Rates of socio-emotional difficulties among deaf and hard of hearing children in Ireland

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Abstract

Higher rates of socio-emotional difficulties for deaf and hard of hearing (DHH) children have been reported compared with their typical hearing (TH) peers. Nonetheless, there has to date been limited examination on this issue internationally and no such examination in the Republic of Ireland. In this study, data was collected from parents using an online survey which included the Strengths and Difficulties Questionnaire to examine the socio-emotional development of 113 DHH children aged 5-16 in the Republic of Ireland. The results were compared with data from typically hearing (TH) children obtained from a large longitudinal study of childhood in Ireland – the Growing Up in Ireland study. The findings demonstrate that the prevalence of socio-emotional difficulties among this cohort of children is over three times that of the general population of children in Ireland, with 42% of the sample demonstrating clinically significant problem scores. Furthermore, DHH children had elevated subscale scores for the four problem scales in the SDQ when compared against the TH sample. These differences were statistically significant and had a range of effect sizes from small to large. The subscale of most concern was the peer problems subscale where the DHH sample had mean scores that were roughly double those of the GUI samples, with medium to large effect sizes found. Finally, bivariate analysis revealed that several background variables were associated with elevated difficulty scores for DHH children, namely male gender, poorer communicative competency, and presence of an additional educational need.

Keywords:

Deaf; socio-emotional development; psychosocial; strengths and difficulties; peer problems

Statements and Declarations

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Introduction

Deaf and hard of hearing (DHH) children have been shown to present with higher rates of socio-emotional difficulties than their Typical Hearing (TH) peers (Aanondsen et al., 2023; Agung et al., 2021; Ching et al., 2021; Dammeyer, 2010; Fellinger et al., 2012; Hintermair, 2007; Laugen et al., 2016; Stefanis et al., 2006; Stevenson et al., 2015; Theunissen et al., 2022). The actual rate of difficulty varies across individual studies from 1.5 times (Hindley et al., 1994) to between 2 and 4 times that of a similar TH sample (Kentish & Mance, 2009). In general, studies show a prevalence rate ranging from 20%-50% (Dammeyer, 2010), and many studies using the Strengths and Difficulties Questionnaire (SDQ) (as was used in this study) have rates between 35% and 40% (Dammeyer, 2010; Fellinger et al., 2008; Hintermair, 2007). Some studies have not found any difference between rates of socioemotional difficulties between DHH and TH samples (Anmyr et al., 2015; Maes & Grietens, 2004; Mejstad et al., 2009). Furthermore, there can be discrepancies between the rates of difficulties reported by parents, teachers, and DHH children themselves (Overgaard et al., 2021). Overall, when data from multiple studies are taken into account, there is evidence of a 0.23 standard deviation increase on difficulty scores for DHH children compared with their TH peers (Stevenson et al., 2015).

There are various socio-emotional difficulties that may present for DHH children. For example, studies using the Strengths and Difficulties Questionnaire (Goodman et al., 1998) can compare children's performance across the five subscales, the positive prosocial subscale and four problem subscales: emotional, conduct, peer problems, and hyperactivity. Detailed analysis of the extant literature shows that DHH children tend to have difficulties across all four problem subscales (Fellinger et al., 2008; Hintermair, 2007; Laugen et al., 2016), with particular concerns for the peer problems domain (Ching et al., 2021; Stevenson et al., 2015). Indeed, the peer problems subscale on the SDQ has also been shown to explain variance in suicide attempts among samples of DHH youths (Gryglewicz et al., 2017).

Many studies have sought to investigate what background variables are associated with higher rates of socio-emotional difficulties among DHH children. A number of common themes emerge: boys are often shown to have higher problem scores than girls (Laugen, et

al., 2016; Polat, 2003). On the other hand, a recent study by Terlektsi, et al. (2020), found that girls reported more incidents of conflict within long lasting friendships than boys.

As well as gender, communication and language skills have been shown to influence socio-emotional development. Bottcher and Dammeyer (2013) remarked that psychopathology amongst this population is not caused by being DHH, rather it is communicative competence that is the link between socio-emotional difficulties and DHH. As communicative competence is essential for establishing and maintaining interactions and friendships (Xie et al., 2014), it is unsurprising that a number of studies have noted an association between socio-emotional development and communicative competence (Bottcher and Dammeyer, 2013; Cagulada and Koller, 2019; Dammeyer, 2010; Hintermair, 2007; Polat, 2003; Stevenson et al., 2015; Wong et al., 2020).

Finally, there is a large body of evidence indicating that presence of an additional need is a risk factor for higher rates of socio-emotional difficulties (Hindley et al., 1994; Hintermair, 2007; Polat, 2003; van Eldik et al., 2004; Van Gent et al., 2007; Wong, et al., 2020). Dammeyer (2010) observed that additional disabilities affected both signing and spoken language abilities, which we know from above is associated with socio-emotional development while Polat (2003) also observed that academic achievement positive correlated with socio-emotional wellbeing.

Purpose of the Study

While the body of evidence on this phenomenon is growing internationally, it remains important to measure and interrogate the socio-emotional outcomes of DHH children across different populations. Thus, studies which seek to identify the prevalence rates across individual countries are important and valuable. Unfortunately, we have had little to no evidence in the Republic of Ireland on this phenomenon to date. This paper addresses that gap.

Given the complete dearth of information on this phenomenon on a national level, the purpose of this study was to establish rates of socio-emotional difficulties (as reported by their parents) among a sample of DHH children in Ireland and to compare that against rates of such difficulties among Irish children generally. Establishing these rates would add to what is already known internationally. Furthermore, analysis on the data from DHH children

sought to establish what relationship, if any, there was between levels of difficulty in that cohort and a host of background variables such as gender, degree of deafness, communicative competence, whether deafness was from birth, and presence of an additional educational need. The following research questions guided the project:

1. What are the rates of socio-emotional difficulties, as reported by their parents, among a sample of DHH children in the Republic of Ireland and how do these compare with data from a nationally representative sample of children in Ireland?
2. What background variables are associated with socio-emotional difficulties among the DHH sample?

Methods

Sample

Data is presented below from two independent samples: a non-random sample of DHH children (n=113) collected by the author in 2019/20 for this study, and a nationally representative sample of 9 year old children in Ireland (n>8000) from a large longitudinal study of childhood in Ireland (Thornton et al., 2010) collected between 2017 and 2018. In the case of both samples, we are examining data provided by their primary care givers (hereafter referred to as parents). As such, parents are deemed to be the participants in this study. There is no database of DHH children available to researchers in the Republic of Ireland and thus, a random sample was not possible.

The sample of TH presented in this article is drawn from a large longitudinal study of childhood in Ireland called Growing Up in Ireland (GUI). The GUI study has collected data from two separate groups known as Cohort '08 and Cohort '98. The current study used Cohort '08 for analysis since it provides the most recently collected SDQ data. Data was requested and provided from the Irish Social Science Data Archive at University College Dublin for this cohort. Five waves of data have been published for Cohort '08, when the children were aged 9months, 3 years, 5 years, 7/8 years and 9 years of age. The fifth (most recent) wave of data collection is used in this study. A detailed description of this cohort can be found in McNamara et al (2021). In summary, the sample comprises 8,032 children selected systematically from a sampling frame of all children in Ireland (the Child Benefit Register) and is deemed to be a nationally representative sample, weighted for attrition and non-response, thus acting akin to a norm for this research. The sample contains a percentage (24%) of children with "a long-standing illness, condition or disease", the most common of

which are asthma and eczema. This data was collected in 2017/18 and includes the parent-reported SDQ. All analysis of the GUI data presented here has been carried out with the recommended weighting variable applied.

Parents were recruited to the study using a variety of methods to ensure a broad and unbiased reach to as many potential participants as possible. Recruitment notices were sent to *all* schools for DHH children in the Republic of Ireland, including all schools where there was a class for DHH children in operation. In order to reach the parents of children in mainstream schools with no class for DHH children, there was also a social media campaign. Notices about the study were posted to the researcher's Twitter/X account and, following a request by email from the researcher, these were shared in turn by the parent-run organisations for families with DHH children in Ireland on both Twitter/X and Facebook. Posters were displayed the National Cochlear Implant Program centre (there is only one such centre in Ireland in which all DHH children with implants receive services). Emails were sent directly to national service providers for DHH people (the Irish Deaf Society, Chime and Reach Deaf Services) and to teachers working with DHH children who have volunteered to be part of a database receiving information about research in deaf education. A total of 223 parents engaged with the survey. However, there were several incomplete and duplicate entries. Following data cleaning, data was presented from 113 families for analysis, which represents just over 5% of the total school going population of deaf children in Ireland. The families came from 23 out of the 26 counties in the Republic of Ireland and, as such, this study has large geographic representation. Most (62%) of the children were reported to have been born deaf.

Since parents were the key informants in this study, it is important to understand their background characteristics. In the majority of cases (92%), the questionnaire was completed by the child's mother, with the remaining 8% from fathers of the children. Seventy-five percent of parents self-identified as hearing with 22% identifying as DHH. Parents were asked to report their highest level of education obtained. The results indicated a highly educated respondent cohort, with 81% of the sample having some form of post-school qualification. Furthermore, many of the parents held either an honours undergraduate degree or a postgraduate degree (45%). Nineteen percent of respondents indicated that they used a language other than English as the main language of their home - this equates with 21

families. Of these respondents, 4 used Irish Sign Language in the home, 5 used Gaeilge (Irish language), and a further 4 spoke Lithuanian, Polish or Russian. The remaining participants used a range of languages in the home including Urdu, Punjabi, Latvian Sign Language, Catalan, Hungarian and Mandarin Chinese. Summary data about the children as reported by their parents is reported in Table 1 below.

Table 1

Characteristics of the DHH sample in the study

Variable	**Summary statistics**
Mean age	9.58 years
Child gender	52% male 48% female
School placement	67% mainstream 21% deaf schools *or* classes for deaf children in mainstream schools 4% special schools/classes (non-Deaf) 8% preschool age
Levels of deafness of child	34% profound 19% severe 37% moderate 10% mild
Device used	55% hearing aids 34% cochlear implants *[11% one cochlear implant* *23% two cochlear implants]* 11% no amplification
Deafness present since birth?	62% yes 22% no 16% do not know
Age at which deafness identified (in months)	Mean: 28months Median: 20months Range: 128months

Deafness identified through universal neonatal hearing screening?	30% identified through UNHS 70% not identified through UNHS
Laterality of deafness	11.5% Unilateral 88.5% Bilateral
Has the child ever used sign language to communicate?	45% yes 54% no
Presence of additional educational need	40% yes 60% no

Forty per cent of the DHH sample (45 children) were reported by their parents to have additional educational needs, a figure not dissimilar to that identified in the seminal Fortnum and Davis (1997) research in the UK . Parents were asked for further information on this need in in an open question. The 45 parents mentioned 56 different types of needs, demonstrating that there are sometimes overlapping and multiple issues at play. This made summarising this data according to type of additional need difficult. A summary of this material is presented below in Table 2.

Table 2

Data on presence of additional educational need among the DHH sample

	Number of times parents mentioned this need
Autism Spectrum Disorder	4
Attention Deficit Hyperactivity Disorder	4
Specific learning difficulty such as Dyslexia, Dyscalculia, Dyspraxia	10
General learning disability	7
Anxiety	3
Sensory or Auditory Processing Disorder	6

Charge syndrome/Usher Syndrome or a Visual Impairment	5
Down Syndrome	6
Physical disability	3
Speech and language delay	8

In a separate question specifically on mental health, 14% of the parents mentioned that their child had received mental health services or supports with a further 5% on the waiting lists for such services. It should be noted that of the 14% of parents whose children had received mental health services or supports, most (64%) had also indicated in the earlier question that their child had an identified additional need (other than mental health). Parents had the opportunity to elaborate on the additional mental health needs of their child. Many mentioned referral to and support from the national Child and Adolescent Mental Health Service (CAMHS) or from charitable services for people with mental health difficulties.

The instrument

Data was gathered using an online questionnaire which included an extensive list of demographic questions about the child (age, gender, level of deafness, age of onset of deafness, presence of additional needs, prior history of mental health difficulties, use of amplification devices such as hearing aids or cochlear implants), their home life (parental hearing status, parental education level, language of the home) and some questions measuring parent-reported communicative competence of the child. Communicative competence was measured for spoken language by combining the scores given on two scales: the Categories of Auditory Performance (CAP) and the Speech Intelligibility Rating Scale (SIRS). For sign language users, communicative competence was measured by combining the scores parents gave on the Sign Language Production Scale (SLPS) and the Sign Language Understanding Scale (SLUS) (Dammeyer, 2010). Communicative competence for DHH children has been measured in this way previously (Aanondsen et al., 2023). While it is not a detailed measure of language or communication, it provides a means of capturing skills in listening, speaking, sign language production and sign language understanding in a simple form for research purposes, and is particularly helpful where it is not possible for the research to directly assess language or communication skills in the children in the study.

Socio-emotional development was measured using parent reports on the Strengths and Difficulties Questionnaire (SDQ) (Goodman et al., 1998). The SDQ is a questionnaire consisting of 25 items comprising five scales the first four of which are problem subscales and the fifth captures strengths:

- Emotional problems scale
- Conduct problems scale
- Hyperactivity scale
- Peer problems scale
- Pro-social scale

The maximum score for each subscale is 10. A total difficulty score (SDQ-TDS) is calculated using the first four of these subscales, giving a maximum SDQ-TDS of 40 with higher scores for those with greater levels of socioemotional difficulty. The scoring guide for the SDQ provides cut points for categorising the SDQ-TDS from parent-reports into one of three qualitative categories: normal (0-13), borderline (14-16) or abnormal (17-40). Furthermore, scores above 20 are considered to be very high. Both borderline and abnormal scores are clinically significant. Given that this is the first study of its kind in Ireland, that the SDQ is not yet available in Irish Sign Language, and that the broad age range of children involved would likely raise issues with literacy skills, a decision was made *not* to administer the self-report test to the DHH child.

The SDQ is a widely-used measure of socio-emotional development, including in studies amongst DHH children (Anmyr et al., 2012; Fellinger et al., 2009; Hintermair, 2007, 2013; Hogan et al., 2014; Laugen et al., 2016; Mejstad et al., 2009; Pinquart & Pfeiffer, 2015; Terlektsi et al., 2020). While it is a screening tool, it has been shown to have good sensitivity in identifying mental health concerns when compared with a clinical assessment (Roberts et al., 2015). It has also been used in a large longitudinal study of the Irish child population called the Growing Up in Ireland (GUI) study (Thornton et al., 2010) therefore allowing for comparison across research studies.

The internal consistency of each of the subscales of the SDQ was assessed in this study using Cronbach's alpha and all five subscales were found to have acceptable reliability (Emotional subscale: 0.797, Conduct subscale: 0.779, Hyperactivity subscale: 0.846, Peer problems subscale: 0.762, Prosocial subscale: 0.736). The instrument was piloted by a parent and some minor amendments, deletions and additions were made to strengthen the instrument

– no changes were made to the SDQ scale itself, only to demographic questions. For example, they requested amendments to the multiple choice options so that parents of adopted children could respond (e.g. reflecting that they may not know the aetiology of their child's deafness). They also requested changes to how the data was collected so that parents of more than one DHH child could provide two returns (this has been disabled on the original online survey collection tool). This study commenced in September 2019 with participant recruitment and data collection occurring between February 2020 and February 2021. This coincides with the Covid-19 pandemic and subsequent restrictions in Ireland. The possible implications for this are discussed further below.

Statistical Analysis

Data were cleaned and inputted into IBM SPSS 27 for analysis and production of descriptive and inferential statistics. Parametric tests were used throughout the study since the data set comes from a large (n>100) sample and the Central Limit Theorem can be presumed (Field, 2018). However, since this sample was not random, to add a further protective measure in the analysis and interpretation of the data, in tests comparing means of independent samples, equal variance was not assumed. The statistical test used (e.g. Pearson correlations, independent samples t-test) for bivariate analysis depended on the variables in question.

Ethics

Each questionnaire contained a plain language statement in English, clearly outlining to participants the purpose of the study, what would be expected of them during participation, any potential risks or benefits to participation, how their data would be stored, and their right to withdraw from the study. A personal data protection notice (as required under European General Data Protection Regulation legislation) was also provided highlighting what personal data would be collected and providing contact details should research participants wish to complain. At the very top of the ethics statement (i.e. the first written sentence on the form), there was a statement that anyone who wanted information to be made available through Irish Sign Language could contact the PI at an email address provided. There was no request for information to be made available in Irish Sign language. The study was approved by the Research Ethics Committee at [xxx redacted for review xxx]. All participants indicated their

consent to take part by ticking a box at the end of the plain language statement – a signature was not required before the form was submitted online and participants had the right to remain anonymous to the researcher.

Results

Rates of difficulty of DHH versus TH children were compared by using the total difficulty score on the SDQ (hereafter referred to as SDQ-TDS) and categorising all children in each sample into either the normal, borderline or abnormal categories as per the SDQ guidelines. Since both abnormal and borderline are considered to be clinically significant, the combination of those groups is used to give a percentage prevalence rate for difficulties.

Rates of difficulty of DHH versus TH children

Descriptive statistics for the SDQ-TDS from the DHH and TH samples are presented in Table 3 below. They reveal a statistically significant difference in the mean SDQ-TDS for DHH and TH samples, $t(113.294) = 5.134$, $p = <0.001$, with a medium effect size (g=0.73, 95% CI [0.543-0.915]).

Table 3

Descriptive Statistics for SDQ-TDS *on the SDQ for the DHH and TH samples.*

Description	**DHH sample**	**TH sample**
Sample size	113	8518
Mean	11.89	7.98
Standard deviation	8	5.31
Range	32	37

Looking at individual scores and using the cut-off points detailed above (0-13, 14-16, 17-40), the children can be categorized into the three qualitative groups as presented in Table 4 below:

Table 4

Distribution of Normal, Borderline and Abnormal SDQ-TDS for DHH and TH children

Category	DHH sample % (n)	TH Sample % (n)
Normal	58% (66)	85% (7261)
Borderline	14% (16)	8% (653)
Abnormal	28% (31)	7% (609)

Using the cut-off score of 14, the prevalence rate of difficulties among the DHH children in the current study is 42% (Table 2) versus 15% for the TH sample. Furthermore, for those DHH children in the abnormal category, just under half (13% of the total DHH sample) are deemed to have 'very high' scores versus 4% of the TH sample. Of those DHH children with abnormal scores (31 children), the mean score is 22 (the cut off point for a very high score is 20).

Given that the dataset of DHH children has a broad age range (5-16) and is being compared against a sample of TH children with a very narrow age-range, the DHH dataset was assessed to see if there was a relationship between age and SDQ-TDS. A Spearman correlation test revealed no statistically significant relationship between children's age at time of testing and their parent-reported SDQ-TDS (r_p 0.104, p=0.273), suggesting that the overall SDQ-TDS for the DHH cohort has developmental invariance, a feature which has been found elsewhere (Murray et al., 2022). Nonetheless, the difference in age-range between the two samples remains an unavoidable limitation of this study.

Subscale scores

The results from the four problem subscales and the pro-social subscale for both samples are reported in Table 5, comparing the results of TH children against the DHH cohort. Detail on each of the subscales is presented below.

Table 5

Subscale scores from the SDQ for the Deaf and Hard of Hearing Sample and the GUI '98 Cohort

		Emotional Problems*	Conduct Problems	Hyperactivity *	Peer Problems *	Prosocial Scale*
Mean subscale scores	TH n=8518	2.14	1.37	3.22	1.25	8.88
	DHH n=113	3.30	1.74	4.25	2.59	8.21

Emotional Problems

This study saw an elevated emotional subscale mean score for DHH children, over one and a half times that of the national data from the GUI. This difference in the mean emotional subscale score is statistically significant $t(113.537) = 4.487$, $p = <0.001$ with a medium effect size (g=0.563, 95% CI [0.377 - 0.749]).

Conduct Problems

This study saw an elevated conduct problems subscale mean score for DHH children, approximately 1.5 times that of the national data from the GUI. This difference in the mean conduct problems score was approaching statistical significance $t(113.606) = 1.923$, $p = 0.057$, with a small effect size (g=0.245, 95% CI [0.060 - 0.431]).

Hyperactivity

This study saw an elevated hyperactivity subscale mean score for DHH children, approximately a third higher than for TH children. This difference is statistically significant $t(114.039) = 3.594$, $p = <0.001$, with a small effect size (g=0.409 95% CI [0.223 - 0.595]).

Peer Problems

This study saw an elevated peer problems subscale mean score for DHH children, roughly double that of TH children. This difference is statistically significant $t(113.120) = 5.848$, $p = <0.001$ with a large effect size (g=0.888, 95% CI [0.702-1.074]).

Pro-social skills

The fifth subscale is a pro-social measure where positive social skills such as sharing are measured. The maximum score is 10. This study found a marginally lower prosocial mean subscale score for the DHH sample compared with that TH children, a difference that was statistically significant $t(113.622) = -3.951$, $p = <0.001$ albeit with a small effect size (g=-0.456, 95% CI [-0.642- -0.271]).

Variables contributing to the high prevalence rate for the DHH cohort

Given the high prevalence rate of socioemotional difficulties among the DHH cohort in this study, further bivariate analysis helps to identify factors that may be associated with this increase. The variables examined included gender, degree of deafness, communicative competence (listening and speaking skills, and sign language understanding and production), age of onset of deafness (whether the child was deaf at birth or not), parental hearing status (whether parents were deaf or hearing), school placement (specialised versus mainstream setting) and presence of an additional educational need. The results are presented in table 6 below:

Table 6

Variable	**Test statistic**	**P value**	**Effect size**
Gender*	*t*=2.462 df=110.755	0.008	*g*=0.460 95%CI [0.087-0.830]
Degree of deafness	H = 5.062 df = 3	0.167	n/a
Communicative competence (spoken language)*	r_p = -0.226	0.018	r_p = 0.22
Communicative competence (sign language)	r_p = -0.140	0.371	n/a
Deaf at birth	*t*=1.617 df=42.724	0.057	n/a
Parental hearing status	*t*=1.560 df=30.525	0.065	n/a
School placement	*t*=-0.396 df=3.420	0.358	n/a
Presence of additional educational need*	*t*=4.268 df=81.742	<0.001	*g*=0.847 95%CI [0.455-1.236]

Gender, spoken language ability, and presence of an additional need were found to have statistically significant relationships with the SDQ-TDS. Boys had higher SDQ-TDSs (M=13; n=59) than girls (M=8.5; n=54), a finding that was statistically significant (p=0.008) with a small effect size. A measure for communicative competence in spoken language was obtained by combining the scores on the Categories of Auditory Performance and Speech Intelligibility Rating Scale. A similar score was calculated for children using sign language by combining the Sign Language Production Scale and the Sign Language Understanding Scale. Better spoken language skills had a weak negative correlation with SDQ-TDSs (r_p = -0.226) that was statistically significant (p=0.018), indicating that children with higher spoken language skill ratings had lower problem scores (n=109). No significant relationship was found between sign language skills and the TDS (n=43). Presence of additional educational needs was found to have a statistically significant relationship (<0.001) with TDSs with those children who had additional needs having considerably higher problem scores (M=16) versus those who did not (M=7.5); the effect size was large. There was no relationship found between parental hearing status, school placement, degree of deafness, or whether children were deaf from birth or not, and their SDQ-TDS.

Discussion

This study found that mean parent-reported SDQ-TDS from a sample of 113 DHH children indicated a prevalence rate of socio-emotional difficulties of 42%. This is approximately three times that of the rate of TH children from a large national longitudinal study of childhood. The large range (32) and standard deviation (8.05) among the DHH cohort indicate that there is considerable variability in this domain among DHH children. These findings are generally in line with international findings on DHH children (Cornes & Brown, 2012; Dammeyer, 2010; Fellinger et al., 2008; Hintermair, 2007) which demonstrate that this is an area of difficulty for this cohort. Dammeyer (2010) reports that prevalence rates of difficulties generally range from 20-50%, though there have been some studies reporting rates no higher than their TH peers and some studies with rates as high as 77%. Typically, those studies using the SDQ to ascertain socio-emotional difficulties have reported rates between-40% (Dammeyer, 2010; Fellinger et al., 2008; Hintermair, 2007). As such, the prevalence rate for the Irish sample of DHH children is largely in line with international findings, albeit at the upper end.

Furthermore, the DHH children in this study had a prevalence of very high scores on the SDQ that is approximately five times that of their TH peers. For those DHH children in the abnormal category, almost half had very high scores with a mean score of 22 in the abnormal category (the cut off point for a very high score is 20). This finding is considerable since it indicates that those children who fall into the abnormal SDQ-TDS category tend to have very high scores. This implies that there are difficulties across several areas, a finding echoed in the existing research (Fellinger et al., 2008; Hintermair, 2007; Laugen et al., 2016). The difference in means between DHH children and their TH peers across the four problem subscales confirms this and suggests that the difficulties DHH children face in socio-emotional development are multifaceted. Of particular concern is the elevated mean subscale score for peer problems, also found by Stevenson et al (2015), which was roughly double that of TH children, a difference that was statistically significant and had a large effect size. This finding is of great importance given that peer problems, as measured through the SDQ, has also been shown to explain variance in suicide attempts among samples of DHH youths (Gryglewicz et al., 2017).

Examination of the relationship between the DHH children's SDQ-TDS and a host of background variables revealed that boys, those with poorer spoken language skills, and those with additional educational needs had higher problem scores. Higher SDQ-TDSs for boys have been found elsewhere for both TH (Arnfred et al., 2019; Dahlberg et al., 2020) and DHH (Polat, 2003). Language has also been found to be associated with poorer outcomes on the SDQ for DHH children (Stevenson et al., 2015). So too has presence of an additional need (Hindley et al., 1994; Hintermair, 2007; Polat, 2003; van Eldik et al., 2004; Van Gent et al., 2007). As such, this research adds to our knowledge on this phenomenon by confirming earlier findings with data from an Irish context.

As with all research, this study is limited by a number of issues relating to its design and execution. First, as with all quantitative studies, the data presented here does not investigate the underlying causes of socio-emotional difficulties or the experiences of young DHH people who are struggling in this area. Furthermore, these data were collected between February 2020 and February 2021. This is broadly in line with the period of the strictest closures relating to the Covid-19 pandemic and may thus be subject to the threat of history on external validity. It is uncertain what, if any, influence this may have had on the outcomes of the study overall. Parent surveys were collected between February and September 2020. In an effort to ascertain if the pandemic had an impact on the study, the data file was split in two to

compare the mean parent-reported TDS of children whose families responded to the survey during the period of strictest closure (February, March, April, May, June 2020) with those who responded to the survey as restrictions were easing (July, August, September 2020). There was no statistically significant difference between the means of those completing the survey during more restrictions ($\overline{x} = 11.98$) versus those completing it during less restrictions ($\overline{x} = 11.73$): $t(101.479)$ 0.166, $p = 0.869$. Furthermore, the fact that results are broadly comparable with international findings from DHH children would suggest that the pandemic did not have a pronounced influence on the study. Nonetheless, future large-scale studies on this topic in the Republic of Ireland would be helpful to confirm or refute this finding.

The sample presented above is relatively heterogenous and from a non-random sample. As such, there are problems with generalising to the population of Irish DHH children as a whole. Also, while the sample size is acceptable for statistical analysis, it represents just over 5% of the population of school going DHH children in Ireland. Further research with larger, preferably random samples, should be facilitated by Government bodies with access to the full population of DHH children, and will be required in this area to confirm the rates identified in this project.

Conclusion

This study represents the first large-scale national investigation into the socio-emotional development of DHH children in the Republic of Ireland. Heretofore, we have had little to no evidence in this jurisdiction on this phenomenon. This study has demonstrated that, owing to the high prevalence rate identified through the SDQ-TDS, in particular the trend of very high scores and the multi-faceted nature of difficulties, this is an area of considerable concern and warrants attention from service providers, educators, clinicians and Government departments. Further research is required in this domain, in particular to include the self-reports of young DHH people.

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