to low statistical power in the current study (for instance, out of parents with university education, 2 were unresolved and 15 were resolved, which makes for a disproportionate comparison). A study on parents of children with Cerebral Palsy found that parents with lower education were more likely to be unresolved about their child's diagnosis (Krstić et al., 2016). It is likely that education also acts as a protective factor: parents with higher education may have more cognitive tools, better parenting morale, and resilience to reframe and mitigate negative reactions to diagnosis. Lastly, parents with higher education may also have more social capital, enabling them to navigate through social challenges, including advocacy, search for support and guidance, and dealing with systemic discrimination that marginalises disabled people. While parents of disabled children do have challenging experiences adjusting to their child's differences, how communities respond to their child's disability also contributes to that ongoing experience (Thomas, 2020).

## Strengths and Limitations

The main strength of the present study is the recruitment of a clinical sample ( $n = 84$  altogether,  $n = 32$  of those included siblings), the use of a sibling comparison design, and the use of a narrative interview (albeit with online delivery) to capture parent representations of the child and resolution of diagnosis. The sibling design enabled better statistical power, despite the small sample and controlled for parent characteristics. The study also ensured pseudo-randomisation by presenting the questionnaires for the younger sibling first and the older sibling second to mitigate any possible order effects. The Reaction to Diagnosis Interview (RDI) is a sophisticated measure that is well grounded theoretically and yields both qualitatively and quantitatively rich data, providing insights into how parents feel about their child's hearing loss diagnosis. It has the further advantage of being opaque to socially desirable reporting. There are no clear right and wrong answers and parents respond freely to open-ended questions. The online survey methodology is also another strength of the study as it has more potential to conveniently obtain a representative sample with very low costs and minimal observer bias.

There are, however, several limitations to consider. Firstly, the RDI was originally designed to be utilised as a face-to-face interview. The coding for the interview measure takes into account not just the verbal response, but body language and tone of voice as well. Additionally, face to face interviews allow for opportunities to probe for more detailed responses. The coding process in this study was restricted to written text only, potentially missing out on other more subtle indicators parents may have displayed.

Having said that, the Adult Attachment Interview coding guide (George et al., 1996) does state that all analyses should be limited to the transcript only, for purposes of maintaining objectivity. A new RDI questionnaire measure was recently developed which may be a useful complement to written responses to RDI questions for future online survey research regarding parental reaction to diagnoses (Sher-Censor et al., 2020).

Parents in this study were primarily female (80%) which is an important limitation to consider as fathers are also major figures in family systems and do play fundamental parts in heteronormative family dynamics alongside mothers. This study did not account for how fathers may fundamentally influence parent-deaf child dynamics. Low number of fathers participating in parenting research is an ongoing issue and is likely due to social norms emphasising mothers as the primary caregiver. Future research could benefit from incorporating more fathers in research by specifically targeting them and incentivising research participation (Cabrera et al., 2018; Davison et al., 2016).

The attrition rate in the current study was high. Only 84 out of a total 188 individuals who started, completed the survey. Further cases were lost for the sibling comparison analyses because some siblings also had hearing loss. A number of parent feedback comments on the survey mentioned that parents found some questions confronting – specifically questions about hitting the child, which were included in the measure of authoritarian parenting – and some stated that they felt judged while completing the survey. Parents of disabled children do commonly report feelings of being judged (Ludlow et al., 2011). It is also plausible that those who did not complete the study questionnaire may have been disproportionately more likely to engage in suboptimal parenting styles, or to be unresolved about their child's diagnosis. Attrition may have also been related to the length of the online questionnaire. The parenting styles questionnaire had 62 items, socially desirable reporting is possible. Future research could consider alternative measures.

There were further limitations in study measures. The child vulnerability scale, although it yielded significant findings, was not an ideal measure due to its focus on illness. This questionnaire did not capture other aspects of perceived vulnerability – such as social vulnerability – that was reported in the answers to the RDI questions. Future research would benefit from utilising alternative vulnerability scales (particularly those looking at communication and social vulnerability which is a fundamental issue for deaf people), as well as over-protective parenting measures. Additionally, exploring more factors relating to rehabilitation, intervention, and support (such as cochlear implant programs) may be useful to highlight further protective factors when it comes to experiences parenting deaf

children. Finally, the reliance on self-report measures should also be addressed by incorporating external observation and reports from children.

## Clinical Implications and Future Directions

The findings from this study contribute to a better understanding of the experiences of hearing parents raising deaf children, with potential to inform policy and appropriately targeted supportive interventions designed to improve the wellbeing of both hearing parents and deaf children. This study has provided evidence that indicates parents of deaf children may continue to be affected for many years by their child's hearing loss diagnosis, often experiencing lower parenting morale and greater perceived child vulnerability.

Responses to the RDI questions revealed recurring themes and concerns. Upon receiving their child's hearing loss diagnosis, many parents reported that they had experienced feelings of anxiety, grief, despair, devastation, and shock. Many also reported similar concerns about their deaf child's future: concerns about the unknown, not knowing anything about deafness and where to get help, worries about communication issues, barriers to accessibility issues, learning and career prospects, and issues with self-image and bullying. One parent who was classified as resolved illustrates the intensity of the grief as she describes her experience coming to terms with the diagnosis over time:

I was in shock. I was grieving for the life I had dreamed for my son. My life and my whole families' life changed that day. I was so upset at the time I was told and really can't remember much of what happened after I was told. I felt like I was 'out of my body' observing what was happening. I couldn't think straight. I was upset for months and couldn't talk about it without crying. I was going through the motions of being a parent to both kids, taking my son to appointments, learning everything new along the way. As the years have gone on, it's got so much easier. I look back on the first few years as the hardest. Those first few years are so uncertain, and the grief keeps coming back at times. I think I was depressed as well, I started to look at life differently and didn't feel as carefree, didn't find joy as easily. I think after the first 2-3 years everything was easier. I had accepted our life, I felt more confident about his future, I was proud of my son and wouldn't change his hearing loss but in the early days I would have given anything for him to have normal hearing.

This excerpt indicated elements of resolved feelings such as understanding the diagnosis as a time of difficulty, clearly

describing her past and present thoughts and feelings as different, recognising the changes over time, and feeling more settled about the future. In contrast, parents who are unresolved do not show indications that they moved on from the diagnosis; the same feelings and thoughts they experienced when they received the diagnosis appear to persist years later. Feelings of guilt and self-blame for their child's deafness were frequently articulated by parents whose responses were classified as unresolved. One parent put it this way:

Absolute heartbreak. I almost mourned the loss of the child I thought he should have been. I was worried about him growing up and marrying, I was worried that he would be bullied, I worried if I had exposed him to enough speech and auditory experiences before the progression. I spent hours of sleepless nights searching the internet for information only to find very little. He has been aided for a year and a half. He is doing so well at school but there are still times when I feel so guilty. I think every progression makes you realise the loss all over again.

The key differences between the resolved and unresolved excerpts above are the absence of looking into the future, and no explicit statement reflecting change from past to present feelings. Reliving the feelings of loss, grief, and guilt would likely have an ongoing impact on the parent's state of mind.

A number of parents also commented on audiologists not breaking the news of the child's diagnosis in an appropriate manner, nor providing an appropriate time and place for the parents to process the news. One stated:

I was with my husband and the audiologist at the hospital who wasn't very nice in telling us the news. To him, he was just doing his job. To me, being a first-time mum, I wasn't sure why I was in the hospital or why my son needed further testing, I needed someone more supportive as I was new to the whole "deaf" world.

Another parent who was deaf also shared similar feelings about audiologists not sharing the news of diagnosis with sufficient care:

I was at the audiologists' office, very mundane and sombre atmosphere. Test was conducted at a centre where it is known that they are very anti-Auslan and are strong advocates for AVT (auditory-verbal therapy). Quick to usher me in and out of waiting room / testing, etc. Terminology used is very negative - failed, did not succeed, did not achieve, etc. They assumed that I was deaf myself, that they did not need to give me information. I was left to my own means.

With this kind of environment, I felt that I could not soak in the results and discuss. Therefore, leading me to feel despair and grief.

Clinicians need to provide individualized support and guidance for parents going through news of diagnosis in order to mitigate this, and help them to work towards realistic (and non-catastrophic) expectations for the child, to minimize lasting negative impacts on parent and child wellbeing.

A mix of positive psychology and awareness of deaf culture and epistemology could also be incorporated into parental support and rehabilitation processes. This may involve helping parents to learn and understand what it is like to be deaf, to consider the positive and unique aspects of raising deaf children by talking to deaf people and mentors and providing them a list of common questions with informed evidence-based answers (see Humphries et al., 2019). Additionally, conversations with other parents of deaf children via parent-to-parent support have also been found to be significantly helpful (Henderson et al., 2016; Mehta et al., 2019). One parent revealed: "My daughter also has so many questions we do not have answers for; such as 'how come I'm the only one with hearing loss?'" Educating parents about deafness, deaf culture, and deaf epistemology could have positive outcomes for the deaf child, particularly in terms of psychological resilience, helping them to learn to embrace their deafness rather than seeing it as a lifelong burden (Hauser et al., 2010; Szarkowski & Brice, 2016). Additionally, improving communications between parent and deaf child is a priority as it has significant long term implications for parent-child relationships and their wellbeing (Barker et al., 2009; Humphries et al., 2019; Lam-Cassettari et al., 2015; Tomaszewski, 2008) Future research should further consider how both hearing parents and deaf children can build resilience through applications of positive psychology, deaf culture and epistemology, and interventions focused on improving parent-deaf child communications, especially exploring the use of bimodal bilingualism (using both spoken and sign language) to mitigate communication barriers (Humphries et al., 2019).

## Conclusion

This study found parents who have persistent unresolved feelings about their child's hearing loss diagnosis experience lower parenting morale and perceive their deaf child to be more vulnerable than parents who are more resolved and reflective about the diagnosis. Further, parents also reported greater perceived vulnerability in relation to their deaf child compared to hearing siblings. These results suggest further research is needed to better understand the impact a deaf child can have on the parent-child relationship and

parenting state of mind, and to consider how applications of parenting education, positive psychology, and deaf epistemology can help mitigate such impact.

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## Compliance with Ethical Standards

**Conflict of interest** The authors declare that they have no conflict of interest.

**Ethics approval** The study received ethics approval from the Human Research Ethics Committee (review reference no.5201951718200).

**Informed consent** Informed consent was obtained from all individual participants included in the study. This included consent to both participate and have study data published provided they were made anonymised.

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