CHAPTER 3

Parental Stress among Parents of Toddlers with Moderate Hearing Loss

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ABSTRACT

Objectives

The purpose of this study was to examine parental stress in parents of toddlers with moderate hearing loss compared to hearing controls. Furthermore, the associations between parental stress and child- and parent-related factors such as language, social-emotional functioning and social support were examined.

Design

The study sample consisted of 30 toddlers with moderate hearing loss and 30 hearing children (mean age 27.4 months). The two groups were compared using the Nijmegen Parenting Stress Index (NPSI) and parent-reports to rate the amount of social support and the children's social-emotional functioning. Receptive and expressive language tests were administered to the children to examine their language ability.

Results

Parents of toddlers with moderate hearing loss reported comparable levels of parental stress to parents of hearing children. Individual differences in parental stress were related to child- and parent-related factors. Poorer social-emotional functioning and language ability of the child were related to higher stress levels in parents. Parents who experienced less social support reported higher stress levels.

Conclusions

Parents of toddlers with moderate hearing loss experience no more parental stress than parents of hearing children on average. Given parental stress was found to be related to poorer child functioning, early interventionists should be aware of signs of elevated stress levels in parents.

INTRODUCTION

The diagnosis of hearing loss in a child can often result in parents feeling distressed, uncertain, and grieving (Kurtzer-White & Luterman, 2003). Parents are faced with a number of new challenges and stressors, such as changes in daily routines (e.g., being aware of background noise, eye contact), communication modes, and decisions about possible hearing aids. Indeed, parents of children with disabilities report more parental stress in general than parents of children without disabilities (Britner, Morog, Pianta, & Marvin, 2003; Davis & Carter, 2008). This is a concerning fact, given that parental stress has been linked to negative child functioning in typically developing children and in children with hearing loss (HL) (Baker et al., 2003; Crnic, Gaze, & Hoffman, 2005; Hintermair, 2006; Pipp-Siegel, Sedey, & Yoshinaga-Itano, 2002)

Children with moderate hearing loss (MHL; here defined as those with better-ear pure-tone averages (PTAs) of 40 -70 dB HL) speak relatively well and hear more sounds than their deaf peers (Stelmachowicz, Pittman, Hoover, Lewis, & Moeller, 2004). Despite these advantages, children with MHL show language and social-emotional difficulties, just like their deaf peers (Davis, Elfenbein, Schum, & Bentler, 1986; Koehlinger, Van Horne, & Moeller, 2013). It has been argued that the impact of hearing loss on the functioning of children with MHL is frequently underestimated (Moeller, 2007). Most research on parental stress has focused on parents with deaf children, and not on the MHL population in particular. To fill this gap, the main aim of this study was to examine the extent to which parents with a child with MHL experience parental stress compared to parents with hearing children. Further, associations between parental stress and child- and parent-related factors like language, social-emotional functioning and social support were examined.

Children with moderate hearing loss

Children with MHL are unlikely to have the same auditory experience as hearing children (Wolfe et al., 2011). It is hard for children with MHL to understand speech in an environment with a noisy background, such as the playground, school or day care setting (Blaiser, 2010; Crandell & Smaldino, 2000). In most cases, hearing aids help these children to improve their hearing of sounds and speech, which in turn supports the development of more intelligible speech (Ambrose et al., 2014; Stelmachowicz et al., 2004; Tomblin, Oleson, Ambrose, Walker, & Moeller, 2014; Wolfe et al., 2015). Despite these hearing aids, not all words and sounds are heard clearly, and this can negatively impact their speech and language development (Stelmachowicz, Pittman, Hoover, & Lewis, 2001). Recent studies show that the performance of many early-identified children with MHL resembles the performance of their hearing peers, or at least within one standard deviation on norm-referenced measures (Fulcher, Purcell, Baker, & Munro, 2012; Stika et al., 2015; Tomblin et al.). The results of other studies indicate that children with MHL lag behind their hearing peers in specific domains of language development (Hammer & Coene, 2016; Koehlinger et al., 2013; Moeller et al., 2010).

Children with MHL do respond to voices and sound, although inconsistently. This inconsistency is confusing for parents and may evoke parental stress (Kurtzer-White & Luterman, 2003). The fact that children with MHL can hear many sounds and speak relatively well might, counter-intuitively, be disadvantageous to the social-emotional development of children with MHL. People have higher expectations of their abilities compared to their peers with a more severe hearing loss (Moeller, 2007). Several studies have examined the effect of the degree of hearing loss on children's social-emotional functioning and found no association (Hintermair, 2007; Kouwenberg, Rieffe, Theunissen, & de Rooij, 2012; Theunissen et al., 2012; Theunissen et al., 2011; Wolters, Knoors, Cillessen, & Verhoeven, 2014). Both children with MHL and children with more severe hearing loss were found to be more at risk for developing emotional problems, peer problems, anxious/depressed symptoms, and hyperactive behavior than their hearing counterparts. These studies focused on school-aged children who did not benefit from early intervention. Similarly, Stika and colleagues (2015) examined the social-emotional functioning of 12 to 18-month-old hard of hearing children who did benefit from early intervention. Their results indicated no differences between hard of hearing children and their hearing peers in social-emotional functioning at this young age and no effect of the degree of HL on social-emotional functioning. However, Fulcher et al. (2012) reported that the degree of hearing loss had a significant effect on language development in children with HL. Their results showed that children with MHL at three, four and five years of age performed less well on speech measures than children with severe to profound HL. The researchers argued that the less frequent intervention sessions and inconsistent hearing aid use in children with MHL could attribute to the differences with children with severe and profound HL.

Taken together, the (inconsistent) findings in the literature underscore the importance of conducting more specific research on children with MHL. In the current study, the focus is on parental stress among parents of young children with MHL, since parental stress has been linked to different aspects of child development.

Parental stress

Stress is a state of mental or emotional strain or tension resulting from adverse or demanding circumstances (Pipp-Siegel et al., 2002). Parental stress has been defined as "the aversive psychological reaction to the demands of being a parent" (Deater-Deckard, 1998, p. 315). Both factors inherent to the child and factors inherent to the parent can evoke parental stress (Abidin, 1995). As high levels of parental stress have been linked to negative parent and child outcomes, it is desirable that parental stress should be maintained within the normal range (Baker et al., 2003; Crnic et al., 2005; Hintermair, 2006; Pipp-Siegel et al., 2002).

Over 90 percent of children with hearing loss are born to hearing parents (Mitchell & Karchmer, 2004), who have little or no experience with hearing loss. These parents may experience concerns about their child's development, educational opportunities, and ways

to communicate with them. As a result of this lack of experience and possible concerns, raising a child with HL may be more stressful than raising a hearing child (Kurtzer-White & Luterman, 2003). Could raising a child with MHL be even more stressful than raising a child with more severe HL? Because children with MHL often react to sounds and voices, parents may believe that their child has understood more than they have. Parents may also have higher expectations of children with MHL because their communicative functioning seems to be adequate. Raising a child with MHL might be quite different from parental expectations and this discrepancy can be stressful for parents.

Relatively few studies on parental stress have included children with MHL, and even then they have mostly been included as part of a larger sample of children with HL (e.g. Calderon & Greenberg, 1999; Hintermair, 2000, 2006; Meadow-Orlans, 1994; Pipp-Siegel et al., 2002; Stika et al., 2015; Topol, Girard, St Pierre, Tucker, & Vohr, 2011). Most of these studies show that parents of children with HL experience the same level of stress compared to parents of hearing children. In general, the studies found that the degree of hearing loss did not affect the outcomes. However, two studies reported an effect of the degree of hearing loss on parental stress (Hintermair, 2000; Pipp-Siegel et al., 2002). These two studies showed that parents of children with a less severe hearing loss reported more stress concerning parent-child interaction compared to parents of children with more severe hearing loss. The two studies were completed before newborn hearing screening was fully implemented. A question that follows logically is whether or not this finding holds true for early-identified children with Hl with timely access to interventions (in Pipp-Siegel et al. only 58% of the participants were identified with a HL below 12 months old and these participants may not have been children with MHL).

One of the first studies that focused on parental stress in early-identified hard of hearing children (20 to 89 dB HL) is that of Stika and colleagues (2015). In this study, the developmental outcomes of hard of hearing children aged 12 to 18 months old were investigated. They found similar levels of parental stress in 27 mothers of hard of hearing and normal hearing children. Further, the children with hearing loss showed age-appropriated language scores and were comparable to children with normal hearing on psychosocial outcome measures. It could be argued that these optimistic outcomes of hard of hearing children are the result of early identification and early start of intervention. However, Stika and colleagues mentioned that caution should be used when interpreting these findings, because differences in developmental outcomes in hard of hearing children could emerge at a later age. Research on older early-identified hard of hearing children is therefore needed. Furthermore, the range of hearing loss in the Stika study was 20 - 89 dB HL. A more restricted range like 40-70 dB HL better reflects the population of children with moderate hearing loss.

Individual differences in parental stress

Individual differences in parental stress, could also be related to various child- or parent-related factors besides hearing loss, such as language ability, social-emotional functioning,

and perceived amount of social support (Hintermair, 2000, 2006; Meadow-Orlans, 1994; Pipp-Siegel et al., 2002; Quittner et al., 2010; Stika et al., 2015; Topol et al., 2011). Different studies have demonstrated an association between parental stress and language delay in children with hearing loss (Pipp-Siegel et al., 2002; Quittner et al., 2010; Topol et al., 2011). Not being able to understand well what a child expresses may contribute to parents feeling stressed. Additionally, children with hearing loss have difficulties in regulating their emotions and expressing their needs and desires, leading to frustration and acting-out behavior (Stevenson et al., 2010). Several studies have shown that high parental stress levels are associated with social-emotional behavior problems in children with hearing loss (Hintermair, 2006; Quittner et al., 2010; Stika et al., 2015; Topol et al., 2011). Protective factors have also been identified in past studies. Increased social support has been found to have a positive effect on stress in families with children with hearing loss. Feeling supported by a spouse, friends, and family may help people to adjust to stressful situations (Dunst, Trivette, & Cross, 1986). Additionally, early intervention by professionals offering emotional support and practical guidance could (indirectly) buffer parental stress, due to the resulting improved language and social-emotional outcomes for children with HL (Meinzen-Derr, Wiley, & Choo, 2011; Moeller, 2000; Stika et al., 2015; Yoshinaga-Itano, 2003).

Present study

As early as the 1970's and early 1980's, Davis and colleagues have emphasized the need for more research on the group of children with MHL. Now, 40 years later, these children are still underrepresented in research compared to deaf children. To our knowledge, the current study is one of the first, together with Stika and colleagues' 2015 study that examines parental stress in a well-defined group of children with MHL who were identified early in life and for whom intervention was initiated soon after hearing loss was diagnosed.

The primary aim of this study was to examine the amount of perceived parental stress in parents of young children with MHL compared to parents of hearing children. Parental stress was divided in child-related stress (e.g. child's mood, hyperactivity, and acceptability) and parent-related stress, (e.g. parent depression, health, and marital relationship). A secondary aim of the current study was to explore the associations between parental stress and child- and parent-related factors, including language ability, social-emotional development and social support, in children with MHL and their hearing peers.

METHOD

Participants

This study included 30 children with moderate hearing loss (MHL) and 30 hearing children (NH) between 17 and 33 months of age (mean age 27.4 months). Characteristics of the samples are reported in Table 1. The hearing children were born to hearing parents. Of the sample of children with MHL, six fathers and two mothers had a moderate hearing

Table 1. Demographic profile of participants

	MHL	NH
No. of children	30	30
Age, mean (SD) months	27.7 (5.6)	26.5 (6.5)
Age, range months	18-33	17-33
Gender, no (%)		
Male	11 (27%)	17 (56%)
Female	19 (63%)	13 (44%)
Socioeconomic status, mean (SD)*[1]	2.8 (1.1)	3.3 (0.9)
Degree of hearing loss (dB), mean (SD)	52 (8.4)	NA
Degree of hearing loss, *n* (%)		
Moderate (40-60 dB)	28 (93%)	
Moderate-severe (60-70 dB)	2 (7%)	
Age at start family intervention, mean (SD) months	8.3 (7.5)	NA
Age at start family intervention, range months	1-25	NA
Age at amplification hearing aid, mean (SD) months	9,4 (9.1)	NA
Age at amplification hearing aid, range months	1-33	NA

Abbreviations: MHL Moderate Hearing Loss, NH Normal hearing, SD Standard deviation, NA Not Available. *[1] (1=no/primary education, 2 = lower general secondary education, 3= higher general education, 4 = college / university).

loss and one father was deaf. None of the children had more than one parent with hearing loss. Seven children did have one or more siblings with hearing loss.

The inclusion criteria for the children with MHL were having congenital moderate hearing losses (40-70 dB HL) in both ears (residual hearing was calculated by averaging unaided hearing thresholds at 500, 1,000 and 2,000 Hz). All hearing children passed neonatal hearing screening. The exclusion criteria were having any other medical or developmental disability such as mental retardation, visual impairment or speech-motor problems. All children with MHL were wearing hearing aids and received care by an audiologist. In 18 children, the amplification of their hearing aids was within six months after birth. In nine children, this occurred at a later age; for three remaining children, the exact date of amplification is unknown. All children with MHL, except one, participated in an early family intervention program, including family counseling, speech therapy and specialized playgroups. Eighteen children started the family intervention program within six months after birth; eight children started later; and the exact date of commencement of the early family intervention program is unknown for three children. Age, gender and socioeconomic status (based on maternal education level) did not differ between the groups.

Procedure

The study was carried out in accordance with the standards set by the Declaration of Helsinki. The children with MHL were recruited by three different counseling services all over the Netherlands. The hearing children were recruited by the Youth Health Care

organization (YHC). Parents received written information about the study and were required to sign an informed consent form. A positive response rate of 90 percent was achieved. Parents were asked to fill in questionnaires. Additional information, such as age at diagnosis, age at amplification and start intervention, was obtained from medical and/or parents' records. The language ability of the children with MHL was assessed using the assessment protocol of the early intervention program for children with MHL. Within this protocol, language ability is assessed in all children with MHL at 17 and at 30 months of age by a speech and language therapist. The language abilities of the hearing children were also assessed at 17 and at 30 months of age by a speech and language therapist. The children were tested in a quiet surrounding, in the home environment of the child. Parents of both groups of children filled in the questionnaires at the same time the child's language ability was assessed.

Measures

Parental stress

The Nijmegen Parenting Stress Index (NPSI; De Brock, Vermulst, Gerris, & Abidin, 1992), which is the Dutch version of Abidin's Parenting Stress Index (Abidin, 1983), was used to assess the level of perceived parental stress. The NPSI, a self-report measure, consists of 123 items tapping into child and parent characteristics. The Total Stress scale is comprised of a child and a parent domain. The Child Domain (child-related stress) is composed of six subscales: distractibility/hyperactivity, adaptability, positive reinforcement, demanding, mood, and acceptability. The Parent Domain (parent-related stress) consists of seven subscales: sense of competence, social-isolation, attachment, health, role restriction, depression and marital relationship. In the current study, the scores on the Child Domain and Parent Domain scale are reported. Parents rated their agreement with each item on a six point Likert scale from (0) strongly disagree to (5) strongly agree. All scores are reported as raw scores, with higher scores indicating more stress. The internal consistency of the NPSI in this study is reported in Table 2.

Table 2. Psychometric properties of questionnaires

	No. of items	Range	Cronbach's Alpha
Parental Stress (NPSI)			
Parent domain	58	0-5	.92
Child domain	63	0-5	.95
Social-emotional functioning (ITSEA)			
Externalizing	23	0-2	.86
Internalizing	25	0-2	.65
Dysregulation	34	0-2	.85
Competence	34	0-2	.85
Social support (MPSS)	12	1-6	.88

Language ability

The language ability of children younger than 24 months of age (N = 13; MHL = 5; and NH = 8) was measured with the Dutch non-speech test (NNST; Zink & Lembrechts, 2000). The NNST is the Dutch version of the American non-speech test by Huer (1983) and contains an expressive and receptive language scale with 50 items each. The language ability of children older than 24 months of age (N = 40; MHL = 21; and NH = 19), was assessed with the Reynell Developmental Language Scales - Dutch Version (Schaerlaekens, Zink, & Van Ommeslaeghe, 1993) for receptive language skills and with the Sentence Development scale of the Schlichting Expressive Language Test (Schlichting, van Eldik, & Lutje Spelberg, 1995) for expressive language skills. Both language tests were developed and standardized for children between two and five years of age. The language scores of seven children (MLH = 4 and NH = 3) were missing.

Social-emotional functioning

The Infant-Toddler Social and Emotional Assessment (ITSEA; Carter et al. 2003) is a parent-report scale that assesses young children's social-emotional behavioral problems and competencies in four domains (Externalizing, Internalizing, Dysregulation, and Competencies). The Externalizing domain includes activity/impulsivity, aggression/defiance, peer aggression, and negative emotional reactivity. The Internalizing domain consists of scales that address inhibition/separation, fears, and depression/withdrawal. The Dysregulation domain includes the following scales: sleep, eating, and toileting. The Competence domain consists of attention, compliance, prosocial peer, empathy, emotional positivity, mastery motivation, and emotional awareness. Parents completed the Dutch version of the ITSEA (Visser et al., 2000). In the present study, the raw scores of the four domains are reported. Items were rated on the following 3-point likert scale: (0) Not true/rarely, (1) Somewhat true/sometimes, and (2) Very true/often. Across several studies, the ITSEA has demonstrated acceptable internal consistency, test-retest reliability, and validity relative to other parent-report checklists and independent behavioral observations (Carter et al. 2005). The internal consistency of the ITSEA in this study is reported in Table 2. The ITSEA was developed for children between 12 and 36 months of age.

Social support

Social support was assessed with the Multidimensional Scale of Perceived Social Support (MPSS; Zimet, Dahlem, Zimet, & Farley, 1988). The MPSS, a 12-item self-report scale, has three subscales measuring perceived social support from family (e.g., "My family really tries to help me"), friends (e.g., "I have friends with whom I can share my joys and sorrows"), and significant others (e.g., "There is a special person in life who cares about my feelings"). Parents rated their agreement with each item on a six-point Likert scale from one (strongly disagree) to six (very strongly agree). In the current study the total score was utilized. The internal consistency of the MPSS in this study is reported in Table 2. From one parent (MHL) we did not receive the questionnaire back.

Statistical analysis

The first research question was addressed by carrying out independent sample *t*-tests in order to compare children with MHL and hearing children on parental stress and background variables. Holm's sequential Bonferroni method was used to control for Type I error at the .05 level across comparisons. In order to answer the second research question, relations between parental stress and child's language ability, social emotional functioning and parent's social support were examined by means of Pearsons's correlations. The correlations were compared between the two groups using Fisher's r-to-z transformations to be able to show significant differences between correlations.

RESULTS

Table 3 shows the mean scores and standard deviations for all variables that were included in this study per group. All questionnaires showed to be filled in by the mothers of the children. No significant differences were found on the levels of stress for parents with a child with MHL or a hearing child; neither on the child-related nor on the parent-related stress factors. Children's social-emotional functioning did not differ significantly between the two groups (Externalizing, Internalizing, Dysregulation and Competence). However, parents of children with MHL perceived less social support than parents of hearing children.

Table 3. Parental stress, social-emotional functioning, social support and language measures by group

	Mean scores (SD)		T	*p*
	MHL (n=30)	NH (n=30)		
Parental Stress (NPSI)				
Parent domain	1.9 (0.5)	1.8 (0.4)	0.61	.544
Child domain	1.9 (0.5)	1.8 (0.5)	0.05	.959
Social-emotional functioning (ITSEA)				
Externalizing	0.44 (0.3)	0.48 (0.3)	-0.56	.578
Internalizing	0.36 (0.1)	0.39 (0.2)	-0.91	.369
Dysregulation	0.39 (0.2)	0.46 (0.3)	-1.07	.289
Competence	1.44 (0.3)	1.51 (0.2)	-1.21	.230
Social support (MPSS)	5.2 (0.6)	5.6 (0.4)	-2.78	.007
Language ability				
	MHL (n = 5)	NH (n = 8)		
NNST receptive language	27.8 (9.8)	34.6 (6.0)	-1.56	.146
NNST expressive language	25.0 (12.5)	28.5 (6.3)	-0.63	.543
	MHL (n =21)	NH (n = 19)		
Reynell receptive language	96.9 (17.5)	110.9 (10.8)	-3.01	.005
Schlichting expressive language	96.9 (17.2)	110.8 (11.5)	-2.93	.004

Abbreviations: MHL Moderate Hearing Loss, NH Normal hearing, SD Standard deviation,

Furthermore, the receptive and expressive language ability of the children with MHL older than 24 months of age was poorer than the receptive and expressive language ability of the hearing children. No differences in language ability between the two groups were found at younger ages. The abovementioned results remained the same when we excluded the children with a parent with hearing loss and repeated the analyses. The results also remained the same when gender was added as covariate in the analysis.

The relationships between parental stress, social support, and child characteristics were also examined (Table 3). For both parents with a child with MHL and parents with a hearing child, higher levels of child-related stress levels (e.g., adaptability, positive reinforcement, demanding, mood) were related to lower levels of social-emotional functioning (Externalizing, Internalizing, Dysregulation and Competence) and lower language ability in the children. Higher levels of parent-related stress were related to lower language ability in the younger children. Furthermore, higher levels of parent-related stress were related to more internalizing behavior problems of the children in both groups and less perceived social support. However, in the group of hearing children, higher parent-related stress levels were related to more externalizing behavior and emotional dysregulation; this relationship was not found in the group of children with MHL. The correlations between parental stress and child's social emotional functioning kept their significance after controlling for the effect of age. Within the group of children with MHL, no relationship was found between child- and parent-related stress levels and intervention (age at amplification and start of family intervention).

Table 4. Correlations between stress and social-emotional functioning, language, intervention, and social support

	Parent related stress	Child related stress
Social-emotional functioning (ITSEA)		
Externalizing	.15 /.63***	.65***
Internalizing	.46***	.57**
Dysregulation	.14/.60**	.65**
Competence	-.21	-.25*
Language ability		
NNST receptive language	-.60*	-.55*
NNST expressive language	-.69*	-.52*
Reynell Receptive language	-.26	-.35*
Schlichting expressive language	.01	-.16
Intervention		
Age at amplification	.10	.11
Age at start family intervention	.30	.16
Social support (MPSS)	-.31*	-.14

Note. Correlations are provided separately for the children with moderate hearing loss and hearing children when these were found to be significantly different (using Fisher Transformation) (MHL/NH).
* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

DISCUSSION

Raising a child with MHL can bring additional challenges and demands for parents. To date, this study is one of the first to explicitly compare children with MHL and hearing children in terms of parental stress. The outcomes of the study showed that parents of young children with MHL, who had access to early intervention reported comparable stress levels than parents of hearing children. These findings are in line with that of Stika and colleagues (2015) who found comparable stress levels in parents of hard of hearing infants and parents of hearing infants. In contrast, Pipp-Siegel et al.(2002) found that parents of children with a less severe HL reported higher stress levels than parents of children with a more severe HL. However, Pipp-Siegel et al. (2002) did not compare children with a less severe HL and hearing children directly and not all children included in the study were identified early and had access to early intervention.

Since almost a third of the children with MHL in our sample had either a parent or sibling with HL we might speculate that having experience with hearing loss could have an ameliorative effect on parental stress levels. Parents wit HL are more familiar with the effect of HL on their daily functioning and probably know better which challenges will faced when growing up with having a HL. On the other hand when we excluded the children with a parent with HL from the analyses the results remained the same. Furthermore, the mothers filled in the parental stress questionnaire and only two mothers in the sample had a HL compared to seven fathers.

The positive finding of the current study that parents of both groups reported comparable stress levels could be related to the early intervention programs which all but one of the children with MHL and their parents were involved in. Indeed, 86 percent of the children with MHL were identified within the first six months of their life, and a majority (68%) of these children began an early intervention program within these six months. This program entailed home visits from early interventionists who provided families with the necessary information and support to promote their child's auditory, language, and social-emotional development. Having more knowledge about MHL and better strategies to communicate with a child with MHL in the context of everyday activities may result in reductions in parental stress. Future studies should further explore the protective influence of early intervention programs and, more specifically, identify which factors contribute to lower parental stress.

Despite having stress levels approximately equal to parents of hearing children, parents of children with MHL did report receiving less social support. As stated in the introduction, an overestimation of the access to social environment of a child with MHL can easily occur and might also account for this finding. Children with MHL react seemingly appropriately to many sounds and words and speak relatively well. Consequently, other people may assume that children with MHL function as well as their hearing peers. Consequently,

people in the social network of parents of a child with MHL may not be aware of the challenges and difficulties that both the children and their parents face.

Individual differences in parental stress

Although, in the present study, the stress levels of parents of children with MHL and parents of hearing children did not differ on an absolute level, individual differences appeared in relation to other factors. Social support was an important mediator of parental stress in previous studies (Asberg, Vogel, & Bowers, 2008; Hintermair, 2000; Lederberg & Mobley, 1990; Sarant & Garrard, 2014). In line with these studies, we also found that more social support was related to less parent-related stress (i.e., parent-related factors such as social isolation, role restriction). Future research should also focus on perceived support from professionals since this study focused solely on support from close friends and family. An increase in professional support could act as a buffer for parental stress levels.

Child-related factors may also account for individual differences in parental stress levels. In line with previous results, language delays in children contributed to higher levels of parental stress (Hintermair, 2000; Pipp-Siegel et al., 2002; Quittner et al., 2010; Topol et al., 2011). In the current study, both receptive and expressive language was related to child- and parent-related stress in children younger than 24 months of age. However, amongst the children older than 24 months of age, only lower receptive language ability was associated with higher child-related stress factors. Children with lower receptive language abilities may have more difficulties understanding parental instructions, requests, and explanations, and they may therefore behave less adaptively. These difficulties in turn may negatively influence parent-child interactions, consequently evoking stress in the child.

As could be expected and in line with previous findings (Hintermair, 2006; Quittner et al., 2010; Stika et al., 2015;Topol et al., 2011), problems in children's social-emotional functioning were related to higher levels of child-related stress factors. For social-emotional functioning and parent-related stress factors we observed a different pattern. Higher levels of internalizing symptoms in children from both groups were related to higher levels of parent-related stress. In contrast, higher levels of externalizing problems and dysregulation in children were related to higher levels of parent-related stress only in parents of hearing children. Taken together, these outcomes suggest not only that child-related factors affect parental stress independently of children's hearing status, but that the pattern differs for parent-related stress factors. It is possible that externalizing behaviors are a result of parental stress, and not the cause. The present study has a cross-sectional design, but future studies examining the causal relationships between the child- and parent-related factors could shed more light on the causality of the found associations.

Conclusions and implications

A positive and promising outcome of this study was the comparable stress levels found in parents of children with MHL and parents of hearing children. Despite reporting lower levels of social support and lower children's language levels, parents of children with MHL did not experience higher stress levels. It is essential that future research explores in more detail how early intervention may act as a buffer for parent stress levels, in order to ensure these positive outcomes are sustained. It is also important to monitor the ways in which stress levels may change over time as children begin to develop beyond the toddler years, and how the further development of factors such as language and behavior may influence stress levels differently in families of older children.

More research on children with MHL is needed as our findings indicate a difference in language ability at the age of 30 months compared to hearing. It is interesting to find out whether this gap will close or perhaps will get larger as children get older. Other important variables that are related to child functioning, like parent-child interaction need to be investigated to get a more comprehensive picture of the group of children with MHL.

Within early family intervention programs, professionals should be aware of signs of parental stress, and the relationships between parental stress and language and social-emotional development of the child. Given that social support is an important buffer for parental stress, early intervention professionals should also pay attention to the social network of parents of children with MHL. Early intervention professionals could support parents in informing and involving important relatives in the care for their child with MHL.

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