



Article

The Behavioural Outcomes of Children with Autism Spectrum Disorder and Other Developmental Disabilities as Perceived by Parents during the COVID-19 Lockdown

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Abstract: The COVID-19 lockdown and closure of schools, clinics, and community-based services put children with autism spectrum disorders (ASDs) and other developmental disabilities (DDs) at increased risk of negative outcomes. This study aimed to investigate parents' perceptions of their children's behavioural outcomes during the COVID-19 lockdown, parents' satisfaction with services during this time, and willingness to engage in telehealth. A cross-sectional study was conducted in Ireland. Parents ($n = 89$) completed an online questionnaire that included the strengths and difficulties questionnaire (SDQ-P). Results demonstrated that children with ASD/DDs were vulnerable to negative outcomes including hyperactivity, emotional symptoms, problems with peers and fewer prosocial behaviors. Children's behavioral outcomes ('current sample', $n = 89$) were also compared with pre-COVID-19 data taken from the Growing Up in Ireland Study ('GUI sample', $n = 327$). The current sample exhibited significantly more behavioral difficulties than the pre-COVID GUI sample ($p < 0.001$). For the current sample, scores on each of the five SDQ subscales were significantly associated with a total impact score, and parents reported dissatisfaction with support services provided and willingness to engage in behavioral telehealth. Commitment is required to identify barriers to services faced by families in Ireland and to address the need for adapted behavior support services during periods of emergency.

Keywords: COVID-19; intellectual disabilities; developmental disabilities; autism; behavior; behavioral support



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1. Introduction

The Coronavirus pandemic (COVID-19) has had an unprecedented impact on life around the world [1]. Nationwide lockdowns banned non-essential travel and contact with individuals from outside one's own home and resulted in the closure of schools, clinics, and community-based services. The suspension of community and school-based services such as special education, behavioural intervention and support, speech and language therapy (SLT), physical and occupational therapy (PT/OT), and psychological supports put neurodivergent children, including those with intellectual and developmental disabilities (IDD's) and autism spectrum disorder (ASD), at increased risk of negative outcomes [1,2]. Estimates suggest that there are about one in 160 children worldwide with an ASD [3], although other sources suggest that this figure is highly underestimated [4]. These figures highlight the large numbers of individuals and their families whose lives have likely been impacted by the closure of special education schools and disruption to behavioural support services. Individuals with ASD were particularly vulnerable, considering the impact that the COVID-19 pandemic and lockdown may have on their well-being and behavioural outcomes [5]. As ASD is characterised by deficits in social communication, difficulties with reciprocal interactions, and inflexible and repetitive behaviours [6], those with ASD

often require predictable environments, as unpredictability and complex changes to their environment can cause distress, anxiety and increase the risk of challenging behaviours [7].

1.1. Impact on Behavioural Support Services

Recent research has highlighted priority concerns for people with IDD or ASD during the pandemic [8]. Senior representatives from the IDD community in the UK, Ireland and Wales reported concerns in the domain of mental health and challenging behaviour including (a) access to services, (b) relapse or further deterioration in mental health, (c) disruption to routines, (d) relapse of, or further deterioration in challenging behaviours and (e) carer strain [8]. As support services are designed to target improvements in such outcomes, it is likely that the impact of COVID-19 has affected individuals' therapeutic progression.

Globally, it is unclear to what extent the pandemic has affected behavioural support services specifically, however, in a survey conducted by the World Health Organisation [9], it was reported that the COVID-19 pandemic disrupted or halted critical mental health services in 93% of countries worldwide, with over 60% reporting disruptions to mental health services for vulnerable people. In the U.S., disruptions to ASD services were reported for services such as ABA (77% of parents reported disruptions) and special education (80% reported disruptions) across all age-groups; and 64% of those interviewed reported that disruptions to services and therapies had *severely* or *moderately* impacted their children's ASD symptoms, behaviours or challenges [1]. Similarly, in Ireland, in addition to the closure of schools and clinics, community-based disability services such as day supports, and respite services were unavailable for approximately 19,500 people with ID's [10]. With these increased reports of disruption to services during the pandemic, comes increased concern for the impact that these disruptions may have on the individual service users.

1.2. Behavioural Outcomes

There have been studies conducted to examine the impact of the COVID-19 pandemic on autistic symptomology outcomes and some studies have reported mixed results. For example, Di Renzo et al. [11] measured outcomes such as inflexible, repetitive behaviours, self-care skills, hyperactivity and sleep, and children's sensory profile using the parent-report Adaptive Behaviour Assessment System-II (ABAS-II) [12], the ASD Behaviour Inventory (ASDBI) [13], and the short sensory profile [14]. Results from the ASDBI [13] showed increased scores of hyperactivity, fear in new situations, sleep regulation problems, moodiness and irritability. In contrast, Di Renzo et al. [11] reported no significant changes in aggressive behaviours, while 30% of parents reported improvements in their child's socio-communicative behaviours. In a similar study, Colizzi et al. [15] reported that a large majority (93.9%) of parents of children with ASD found the pandemic period *challenging* or *very challenging*, with 77% finding it more challenging than pre-COVID times. Authors reported that individuals with pre-existing behaviour problems were 2.16 times more likely to exhibit more intense, frequent behaviour problems than those without pre-existing problems [15]. Meral [16] collected both qualitative and quantitative data from parents of children with IDD's during the COVID-19 pandemic in Turkey. Similar to previous findings [11,15], parents reported negative effects such as unmet educational and behavioural needs along with feelings of social isolation for their children. However, contrary to this, Meral [16] reported positive outcomes for children and their families including perceived improvements in verbal behaviour and self-care skills. Parents also perceived low levels of family distress, with feelings of happiness and satisfaction with quality of life [16]. These findings were similar to Di Renzo et al. [11] who also reported mixed outcomes for children and their families during the pandemic. A common challenge faced by researchers during the pandemic is the reliance on cross-sectional subjective perceptions of feelings and behaviours associated with a stressful experience; as these responses are subject to recall bias and social desirability [11]. For example, parents reported their

children's behaviour was 'worse than before' but there were no pre-pandemic data to compare their responses to.

Nonweiler et al. [17] addressed this issue to an extent by comparing responses during the pandemic to normative data collected pre-COVID. Specifically, parents reported behavioural outcomes for children and young people (CYP) aged 4–15 with neurodevelopmental disorders (NDD) and a control group of neurotypical CYP on the strengths and difficulties questionnaire (SDQ) [18]. Nonweiler et al. [17] then compared scores in five behavioural domains (emotional, conduct, hyperactivity, peer and pro-social) against normative data from a UK mental health cohort. When compared to the pre-COVID-19 cohort, both groups (NDD and neurotypical CYP) scored more negatively on measures of emotional symptoms, hyperactivity and prosocial behaviours. When compared to neurotypical controls, the NDD group had a significantly higher prevalence of emotional symptoms and conduct problems, with lower pro-social behaviours. The results from this and other studies [11,15] demonstrate the potential risk posed to neurodivergent children during the COVID-19 pandemic, with particular concern for mental well-being and behavioural outcomes. Limitations of the Nonweiler et al. [17] study included the comparability of those with NDD to those with diagnoses of mental health disorders [19] and the absence of data indicating whether participants engaged in clinical services via telehealth during the lockdown period. The authors concluded that their data required [17].

1.3. The Current Study

Many families in Ireland lost access to behaviour support services as a result of school closures and restrictions on in-person therapies beginning in March 2020 and again in January 2021. In the current study, the parent-perceived impact of the COVID-19 lockdown on children's behavioural outcomes was investigated. Participants were required to be over 18 and be the primary caregiver of a child (under the age of 18) who had a developmental and/or intellectual disability or behavioural challenges. To address our first research question, as stated below, we used a similar framework to Nonweiler et al. [17]. Specifically, parent reported SDQ scores were compared against nationally representative data taken from the "Growing-up in Ireland" Study [20]. Growing Up in Ireland (GUI) data were included for comparison if the parent-report SDQ was used, children were age between 2–18 years at the time of data collection, and parents answered "yes" to the question; "Does your child have any longstanding illness, condition or disability?"

This study aims to add to the literature assessing the impact of the COVID-19 lockdown on children with IDD/ASD. The research questions were: (1) What is the impact of the lockdown on children's behavioural outcomes (SDQ), and are there differences between these outcomes and scores on the SDQ from a pre-COVID-19 sample (GUI data)? (2) Have children's behavioural outcomes impacted their lives? (3) Are parents satisfied with the behavioural support services provided to them during the lockdown? and (4) Is telehealth an acceptable approach to providing behavioural support for parents?

2. Method

2.1. Participants

Ninety-two parents/caregivers originally participated in this study. Three cases were subsequently removed as parents reported their child to be aged over 18 years ($n = 3$), leaving a total of eighty-nine participants in the current sample ($N = 89$). The participants' children ranged in age from 3 to 18; 57 were male and 30 were female. Participants were recruited online, primarily from disability support groups in Ireland, including "Autism Families Ireland" and "ABA Ireland", both found on the social media platform Facebook. Additional participants were recruited through two behaviour intervention agencies in the east and west of the country via email. The parents of students in two special schools for ASD in the east of the country were also recruited via email. Recruitment took place between February and April of 2021.

2.2. Materials/Measures

Microsoft Forms, an online platform provided by Microsoft® (Microsoft, Redmond, WA, USA), was used to design and administer the questionnaire. Microsoft Excel (2013) was used to collect and sort data (Excel version 13, Microsoft, Redmond, WA, USA). SPSS software version 25 (IBM Corp., 2017, Armonk, NY, USA) was used for all statistical analysis.

2.2.1. Demographic Information

Demographic questions consisted of seven items including age (3–4, 5–6, 7–8, 9–12, 13–18 years), gender (male/female, non-binary and other), diagnosis (autism spectrum disorder, intellectual disability, attention deficit/hyperactive disorder and other), area lived in (county), and three questions regarding service provision including “is your child currently in receipt of behaviour support services” and if yes, “are these services provided by public or private bodies?”

2.2.2. The Strengths and Difficulties Questionnaire (SDQ)

The SDQ [18] is a brief behavioural screening questionnaire that gives an overview of an individual’s behaviour, emotions and relationships and comprises of 25 items that are divided into five subscales. Subscales include emotional symptoms, conduct problems, hyperactivity, peer problems and pro-social behaviour. Each subscale consists of five attributes associated with that symptom, for example, “restless, overactive, cannot stay still for long” is one attribute on the hyperactivity subscale. Respondents use a 3-point Likert scale to indicate how much a certain attribute applies to their child’s behaviour over the past six months (0 = not true, 1 = somewhat true and 2 = certainly true). Scores from five attributes/items on a subscale are added to calculate a summary score (0–10) for each subscale.

The total difficulties score is calculated by adding the summary scores of four of the SDQ subscales (excluding prosocial); emotional scale (0–10), conduct scale (0–10), hyperactivity scale (0–10) and peer problem scale (0–10). The total difficulties score ranges from 0–40, with a higher number associated with more difficulties. According to SDQ classification guidelines (based on UK norms), total difficulties scores of 0–13 are *close to average* with clinically significant risk unlikely; scores of 14–16 are *slightly raised* and may reflect clinically significant problems; scores of 17–19 are *high*; and scores 20–40 are *very high*, suggesting that there is a substantial risk of clinically significant problems for that individual [21,22]. The extended version of the SDQ-P asks parents whether they perceive their child to have difficulties in areas of emotion, concentration, behaviour or relationships (Item 26), and how long they perceive the behavioural difficulties to be present (Item 27; 1 = less than a month, 2 = one to five months, 3 = six to twelve months, 4 = over a year). The SDQ-P also includes an SDQ Impact scale with five additional items (28–32) examining the parent-perceived impact of their child’s behavioural difficulties on different aspects of their life. Specifically, parents are asked to what extent difficulties cause distress to their child (Item 28) and interfere in their home life (Item 29), friendships (Item 30), classroom learning (Item 31) and leisure activities (Item 32). These four domains are selected based on WHO’s (1996) classification of psychosocial disabilities in children and young people [23]. Items 28–32 are scored on a 3-point scale (0 = not at all/ only a little, 1 = quite a lot, 2 = a great deal) [22,24]. Scores from individual items are combined to calculate the SDQ total impact score (0–10) with a higher score indicating a greater degree of negative impact on the child’s life. According to Goodman and Scott [24], who reported the extended SDQ-P as a valid tool for predicting psychiatric cases; an impact score of ≤ 1 was considered *low* and a score of ≥ 2 was considered *high* (i.e., with a score of ≥ 2 , the parent reported ‘quite a lot of distress/impairment’ in two domains or ‘a great deal’ in one domain). The final item (33) in the impact supplement asks parents about the *burden* posed on the family as a result of the behavioural difficulties mentioned, and was scored on a 4-point Likert scale (0 = not at all, 1 = a little, 2 = quite a lot, 3 = a great deal).

The psychometric properties of the SDQ have been assessed in several studies [18,24–29]. Reliability was assessed by internal consistency, interrater agreement and test-retest stability, all of which were found to be generally satisfactory [29]. Goodman [29] found that high SDQ scores were associated with an increased psychiatric risk, thus, deeming that the SDQ is a scientifically valid tool for screening, clinical assessment or measure of treatment outcomes. The Cronbach's alpha score for the current sample ($n = 89$) was 0.65, indicating low but acceptable internal consistency.

2.2.3. Satisfaction with Services

Satisfaction with the services was measured using one item. Parents were asked to indicate on an 11-point Likert scale, the extent to which they were satisfied with the behavioural support services offered to them and their children throughout the March 2020 and January 2021 lockdowns. On a scale from 0–10, a lower score indicated dissatisfaction with the services offered, while a higher score indicated satisfaction with the support services offered to them during this time (0 = extremely dissatisfied, 10 = extremely satisfied). An arbitrary cut off point was applied for the interpretation of results; scores ≤ 5 were considered dissatisfied and scores > 5 were considered satisfied with services.

2.2.4. Behavioural Telehealth Acceptability

Behavioural telehealth acceptability was measured using one item. Using an 11-point Likert scale, parents were asked to indicate how willing they would be to engage in behavioural telehealth services for their child, if it was available to them. A lower score on the 0–10 scale indicated that parents would not be willing to engage, whereas a higher score suggested that parents would be more willing to engage in behavioural telehealth services for their child now or in the future (0 = not at all willing, 10 = extremely willing). An arbitrary cut off point was applied for the interpretation of results; willingness scores ≤ 5 were considered as unwilling, and scores > 5 were considered as willing to engage.

2.3. Procedure

Participants completed an online questionnaire administered by the researcher via web link. By clicking the web link, respondents were directed to the study information and consent form. All respondents provided informed consent before beginning the questionnaire, failure to provide consent resulted in denied access to the questionnaire ($n = 1$). The online questionnaire comprised of four sections with 45 items in total (available upon request). Upon opening the questionnaire, participants were first presented with a brief information section in which they answered seven demographic questions related to their child. The next section consisted of the SDQ, where participants were presented with 25 statements and asked to select "not true", "somewhat true" or "certainly true" for each statement, on the basis of their child's behaviour over the previous six months. The SDQ impact section followed on from this, where participants were asked to provide details about the impact that these behavioural difficulties have on their child and family as a whole. In the last section, participants answered questions about the behavioural support services offered to their child during the COVID-19 lockdown and their attitude towards behavioural telehealth. Overall, the questionnaire took an average of seven to ten minutes to complete. Upon completion of the questionnaire, parents were provided with a de-briefing form that included the contact details of relevant support services.

2.3.1. Ethical Considerations

This project received ethical approval from the relevant Research Ethics Committee on 9 February 2021. No personal data were processed during this study, data protection approval was granted by the Data Protection Officer on 24 November 2020. Informed consent was obtained from all participants before completing the questionnaire. Partici-

parent's confidentiality was maintained through anonymity, ensured by using the platform Microsoft Forms for all data collection.

2.3.2. GUI Data Preparation

To address Research Question 1, access to the GUI data was requested, and was permitted by the Irish Social Science Data Archive (ISSDA) on 14 January 2021. To support comparability with the current sample, GUI data were required to meet the following inclusion criteria: (a) the parent-report SDQ was used, (b) children were age between 2–18 years at the time of data collection, and (c) parents answered “yes” to the question; “Does your child have any longstanding illness, condition or disability?” With regard to criterion (c), parents reported disabilities at three time-points across the waves of GUI data collection. The data were included if parents answered “yes” on *at least* two of the three time-points (age 2/3, age 4/5, age 13). Specifically, if parents answered “yes” on all three time-points, the data were included. In addition, if parents responded “yes” at time-points 2 (age 4/5) and 3 (age 13), the data were included (if a parent answered ‘no’ age 2/3 and ‘yes’ at the latter two time-points, we hypothesised that a diagnosis of a disability might not have been present at Time-Point 1 but was present subsequently). If data were missing for one time-point, parents need to have responded ‘yes’ on the other 2 time-points.

The total number of cases included in the GUI group was 327. As per the approach taken by Nonweiler et al. [17], SDQ scores from the GUI dataset were compared with the cross-sectional data for the current study group. The SDQ data were extracted from the GUI dataset at each wave and overall (mean) SDQ scores for each GUI participant were totaled. These data were entered into the SPSS analysis and compared with the data from the current sample to address research question 1 (RQ1).

3. Results

3.1. Demographic Data

Parent-reported demographics on the children from the current sample are presented in Table 1. Data from 89 children were included, with 64% male ($n = 57$), 33.7% female ($n = 30$), one non-binary ($n = 1$) and one child's gender was not reported by their parent or caregiver ($n = 1$). The age of children ranged from 3–18 years, with the largest portion of the sample, 65%, under the age of 9 ($n = 58$). ASD was the most prevalent diagnosis in 87.6% of children ($n = 78$). Respondents came from most counties in the Republic of Ireland, with the majority living in Dublin (29.2%, $n = 26$) and Cork (10.1%, $n = 9$), while the rest of the sample was spread across 19 counties ($n = 54$). When asked if their child was currently (February–April 2021) in receipt of behavioural support services, 70.8% of parents said no ($n = 63$). Of the families who accessed behavioural support services, the majority of them were provided through public bodies such as the HSE and Dept. Education and Skills ($n = 19$), while ten parents reported the use of private behaviour support services.

3.2. Research Question 1

To examine the impact of the lockdown on parents' perceptions of children's behavioural outcomes, SDQ summary scores from the current sample (collected during lockdown, $n = 89$) were analysed and compared to data from the GUI sample (collected pre-COVID, $n = 327$). Summary scores for the SDQ subscales are presented in Table 2. Higher scores indicated a higher prevalence of the specified behaviour. Mean scores for the current sample were as follows; emotional symptoms 5.62 ($SD = 2.52$), conduct problems 3.36 ($SD = 1.87$), hyperactivity 8.29 ($SD = 2.09$), peer problems 5.64 ($SD = 2.04$) and prosocial behaviours 3.81 ($SD = 2.62$). According to SDQ classifications guidelines, the scores yielded on the hyperactivity, emotional and problem with peers subscales can all be interpreted as *high*, with a substantial risk of clinically significant problems in these areas. Conduct problems, measured by attributes such as stealing, lying, fighting and losing temper were reported as *slightly raised* according to SDQ classification ($M = 3.36$, $SD = 1.87$). On the prosocial scale, a lower score represented a more negative outcome. The prosocial scores for

the current sample can be interpreted as *very low* ($M = 3.81$, $SD = 2.62$), with a substantial risk of clinically significant problems in this area. The mean total difficulties score was 22.91 ($SD = 5.33$), which, according to SDQ classification guidelines, can be interpreted as being *very high*, with a substantial risk of clinically significant problems for the individual [21].

Table 1. Demographic Characteristics of Children Reported by Parents ($n = 89$).

Characteristic		<i>n</i>	%
Gender	Female	30	33.7
	Male	57	64
	Non-binary	1	1.1
	Prefer not to say	1	1.1
Age	3–4 years	10	11.2
	5–6 years	21	23.6
	7–8 years	27	30.3
	9–12 years	16	18
	13–18 years	15	16.9
Diagnosis	ASD	78	87.6
	ID	7	7.9
	ADHD	1	1.1
	Other	3	3.4
Currently in receipt of services	Yes	26	29.2
	No	63	70.8
If yes, service provider	Public (HSE, Dept. Education and Skills)	16	61.5
	Private	7	26.9
	Both	3	11.5

Note. Abbreviations can be read as autism spectrum disorder (ASD), intellectual disability (ID), attention deficit hyperactivity disorder, health service executive (HSE) and the Department of Education and Skills (Dept. Education and Skills).

Table 2. Summary Scores for SDQ Subscales (Current and GUI), Satisfaction with Services, and Will-ingness to Engage in Telehealth.

Subscale	Mean	Standard Deviation	Minimum	Maximum
Emotional symptoms				
Current	5.62	2.52	1	10
GUI	1.87	1.10	0	6
Conduct problems				
Current	3.36	1.87	0	9
GUI	1.82	0.98	0	4.67
Hyperactivity				
Current	8.29	2.09	2	10
GUI	3.73	1.59	0.33	8.33
Peer problems				
Current	5.64	2.04	1	10
GUI	1.36	0.92	0	4.67
Prosocial behaviours *				
Current	3.81	2.62	0	10
GUI	8.18	1.12	4	10
Total difficulties score				
Current	22.91	5.33	8	35
GUI	8.78	3.23	1	20.33
Total impact score (current)	6.44	3.12	0	10
Satisfaction with services *	1.47	2.54	0	10
Willingness to engage in telehealth	6.89	3.32	0	10

Note. Abbreviations can be read as the current/post-COVID group (current) and the Growing up in Ireland group (GUI). * Lower score (0–10) indicating a negative response i.e., dissatisfaction with services and fewer pro-social behaviours.

The mean scores from the GUI dataset ($n = 327$) are also presented in Table 2. The mean summary scores for the GUI sample are as follows; emotional ($M = 1.87$, $SD = 1.10$), conduct problems ($M = 1.82$, $SD = 0.98$), hyperactivity ($M = 3.73$, $SD = 1.59$), peer problems ($M = 1.36$, $SD = 0.92$), and prosocial ($M = 8.18$, $SD = 1.12$). According to SDQ classification, GUI scores on all subscales are *close to average*, with significant problems unlikely (RQ1). The mean Total Difficulties score for the GUI group was 8.78 ($SD = 3.23$) which can be interpreted as average with significant problems unlikely [22].

To investigate if differences in SDQ scores between the current sample and GUI group were significant, a mixed analysis of variance (ANOVA) was conducted. The between Participants IV was group, the within Participants IV was SDQ subscale and the DV was SDQ scores. Preliminary analyses were conducted to ensure that the data were suitable for analysis with a mixed ANOVA. Outliers were assessed by inspection of a boxplot, outliers were determined to be a result of unusual values and it was concluded that the outliers would not be removed from analyses. The data were non-normally distributed as assessed by Shapiro–Wilk’s test for normality ($p < 0.001$) and visual inspection of normal Q–Q plots. The assumption of homogeneity of variance was violated ($p < 0.001$) assessed by Levene’s test of homogeneity of variances. Mauchly’s test of sphericity indicated that the assumption of sphericity was violated $\chi^2(14) = 1068.46$, $p < 0.001$, therefore, the Greenhouse–Geisser correction ($\epsilon = 0.429$) was used ($p < 0.001$). There was a significant main effect for SDQ Subscale $F(2.145, 888.23) = 2046.33$, $p < 0.001$ and a significant interaction effect for Group * Subscale $F(2.145, 888.23) = 767.32$, $p < 0.001$. Between-group effects showed that there was a statistically significant difference in SDQ scores between the current (lockdown) sample and the GUI group (pre-COVID) $F(1, 414) = 766.64$, $p < 0.001$.

To examine the differences in scores on separate SDQ subscales between the two groups, a non-parametric Mann–Whitney U test was run. Results showed subscale scores in the current sample were significantly higher than the GUI group on; emotional (mean rank = 341.85), $U = 2683.50$, $z = -11.83$, $p < 0.001$, conduct problems (mean rank = 295.01), $U = 6852$, $z = -7.69$, $p < 0.001$, hyperactivity (mean rank = 350.92) $U = 1876$, $z = -12.63$, $p < 0.001$, and peer problems (mean rank = 361.76) $U = 1876$, $z = -13.61$, $p < 0.001$. In addition, prosocial scores in the current sample (mean rank = 73.15) were significantly lower compared to the GUI group (mean rank = 245.34); $U = 2505.50$, $z = -12.01$, $p < 0.001$. Lastly, the total difficulties score in the current sample (mean rank = 366.54) was significantly higher than those in the GUI group (mean rank = 165.49), $U = 486$, $z = -13.99$, $p < 0.001$.

3.3. Research Question 2

To examine the impact of behavioural challenges on individuals and their families from the current sample ($n = 89$), the SDQ impact statement and total impact scores were examined. The mean total impact score was 6.44 ($SD = 3.12$), as reported in Table 2. Parents were asked if they thought that their child had difficulties with emotions, concentration, behaviour or getting along with people. With regard to emotional difficulties, 77.5% of parents reported that their child had definite difficulties ($n = 69$) with 2% reporting no difficulties at all with emotions ($n = 2$). Parents also reported difficulties with their child’s concentration, with 98.9% of parents reporting minor–definite difficulties with concentration ($n = 88$). Difficulties with behaviour and relationships were also reported, with 69.7% of parents ($n = 62$) reporting definite difficulties with behaviour and 59.5% reporting that their child has definite difficulties getting along with others ($n = 53$). Results from the chronicity rating showed that 80.9% of parents perceived their child’s behavioural difficulties to have been present for over a year ($n = 72$).

To determine which of the behavioural challenges were associated with greater impact scores, a Spearman’s rank-order correlation was conducted. All SDQ subscales were included for analysis with total impact scores. There were strong, positive correlations between impact scores and emotional Symptoms ($r_s = 0.490$, $p < 0.001$), conduct problems ($r_s = 0.398$, $p < 0.001$), hyperactivity ($r_s = 0.450$, $p < 0.001$) and peer problems ($r_s = 0.223$,

$p = 0.036$). Results also showed positive correlations between emotional symptoms and conduct problems ($r_s(8) = 0.220, p = 0.039$) and emotional symptoms and prosocial behaviour ($r_s = 0.276, p < 0.001$). Hyperactivity positively correlated with conduct problems ($r_s = 0.455, p < 0.001$) and peer problems ($r_s = 0.345, p < 0.001$). Conversely, prosocial behaviour had strong negative correlations with hyperactivity ($r_s = -0.342, p < 0.001$) and conduct problems ($r_s = -0.331, p < 0.001$), see Table 3.

Table 3. Descriptive Statistics and Correlation Coefficients (Spearman's Correlation r_s) for SDQ Subscales and Total Impact Score.

Subscale	M	SD	1	2	3	4	5	6
1. Total Impact Score	6.44	3.12						
2. Emotional Symptoms	5.62	2.52	0.490 **					
3. Conduct Problems	3.36	1.87	0.398 **	0.220 *				
4. Hyperactivity	8.29	2.09	0.450 **	0.07	0.455 **			
5. Peer Problems	5.64	2.04	0.223 *	0.149	-0.043	0.345 **		
6. Prosocial Behaviours	3.81	2.62	-0.124	0.276 **	-0.053	-0.342 **	-0.331 **	

Note. $N = 89$; Statistical Significance: ** $p < 0.001$ (2-tailed) * $p < 0.05$.

3.4. Research Questions 3 and 4

In the current sample ($n = 89$), satisfaction with services was measured on a scale from 0–10 with a lower number indicating negative outcomes. Results are presented in Table 2. Satisfaction with services ($M = 1.47, SD = 2.54$) was low, meaning parents were dissatisfied with the support services offered to them during the pandemic ($M < 5 =$ dissatisfied with services, $M > 5 =$ satisfied with services). A total 65.2% of parents reported that they had less than one day of behaviour support service during the March 2020 and January 2021 lockdowns ($n = 58$), with 16.9% reporting that they had none at all ($n = 15$). Further, 82% of parents reported that they had not been offered any form of behavioural telehealth during either of the lockdowns ($n = 73$), with 18% reporting that they had been offered behavioural telehealth in some form ($n = 16$). Willingness to engage in telehealth was high ($M = 6.89, SD = 3.32$) in the current group ($< 5 =$ unwilling to engage, $> 5 =$ willing to engage).

3.5. Summary of Results

Overall, the results demonstrated that the current group (lockdown) had *high* scores on the SDQ subscales and scored significantly higher than the GUI sample (pre-COVID) on total difficulties, and on the SDQ subscales of emotional, hyperactivity, peer and conduct problems, with higher scores indicating greater behavioural difficulties. Additionally, the current group scored significantly lower on the prosocial scale compared to the GUI sample, indicating a lower presence of positive social behaviours in the current group. Impact scores in the current group were classified as *high*, with emotional symptoms and hyperactivity significant predictors of impact scores. Satisfaction with services (current group) was low and willingness to engage in behavioural telehealth was high.

4. Discussion

Results demonstrated that children in the current sample, who were recruited during the COVID-19 lockdown, exhibited high levels of behavioural difficulties. There were negative outcomes across several behavioural domains including; hyperactivity, emotional symptoms, prosocial behaviours and peer problems. These results are consistent with findings from other studies carried out during the COVID-19 lockdown [11,15,17], who also reported difficulties in the same domains for children with IDD. When compared against the pre-COVID GUI sample, the current sample scored significantly worse on emotional, hyperactivity, conduct, peer problem and pro-social scales. These results suggest that children in the current group exhibited significantly more behavioural difficulties than children in a pre-COVID-19 nationally representative sample.

The SDQ total difficulties score for the current sample was classified as *very high*, with a substantial risk of clinical intervention required, and was significantly higher than the scores of children in the GUI sample. These results further support the suggestion

that the COVID-19 lockdown exacerbated behavioural challenges across many domains for people with IDD. These difficulties appeared to have had a considerable negative impact on several aspects of the children's lives, as measured by the SDQ Impact. In particular, children in the current sample were vulnerable to increased hyperactivity, conduct problems and emotional difficulties, all of which were associated with high *impact* scores. A high SDQ Impact score suggests that the perceived behavioural difficulties negatively interfere with the child's experience at home, their friendships with others, their classroom learning as well as the activities they engage in for leisure. High levels of emotional symptoms were associated with higher levels of conduct problems. This suggests that higher levels of emotional dysregulation, stress or anxiety in children may have contributed to their behavioural difficulties as children attempted to cope with the unprecedented changes to their daily lives. Higher levels of hyperactivity were associated with higher levels of conduct and peer problems. Hyperactivity is often characterised by impulsiveness, an inability to sit still and engage with people or tasks, and excessive movement and talking. The results suggest that hyperactive characteristics may have a negative impact on an individual's behaviour and relationships with peers; this point is supported by the observed relationship between prosocial behaviour and hyperactivity and conduct problems. Children who demonstrated more prosocial behaviours exhibited less hyperactivity and behavioural difficulties. Goodman [18] stated that an impact score of two or more was a discriminating predictor of clinically significant psychosocial difficulties. The GUI study did not use the extended SDQ so comparisons across groups were not possible. However, if visually compared to the Impact score from U.K. normative data (pre-COVID) ($M = 0.4$, $SD = 1.1$) [19] the impact score in the current group is higher, suggesting a greater negative impact experienced by the children in the current sample. In addition to the negative impact on the children themselves, parents reported that the behavioural difficulties pose a *great burden* on the family as a whole. In terms of chronicity of the behavioural difficulties, a large number of parents reported the behavioural difficulties had been present for over a year, meaning that children and families were experiencing these challenges for the entirety of the COVID-19 lockdown (March 2020–February 2021), and potentially even longer.

Parents reported feeling dissatisfied with the behaviour support services offered to them during the lockdown, with a large number reporting less than one day of service per week, and some parents reporting no access to support services at all. Of the families who had some access to services, it is not clear in what capacity these services were provided. It is possible that these families may have engaged in some form of behavioural telehealth, but future studies would need to examine this explicitly. When compared to parents in a similar study in Italy during COVID-19 [15], the amount of behavioural support services offered to families in the current group appear to be lower than their European counterparts. Colizzi et al. [15] reported large numbers of families in their study receiving direct support from children's schools (e.g., phone calls/video calls), and many receiving behavioural support from a private therapist or local healthcare service. Consistent with previous findings [30–32], behavioural telehealth acceptability was high. Parents indicated that they would be willing to engage in telehealth if it was available to them. Unfortunately, however, a large majority of parents reported that behavioural telehealth had not been offered to them in any form during the lockdown.

Increased behavioural challenges at a clinically significant level are a cause for great concern for the children and families in this group. The behavioural challenges exhibited by the children in this group were classified as *very high* with clinical intervention recommended, as well as this, the impact score indicated clinically significant psychosocial difficulties. With this in mind, we are forced to consider what could have been undertaken to support these families more, and what should be performed to safeguard these individuals from similar negative outcomes in the future. As we emerge from the COVID-19 lockdowns, restrictions begin to ease on in-person therapies including behavioural therapy, which may be of benefit; and yet, only a small number of families in the current sample

were accessing behaviour support services at this time. This suggests that there may be longer-term barriers to accessing services that might continue to be problematic as we move towards a future of 'living with COVID'. Future research should examine awareness and acceptability of behaviour support services in such contexts, while also considering long-term barriers to accessing such services.

One barrier to behavioural therapy that has been consistently identified in the literature is cost [33]. A recent Irish study reported that families with a child with ASD spent an average of EUR 28,464.89 per child on necessary resources, whereas the annual state expenditure on ASD-related health, social and educational resources was EUR 14,192 per child. Parents' personal finances are therefore critical to meeting the needs of young people with ASD [34]. Little et al. [35] reported that a telehealth model can cost families up to 3.36 times less than other therapeutic models, relieving the cost burden for both families and service providers. Studies have also reported positive findings for the use of behavioural telehealth to provide parent-training in basic behavioural principles and skills [30–32]. There have been reports of positive behavioural outcomes for children with ASD and parents themselves, as well as reports of high acceptability and feasibility [30,32]. Within the current study, parents were willing to engage in behavioural telehealth now and in the future, although very few families were offered this support during the lockdown. This highlights the need for adapted, cost-effective alternatives to in-person therapies that can be accessed by a larger number of families. Improved telehealth services could relieve the cost and travel burden for families, could be utilised for parent-training to manage hyperactivity and emotional symptoms, and may provide much-needed, meaningful intervention to children and families beyond the COVID-19 pandemic.

5. Limitations

This study has highlighted the increased behavioural challenges faced by children with IDD's and their families during lockdown. However, without pre-COVID SDQ data for the current group, it was not possible to directly compare behavioural outcomes pre-COVID and during the lockdown. Hence, it is difficult to state with certainty that the high levels of behavioural difficulties can be attributed to the lockdown and lack of services specifically. Nonweiler et al. [17] faced a similar challenge without pre-COVID SDQ data for the study group; the authors compared cross-sectional data from their study to data from a U.K. mental health cohort with similar symptomologies. We took a similar approach in comparing our sample scores with the GUI data. GUI provides the most recent nationally representative data for children and youth living in Ireland, and could therefore, provide an indication of the differences in behavioural difficulties experienced between pre-COVID and lockdown groups. The GUI data provided limited demographic information for comparison, future research should aim to compare demographic characteristics between pre- and post-COVID groups; this could provide a better understanding of the contributing factors leading to the differences in behavioural outcomes. The difference between the two groups in terms of access to services and treatment is not known. However, with the majority of the current group reporting less than one day of service per week along with the known disruptions to disability services during the pandemic, it is assumed that the post-COVID group had less access to services as a direct result of the COVID-19 lockdown. To maintain homogeneity across groups, GUI cases were included for comparison if a parent indicated the presence of a "long standing illness, condition or disability", however, the illness, condition or disability was not specified in the data, making it difficult to compare scores across similar symptomologies. The next limitation was shared with several other studies carried out during COVID-19 [11,15,17] barriers to study participation caused by restrictions on face-to-face contact. We had to rely solely on online sources to recruit parent participants and this small, self-selected sample was vulnerable to bias and misrepresentation of the entire population. As well as this, this study relied on subjective perceptions of feelings and behaviours associated with a stressful experience.

These subjective perceptions of parents make the responses subject to recall bias and social desirability [11]. The results should therefore be interpreted with appropriate caution.

The reliability and validity of the extended SDQ-P used in this study has been demonstrated in the literature [18,24–29]. In this study, reliability of the SDQ-P was assessed by a measure of internal consistency which was deemed acceptable. Single-item measures of satisfaction and willingness to engage in services were used to keep the questionnaire brief for respondents. These measures were deemed to be valid based on their unambiguity; the construct being measured was clear to the respondent. Single-item measures have shown to reliably capture a range of psychosocial constructs [36,37] and can be deemed acceptable for use following appropriate justification by the author. The 11-point Likert scale was used to measure satisfaction and willingness. The use of an 11-point scale (0–10) in social sciences has been supported in several studies [38–40], who demonstrated that they can increase scale sensitivity, are closer to interval level of scaling and normality, and are easily understood by participants. Nonetheless, it will be important to examine test-retest reliability of these measures for future use of the questionnaire. Finally, although this study has highlighted the negative outcomes for children and their families during COVID-19, it is important to consider the alternate positive findings in the literature [11,16]. Future research should aim to include measures of both positive and negative outcomes for children with IDD's and their families as we strive to understand the full impact of the COVID-19 lockdown.

6. Conclusions

This study has demonstrated that children with IDD's in this study were vulnerable to negative behavioural outcomes during the COVID-19 lockdown. Children in this group exhibited significantly more challenges with emotional symptoms, hyperactivity, problems with peers, conduct problems, and prosocial behaviours compared to children in a nationally representative (pre-COVID) sample. SDQ classifications suggested that there was a substantial risk and clinical intervention required for these behavioural and psychosocial difficulties. Parents felt greatly dissatisfied with the behaviour support services offered to them during the lockdown, with a large number reporting less than one day of service per week. Support services were therefore deficient at a time when parents and children were most vulnerable to difficulties associated with increased emotional symptoms, hyperactivity and social isolation. These behavioural outcomes were shown to have a negative impact on the children's lives, as well their families who felt a great burden during this time. Families who were accessing behaviour support services (immediately) post-lockdown remained low. When considered in relation to the behavioural challenges identified by families, this suggests that more action needs to be taken by service providers and policy makers to identify longer-term barriers to accessing services. With periods of remote living and reduced social interactions becoming a new normal for everyone, future studies should seek to examine the acceptability, feasibility and outcomes of behavioural telehealth models of intervention and parent-training, specifically targeting strategies to manage children's hyperactivity, emotional symptoms and increasing prosocial behaviours.

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