



Ollscoil Chathair
Bhaile Átha Cliath
Dublin City University

Socio-Emotional Development in Deaf and Hard of Hearing Children

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Chime

The National Charity for
Deafness and Hearing Loss

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Foreword

There are over 5,000 Deaf and Hard of Hearing children and young people in Ireland, but there is very little information on how well they are getting on. There is a dearth of information on how this cohort of children are progressing throughout their childhood.

Chime has supported Deaf and Hard of Hearing children and their families over many years. We have been aware for some time that a significant number of children were struggling in terms of their general development and wellbeing. We wanted to take steps to establish the extent of the problem. We commissioned Dr Elizabeth Mathews from Dublin City University to examine the socio-emotional development of Deaf and Hard of Hearing children, the first report to examine this issue in this cohort of children. I want to thank Dr Mathews and her research team for an excellent report that will be invaluable in the years ahead.

The report provides strong evidence that many Deaf and Hard of Hearing children are experiencing socio-emotional difficulties on a scale much greater than that of the wider child population. The findings merit consideration by all who support children and young people living with deafness or hearing loss – teachers, psychologists, social workers and others. It is important to note that deafness in and of itself does not cause these difficulties – rather it is the challenges of growing up in a predominantly hearing world where accessibility, awareness and support may be lacking.

Chime will be using the report's findings to inform our service developments for Deaf and Hard of Hearing children into the future and to re-double our efforts to encourage other relevant stakeholders to take steps to ensure that these children can prosper on a par with their hearing peers.

Mark Byrne
CEO Chime

Executive Summary

Introduction

This document presents findings from a study examining the socio-emotional outcomes for a large sample of deaf and hard of hearing (DHH) children in the Republic of Ireland. Specifically, this report focuses on the following objectives:

1. to identify the prevalence of socio-emotional difficulties among a large sample of DHH children in Ireland (hereafter referred to as 'the sample');
2. to compare the prevalence identified among the sample with national and international findings.

Setting the Scene: Socio-Emotional Outcomes for DHH Children

Deafness has implications for spoken language development, social engagement, thought processes, learning ability, and quality of life (Brown & Cornes, 2015) and so it is not unsurprising that there is interest in the socio-emotional development of DHH children. Internationally, studies overwhelmingly indicate that DHH children demonstrate higher rates of socio-emotional difficulties than their Typical Hearing (TH) peers (Dammeyer, 2010; Fellingner et al., 2012; Hintermair, 2007; Laugen et al., 2016; Stefanis et al., 2006; Stevenson et al., 2015; Theunissen, Rieffe, Kouwenberg, et al., 2014; Theunissen, Rieffe, Netten, et al., 2014). Furthermore, socio-emotional problems have a greater impact on home life, classroom learning, and the ability to get along with others for DHH students than for their TH peers with these difficulties (Mekonnen et al., 2015). Because of these far-reaching consequences, it is imperative to measure and understand the socio-emotional outcomes of DHH children in any population. Unfortunately, we have had little to no evidence in the Republic of Ireland on this phenomenon.

It is important at the outset to stress that deafness in and of itself is not the cause of these difficulties. Rather, a host of factors leave DHH children more vulnerable to socio-emotional difficulties. These include, but are not limited to, delayed identification of their deafness and appropriate intervention; lack of access to language and subsequent language delay; and stigma towards deafness and the stressors associated with that.

This study used the Strengths and Difficulties Questionnaire (SDQ) as it has been used in international studies with cohorts of DHH children and has also been used on a large sample of the Irish child population in the Growing Up in Ireland (GUI) study (Thornton et al., 2010), thus providing a basis for a comparison of results. There have been three waves of data collection in the GUI study against which data from this cohort can be compared. Studies in Europe using the SDQ have found prevalence rates for socio-emotional difficulties in DHH children of between 35% and 40% (Dammeyer, 2010; Fellingner et al., 2008; Hintermair, 2007), several times the rate for TH peers. Such studies generally found that DHH children have more difficulties than their hearing peers across all four problem domains measured on the SDQ scale: emotional problems, conduct problems, hyperactivity and peer problems (Fellingner et al., 2008; Hintermair, 2007; Laugen et al., 2016). In their meta-review, Stevenson et al. (2015) identified peer problems as the area which reflected the greatest level of social difficulties for DHH students. Elsewhere, emotional regulation has been noted as important for making and maintaining friendships, and for constructive conflict resolution during adolescence (Terlektsi et al., 2020). Peer problems, as measured through the SDQ, have been shown to explain variance in suicide attempts among samples of DHH youths, with each one-point increase in score on the SDQ peer problem subscale corresponding with a 58% increase in odds of making a lifetime suicide attempt (Gryglewicz et al., 2017). These significant international findings underline the need for this study to investigate the current socio-emotional development of Irish DHH children

How the study was conducted

This is a quantitative study, capturing data using the same structured data-collection tool from a large sample of participants. A range of methods was used to recruit participants to this study; the study sample is not random. The study was broadly advertised to reach parent-participants.

The data was collected using an online questionnaire and socio-emotional development was measured using the SDQ (Goodman, 2005). The SDQ is a tool for screening for mental health difficulties. There are five subscales, four of which indicate problem areas and the fifth is a measure of pro-social skills. A total of the first four problem scales gives a Total Difficulties Score (TDS). The TDS can be used to categorise children into those who have 'normal,'¹ 'borderline', or 'abnormal' scores. In this study the parent and teacher versions of the questionnaire were used, though this report focuses on the results of the former.

The target participant group comprised parents and teachers of children aged 4-17 with all types of deafness from mild through to profound, from all communication backgrounds, across all school placement types, from those with additional needs and none, across the 26 counties of the Republic of Ireland.

Results

About the participants

Data was gathered from 113 families from 23 out of the 26 counties in the Republic of Ireland. Seventy-five percent of parents self-identified as hearing with 22% identifying as DHH. Children aged from 4-17 (inclusive) are included and the mean age of the study children was 10 years. Fifty-two percent of the children were male and 48% female. Most (67%) were enrolled in mainstream primary or post primary schools (including Gaelscoileanna) 21% were in Schools for the Deaf or classes for DHH children attached to mainstream schools, with a further 4% in special schools or special classes (not for DHH children). The remaining 8% were in preschool or had not yet started school.

In terms of levels of deafness, parents reported that 34% of the children were profoundly deaf, 19% severely deaf, 37% were moderately deaf and 10% had mild deafness. Most (89%) of the children had bilateral deafness and most (62%) were born DHH. Fifty percent of the children used hearing aids, 5% used bone anchored hearing aids (BAHAs) or a bone conduction hearing aid, 11% used one cochlear implant (often with a hearing aid on the other ear) with a further 23% using bilateral implants, and 11% were reported as not routinely using any amplification.

There were 40% (45 children) noted to have additional needs. In addition, 14% of the children in the study had received mental health services or supports with a further 5% on the waiting lists for such services. Parents had the opportunity to elaborate on the additional mental health needs of their child. Many mentioned referral to and support from the Child and Adolescent Mental Health Service (CAMHS), Jigsaw, Pieta House or local counselling services.

1 The language of 'normal', 'borderline' and 'abnormal' may be offensive to some readers of this report. This does not align with a socio-cultural model of Deafness. However, the language as used here has a very specific purpose in delineating categories of performance on validated scales. As such, 'normal', 'borderline' and 'abnormal' have specific quantifiable meanings. The language is maintained throughout this report since it is used internationally and consistency is required to allow readers to compare findings from this research against other published results.

Strengths and Difficulties Questionnaire Results

One hundred and thirteen parents completed the SDQ in full for their child. The mean TDS was 11.89 which, while within the normal range, is higher than the means obtained from any of the three waves of the GUI study² (see Table A). Within the DHH sample, 42% were found to have a TDS that is clinically significant (i.e. 14 or more), more than three times that of the GUI samples. Furthermore, 13% of the DHH sample had very high scores (i.e. 20 or more) compared of 2-3% across the GUI waves, meaning DHH children were at an almost five-fold risk of being in this high scoring category.

In addition to a higher mean TDS score, this study found elevated subscale scores for the four problem scales in the SDQ when compared against the GUI sample. These differences were statistically significant and had a range of effect sizes from small to large. The prosocial behaviour subscale had a statistically significant, marginally lower (i.e. worse) mean in the DHH sample than the GUI samples, albeit with a small effect size. 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.

Table A: A comparison of the TDS of the DHH cohort against waves 1-3 of the GUI study

	Mean	Range	SD	Prevalence	Prevalence of very high scores
GUI Wave 1	7.98	37	5.31	15%	3%
GUI Wave 2	7.09	35	5.40	12%	3%
GUI Wave 3	6.92	33	5.09	11%	2%
DHH Sample	11.89	32	8.05	42%	13%

² The means used for GUI Waves 1, 2, and 3 include all children in that cohort. This may cause an underestimate of the differences between the DHH cohort and the GUI cohorts since the GUI study sample also contains children with disabilities, as well as a small number of children who are Deaf.

Conclusions

This study represents the first large-scale national investigation into the socio-emotional development of DHH children in the Republic of Ireland. The findings demonstrate that the prevalence of socio-emotional difficulties among this cohort of children is approximately three times that of the general population, with 42% of the sample demonstrating clinically significant TDSs. This finding is generally in line with international evidence on DHH children (Brown & Cornes, 2015; Dammeyer, 2010; Fellingner et al., 2008; Hintermair, 2007), albeit at the higher end of prevalence rates.

Furthermore, DHH children have a prevalence of very high scores on the SDQ that is almost five times that of their TH peers. This would suggest that those children with difficulties tend to have difficulties across many areas. The difference in means 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 in the DHH sample, which was roughly double that of any of the GUI waves, and when compared to the GUI scores, 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, with each one-point increase in score on the SDQ peer problem subscale aligning with a 58% increase in odds of making a lifetime suicide attempt (Gryglewicz et al., 2017).

Notwithstanding some limitations of this report (outlined in detail in the body of the report), the results provide strong evidence of high levels of socio-emotional difficulties in the DHH sample compared to the wider child population. This should be of concern to health providers, and it is noteworthy that the need for specialist services for DHH children with complex needs has been recognised by the HSE in Ireland (National Advisory Group on Specialist Services for Deaf Children, 2017).

Recommendations

An examination is needed to ascertain if appropriate services are available given the higher prevalence of socio-emotional difficulties among this population. This study found that 42% of DHH children have scores on a mental health screening tool that are of clinical significance. However, only 14% of the sample are currently in receipt of mental health supports. For this reason, evidence of elevated prevalence rates of socio-emotional difficulties amongst DHH children should warrant concern from health and educational professionals working with these individuals. The specific needs of DHH children as a result of both their language and communication needs and the higher prevalence rates of additional needs that they experience would suggest that specialist screening and intervention services might be required to identify and serve these children.

Further research is needed in this area. First, a follow-up study looking at self-reports of DHH children using the SDQ would complement the findings of this study. To facilitate this, an Irish Sign Language translation of SDQ is warranted, alongside research examining the reliability and validity of such a translation. Second, a qualitative examination of the experiences of young DHH people with socio-emotional difficulties and their families, including their access to services, would provide more nuance to the information gleaned in this study. Third, studies to examine the effectiveness of interventions in this area would help professionals and organisations in their planning of services. Finally, a mixed-methods study with service providers to ascertain difficulties in reaching and serving this population may also assist with future service planning.

Special attention needs to be given to the area of peer problems. This area was the subscale of greatest difference when compared with the national GUI data and research evidence shows that this subscale may be a useful screen for self-harm and suicidal behaviour in young DHH people (Gryglewicz et al., 2017). This may have implications for schools in particular where these problems may arise and have the potential to be addressed.

Introduction

This document reports findings from a study examining the socio-emotional outcomes for a large sample of deaf and hard of hearing (DHH) children in the Republic of Ireland. The overall study had the following objectives:

1. to identify the prevalence of socio-emotional difficulties among a large sample of DHH children in Ireland (hereafter referred to as 'the sample')
2. to compare the prevalence identified among the sample with national and international findings
3. to establish any relationship between socio-emotional outcomes in the sample and a host of background variables
4. to establish any relationship between socio-emotional outcomes of the child and the relationship between children in the sample and their primary care giver or their teacher.

This document reports on the first and second objectives listed above.

This study commenced in September 2019. Data collection was carried out between February 2020 and February 2021 and is thus aligned with the period of the Covid-19 outbreak and subsequent restrictions in Ireland. This report includes a literature review, an outline of the research methodology used for the study, results of the study, and a conclusion that discusses the findings and limitations of the study as well as key recommendations.

DHH children and their families can avail of a range of services in the Republic of Ireland. They are often identified at birth through a universal neonatal hearing screening initiative in the hospital system. A number of services become available soon after identification and continue through childhood: paediatric audiology services including simultaneous bilateral cochlear implantation for eligible candidates, speech and language therapy services, Irish Sign Language home tuition support, a visiting teacher service, and supports for accessing preschool, primary school and post-primary school. Access to these services is not unproblematic and there are often extensive delays and waiting lists involved, in particular for audiology and speech and language therapy (Mathews, 2017). There is also a host of other services provided through the charity sector by agencies such as: Chime, the Irish Deaf Society, the Cork Deaf Association, the Kerry Deaf Resource Centre, Reach Deaf Services, parent support groups such as Our New Ears and Sharing the Journey, and others.

In spite of the array of services available, there are limited specialist mental health supports for this cohort. DHH children can access the existing mainstream services under the Child and Adolescent Mental Health Services (CAMHS) as well as those services provided by the charity sector. However, these services may struggle to meet the needs of DHH children given the difficulties in appropriate assessment of (Hindley et al., 1994) and subsequently serving DHH children with mental health problems. To date, more urgent cases requiring specialist attention have been seen by a specialist psychiatrist from the UK who has been funded through charities such as Chime and the Cork Deaf Association (National Advisory Group on Specialist Services for Deaf Children, 2017), though this approach is *ad hoc* and unsustainable.

Literature Review

Setting the Scene: Socio-Emotional Development in DHH Children

Socio-emotional development is central to academic and personal development (Woolfolk et al., 2007). Given that the presence of deafness has implications for spoken language development, social engagement, thought processes, learning ability and quality of life (Brown & Cornes, 2015), it is unsurprising that there is interest in the socio-emotional development of DHH children. Internationally, studies overwhelmingly indicate that DHH children demonstrate higher rates of socio-emotional difficulties than their Typical Hearing (TH) peers (Dammeyer, 2010; Fellingner et al., 2012; Hintermair, 2007; Laugen et al., 2016; Stefanis et al., 2006; Stevenson et al., 2015; Theunissen, Rieffe, Kouwenberg, et al., 2014; Theunissen, Rieffe, Netten, et al., 2014). Furthermore, socio-emotional problems have a greater impact on home life, classroom learning, and the ability to get along with others for DHH students than for their TH peers with these difficulties (Mekonnen et al., 2015). Because of these far reaching consequences, it is imperative to measure and understand the socio-emotional outcomes of DHH children in any population. Unfortunately, we have little to no evidence in the Republic of Ireland on this phenomenon.

It is important at the outset to stress that deafness in and of itself is not the cause of socio-emotional difficulties. Rather, a host of factors leave DHH children more vulnerable to these problems. These include, but are not limited to delayed identification of their deafness; delayed appropriate intervention; lack of access to language and subsequent language delay; stigma towards deafness and the stressors associated with that, and so forth. As Van Gent et al (2007, p.956) summarise, “[i]t is not deafness per se that contributes to psychiatric problems ... but that additional factors, such as communication problems, physical health problems, adverse living conditions and other factors may increase the risk of psychiatric disorders in this population”.

While the research is almost unanimous that rates for socio-emotional difficulties are higher in DHH children (Cornes & Brown, 2012; Fellingner et al., 2008; Gryglewicz et al., 2017; Hintermair, 2007; Hogan et al., 2011; Laugen et al., 2016; Mekonnen et al., 2015; Netten et al., 2015), there has been no consensus on the exact prevalence rates of these difficulties. The rate of psychiatric disorders amongst DHH children has been approximated from 1.5 times that of a similar TH sample (Hindley et al., 1994) to between 2 and 4 times (Kentish & Mance, 2009). Brown and Cornes (2015) found that 39% of their sample of 89 DHH youth in Australia had scores indicating problems, compared with 14% of their TH peers, a rate of 2.8 times. Fellingner et al (2008) found that 35.9% of their sample of 99 DHH children in Austria had problem scores (i.e. 'borderline' or 'abnormal' on the scale used). For Hintermair (2007), their study of 213 children in Germany yielded a prevalence rate of 36% and for Dammeyer's (2010) sample of 334 children in Denmark, the rate was 37%. While others have found rates over 70% (Vostanis et al., 1997), in general, studies had a prevalence rate ranging from 20%-50% (Dammeyer, 2010). Furthermore, many studies using the Strengths and Difficulties Questionnaire (SDQ) (as was used in this study) have rates between 35% and 40% (Dammeyer, 2010; Fellingner et al., 2008; Hintermair, 2007).

Notwithstanding the trend identified above, a number of studies have had more promising results. Maes and Grietens (2004) found no more difficulties than TH children. Likewise, Mejstad et al. (2008) did not find a statistically significant difference between the total difficulties scores (TDS) from the SDQ of Swedish male DHH participants and normative SDQ scores from Norway or Finland. The authors observed that Sweden provides a high level of early support to families of DHH individuals, a support that may help explain some of the variance. Furthermore, female DHH participants demonstrated a statistically significant lower TDS (i.e. fewer problems) than TH peers. This is reflective of findings from an earlier Finnish study (Sinkkonen 1994) which saw that there was no significant difference in psychiatric disorders between DHH children and a control group of their TH peers. He notes that all of the mothers in their study and most of the fathers had proficiency in sign language, thus facilitating communication with their DHH children. Anmyr et al. (2012) noted no statistically significant deviation from the norm for TDS scores on the SDQ for 22 DHH participants with cochlear implants (CI's). It is interesting, however, that the DHH participants in this study rated themselves with more difficulties than their parents and teachers on emotional and conduct scales,

and a quarter of participants had results that were classified as being in the borderline or abnormal range¹. It is also worth noting that this study held a gender imbalance (15 girls, 7 boys), and did not include any participants with additional disabilities – both boys and those with additional disabilities have been shown to have poorer outcomes in this domain.

More fine-tuned analysis can reveal the particular domains in which DHH children tend to struggle. While individual studies show varied results for performance on the subscales of the SDQ, they generally indicate that DHH children have more difficulties than their TH peers across all four problem domains measured on that scale: emotional, conduct, hyperactivity and peer problems (Fellinger et al., 2008; Hintermair, 2007; Laugen et al., 2016). In their meta-review, Stevenson et al. (2015) identified peer problems as the area which reflected the greatest level of social difficulties for DHH students. Emotional regulation is important for making and maintaining friendships, and for constructive conflict resolution during adolescence (Rieffe et al., 2018; Terlektsi et al., 2020). Hintermair (2007) noted that, unlike the control group of TH children, emotional problems and peer problems for DHH adolescents have a positive correlation with age, with older children having higher TDSs (i.e. more difficulties). Peer problems, as measured through the SDQ, has also been shown to explain variance in suicide attempts among samples of DHH youths, with each one-point increase on the SDQ peer problem subscale, there was a 58% increase in odds of making a lifetime suicide attempt (Gryglewicz et al., 2017).

Factors that might influence the socio-emotional development of DHH children

A number of key variables have been found to influence socio-emotional outcomes for DHH students. These are summarised in brief below.

Child-related factors

Mixed results have been found for the influence of **gender** on the socio-emotional development of DHH children but there is a trend showing DHH boys to have higher levels of socio-emotional difficulties than their female peers (Dammeyer, 2010; Laugen et al., 2016; Mejstad et al., 2008; Polat, 2003; Rieffe et al., 2018). Perhaps surprisingly, the majority of studies show that **level of deafness** does not correlate with socio-emotional difficulties (Hindley et al., 1994; Hintermair, 2011; Terlektsi et al., 2020; Theunissen, Rieffe, Kouwenberg, et al., 2014; Wong et al., 2020). However, within a large-scale study of 1,097 students attending mainstream schools in Turkey, higher levels of deafness were related to the poorer adjustment of DHH students (Polat, 2003). Furthermore, although Wong et al. (2020) did not note level of deafness as significantly associated with emotional and behavioural difficulties of DHH children, it was found that DHH children with poorer levels of *functional auditory behaviour* had higher levels of emotional and behavioural difficulties (Wong et al., 2020). Thus, attention may need to be given to levels of functioning (assisted) hearing rather than levels of auditory deafness when drawing conclusions about the role of this factor.

Age of onset, identification and intervention have mixed relationships with later socio-emotional outcomes. It is thought that later-onset deafness may influence socio-emotional wellbeing as individuals mourn their loss of hearing (Luey et al., 1995). Indeed, several studies have identified that post-lingual DHH individuals present with higher levels of socio-emotional difficulties than pre-lingual DHH individuals (Polat, 2003; Theunissen, Rieffe, Netten, et al., 2014). Furthermore, late diagnosis of deafness has been associated with lower levels of parental acceptance, a factor that has been thought to impact the socio-emotional development of DHH children (Kentish & Mance, 2009). Theunissen, Rieffe, Netten, et al., (2014) also found that age at intervention was related to levels of psychopathy, highlighting the importance of targeted early intervention for DHH children (Calderon & Greenberg, 2003; Hintermair, 2013; Laugen et al., 2016).

¹ The language of 'normal', 'borderline' and 'abnormal' may be offensive to some readers of this report. This does not align with a socio-cultural model of Deafness. However, the language as used here has a very specific purpose in delineating categories of performance on validated scales. As such, 'normal', 'borderline' and 'abnormal' have specific quantifiable meanings. The language is maintained throughout this report since it is used internationally and consistency is required to allow readers to compare findings from this research against other published results.

Use of amplification devices also produces mixed results. Early cochlear implantation is associated with better socio-emotional outcomes (Anmyr et al., 2012; Kral & O'Donoghue, 2010). Furthermore, cochlear implants have been found to substantially improve socio-emotional wellbeing in post-lingual DHH individuals, and they are associated with improved speech perception and speech production amongst this population (Fellinger et al., 2012). On the contrary, other studies have found no impact from cochlear implants on rates of current or lifetime diagnoses of psychiatric disorder in DHH children (Fellinger et al., 2009), or socio-emotional wellbeing (Chapman & Dammeyer, 2017b; Dammeyer, 2010). Qualitative findings in this regard indicate that parents of DHH children with cochlear implants expressed concern about the development of social skills (Punch & Hyde, 2011). Punch and Hyde (2011) also observed that a third of cochlear implant wearers had difficulties forming friendships with TH peers, and did not have age appropriate social skills (Punch & Hyde, 2011). With cochlear implants, it must be remembered that, although they provide the physiological stimulation required to hear speech sounds (Kral & O'Donoghue, 2010; Theunissen, Rieffe, Kouwenberg, et al., 2014), factors such as background noise impact on their effectiveness in any given situation (Kral & O'Donoghue, 2010; Punch & Hyde, 2011) and the overall outcomes among child candidates of implantation is varied.

Likewise, mixed results have been found for the relationship between hearing aid use and socio-emotional development. Children that used conventional hearing aids were found to display higher levels of reactive aggression, proactive aggression, and clinical definitions of delinquency as opposed to DHH peers with cochlear implants (Theunissen, Rieffe, Kouwenberg, et al., 2014). Interestingly, language ability was noted by teachers to be a statistically significant predictor of emotional and behavioural difficulties amongst hearing aid users, however, the same relationship did not hold true for cochlear implant users (Wong et al., 2020). Using the SDQ, Michael et al. (2019) found a slightly higher correlation between increased TDSs (i.e. more difficulties) and having a hearing aid rather than a cochlear implant. Elsewhere, the use of hearing aids was found to positively relate to psychosocial wellbeing (Polat, 2003). Subsequently, the relationship between amplification devices and socio-emotional outcomes is unclear and may be confounded by other variables such as language skills and age and level of intervention.

Chapman and Dammeyer (2017b) found that **identity** contributed to explaining variance of psychological wellbeing. Positive perceptions of self-esteem have been noted as a protective factor for socio-emotional wellbeing amongst DHH individuals (Cagulada & Koller, 2019; Kentish & Mance, 2009). When deafness is perceived as a disability, emotional and behavioural difficulties can appear par for the course (Kentish & Mance, 2009). By contrast, it has been found that identifying as culturally Deaf may positively influence socio-emotional development (Chapman & Dammeyer, 2017b; Kentish & Mance, 2009). Chapman and Dammeyer (2017b) investigated the influence of Deaf identity on psychological wellbeing, and found that both culturally Deaf participants, and marginal identity groups reported high levels of feeling discriminated against. However, feelings of discrimination only negatively influenced wellbeing for the marginal identity group (Chapman & Dammeyer, 2017b). It must also be considered that feeling excluded from the Deaf community may also have a negative influence on wellbeing (Kentish & Mance, 2009).

The relationship between socio-emotional outcomes and **presence of an additional disability** (other than deafness) is more clear cut. Deafness is often coupled with an additional disability and/or learning need (Bottcher & Dammeyer, 2013). Almost 30% of DHH individuals present with an additional disability (Fortnum et al., 2002), and it is estimated that DHH children present with additional disabilities approximately three times more than their TH peers (Kentish & Mance, 2009). DHH children with additional disabilities have been found to display increased difficulties with socio-emotional development (Dammeyer, 2010; Hintermair, 2007; Polat, 2003; Theunissen, Rieffe, Netten, et al., 2014; Wong et al., 2020) and poorer psychological wellbeing scores (Chapman & Dammeyer, 2017b). Dammeyer (2010) observed that additional disabilities influenced both signing and oral language abilities, which has a related knock-on impact on socio-emotional development. Students with significant cognitive disabilities and deafness are more likely to have complex profiles of sensory needs than their TH peers (Erickson & Quick, 2017); for example, they are four times more likely to have a dual diagnosis of a visual impairment. As DHH children rely heavily on the interpretation of visual stimuli, any disruption to cognition is likely to have an impact on their overall development (Kentish & Mance, 2009).

The results are also clearer around **communicative competence or language ability**. 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 deafness. 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 & Dammeyer, 2013; Dammeyer, 2010; Hintermair, 2007; Hogan et al., 2011; Polat, 2003; Theunissen, Rieffe, Kouwenberg, et al., 2014; Theunissen, Rieffe, Netten, et al., 2014; Torres et al., 2016; Wong et al., 2020). Many DHH children experience difficulties communicating, initiating conversation, and maintaining interactions with TH peers (Cagulada & Koller, 2019; Nunes et al., 2001; Xie et al., 2014). The importance of communicative competence as a variable in the socio-emotional development of the DHH individual is again underlined by the findings that being teased was related to parent's perception of a child's ability to make themselves understood (Fellinger et al., 2009), and that DHH adolescents found that difficulty being understood was a barrier to making new friends (Terleksi et al., 2020). Interestingly however, Xie, et al. (2014) found that DHH children with age-appropriate communication skills continued to experience exclusion from peer interactions. This indicates that communicative competence is not the only barrier to social inclusion faced by DHH children. In a mainstream setting in London, a mixed-method study found that, although DHH students were not disliked more than their TH peers, they were more likely to be neglected by their peers and less likely to have a friend in the classroom (Nunes et al., 2001).

Amongst the DHH population, lower levels of communicative competence have been related to increased incidences of proactive aggression, psychopathy, ADHD, Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD) (Theunissen, Rieffe, Kouwenberg, et al., 2014), though the same correlation is not evident amongst TH individuals (Theunissen, Rieffe, Kouwenberg, et al., 2014). Polat (2003) found that speech intelligibility was positively associated with psychosocial adjustment, Hogan et al. (2011) found that poorer receptive language skills were predictive of TDSs, and suggest that DHH children may not be poorly socially adjusted as a result of an inherent mental health difficulty, but rather that they do not understand what is required of them socially. On the other hand, Laugen, et al. (2016) did not find a relationship between receptive language ability and psychosocial difficulties.

Regarding use of sign language, mixed results have been found for the relationship between sign language and psychopathy in their meta-review of literature (Theunissen, Rieffe, Netten, et al., 2014). Further supporting the correlation between communicative competence and socio-emotional development, Fellinger et al. (2009) found that a lifetime diagnosis of a psychiatric disorder was related to the parent's perception of the DHH child's ability to make themselves understood in the family. At this point, it is important to note the finding of Dammeyer (2010), whereby DHH participants that had adequate communication skills demonstrated no psychosocial differences from their TH peers, regardless of modality of communication (signed or spoken).

Environmental Factors

A number of **family factors** can have a bearing on later socio-emotional outcomes. For instance, there appear to be differences in socio-emotional outcomes between DHH children with DHH parents and those with hearing parents (Kentish & Mance, 2009; Polat, 2003). This could be related to the better language and communication skills of children with DHH parents (Kentish & Mance, 2009; Theunissen, Rieffe, Netten, et al., 2014). It has also been found that DHH children of DHH parents are better adjusted than DHH children of TH parents (Polat, 2003), potentially because DHH parents are better positioned to foster the acceptance and self-esteem of the DHH child (Kentish & Mance, 2009).

Although supportive familial relationships can help DHH children to navigate the demands of hearing loss (Cagulada & Koller, 2019; Kentish & Mance, 2009), there also appears to be a trend whereby some DHH individuals are overprotected by parents, limiting chances to develop independence and socio-emotional awareness (Mathews, 2015). In Ireland for example, parents of DHH adults have cited communication difficulties as a barrier to teaching life skills at home (Mathews, 2015). Several of these parents expressed that they continue to complete many daily living tasks for their adult children, including cooking, shopping, arranging social outings, and managing money. These actions contribute towards the development of learned helplessness within this population (Mathews, 2015). Communication barriers may also influence parenting styles and studies have noted that DHH children are more likely to be physically disciplined by parents (Koester & Meadow-Orlans, 1990; Knutson et al., 2004). The use of physical discipline, or physical removal from a situation, may be employed if parents do not feel capable of communicating clearly with their DHH child (Koester & Meadow-Orlans, 1990). However, this form of discipline does not facilitate children to learn exactly what about their behaviour was wrong, thus hindering the socio-emotional development of the child (Koester & Meadow-Orlans, 1990).

We saw earlier that communicative competence and language skills can have a bearing on peer relationships. In turn, **peer relationships** can have a protective influence on socio-emotional development. This is particularly the case during adolescence, which may be particularly difficult for DHH teens (Terlektsi et al., 2020), when issues pertaining to uncertainty of identity and reduced self-esteem come to fore (Cambra, 2005; Kral & O'Donoghue, 2010). If DHH adolescents feel that they are accepted and liked by their peers, they will develop positive feelings and self-esteem (Cambra, 2005). Peer support has also been associated with less victimization amongst DHH and TH students (Pinquart & Pfeiffer, 2015). For this reason, forming and maintaining friendships is crucial during this period of development (Rieffe et al., 2018). It is positive to note, therefore, that the majority of DHH adolescents in a recent qualitative study experienced positive relationships with their peers and friends (Terlektsi et al., 2020). This study used semi-structured interviews to investigate peer problems and their causes amongst a sample of 30 DHH adolescents with moderate to profound hearing loss, that were attending a variety of educational settings. Although Terlektsi, et al. (2020) observed many positive experiences amongst the dataset, 72% of participants also reported some negative experiences within their friendships (e.g. conflict, losing contact with friends). Of greatest concern was the finding that 77% of the participants recalled being bullied in primary school, with those who attended mainstream primary schools feeling that the bullying ended when they transitioned from their mainstream primary schools to specialist DHH settings.

School setting does not appear to solve the issue of bullying in all circumstances. In a German study of 181 DHH attending Schools for the Deaf, only between 2% (deaf students) and 10% (hard of hearing students) reported that they had never experienced bullying (Pinquart & Pfeiffer, 2015). This study also found that DHH students tended to report higher levels of victimization than TH peers, and noted a statistically significant relationship between TDSs and the experience of being bullied. With regards perpetrating the bullying, no difference was found between DHH and TH peers (Pinquart & Pfeiffer, 2015).

Mixed results have been found for the relationship between socio-emotional development and specialist educational settings. Research has identified that students in DHH specific settings display higher psychopathy scores than their DHH peers in mainstream schools are at greater risk of depression and delinquency (Theunissen, Rieffe, Netten, et al., 2014), and demonstrate lower awareness of their own emotions for emotional regulation (Rieffe et al., 2018). This cohort demonstrates more conduct problems and lower prosocial skills (Mejstad et al., 2008), and shows lower levels of social adjustment than their TH

peers (Musselman et al., 1996). Theunissen et al. (2014) also found that students attending specialised settings that use hearing aids as opposed to cochlear implants are at particular risk of psychopathy. In contradiction to these findings however, Polat (2003) found that segregated residential DHH school settings were positively correlated with overall adjustment, social adjustment, and self-image. It is possible to relate Polat's (2003) finding to the discourse around Deaf identity, and its protective role in supporting the socio-emotional wellbeing. It could thus be argued, that attendance at a School for the Deaf and the development of sign language ability could support feelings of inclusion amongst the Deaf community for some DHH children (Chapman & Dammeyer, 2017a), though the findings on the influence of school setting overall are mixed.

With regards mainstream placements, socio-emotional outcomes vary. Although inclusion debates often centre on academic gains, the inclusion of DHH students into mainstream settings should also be measured in terms of the socio-emotional development of the DHH child (Nunes et al., 2001). On the positive side, mainstream DHH students feel positive about school (Kent, 2003), show better social adjustment (Hintermair, 2011; Wolters et al., 2011), demonstrate better emotion-awareness and emotion-regulation (Rieffe et al., 2018), and relate school and social activities with peers to improved quality of life (Hintermair, 2011). On the other hand, DHH students are less popular and less accepted than their TH peers (Wolters et al., 2011) and experience higher rates of loneliness (Kent, 2003). Kent (2003) found that loneliness and bullying was particularly prevalent amongst DHH children that self-identified as being deaf. Some studies show that parents feel that the drive towards inclusion has not succeeded in changing negative societal stigma and lack of understanding towards DHH children (Cagulada & Koller, 2019). Indeed, Mathews (2017) observes that the communication and cultural gaps between DHH and their TH peers are difficult to overcome, when it is considered that the mainstream school is oriented towards speaking and listening. Given the central role that school-life plays in the development of friendships (Rieffe et al., 2018; Terlektsi et al., 2020), it is important that schools take proactive steps to ensure that these gaps are bridged (Nunes et al., 2001). Particularly, as Xie, et al. (2014) remind us, that we cannot assume that interaction will naturally occur between DHH children and their TH peers.

When considering educational setting as a variable influencing the socio-emotional development of the DHH child, it is imperative that we remember that students who have more profound levels of hearing loss, who have struggled in mainstream settings (Mathews, 2017), and who have additional disabilities may be more likely to attend specialist educational settings (Erickson & Quick, 2017; Hintermair, 2013; Mathews, 2017; Rieffe et al., 2018). For example, Erickson and Quick (2017) found that all participants that had significant cognitive disabilities were educated in separate special educational settings and Hintermair (2013) found that participants that presented with cognitive delays or ADHD attended Schools for the Deaf. It is also possible that the nature of the specialist placement influences the socio-emotional development, as students are exposed to a limited range of social experiences within these settings (Musselman et al., 1996). However, educational setting has not been related to current or lifetime diagnostic rates of psychiatric disorder (Fellinger et al., 2009). Overall therefore, caution is needed when interpreting relationships between school placement and outcomes since the direction of the relationship can be difficult to establish e.g. outcomes may be the cause, and not the result, of the placement (whereby children who have struggled in mainstream schools are moved to specialist settings).

Discrimination is an issue faced by many DHH individuals, with parents of DHH children citing lack of understanding and stigma as a factor influencing socio-emotional wellbeing of their DHH children (Cagulada & Koller, 2019). It has been noted that DHH individuals may negatively perceive the wearing of hearing aids and cochlear implants due to self-esteem issues (Kentish & Mance, 2009; Punch & Hyde, 2011), with the physical appearance of the hearing aid cited as making DHH adolescents feel different (Terlektsi et al., 2020). It has also been noted that TH peers may react negatively towards DHH students wearing hearing aids (Pinquart & Pfeiffer, 2015). Similarly, access to services such as a visiting teacher to the school can contribute to feelings of otherness amongst DHH adolescents (Punch & Hyde, 2011). Such negative reactions and othering of DHH children point to a general stigmatising of deafness in our society. This can have a profound and lasting impression on DHH children. As one participant noted while reflecting on their school days, "I was uncomfortable and afraid of meeting other deaf people because they were like me, and I guess I didn't want to be deaf...It was like looking in a mirror. Being with them would be admitting I was deaf too, and deaf people were viewed as flawed in the hearing world where I lived." (Oliva, 2004, p. 70/71).

Research Factors

It appears that there is a **respondent influence** on assessment of socio-emotional difficulties (Fellinger et al., 2009; Hintermair, 2007; Stevenson et al., 2015; Theunissen, Rieffe, Netten, et al., 2014). In a meta-review of literature pertaining to the socio-emotional development of DHH children and adolescents, Stevenson et al. (2015) noted that parents tend to report higher levels of emotional difficulties, while teachers report higher levels of conduct problems; teacher responses were also found to yield higher effect sizes. Antia et al. (2011) found that students tended to score their social skills in a more positive light than their teachers. Similarly, Cornes and Brown (2012) found that DHH children under-estimated clinically significant mental health problems. Amongst parents, mothers have been found to note higher levels of emotional difficulties, while fathers tend to log higher levels of externalised behaviours, such as hyperactivity (Hintermair, 2007). Date of study is also noteworthy, as participants in more recent studies may have benefited from participation in improved neo-natal screening routines (Stevenson et al., 2015). In the Irish context, this would have effect for children born since April 2011, when the first phase of the improved new-born hearing screening programme began (O'Connor et al., 2013).

The Role of Early Intervention

Given that we know DHH children are more vulnerable to socio-emotional difficulties, it is important to consider the potential benefits of early intervention programmes in ameliorating these problems. The benefits of early intervention to DHH children has been well-documented, in particular as it relates to language outcomes (Yoshinaga-Itano et al., 1998). Some early intervention services are broad in scope, such as the provision of a visiting teacher upon identification of infant deafness through universal screening. However, targeted early intervention might be needed to address socio-emotional difficulties. Such interventions should be appropriate to the child's developmental levels and may need to be adapted to include, for example, more visual elements (Hindley, 2005). Furthermore, they should focus on assessment and aim to address any language deficits the child has (Landsberger et al., 2014). Targeted intervention programmes should, where at all possible, adhere to the goals set out in the Principles and Guidelines for Early Intervention (Muse et al., 2013). While these guidelines are developed for services based in the United States, they set out appropriate goals to maximise the developmental well-being of children who are DHH.

Conclusion

Being DHH does not automatically equate to socio-emotional difficulties. However, research has shown that a number of variables leaves this population at an increased risk in this domain. Prevalence rates of difficulties in this domain for DHH people tend to range between 20-50%. A critical evaluation of factors influencing socio-emotional development indicates that gender, communicative competence, presence of additional disabilities, and early intervention influence the socio-emotional development of DHH. Research on a range of other factors has varied results. Although much has been written on the socio-emotional development of the DHH child, there has yet to be published a study within the Irish context. The above review of literature in this field indicates that a study within the Irish context is timely.

Research Methodology

Research Design

This is a quantitative study, capturing data using the same structured data-collection tool from a large sample of participants. There are limitations to quantitative research design, in particular the fact that in-depth responses cannot be collected in the way they might be collected using a qualitative method, for example interviews (Mertens, 2010). As a result, while we will have valuable data to report on socio-emotional development of DHH children, we are not in a position to delve into how this impacts on family and school life. Nor have we collected the views of children themselves in this study. However, since there is no data yet available on this topic in the Irish context, a large scale quantitative study was warranted to identify issues that might be further investigated by means of a qualitative approach.

Data Collection Instrument

The data for this study was collected using an online questionnaire, administered through the Survey Monkey platform. Two questionnaires were designed, the parent questionnaire and the teacher questionnaire. This report focuses on findings from the former. Data was collected first via the parent questionnaire. If parents provided consent to contact their child's school, teachers were then recruited to the study and asked to complete a similar questionnaire. Each questionnaire contained a plain language statement, clearly outlining to participants the purpose of the study, a range of questions gathering background information from participants, as well as a number of established scales. The instrument was piloted by a parent and a teacher familiar with deaf education. Following their reviews, a number of amendments, deletions and additions were made to strengthen the questionnaire. Both also provided an estimate of the time required to complete the questionnaire for the informed consent process. The study was approved by the Research Ethics Committee at Dublin City University. All participants indicated their consent to take part.

The Strengths and Difficulties Questionnaire (SDQ)

Socio-emotional development was measured in this study using the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 2005). The SDQ is a questionnaire consisting of 25 items comprising five scales. Questionnaires designed for parent- and teacher-completion were used in this study. The SDQ has five subscales and these are listed below. The first four of these are designed to capture difficulties with the final subscale focusing on strengths:

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

The maximum score for each subscale is 10. A TDS is calculated using the first four of these subscales, giving a maximum TDS of 40 – higher scores equate with more difficulties. The scoring guide for the SDQ provides cut points for categorising the TDS into one of three qualitative categories: normal, borderline or abnormal. Both borderline and abnormal scores are clinically significant. Several studies have used the SDQ as a measure of socio-emotional development amongst DHH children (Anmyr et al., 2012; Fellingner et al., 2009; Hintermair, 2007, 2013; Hogan et al., 2011; Laugen et al., 2016; Mejstad et al., 2008; Pinquart & Pfeiffer, 2015; Terlektsi et al., 2020). It has been established as a reliable measure with this population (Niclasen &

Dammeyer, 2016) and since it was used in the GUI study, a large comparison cohort that is representative of the population of children in Ireland is available. 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 (>0.7) (see Appendix 1).

Recruitment of Participants

A range of methods was used to recruit participants to this study. The study was broadly advertised through schools and health/social services for DHH children, via email lists of professionals working with DHH children, and through social media to reach parent-participants. Teachers were then recruited to the study directly via the contact details that parents provided if they gave consent for their child's school to be involved. Subsequently, teachers were only recruited to the study if parents had already completed the questionnaire and given their consent to contact the school.

Study Sample

Data was collected on children aged 4-17 inclusive with all types of deafness from mild through to profound, from all communication backgrounds in all school placement types, and from those with additional needs and none, across the Republic of Ireland. While 223 parents engaged with the survey, a considerable number of questionnaires were eliminated because they were incomplete or because they were duplicates, or because the child was outside the age range for the study. A total of 113 valid questionnaires were included in the final analysis.

Data 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.

Data from this study were compared against data from the Growing Up in Ireland (GUI) study (Thornton et al., 2010). The GUI is a national longitudinal study. There are two distinct cohorts in the study, the infant cohort and the child cohort, but for the purposes of analysis with the DHH cohort in this study, only the child cohort is used. Data was requested and provided from the Irish Social Science Data Archive at University College Dublin for the child cohort, also known as Cohort '98. Cohort '98 has had data published from three waves of collection: age 9, 13 and 17/18. The same children are represented across the three waves. These ages allow the most comparison with the current study since they fall within the range of the SDQ. The SDQ was used at all three waves. The sample sizes across the three waves are $n=8568$, $n=7525$ and $n=6216$ respectively. These large samples are representative of the population of children in Ireland. As such, they contain a proportion of children who are DHH. For the purposes of analysis in this report, the entire samples from the GUI datasets were used, rather than excluding the DHH participants from those samples. All analysis of the GUI data presented in this report is done with the weighting variable applied.

Results

About the parents and children in this study

In the majority of cases (92%), the questionnaire was completed by the child's mother, with the remaining 8% from fathers of the children. There is a wide geographic spread of respondents with 23 out of the 26 counties in the Republic of Ireland represented. Just over a quarter of the respondents were based in Dublin, with a further 25% from Cork and Kerry combined. The remainder came from the other 20 counties. There are no returns from counties Leitrim, Sligo or Westmeath. 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 are presented in Figure 1 below, indicating a highly educated respondent cohort, with 45% of parents holding either an honours undergraduate degree or a postgraduate degree.

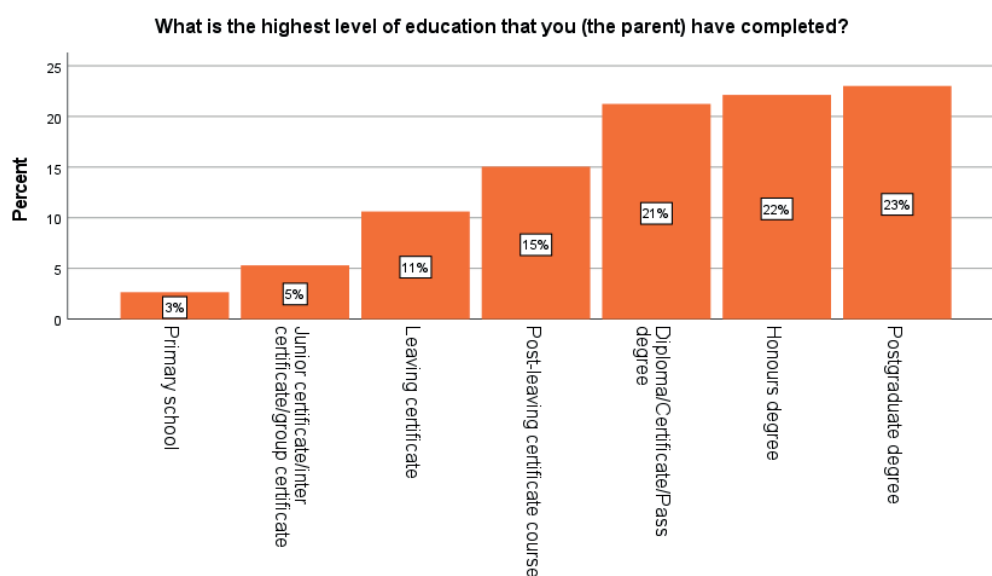


Figure 1: Highest level of education obtained by parents responding to the questionnaire.

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 ISL in the home, 5 used Gaeilge (Irish), 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.

Children aged from 4-7 (inclusive) are represented in the study. The average age of the study children was 10 years. The distribution of ages of children in the study in Figure 2 below demonstrates that while children across the range of ages are represented in the data, there was a concentration of children in the primary school age group. Fifty-two percent of the children were male and 48% female. Most (67%) were enrolled in mainstream primary or post-primary schools (including Gaelscoileanna) 21% were in Schools for the Deaf or classes for DHH children attached to mainstream schools with a further 4% in special schools or special classes (not for DHH children). The remaining 8% were in preschool or had not yet started school.

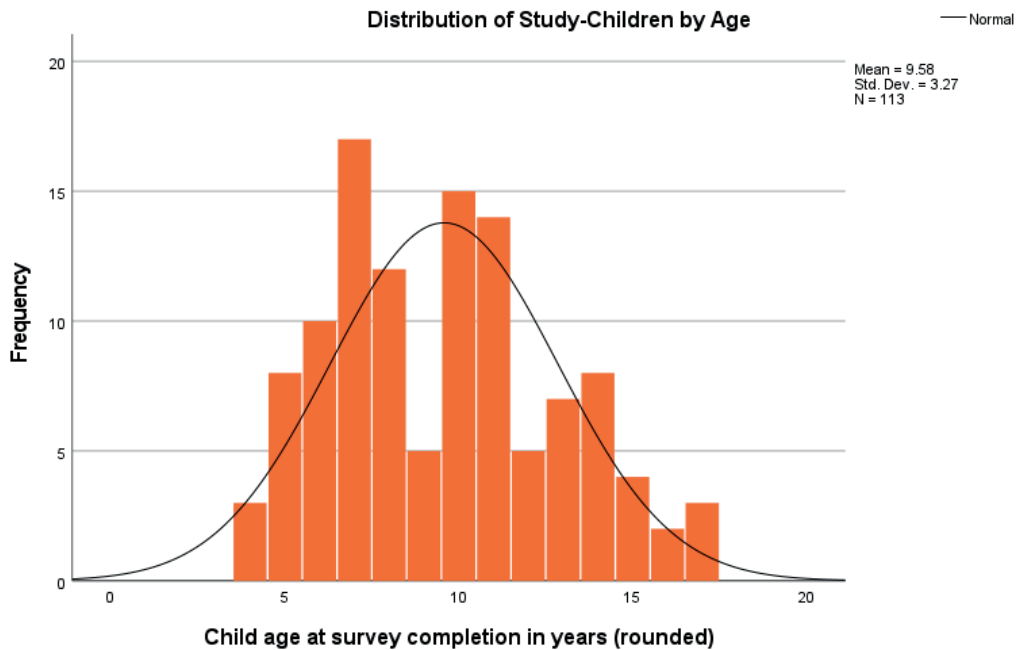


Figure 2: Distribution of study children by age.

In terms of levels of deafness reported by parents, 34% of the children were profoundly deaf, 19% severely deaf, 37% moderately deaf, and 10% had a mild deafness. Most (89%) of the children had bilateral deafness and most (62%) were born deaf. Fifty percent of the children used hearing aids, 5% used BAHAs or a bone conduction hearing aid, 11% used one cochlear implant (often with a hearing aid on the other ear) with a further 23% using bilateral implants, and 11% were reported as not routinely using any amplification.

There were 40% or 45 of the children noted to have additional needs, yet in an open question parents made a total of 56 mentions of different needs, demonstrating that there are often overlapping and multiple issues at play, making categorisation of children according to type of additional need difficult. The following is a list of the additional needs mentioned, including a tally in brackets of how many parents noted their child to be identified with them: Autism Spectrum Disorder (ASD) (4), Attention Deficit Hyperactivity Disorder (ADHD) (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), and others. A further eight parents mentioned that their child had been identified with speech and language delay, likely associated with deafness and delayed identification of same. A further nine parents noted that they were still involved in the assessment process - they are not included in the 40% mentioned above.

In addition to these children with identified additional needs, 14% of the children in the study have received mental health services or supports with a further 5% on the waiting lists for such services. Parents had the opportunity to elaborate on the additional mental health needs of their child has and the support being provided. Many mentioned referral to and support from CAMHS, Jigsaw, Pieta House or local counselling services. To put this in context, 1.6% of the general population of children under the age of eighteen in Ireland were accessing multi-disciplinary services CAMHS (Health Service Executive, 2019). This would indicate that there is a significant demand for mental health supports for DHH children.

As a measure of the communication and language abilities of the children, parents were asked to rate their child's listening on an auditory performance rating scale called the Categories of Auditory Performance (CAP) and their speech on a Speech Intelligibility Rating Scale (SIRS). Analysing the results revealed that approximately three quarters of the children were competent listeners without lipreading and could use speech that was at least intelligible to those with little experience with deaf people's speech. Forty-five percent of parents (51 families) reported that their child has used sign language to communicate

at some point in their lives, though not all continue to do so. However, of the total number of families where children have used sign language, only 15% (7 families) reported that their child uses sign language fluently, as measured on the Sign Language Production Scale and the Sign Language Understanding Scale. Subsequently, those children who use spoken language for communication in this study do so with greater communicative competency than do those who use sign language to communicate.

Socio-Emotional Development: Results of the SDQ

One hundred and thirteen parents completed the SDQ in full for their child. The total difficulties score (TDS) is calculated by adding the first four subscales (excluding the fifth pro-social scale which is a positive measure). TDSs can range from 0-40 with higher numbers indicating greater levels of difficulty. A score of 0-13 is considered normal, 14-16 is borderline, and 17-40 is abnormal. Scores over 20 are considered ‘very high’. A cut-off score of 14 and above has been used elsewhere (Dammeyer, 2010) to calculate prevalence of difficulties among the sample. That cut-off score is used here.

Table 1 Descriptive Statistics for TDS for the sample

Description	Statistic
Sample size	113
Mean TDS	11.89
Standard deviation	8.00
Range	32

As outlined in Table 1 above, the mean (average) parent-reported TDS of the sample of 113 children was 11.89 indicating that, on average, children in the study were within (though at the upper level of) the normal range. However, there were some indications that this population has greater levels of difficulty than their typical hearing (TH) peers. There was a large standard deviation (SD=8) and range in the sample (scores from 0-32) demonstrating that there was considerable variation in scores from child to child. 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 2 below:

Table 2: Distribution of Normal, Borderline and Abnormal Total Difficulty Scores in the SDQ

Category	% of children in the sample (parent-ratings)	Number of children
Normal	58%	66
Borderline	14%	16
Abnormal	28%	31

Both borderline and abnormal scores are clinically significant. Using the cut-off score of 14, the prevalence rate of difficulties among the DHH children in the current study is 42% (Table 2). For those children in the abnormal category, just under half (13% of the total) are deemed to have ‘very high’ scores. Indeed, if we look just at the population of children with abnormal scores (31 children), the mean score is 22 (the cut off point for a very high score is 20) indicating that, on average, those in the abnormal score category have very high scores.

Comparing with national data

Since the SDQ was used in the longitudinal study, Growing Up in Ireland (GUI) (Thornton, et al., 2010), it is possible to compare the TDS of this cohort with results from that study. A comparison of the parent-reported TDS from the current study and the parent-reported TDS from GUI Cohort '98 is presented in Table 3 below. It is evident from Table 3 and Figure 3 below that, while the mean TDS score for the current study is still within the normal range, it is considerably higher than the means obtained from any of the three waves of the GUI study. These differences between the DHH cohort and Cohort '98 are statistically significant for wave 1 $t(113.294) = 5.134, p = <0.001$; wave 2 $t(113.517) = 6.308, p = <0.001$; and wave 3 $t(113.660) = 6.531, p = <0.001$. Medium to large effect sizes were seen for all three: wave 1 $g=0.73, 95\% \text{ CI } [0.543-0.915]$, wave 2 $g=0.88, 95\% \text{ CI } [0.694-1.066]$, wave 3 $g=0.96, 95\% \text{ CI } [0.775-1.149]$. Furthermore, Table 3 demonstrates that the prevalence of socio-emotional difficulties among the DHH cohort is approximately 3.3 times that of the national sample, and approximately 5 times higher for those with very high scores².

Table 3: A comparison of the TDS of the DHH cohort against waves 1-3 of the GUI study.

	Mean TDS ³	Range TDS	SD TDS	Prevalence	Prevalence of very high scores
GUI Wave 1	7.98	37	5.31	15%	3%
GUI Wave 2	7.09	35	5.40	12%	3%
GUI Wave 3	6.92	33	5.09	11%	2%
DHH Sample	11.89	32	8.05	42%	13%

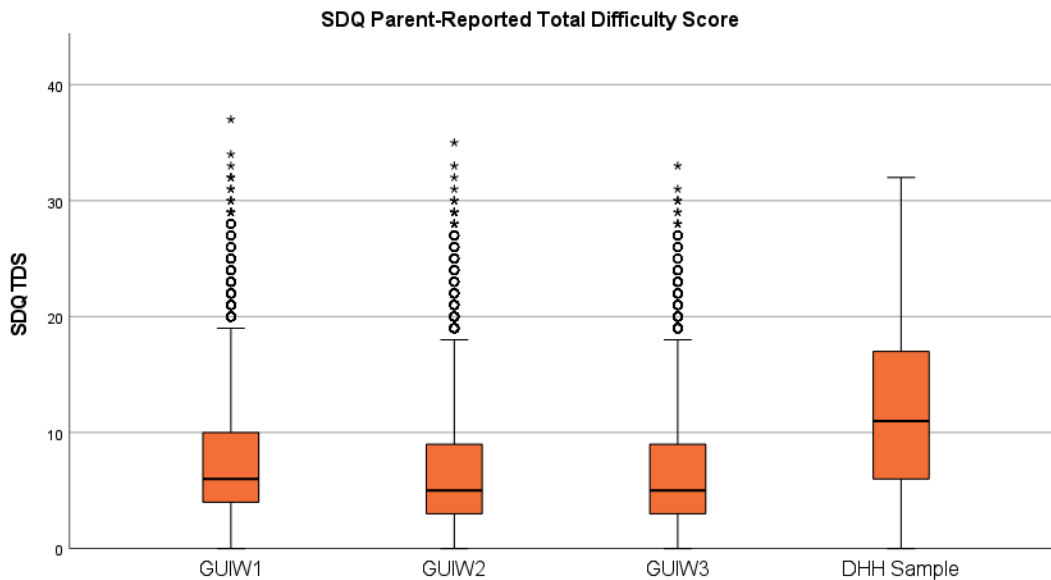


Figure 3 Boxplots comparing TDS from three waves of the GUI study with the DHH sample of the current study

- 2 Mean prevalence rates were calculated across waves 1-3 of the GUI.
- 3 The mean used for GUI Waves 1, 2, and 3 includes all children in that cohort. This may cause an underestimate of the differences between the DHH cohort and hearing children since the GUI study sample also contains children with disabilities, as well as a small number of children who are DHH.

Comparing with international studies

Dammeyer (2010) reports that prevalence rates of socio-emotional difficulties for this cohort, as determined by international literature, 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%. Several studies using the SDQ to calculate prevalence rates have found a rate of between 35-40% (Dammeyer, 2010; Fellingner et al., 2008; Hintermair, 2007). As such, the prevalence rate for the Irish sample of DHH children is in line with international findings, albeit at the upper end.

Subscale scores

The SDQ comprises 5 subscales. The first four of these are problem subscales where higher scores (up to 10) indicate problems and the fifth (the pro-social scale) is a positive measure with higher scores (up to 10) indicating social skills. The results from the four problem subscales and the pro-social subscale are reported in Table 4, comparing the results of the GUI Cohort '98 against the DHH cohort. Detail on each of the subscales is presented below.

Table 4: Subscale scores from the SDQ for the Deaf and Hard of Hearing Sample and the GUI '98 Cohort.

Mean subscale scores	Emotional Problems	Conduct Problems	Hyperactivity	Peer Problems	Prosocial Scale
GUI Wave 1 n=8518	2.14	1.37	3.22	1.25	8.88
GUI Wave 2 n=7523	1.90	1.23	2.82	1.14	8.81
GUI Wave 3 n=6154	2.02	1.04	2.43	1.43	8.68
DHH Sample 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 (Figure 4). This difference in the mean emotional subscale score is statistically significant for wave 1 $t(113.537) = 4.487$, $p < 0.001$; wave 2 $t(113.824) = 5.396$, $p < 0.001$; and wave 3 $t(114.477) = 4.950$, $p < 0.001$. Medium effect sizes were seen for all three: wave 1 $g=0.563$, 95% CI [0.377 - 0.749], wave 2 $g=0.689$, 95% CI [0.503-0.875], wave 3 $g=0.603$, 95% CI [0.416-0.789].

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 (Figure 5). This difference in the mean conduct problems score was approaching statistical significance for wave 1 $t(113.606) = 1.923$, $p = 0.057$; and was statistically significant for wave 2 $t(113.753) = 2.667$, $p = 0.009$; and wave 3 $t(113.740) = 3.631$, $p < 0.001$. Small to medium effect sizes were seen for all three: wave 1 $g=0.245$, 95% CI [0.060 - 0.431], wave 2 $g=0.347$, 95% CI [0.161-0.533], wave 3 $g=0.523$, 95% CI [0.337-0.709].

Hyperactivity

This study saw an elevated hyperactivity subscale mean score for DHH children, in some instances (waves 2 and 3) almost double that of the national data from the GUI (Figure 6). This difference in the mean hyperactivity score is statistically significant for wave 1 $t(114.039) = 3.594, p < 0.001$; wave 2 $t(114.272) = 5.017, p < 0.001$; and wave 3 $t(114.324) = -6.366, p < 0.001$. Small to medium effect sizes were seen for all three: wave 1 $g=0.409$ 95% CI [0.223 - 0.595], wave 2 $g=0.577$, 95% CI [0.391-0.762], wave 3 $g=0.799$ 95% CI [0.613-0.986].

Peer Problems

This study saw an elevated peer problems subscale mean score for DHH children, roughly double that of the national data from the GUI (Figure 7). This difference in the mean peer problems score is statistically significant for wave 1 $t(113.120) = 5.848, p < 0.001$; wave 2 $t(113.277) = 6.327, p < 0.001$; and wave 3 $t(113.538) = 5.074, p < 0.001$. Medium to large effect sizes were seen for all three: wave 1 $g=0.888$, 95% CI [0.702-1.074], wave 2 $g=0.959$, 95% CI [0.772-1.145], wave 3 $g=0.775$, 95% CI [0.600-0.973].

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 of the national data from the GUI study (Figure 8), but this difference was statistically significant for all three waves wave 1 $t(113.622) = -3.951, p < 0.001$; wave 2 $t(114.053) = -3.199, p = 0.002$; and wave 3 $t(114.907) = -2.538, p = 0.013$ albeit with small effect sizes across the board: wave 1 $g=-0.456$, 95% CI [-0.642- -0.271], wave 2 $g=-0.386$, 95% CI [-0.572 - -0.200], wave 3 $g=-0.286$, 95% CI [-0.472 - -0.100].

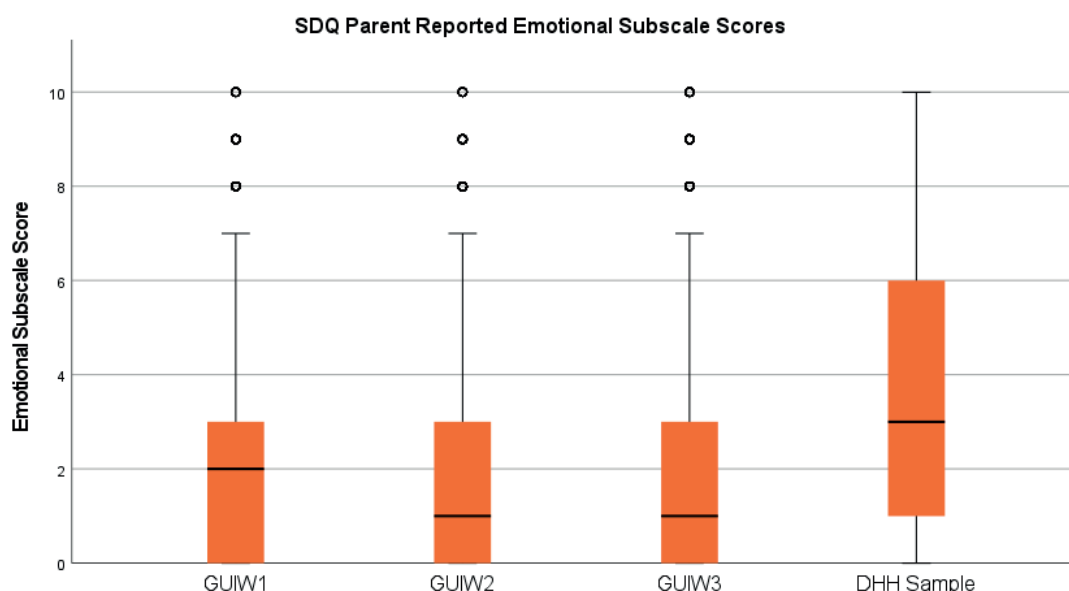


Figure 4 Boxplots comparing emotional subscale scores from three waves of the GUI study with the DHH sample of the current study

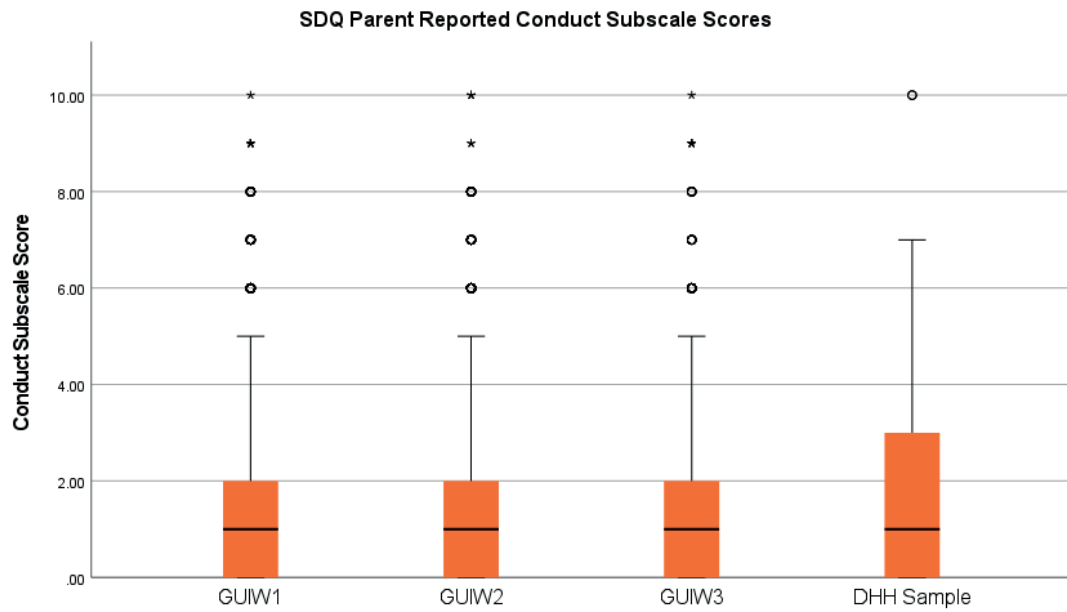


Figure 5 Boxplots comparing conduct subscale scores from three waves of the GUI study with the DHH sample of the current study

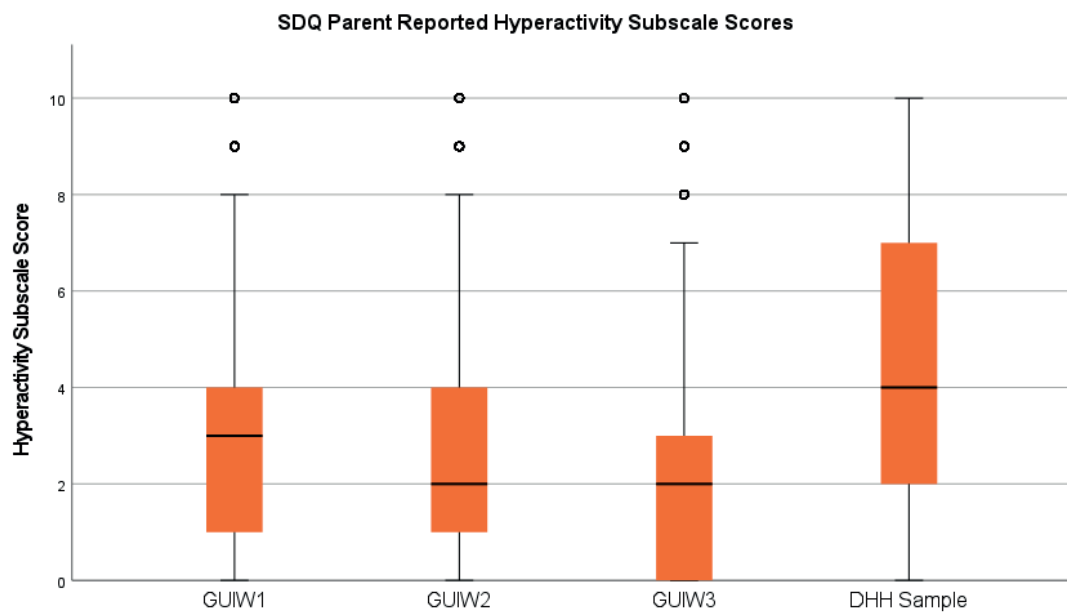


Figure 6 Boxplots comparing hyperactivity subscale scores from three waves of the GUI study with the DHH sample of the current study

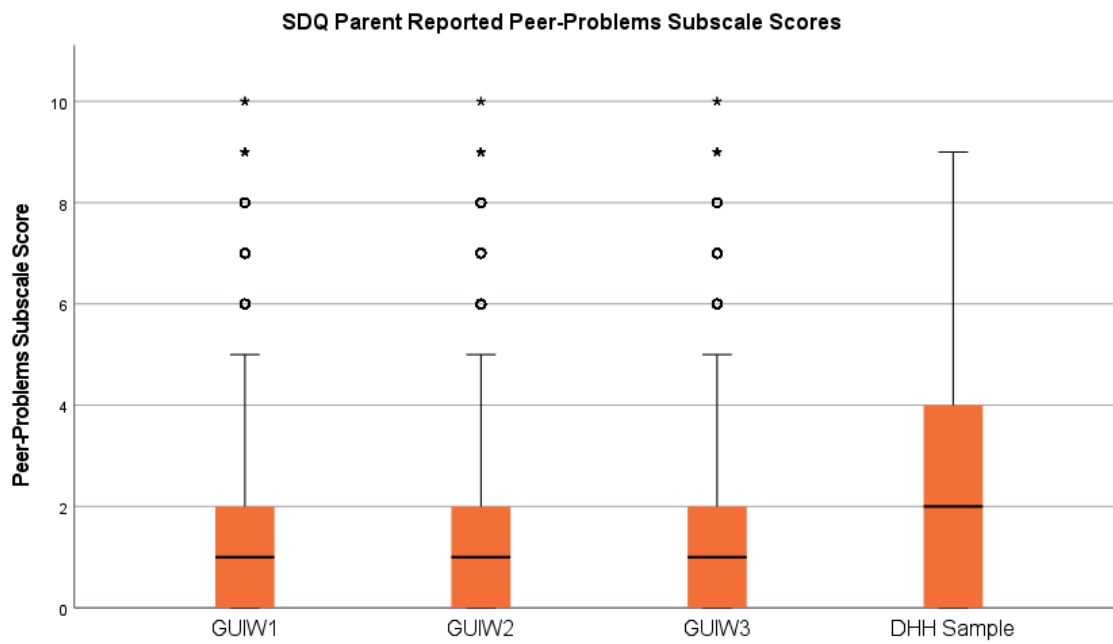


Figure 7 Boxplots comparing peer-problems subscale scores from three waves of the GUI study with the DHH sample of the current study

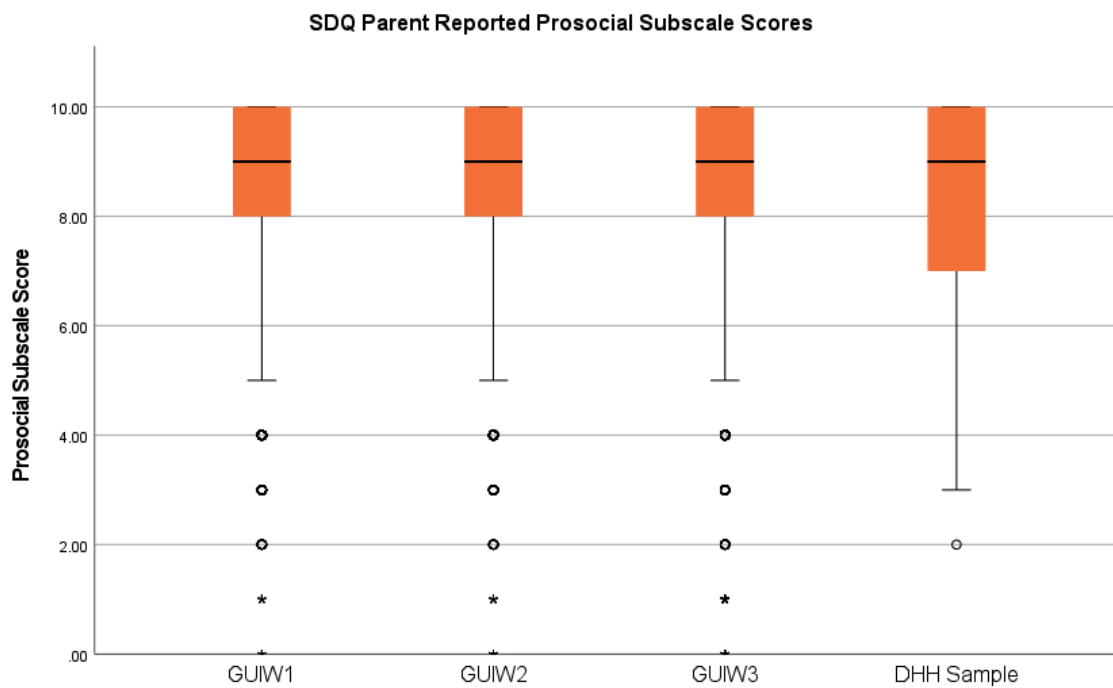


Figure 8 Boxplots comparing prosocial subscale scores from three waves of the GUI study with the DHH sample of the current study.

Conclusion

Using the SDQ, this study found a prevalence rate of socio-emotional difficulties of 42% among a cohort of 113 DHH children. There was a statistically significant difference between the mean TDSs *and* all of the subscales scores⁴ of the DHH sample compared with the GUI samples of children in Ireland. Medium to large effect sizes were found in the differences between the TDSs. The subscale of greatest concern was the peer problems subscale where the DHH sample had mean scores roughly double that of the GUI samples, with medium to large effect sizes reported.

4 There was one exception, the conduct subscale of the DHH sample compared against wave 1 of the GUI where it was approaching significance: $p=0.057$.

Socio-Emotional Development in Deaf and Hard of Hearing Children: Conclusions and Recommendations

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. The findings demonstrate that the prevalence of socio-emotional difficulties among this cohort of children is over three times that of the general population, with 42% of the sample demonstrating clinically significant problem scores. This finding is generally in line with international findings on DHH children (Brown & Cornes, 2015; Dammeyer, 2010; Fellingner et al., 2008; Hintermair, 2007), albeit at the higher end of prevalence rates.

Furthermore, DHH children have a prevalence of very high scores on the SDQ that is approximately five times that of their peers. This would suggest that those children with difficulties tend to have difficulties across many areas. The difference in means 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, which was roughly double that of any of the GUI waves. The difference between the mean subscale score for peer problems of the DHH sample compared with the GUI data 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).

Limitations

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, with teacher surveys gathered after that. 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 ($\bar{x} = 11.98$) versus those completing it during less restrictions ($\bar{x} = 11.73$): $t(101.479) 0.166, p = 0.869$. 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 results of this study were compared against data collected in the GUI study (Thornton et al., 2010). The mean score generated from the GUI study included the total sample of children from that study. As such, it included children who had some hearing difficulties as well as children who had chronic illnesses and other disabilities which may have had an impact on their TDS. This may cause an overall underestimation in the prevalence rate of difficulties among DHH children than if it were compared with a sample of TH children controlled for additional disabilities and needs.

Recommendations

An examination is needed to ascertain if appropriate services are available given the higher prevalence of socio-emotional difficulties among this population. This study found that 42% of DHH children have scores that are of clinical significance in terms of mental health screening, though only 14% of the sample are currently in receipt of mental health supports. For this reason, evidence of elevated prevalence rates of socio-emotional difficulties amongst DHH children should warrant concern from health and educational professionals working with these individuals. The specific needs of DHH children as a result of both their language and communication needs and the higher prevalence rates of additional needs that they experience would suggest that specialist screening and intervention services might be required to identify and serve these children.

Further research is needed in this area. First, a follow-up study looking at self-reports of DHH children using the SDQ would complement the findings of this study. To facilitate this, an Irish Sign Language translation of the SDQ is warranted, alongside research examining the reliability and validity of such a translation. Second, a qualitative examination of the experiences of young DHH people with socio-emotional difficulties and their families, including their access to services, would provide more nuance to the information gleaned in this study. Third, studies to examine the effectiveness of interventions in this area would help professionals and organisations in their planning of services. Finally, a mixed-methods study with service providers to ascertain difficulties in reaching and serving this population may assist with future service planning.

Special attention needs to be given to the area of peer problems. This area was the subscale of greatest difference from the national GUI data and research evidence shows that this subscale may be a useful screen for self-harm and suicidal behaviour in young DHH people (Gryglewicz et al., 2017). Those working with and supporting DHH children should consider interventions that support the development peer relationships. Likewise, TH children in educational settings with DHH children may benefit from support in Deaf awareness.

Conclusion

Heretofore, we knew little about the socio-emotional development of DHH children in Ireland. This study has demonstrated that, owing to the high prevalence rate identified through the SDQ, 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.

Appendix 1 Reliability of the SDQ measure

Table A1: Internal consistency results

	Cronbach's Alpha Parent Ratings	Interpretation	Cronbach's Alpha Teacher Ratings	Interpretation
Emotional subscale	0.797	Acceptable	0.775	Acceptable
Conduct subscale	0.779	Acceptable	0.700	Acceptable
Hyperactivity subscale	0.846	Acceptable	0.886	Good
Peer problems subscale	0.762	Acceptable	0.700	Acceptable
Prosocial subscale	0.736	Acceptable	0.817	Good

On the parent ratings, three of the subscales were found to have an item that, if deleted, the Cronbach's alpha would improve: the hyperactivity subscale (item 21), the peer problems subscale (item 19), and the prosocial subscale (item 20).

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