

1 **Anxiety and Worries of Individuals with Down Syndrome During the COVID-19**
2 **Pandemic: A Comparative Study in the UK**

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Abstract

The present study explored the effects of the pandemic on individuals with Down Syndrome (n= 67) compared to other SEND diagnoses (n= 48) and their Typically Developing Siblings (n= 56). In total, 115 caregivers reported on their own anxiety and worries as well as of their children. Anxiety levels for individuals with Down syndrome appeared to be lower compared to other SEND populations and to Typically Developing Siblings. In terms of worries, individuals with Down Syndrome worried more about social-related worries but worried less about family-related aspects compared to the other groups. In sum, individuals with Down Syndrome might show less anxiety but still worried more about specific aspects related to the impact of COVID-19 pandemic on their lives.

Keywords: *COVID-19, Down syndrome, anxiety, worries, SEND, predictors*

60 **Introduction**

61 Around the world, there has been much research on mental health during the COVID-19
62 pandemic and the World Health Organisation (WHO) has highlighted the increased rates for
63 symptoms of anxiety (6-51%) and depression (15-48%) (WHO, 2021). According to previous
64 research, early life adversities are a key factor for either short- or long-term mental health
65 difficulties (Scott et al., 2011). During the COVID-19 pandemic, some of the most common
66 adversities that are experienced by the majority of the population include unemployment and
67 financial instability; missed education and lost prospects; social isolation and fear of life-
68 threatening disease in self or loved ones (WHO, 2021). In fact, the impact of the COVID-19
69 pandemic varies across the globe, depending on the population. For instance, evidence suggests
70 that those with pre-existing mental health problems and other behavioural disorders who
71 experienced adversities such as financial instability and/or missed education were at a higher risk
72 of mental health during the COVID-19 pandemic (Neelam et al., 2021; WHO 2021).

73 However, there has been limited research on how the COVID-19 pandemic affects
74 individuals with neurodevelopmental disorders. Reports suggests that families of individuals with
75 Special Education Needs and Disabilities (SEND) have been greatly impacted by the pandemic as
76 there was a change in routine; lack of access to support networks as well as added caring
77 responsibilities which caregivers found challenging to combine with other duties (e.g., working
78 from home) (Asbury et al., 2021). There is also evidence that suggests increased rates of anxiety
79 and elevated worries for individuals with SEND after the first wave of COVID-19 in China (Su et
80 al., 2021). Sideropoulos et al. (2021) highlighted the increased levels of anxiety in individuals with
81 SEND during the first months of the pandemic in the UK. In addition, elevated worries about
82 school closures and loss of institutional support for individuals with SEND during the lockdowns
83 have been also discussed in the literature (Sideropoulos et al., 2021, Su et al., 2021).

84 Whist mathematical models of epidemics show the effect of multiple lockdowns can be
85 effective (Scala, 2021), mental health researchers raised concerns around their impact on mental
86 health as many countries, including the UK, were undergoing a series of lockdowns (Rossi et al.,
87 2020; Thakur et al., 2020; Adams-Prassl et al., 2020). The effects of confinement and severe
88 physical or social restrictions has shown deleterious effects on mental health. Such research spans
89 situations such as solitary confinement (Chadick et al., 2018; Reiter et al., 2020), segregation
90 (Valentine et al., 2019; Rubio et al., 2021), and polar expeditions (Palinkas & Suedfeld, 2008;

91 Rubio et al., 2021). Though the impact of the COVID-19 pandemic and its restrictions have caused
92 significant elevated rates of mental health to individuals with SEND (Panchal et al., 2021), to our
93 knowledge there is no research on the effects of the pandemic on individuals with Down Syndrome
94 and the challenges and difficulties families of individuals with Down Syndrome have experienced
95 during the COVID-19 pandemic.

96 Down syndrome (DS) is a genetic disorder caused by an additional chromosome 21
97 occurring spontaneously for approximately 1 in 1000 live births, resulting in intellectual disability.
98 There are large individual differences in DS in general intellectual ability. Around 80% of
99 individuals with DS have moderate intellectual disability, but some fall within the severely
100 impaired range and others overlap with typical development (Chapman & Hesketh, 2000;
101 Pueschel, 1995; Zampini & D’Odorico, 2009; Di Nuovo et al., 2009; Thomas et al., 2020). DS is
102 typically characterized by particular difficulty with expressive language and cognitive delay
103 (Chapman, 1997; Daunhauer & Fidler, 2011) with these difficulties becoming more pronounced
104 overtime due to a slower pace of development (Dykens et al., 2006; Fidler, Hepburn, & Rogers,
105 2006; Miller, 1999; Buckley & Oliver, 1994; Startin et al., 2020; D’Souza et al., 2020). Individuals
106 with DS often show poor short-term memory but relative strengths in relation to visual -spatial
107 difficulties, sensory processing, behavior and social responsiveness (Tasse et al., 2016; Foley et
108 al., 2016). There is wide variability in the language abilities of those with DS from being non-
109 verbal to developing relatively large vocabularies. In addition, individuals with DS are reported to
110 exhibit fine and gross motor problems or delays in adaptive behaviors; such as feeding and dressing
111 oneself (Marchal et al., 2016).

112 Scholars have extensively discussed the emotional and behavioral challenges children with
113 DS experience (Gameren-Oosterom et al., 2011; Naerland et al., 2016). It is common for children
114 with DS to have difficulties with verbal working memory, speaking, writing and arithmetic (Rice
115 et al., 2005; Will et al., 2019; Cuskelly, Faragher, & Jobling, 2017; Faragher, 2017; Næss et al.,
116 2011). Other studies also report problems with social withdrawal, social skills and disobedient
117 behavior (Barisnikov et al., 2018, Coe et al., 1999; Galeote et al., 2011). Despite those challenges,
118 children with DS score significantly lower on anxiety and depression when compared to normative
119 samples (Gameren-Oosterom et al., 2011). However, this could be a result of numerous factors
120 ranging from other concomitant health problems to access to care and more, which are yet to be
121 explored in the literature of DS.

122 Recent research which draws on data from the COVID-19 pandemic in Italy suggests that
123 individuals with DS experienced higher rates of depressive symptoms and social withdrawal
124 compared to before the first national lockdown (Villani et al., 2020). It should be noted that several
125 confounding factors may contribute to either the positive or negative elevated levels in individuals
126 with DS (Esbensen & Seltzer, 2011), including age and sex, which have not yet been researched
127 (Sanchez-Teruel & Robles-Bello, 2020). Hence, there is a vital need to develop a better
128 understanding of the factors associated with syndrome-specific impacts on the mental health of
129 those individuals. For example, at a functional level, scores on the Instrumental Activities of Daily
130 Living scale (IADLs) worsened since the beginning of the pandemic for individuals with DS,
131 whilst scores on the Activities of Daily Living scale (ADLs) did not change significantly. Whilst
132 ADLs include basic self-care tasks such as bathing, IADLs include more complex tasks related to
133 one's ability to live independently (e.g., shopping, using public transportation; Villani et al., 2020).
134 Nevertheless, the research is primarily focused on how these factors contribute to the caregivers'
135 mental health rather than on the impact of those factors on the individuals with DS (Esbensen &
136 Seltzer, 2011).

137 Regardless of the limited evidence available relating to the impact of COVID-19 on
138 individuals with DS, research has previously demonstrated the uniqueness of caring for an
139 individual with DS. For example, Fidler and colleagues (2000) looked at three different groups of
140 children with Intellectual Disability and their families. They compared the scores of maladaptive
141 behavior in children with DS, Williams Syndrome (WS) and Smith-Magenis syndrome, as well as
142 parental outcomes such as Parent and Family Problems and Parental Pessimism. Children with DS
143 exhibited significantly lower rates of maladaptive behavior in comparison to the other two groups.
144 Moreover, among the families participating in the study, the families of children with DS scored
145 the lowest in overall pessimism, and in parent and family problems. The study also found that
146 predictors of stress varied among the three groups, where only age significantly predicted family
147 stress in families of individuals with DS, whilst for families of individuals with Smith-Magenis
148 syndrome, maladaptive behavior predicted stress levels, while in families of individuals with WS,
149 both factors predicted stress levels. The authors suggested that this difference reflects the lower
150 levels of maladaptive behavior found in children with DS. Other studies echo the finding that
151 children with DS not only exhibit lower psychiatric levels of mental health (Spendelow, 2011) but
152 also that they demonstrate the uniqueness of children with DS (Corrice & Glidden, 2009).

153 A different way to address the question of what accounts for the different levels of
154 psychosocial wellbeing observed in individuals with DS is the investigation of caregivers'
155 wellbeing. Research has demonstrated the links between caregivers' mental health and the way
156 they perceive their children's wellbeing (Neece et al., 2012) as well as the different factors that
157 contribute to parental stress depending on the neurodevelopmental condition their child has
158 (Ashworth et al., 2019). Caregivers of individuals with DS often report experiencing lower levels
159 of stress (e.g. Kasari & Sigman, 1997; Esbensen & Seltzer, 2011), having less pessimistic outlooks
160 regarding their child's future (Fidler et al., 2000), perceiving less temperamental difficulties in
161 their children (Kasari & Sigman, 1997), and having greater and more satisfying social networks
162 and support (Hauser-Cram et al., 2001), where these differences were reported in relation to
163 caregivers of children with other developmental conditions, or typically developing children. This
164 effect was named the Down Syndrome Advantage. Whilst exceptions have been found to this
165 phenomenon in the literature (Cunningham, 1996; Esbensen, Seltzer, & Abbeduto, 2008; Gath,
166 1990; Greenberg et al., 2004; Roach, Orsmond, & Barratt, 1999; Sanders & Morgan, 1997),
167 research findings tend to report more positive and less negative wellbeing outcomes for caregivers
168 of individuals with DS compared to mothers of children with other developmental and intellectual
169 disabilities (Esbensen & Seltzer, 2011). In addition, typically developing siblings (TDS) of
170 individuals with DS report more positive wellbeing outcomes compared to TDS of individuals
171 with autism, in terms of their depressive symptoms, warmth within the sibling relationship, and
172 higher levels of positive affect towards their sibling (Hodapp & Urbano, 2007; Orsmond & Seltzer,
173 2007).

174 In sum, whilst previous research has highlighted elevated levels of anxiety in the SEND
175 population during the COVID-19 pandemic (Sideropoulos et al., 2021; Asbury et al., 2021), there
176 is a lack of research on how the experiences of those with DS compare to other SEND group.
177 Seeing that previous studies have shown that individuals with DS may experience and respond to
178 aversive situations differently compared to other groups of SEND, it is not clear whether this also
179 holds for how they experience the impact of COVID19 and thus, it is important to investigate the
180 mental health, specifically anxiety, of individuals with DS during the COVID-19 pandemic
181 compared to other groups of individuals with SEND.

182

183

184 **The present study**

185 The primary aim of the present study was to explore the impact of the COVID-19 pandemic
186 on the anxiety levels of individuals with DS and their families using cross-sectional data from the
187 3rd national lockdown in the UK (early January 2021 to May 2021; COVID-19 Response – Spring
188 2021 (Summary), 2021). Hence, we hypothesized that those with a diagnosis of DS would report
189 lower levels of anxiety during the third lockdown compared to individuals with a different SEND
190 diagnosis. Due to the lack of literature in the area, we also compared individuals with DS to their
191 Typically Developing Sibling (TDS) in terms of anxiety. For this aim, we hypothesized that
192 individuals with DS would exhibit similar levels of anxiety as their TDS. Furthermore, we
193 investigated the predictors for anxiety. Based on previous research (Sideropoulos et al., 2021) on
194 the impact of COVID-19 on individuals with SEND, we hypothesized that those with an existing
195 anxiety disorder, who were aware of COVID-19 and who had an anxious caregiver would report
196 higher levels of anxiety across all groups (Sideropoulos et al., 2021). Finally, we expected that the
197 individuals with DS would score lower across the many and varied worries we measured,
198 compared to the individuals with other SEND as well as their TDS.

199

200 **Methods**

201 *Participants*

202 115 caregivers (97.53% female) of 171 young individuals (115 children with SEND of
203 which 56 had a TDS) completed the online survey. The caregivers were aged 23 to 66 ($M = 46.78$,
204 $SD = 7.96$) and 33.91% ($n = 39$) were educated to a university degree level (e.g., having completed
205 a Bachelors degree).

206 When looking at the total SEND population, parents reported that 21.74% ($n = 25$, 6 of
207 those were individuals with DS) of their children had previously received a diagnosis of anxiety
208 and 70.43% ($n = 81$) were aware of the COVID-19 pandemic. It is important to note that the
209 individuals with SEND may not have consciously understood any changes to their routine caused
210 by the COVID-19 pandemic. Yet, they still may have experienced higher anxiety as a result of the
211 new routines caused by the pandemic (e.g., wearing masks, frequent testing) and thus they were
212 included in the analyses.

213 All the caregivers reported that their child with SEND had received a formal diagnosis
214 (reported in [Table 1](#)). Individuals with SEND (32.65%, $n = 16$ female) ranged in age from 2 to 25

215 years old ($M= 13.37$, $SD = 6.48$). As can be seen from [Table 1](#), 58.3% ($n= 67$) had a diagnosis of
216 DS (47.83%, $n = 33$ female). Due to the hypotheses and aims of this paper, we grouped all the
217 other diagnoses (41.74%, $n= 48$) into a group (named “other SEND”).

218

219 << [Table 1 here](#)>>

220

221 Out of the 115 caregivers, 56 also completed the survey for a TDS (63.16%, $n = 36$ female)
222 in the family. The TDS had a similar age range as the total SEND population; 3 – 24 years ($M=$
223 13.11 , $SD = 5.88$). Only 5.45% ($n= 6$) of the TDS were diagnosed with an anxiety disorder and all
224 of them were aware of COVID-19 ($n= 54$ with two missing data cases).

225 We’ve also measured caregivers’ anxiety on a 5-Likert scale with higher scores denoting
226 higher levels of anxiety. Although caregivers of individuals with DS ($M= 3.75$, $SD= 1.10$) reported
227 higher levels of anxiety compared to caregivers of individuals with other SEND ($M= 3.42$, $SD=$
228 1.37) and caregivers who also reported that they have a typically developing child ($M= 3.58$, $SD=$
229 1.25), these differences were not significant, $F(2,227)= 1.07$, $p= 0.34$.

230

231 *Materials*

232 Caregivers completed an anonymous cross-sectional survey (similar to Sideropoulos et al.,
233 2021) through Qualtrics.

234 This survey contained a range of open-ended and closed questions over four key sections
235 of which only three of them were used for this study: a) demographic questions about the children;
236 b) COVID-19 related questions (not used for this study); c) concerns and worries of the
237 participating caregiver and d) of their children.

238 The thirteen questions around worries were informed by the wellbeing categories as
239 defined by Schalok (1996) and included worries related social inclusion (e.g., not being able to
240 meet others), physical wellbeing (e.g., worries about catching COVID-19 and own health),
241 interpersonal relations (e.g., worry about family conflict and others becoming ill), material
242 wellbeing (e.g., financial worries), emotional wellbeing (e.g., worries about boredom), self-
243 determination (e.g., loss of routine), and Personal Development (e.g., loss of institutional support).
244 These were grouped into the following categories: Health Related Worries, Social Related

245 Worries, School Closure Related Worries and Family Related Worries. All worries were rated on
246 a scale from 1 to 5 (with 1 “not concerned at all” to 5 being “very concerned”).

247 Participants were asked to rate their own and their children’s anxiety and worries over three
248 time-points: a) before March 2020 (pre-pandemic); b) during March 2020 (initial lockdown and
249 start of the pandemic) and c) now (January 2021 to March 2021).

250 All the materials can be accessed on the Open Science Framework website (Van Herwegen,
251 Dukes, & Samson, 2020): <https://osf.io/5nkq9/>.

252

253 *Procedure*

254 The caregivers were recruited through various means of communication such as social
255 networks, social media, word-of-mouth, by emails to special education institutions as well as
256 through support groups such as Williams Syndrome Foundation, Down Syndrome Association
257 UK, and ADHD Foundation UK. Their participation was entirely voluntary as well as anonymous.

258 Caregivers completed the survey between 29th of January 2021 and 29th March 2021 which
259 coincided with the 3rd national lockdown in the UK.

260

261 *Ethics*

262 Ethical approval for the study was obtained from Ethics Commission of UniDistance,
263 Switzerland before the start of the study. Respondents provided online consent to take part in the
264 online study and they were free to withdraw at any stage.

265

266 **Results**

267 *Effect of Time on Anxiety for individuals with DS, Other SEND and TDS*

268 A mixed-model ANOVA was computed to determine the effect of time on anxiety for our
269 three groups (participants with DS, those with a different SEND and their TDS). There was a
270 significant effect for time in our model which indicates that there was a difference in the reported
271 anxiety levels for our groups over time. Mauchly’s Test of Sphericity indicated that the assumption
272 of sphericity had been violated: $\chi^2(2) = 18.46, p < .001$. Hence, the degrees of freedom had to be
273 adjusted using the Huynh-Feldt correction; ($\epsilon=0.91$); $F(1.83, 30136) = 55.73, p < .001, \eta^2 = .08$.

274

275

<< [Figure 1 here](#) >>

276

<< [Table 2](#) >>

277

278 There was also a main effect for Group, $F(2,165) = 10.60, p < .001, \eta^2 = .07$ indicating that
279 there was a difference between the groups' reported anxiety. As reported in [Table 2](#), those with
280 DS had lower reported anxiety compared to other individuals with SEND overall ($p < .001$). There
281 was no significant difference between the young individuals with DS and the TDS group ($p > 1.00$).
282 In contrast, there was a significant difference between young people with other SEND and the
283 TDS group ($p < 1.13e-3$).

284

285 In addition, our mixed model ANOVA indicated that there was also a significant Time X
286 Group interaction. Mauchly's Test of Sphericity indicated that the assumption of sphericity had
287 been violated: $\chi^2(2) = 18.46, p < .001$. Hence, the degrees of freedom were adjusted using the
288 Huynh-Feldt correction; ($\epsilon = 0.91$); $F(3.65, 301.36) = 3.03, p < .002, \eta^2 = 9.24e-3$. Planned post-hoc
289 comparisons for the effect of time, group and the interaction were computed and are reported in
290 [Table 2](#). As can be seen in Figure 1, individuals with DS scored lower at all time points, when
291 compared with those with a different SEND diagnosis. When comparing the individuals with DS
292 to the TDS group, we can see that again the individuals that score lower are those with DS apart
293 from the first time point (Before March 2020) at which time point TDS scored lower.

293

294 In terms of what differences occurred across the timeline of the pandemic, individuals with
295 DS different significantly from those with other SEND ($p < .3.89e-3$) but not the TDS group before
296 the pandemic ($p > 1.00$). At the start of the pandemic (March 2020), there was again a significant
297 difference between individuals with DS and those with other SEND ($p < .2.46e-3$) but not with
298 TDS ($p > 1.00$). However, at the final time point (March 2021), there was no longer a significant
299 difference between those with DS and other SEND ($p > .10$) and again no significant difference
300 from the TDS ($p > 1.00$).

300

301 However, in terms of changes over time within the DS group, there was a significant
302 difference between Before March 2020 and During March 2020 ($p < .001$), in that scores went up,
303 but there was no longer a significant difference between during March 2020 and Now March 2021
304 ($p > 1.00$). For the young individuals with other SEND, we see a significant difference between
305 Before March 2020 and During March 2020 ($p < .6.38e-3$) with scores going up, but similarly to
306 the DS group we see that there was no longer a significant difference between March 2020 and
Now March 2021 ($p > 1.00$). Finally, scores went up significantly between Before March 2020

307 and During March 2020 ($p < .001$) for the TD group. Yet, similarly to the other groups there was
308 no significant difference between March 2020 and Now March 2021 ($p > 1.00$).

309

310 **Predictors of Anxiety**

311 Multiple linear regressions were computed for each of our groups to predict anxiety levels
312 during the time the survey was completed (time-point 3) from the following variables: age, gender,
313 health status, awareness of COVID-19, diagnosis of anxiety disorder and the caregiver's anxiety
314 for the same time-point. To maximise the value of the data we have available, we excluded cases
315 using a pairwise deletion. The reported models can be found in [Table 3](#) and the coefficients from
316 the models in [Table 4](#).

317

318 *Linear Regression to Predict Anxiety for Down Syndrome (Model 1)*

319 In the multiple linear regression analysis ([Table 3](#), [Table 4](#)) for the DS group, we can see
320 an association of health status ($b = -.346$ and $\beta = -.214$), diagnosis of anxiety disorder ($b = 1.753$
321 and $\beta = .390$) as well as awareness of COVID-19 ($b = 1.087$ and $\beta = .398$). However, none of the
322 other factors were associated with anxiety for time-point 3 for the DS group. Individuals with DS
323 who had health problems were more likely to show higher anxiety as well as those who were
324 diagnosed with an anxiety disorder and were aware of COVID-19 during the time the survey was
325 completed.

326

327 *Linear Regression to Predict Anxiety for Individuals with Other SEND (Model 2)*

328 For the multiple linear regression ([Table 3](#), [Table 4](#)) for the other SEND group, we can see
329 a similar pattern where health status ($b = -.467$ and $\beta = -.359$), diagnosis of anxiety disorder ($b =$
330 1.039 and $\beta = .388$), awareness of COVID-19 ($b = .870$ and $\beta = .280$) but this time caregiver's
331 anxiety for the same time-point ($b = .277$ and $\beta = .285$) were associated with higher levels of
332 anxiety. Hence, individuals in the other SEND group with anxious caregivers and health problems,
333 were more likely to score higher on anxiety as well as those who were diagnosed with an anxiety
334 disorder and were aware about COVID-19.

335

336 *Linear Regression to Predict Anxiety for Typically Developing Siblings (Model 3)*

368 **Social-related Worries**

369 For *Worries about Friends*, there was a significant effect of time ($p < .001$) with individuals
370 of DS worrying more about their friends' interaction during time-point 3 compared to individuals
371 with other SEND. Yet, both groups score lower than their TDS.

372 When looking at the *Worries about Approach*, we see the exact same pattern of worrying
373 (time effect significant: $p < .001$). Individuals with DS worrying more about approach techniques
374 during time-point 3 compared to the individuals with Other SEND, yet both groups scored lower
375 than their TDS.

376

377 **School-related Worries**

378 We also measured worries relating to schools. A significant effect of time was detected for
379 both the *Worries about Routine* ($p < .001$) *Worries about loss of Institutional Support* ($p < .001$)
380 and *Worries about Getting Bored* ($p < .001$). This explains the different scores across time.

381 For the *Worries about Getting Bored*, there is also a significant effect of Group ($p < .05$).
382 In addition, there is also a significant Group * Time interaction for the *Worries about Routine* (p
383 $< .036$) and the *Worries about Getting Bored* ($p < .002$). The individuals with DS scored
384 significantly lower when compared to their TDS and the Other SEND groups; providing evidence
385 that individuals with DS worry less when considering that TDS worried more about getting bored
386 than their SEND siblings overall and then the other SEND group scored higher than the individuals
387 with DS.

388

389 **Family-related Worries**

390 *Worries about Family Conflict* were reported to change over time for all the individuals (p
391 $< .001$), but there was no significant difference amongst groups nor an interaction between group
392 and time. When looking at the *Worries about Financial / Economic Situation at Home*, not only
393 there was a difference over Time ($p < .001$) but there was a significant Group effect ($p < .01$) and
394 Group * Time interaction ($p < .01$). We can see differences amongst the groups for this worry over
395 time but also between the groups. Specifically, individuals with DS scored lower when compared
396 to the other two groups; whilst TDS scored higher across all three time-points compared to the
397 other SEND group too.

398

399 << [Figure 2 here](#)>>

400 << [Table 5 here](#)>>

401

402 **Discussion**

403 To our knowledge this was the first study to explicitly focus on families of individuals with
404 DS and examine the impact of the COVID-19 pandemic on caregivers-reported levels of anxiety
405 as well as anxiety and worries of individuals with DS compared to other SEND populations and
406 TDS. We also examined which factors could predict anxiety in all three groups (individuals with
407 DS, other SEND and TDS) and the types of worries related to COVID-19 in terms of their worries.
408 Taken together, these analyses improve our understanding on the impact of stressful life events
409 (i.e., COVID-19 pandemic) and provide insight on the mental health of individuals with DS when
410 compared to other SEND populations and TDS.

411

412 **Anxiety during COVID-19**

413 When accounting for anxiety, our first hypothesis was verified, as individuals with DS
414 scored lower for anxiety across all three time points when their scores compared with individuals
415 with other SEND diagnoses. Such findings are in line with the theory that individuals with DS
416 experience lower mental health adversities compared to other SEND populations (Gameren-
417 Oosterom et al., 2011; Naerland et al., 2016). Furthermore, there was no significant difference
418 between DS and TDS during the pandemic. Yet, the TDS group scored lower before the pandemic.
419 However, in all three groups the same pattern was observed in that all three groups showed an
420 increase in anxiety from before the pandemic to the start of the pandemic and these scores have so
421 far not come down yet.

422

423 **Anxiety Predictors**

424 For the DS group, health status, awareness of COVID-19 and an existing diagnosis of an
425 anxiety disorder were strong predictors of anxiety during time-point 3. Despite the small number
426 in those reporting an existing diagnosis of anxiety disorder in the DS group (n = 6), the magnitude
427 of the relationship is strong enough to indicate its importance. Nonetheless, further examination is
428 needed for individuals with DS with pre-existing anxiety disorders in order to obtain a fuller
429 understanding of how the impact of COVID19 and their worries might differ.

430

431 Similarly, we noticed that for the other SEND group, the same factors predicted anxiety,
432 although this time parental anxiety was also an important factor. Previous research has indeed
433 shown that child related anxiety and parent anxiety do influence one another (Neece et al., 2012;
434 Ashworth et al., 2019). However, our analyses show that caregivers' anxiety is only one factor that
435 explains raised anxiety in the other SEND group and that health status and awareness of COVID19
436 are factors that influence the anxiety of both groups. Whilst caregivers' anxiety for the other SEND
437 group was the lowest compared to the DS and TDS groups, it seemed to be a driving factor for
438 anxiety in our SEND model. This could be explained by the fact that indeed depending on the
439 neurodevelopmental condition of the child, the caregiver experiences different levels of stress
440 (Ashworth et al., 2019).

441 Only a pre-existing anxiety disorder was a strong factor of anxiety for the TDS group.
442 However, some of the factors had to be omitted from our model due to the low number of reported
443 cases (see the limitations discussed below). Nonetheless, our findings indicate that factors such as
444 age and gender did not drive anxiety at all in any of our models.

445 As far as we can tell, this is the first study to provide evidence that COVID-19 awareness can
446 predict anxiety in individuals with DS (see limitation and future studies section) which indicates
447 that the more aware an individual with DS is of a stressful event (e.g., COVID-19 pandemic), the
448 higher the levels of anxiety they will experience. Furthermore, it is in line with Sideropoulos et al.
449 (2021) which showed that COVID-19 awareness, anxiety disorders and caregivers' anxiety are
450 associated with increased anxiety in other SEND populations. These results support claims made
451 in previous studies that increased caregiver's anxiety is linked to perceptions of children's stress
452 and anxiety symptoms (Platt et al., 2016; Russell et al., 2020). Nevertheless, there are other factors
453 that could impact on caregivers' perceptions of children's stress. For instance, our data show that
454 caregivers of individuals with DS had higher anxiety levels, yet caregivers reported lower anxiety
455 for their DS children compared to the caregivers with children diagnosed with other SEND. This
456 contradicts the literature on the Down Syndrome Advantage (Kasari & Sigman, 1997; Esbensen
457 & Seltzer, 2011) and shows that the relationship between the caregivers' anxiety/stress and the
458 perception of their children's anxiety/stress is multifaceted. A possible explanation of the high
459 reported levels of anxiety in the caregivers with DS children group could be due to the lack of

460 access to social network, which from previous research seems to work as a preventing factor
461 (Hauser-Cram et al., 2001).

462

463 **Worries**

464 For our 3rd hypothesis, we expected to see individuals with DS to score lower on the
465 worries compared to other SEND. However, our analyses showed a more complex picture and
466 indeed individuals with DS scored differently on some worries but not all. For the health-related
467 worries, we see a change over time for all groups (DS, other SEND and TDS) with individuals
468 with DS scoring lower or similarly to the TDS group on COVID-19 related worries about theirs
469 or others' health compared to SEND group. Worries around health have been found to be increased
470 in SEND families and our study seems to provide further support to such claims (Asbury et al.,
471 2021). As highlighted by Emes et al., (2021), individuals with DS are at greater risk for severe
472 outcomes of COVID-19, nonetheless our data suggest that it is not a major concern for families
473 and individuals with DS.

474 In terms of social-related worries, both individuals with DS and other SEND diagnosis
475 worried more than the TDS group. Nonetheless, individuals with DS seem to exhibit greater worry
476 about approaching others compared to the other SEND group and the TDS group. This might be
477 linked to the well reported fact that individuals with DS are highly sociable and have good 'people'
478 skills and that they look towards others when being faced with difficult and challenging tasks (see
479 review by Cebula & Wishart, 2008). Seeing the loss of support during the COVID-19 pandemic,
480 we could explain the elevated worries of approach for the DS group. Further evidence in the
481 literature also argues the importance of approach for individuals with DS and other SEND in
482 general and how the lack of social interaction can lead to feelings of isolation (Houtrow et al.,
483 2020), being overwhelmed due to loss of access to support workers who communicate better with
484 individuals with SEND (Asbury et al., 2021), and other stressors that SEND families face.
485 Specifically, for individuals with DS as they are experiencing a lot of sensory processing
486 difficulties (Will et al., 2019; Barisnikov et al., 2018).

487 When looking at the school-related worries, all groups showed to be equally worried.
488 Individuals with DS worried less about boredom than the TDS and the other SEND groups. This
489 suggests, although indirect, that schools provide structured activities that occupy both TDS and
490 SEND groups from becoming bored (Sideropoulos et al., 2021; Jeste et al., 2020). However,

491 individuals with DS reported similar worries in terms of loss of institutional support or loss of
492 routines. This could be explained by the fact that many individuals with SEND (inclusive of DS)
493 with health needs had to be shielded (Van Herwegen, 2020; Van Herwegen, 2020b) and thus,
494 experienced a loss of support that schools provide.

495 Finally, for the family-related worries, the three groups reported similar worries with the
496 exception of *Financial Situations* for which individuals with DS scored lower when compared to
497 the other two groups, while the TDS scored higher compared to the individuals with DS or other
498 SEND diagnosis. It is evident from the WHO (2021) report that financial instability is an adversity
499 that could lead to more stress and anxiety to the general population and that could explain the
500 higher scores of TDS compared to the individuals with DS and other SEND, who tend to be less
501 aware of finance and many struggle with mathematical concepts (Cuskelly, Faragher, & Jobling,
502 2017; Faragher, 2017).

503 Overall, it was observed that individuals with other SEND diagnosis reported higher levels
504 of worries compared to individuals with DS which replicates existing evidence (Sideropoulos et
505 al., 2021) as well as provides further evidence that individuals with DS seem to be less anxious
506 and experience lower levels of worries compared to other SEND groups who have been shown to
507 show increased worries in previous research (e.g., autism: Miniarikova et al., 2021). However,
508 also in individuals with DS anxiety and some areas of worries have increased as a result of the
509 ongoing pandemic. The current study has shown that especially those who are aware of COVID19,
510 have underlying health issues and have existing anxiety disorders are at greater risk to show higher
511 anxiety.

512

513 **Impact and Conclusion**

514 These findings highlight that not all SEND groups are equally affected in terms of anxiety
515 and that minor differences in predictive factors as well as worries exist. This matters in terms of
516 toolkits to be developed to support individuals with SEND during stressful times such as a health
517 pandemic. However, despite the individuals with DS being less anxious at the beginning of the
518 pandemic, they still have significant worries about certain aspects. Therefore, individuals with DS
519 still need to be supported and have serious concerns that need to be addressed.

520

521

522 **Limitations and Future Studies**

523 The present study investigated the anxiety levels and worries through caregiver report,
524 rather than a self-reported measure. Our previous work, but also other research, shows the direct
525 link between caregivers' anxiety and the children's perception of mental health state (Sideropoulos
526 et al., 2020). However, future studies should also examine the experiences of those with SEND
527 diagnoses, including those with DS directly through self-reports.

528 Furthermore, only 6 participants with DS reported an existing diagnosis of anxiety
529 compared to the other SEND which reported 19 cases, whilst this is a very small number for a
530 factor to be used in a regression model, this could be indicative of what we might see in larger
531 sample sizes for the DS population.

532 In addition, anxiety was measured using a non-standardised set of questions. Therefore, it
533 is important that follow-up works use a standardised self-reported method to assess anxiety level
534 of this population such as the Generalised Anxiety Disorder scale (Spitzer et al., 2006).

535 Finally, it is evident from our data that reported anxiety levels in all groups seem to plateau
536 rather than decrease which is of great public health concern for the SEND community. However,
537 this could be due to biased recall of the past. Hence, future studies need to focus on a) longitudinal
538 designs and b) the understanding of mental health of this population as well as on the prevalence
539 factors and recovery from the pandemic's impact.

540

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547

548 **Authors' Contributions**

549 J.VH, D.D. and AC.S conceived of the presented idea. V.S, H.K., D.D., AC.S., O.P. & J.VH.
550 recruited the data for the project. V.S. and J.VH. planned and carried out the data analysis. All
551 authors discussed the results and contributed to the final manuscript.

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Table 1. Overview of diagnosis of children with Special Education Needs and Disabilities (SEND)

Type of diagnosis	Frequency	Percent	Valid Percent	Cumulative Percent
Autism Spectrum Disorder	8	7.0	7.0	7.0
Down Syndrome	67	58.3	58.3	65.2
Intellectual Disability (Not Otherwise Specified)	3	2.6	2.6	67.8
Williams Syndrome	15	13.0	13.0	80.9
Attention-deficit Disorder (with or w/out Hyperactivity)	4	3.5	3.5	84.3
Other Syndrome/Diagnosis:	18	15.7	15.7	100.00
Total	115	100.00		

Table 2. Post Hoc Comparisons for Time, Group (Typically developing siblings = TDS, Down syndrome = DS, Other SEND) and Group * Time

				95% CI for Mean Difference						
			Mean Difference	Lower	Upper	SE	t	Cohen's d	p bonf	
Time	Before. March.20	During March 20	-0.82	-1.03	-0.60	0.09	-9.09	-0.70	< .001 ***	
		Now.March.21.	-0.83	-1.04	-0.61	0.09	-9.19	-0.71	< .001 ***	
	During March.20	Now.March.21.	-9.04e - 3	-0.23	0.21	0.09	-0.10	-7.75e - 3	1.00	
Group	DS	Other SEND	-0.84	-1.31	-0.38	0.19	-4.38	-0.34	< .001 ***	
		TDS	-0.11	-0.56	0.34	0.19	-0.60	-0.05	1.00	
	Other SEND	TDS	0.73	0.24	1.22	0.20	3.63	0.28	1.13e -3 **	
Group * Time	DS, Before March20	Other SEND, Before.March.20	-0.90	-1.65	-0.16	0.23	-3.92		3.89e -3 **	
		TDS, Before.March.20	0.22	-0.49	0.94	0.22	1.00		1.00	
		DS, During.March.20	-0.61	-1.07	-0.16	0.14	-4.34		< .001 ***	
		Other SEND, During.March.20	-1.54	-2.29	-0.80	0.23	-6.69		< .001 ***	
		TDS, During.March.20	-0.98	-1.70	-0.27	0.22	-4.43		< .001 ***	
		DS, Now.March.21	-0.76	-1.22	-0.31	0.14	-5.40		< .001 ***	
		Other SEND, Now.March.21	-1.46	-2.20	-0.71	0.23	-6.32		< .001 ***	
	Other SEND, Before.M arch.2020	TDS, Before.March.20	1.13	0.35	1.91	0.24	4.66		< .001 ***	
		DS, During.March.20	0.29	-0.45	1.04	0.23	1.27		1.00	
		Other SEND, During.March.20	-0.64	-1.18	-0.10	0.17	-3.79		6.38e -3 **	
		TDS, During.March.20	-0.08	-0.86	0.70	0.24	-0.32		1.00	
		DS Now.March.21.	0.14	-0.60	0.89	0.23	0.62		1.00	
		Other SEND, Now.March.21.	-0.55	-1.10	-0.01	0.17	-3.29		0.04 *	
		TDS, Now. March.21.	-0.04	-0.82	0.74	0.24	-0.17		1.00	

TDS, Before.M arch.2020	DS, During.March.20	-0.83	-1.55	-0.12	0.22	-3.76	7.28e -3	**
	Other SEND, During.March.20	-1.76	-2.54	-0.98	0.24	-7.30	< .001	***
	TDS, During.March.20	-1.20	-1.71	-0.70	0.16	-7.67	< .001	***
	DS, Now.March.21.	-0.98	-1.70	-0.27	0.22	-4.43	< .001	***
	Other SEND, Now.Mar.21.	-1.68	-2.46	-0.90	0.24	-6.95	< .001	***
	TDS, Now.March.21.	-1.17	-1.67	-0.66	0.16	-7.43	< .001	***
DS, During.M arch.2020	Other SEND During.March.20	-0.93	-1.67	-0.19	0.23	-4.04	2.46e -3	**
	TDS, During.March.20	-0.37	-1.09	0.34	0.22	-1.67	1.00	
	DS, Now.March.21	-0.15	-0.60	0.31	0.14	-1.06	1.00	
	Other SEND, Now. March.21.	-0.85	-1.59	-0.10	0.23	-3.67	0.01	*
	TDS, Now.March.21.	-0.33	-1.05	0.38	0.22	-1.50	1.00	
Other, SEND, During.M arch.20	TDS, During.March.20	0.56	-0.22	1.34	0.24	2.32	0.76	
	DS, Now. March.21.	0.78	0.04	1.53	0.23	3.39	0.03	*
	Other SEND, Now.March.21.	0.09	-0.46	0.63	0.17	0.51	1.00	
	TDS, Now.March.21.	0.60	-0.18	1.38	0.24	2.47	0.50	
TDS, During.M arch.20	DS, Now.March21.	0.22	-0.49	0.94	0.22	1.00	1.00	
	Other, SEND. Now.March.21	-0.48	-1.26	0.30	0.24	-1.97	1.00	
	TDS, Now.March.21	0.04	-0.47	0.54	0.16	0.24	1.00	
DS Now.Mar ch.21	Other SEND, Now.March.21.	-0.70	-1.44	0.05	0.23	-3.02	0.10	
	TDS Now.March.21.	-0.18	-0.90	0.53	0.22	-0.83	1.00	
Other, SEND, Now.Mar ch.21.	TDS, Now.March.21.	0.51	-0.27	1.29	0.24	2.12	1.00	

Note. P-value and confidence intervals adjusted for comparing a family of 36 estimates (confidence intervals corrected using the bonferroni method).
 Cohen's d does not correct for multiple comparisons
 * $p < .05$, ** $p < .01$, *** $p < .001$

Table 3. Multiple Linear Regression Models Summary

Models	
1 (DS)	$F(6,60) = 6.354, p < .001, R^2 = .389$ and R^2 adjusted = .327
2 (Other SEND)	$F(6,40) = 12.370, p < .001, R^2 = .650$ and R^2 adjusted = .597
3 (TDS)	$F(5,48) = 4.790, p < .001, R^2 = .333$ and R^2 adjusted = .263

DS= Down Syndrome, TDS= Typically Developing Sibling,

Table 4. Coefficients^a of all the multiple linear regression models.

Model		Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	-.141	1.232		-.114	.909		
	Age	-.017	.023	-.093	-.736	.464	.638	1.567
	Gender	-.086	.276	-.033	-.312	.756	.887	1.128
	Health Status	-.346	.172	-.214	-2.017	.048*	.903	1.107
	Caregiver's Anxiety	.225	.125	.191	1.794	.078	.899	1.113
	Anxiety Disorder	1.753	.470	.390	3.726	.000***	.931	1.074
	COVID-19 Awareness	1.087	.352	.398	3.090	.003**	.616	1.624
2	(Constant)	1.947	1.148		1.696	.098		
	Age	-.022	.025	-.095	-.917	.364	.811	1.233
	Gender	-.378	.270	-.136	-1.402	.168	.936	1.068
	Health Status	-.467	.138	-.359	-3.384	.002**	.777	1.287
	Caregiver's Anxiety	.277	.109	.285	2.539	.015*	.697	1.435
	Anxiety Disorder	1.039	.301	.388	3.453	.001***	.692	1.445
	COVID-19 Awareness	.870	.336	.280	2.589	.013*	.746	1.340
3	(Constant)	.251	1.669		.151	.881		
	Age	-8.944E-5	.025	.000	-.004	.997	.970	1.031
	Gender	.154	.318	.060	.484	.631	.912	1.096
	Health Status	-.060	.290	-.026	-.208	.836	.916	1.091
	Caregiver's Anxiety	.119	.125	.117	.951	.346	.914	1.095
	Anxiety Disorder	2.005	.518	.511	3.873	.000***	.798	1.252

a. Dependent Variable: Anxiety (Jan - March 2021)

Note. * p < .05, ** p < .01, *** p < .001

Table 5. Mean Scores and Standard Deviations of the Worries across the three time points and for the three groups (DS= Down Syndrome, TDS= Typically Developing Sibling., Other SEND).

Time-point		Before March 2020			During March 2020			Now (Jan – Mar 2021)		
Group		DS	Other SEND	TDS	DS	Other SEND	TDS	DS	Other SEND	TDS
Type of Worries	Worries about illness in general	1.46 (.84)	2.15 (1.37)	1.52 (.88)	1.82 (1.28)	2.36 (1.42)	2.46 (1.38)	1.97 (1.37)	2.47 (1.50)	2.41 (1.32)
	Worries about COVID-19	1.23 (.65)	1.45 (1.06)	1.41 (.77)	2.12 (1.46)	2.45 (1.47)	3.09 (1.34)	2.30 (1.47)	2.45 (1.36)	2.96 (1.16)
Health-related worries	Worries about family's safety with respect to COVID-19	1.29 (.80)	1.43 (.93)	1.57 (.96)	1.89 (1.39)	2.17 (1.43)	3.22 (1.50)	2.02 (1.39)	2.26 (1.44)	3.19 (1.48)
	Worries about their own health	1.44 (.91)	1.66 (1.05)	1.41 (.88)	1.70 (1.14)	2.02 (1.28)	2.28 (1.28)	1.91 (1.24)	2.11 (1.36)	2.24 (1.26)
	Worries about getting ill	1.35 (.84)	1.64 (1.13)	1.24 (.55)	1.94 (1.39)	2.09 (1.36)	2.43 (1.34)	2.08 (1.44)	2.19 (1.39)	2.30 (1.33)
	Worries about others getting ill	1.45 (1.01)	1.74 (1.13)	1.66 (1.02)	1.98 (1.51)	2.21 (1.49)	3.06 (1.50)	2.00 (1.48)	2.28 (1.51)	3.11 (1.48)
	Worries about friends	1.74 (1.09)	1.83 (1.23)	1.80 (1.26)	2.94 (1.48)	3.13 (1.47)	3.36 (1.32)	3.45 (1.48)	3.33 (1.49)	3.89 (1.25)
Social related worries	Worries about approach	1.50 (.96)	1.70 (1.19)	1.40 (.95)	2.65 (1.48)	2.63 (1.40)	3.09 (1.42)	2.98 (1.65)	2.80 (1.44)	3.19 (1.48)
	Worries about changes in routine	1.91 (1.25)	2.33 (1.43)	1.36 (.71)	2.97 (1.57)	3.24 (1.58)	2.68 (1.30)	2.98 (1.55)	3.15 (1.49)	2.98 (1.25)
Worries related to school closures	Worries about getting bored	1.48 (.85)	1.87 (1.19)	1.59 (1.06)	2.17 (1.33)	2.51 (1.52)	2.83 (1.28)	2.42 (1.49)	2.81 (1.57)	3.31 (1.31)
	Worries about loss of institution (including closure of school)	1.45 (.95)	1.64 (.125)	1.26 (.59)	2.52 (1.68)	2.56 (1.53)	2.59 (1.49)	2.68 (1.67)	2.51 (1.56)	2.81 (1.57)

Family- related worries	Worries about family conflict	1.50 (1.03)	1.49 (1.04)	1.43 (.72)	1.74 (1.13)	1.79 (1.18)	1.98 (1.25)	1.88 (1.27)	1.77 (1.07)	2.06 (1.37)
	Worries about finance	1.08 (.27)	1.26 (.87)	1.20 (.45)	1.09 (.34)	1.32 (1.02)	1.61 (1.09)	1.11 (.40)	1.38 (1.15)	1.69 (1.15)

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Figure 1. Visualisation of the effect of time on reported child anxiety

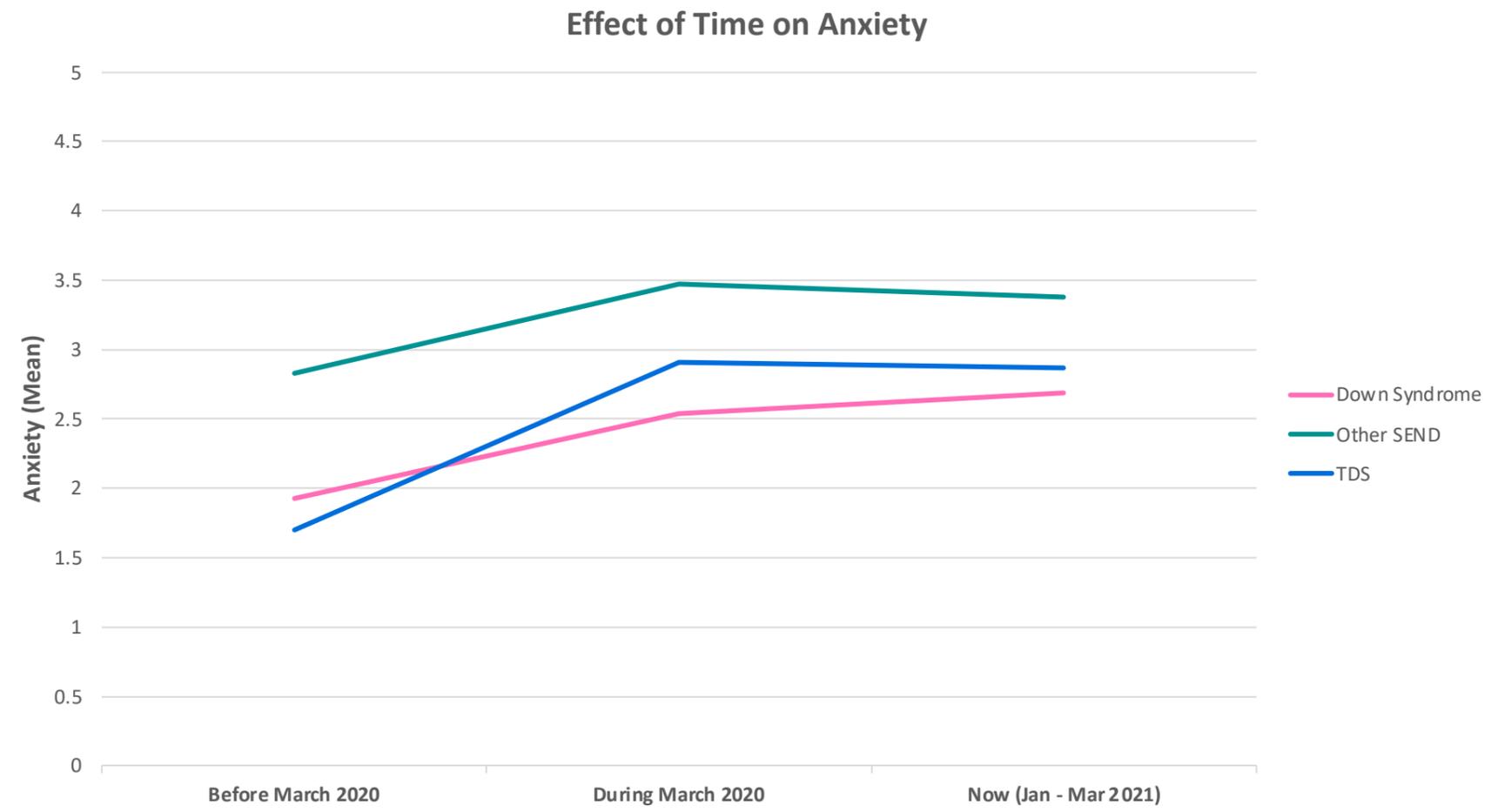


Figure 2. Visualisation of change over time for reported child worries

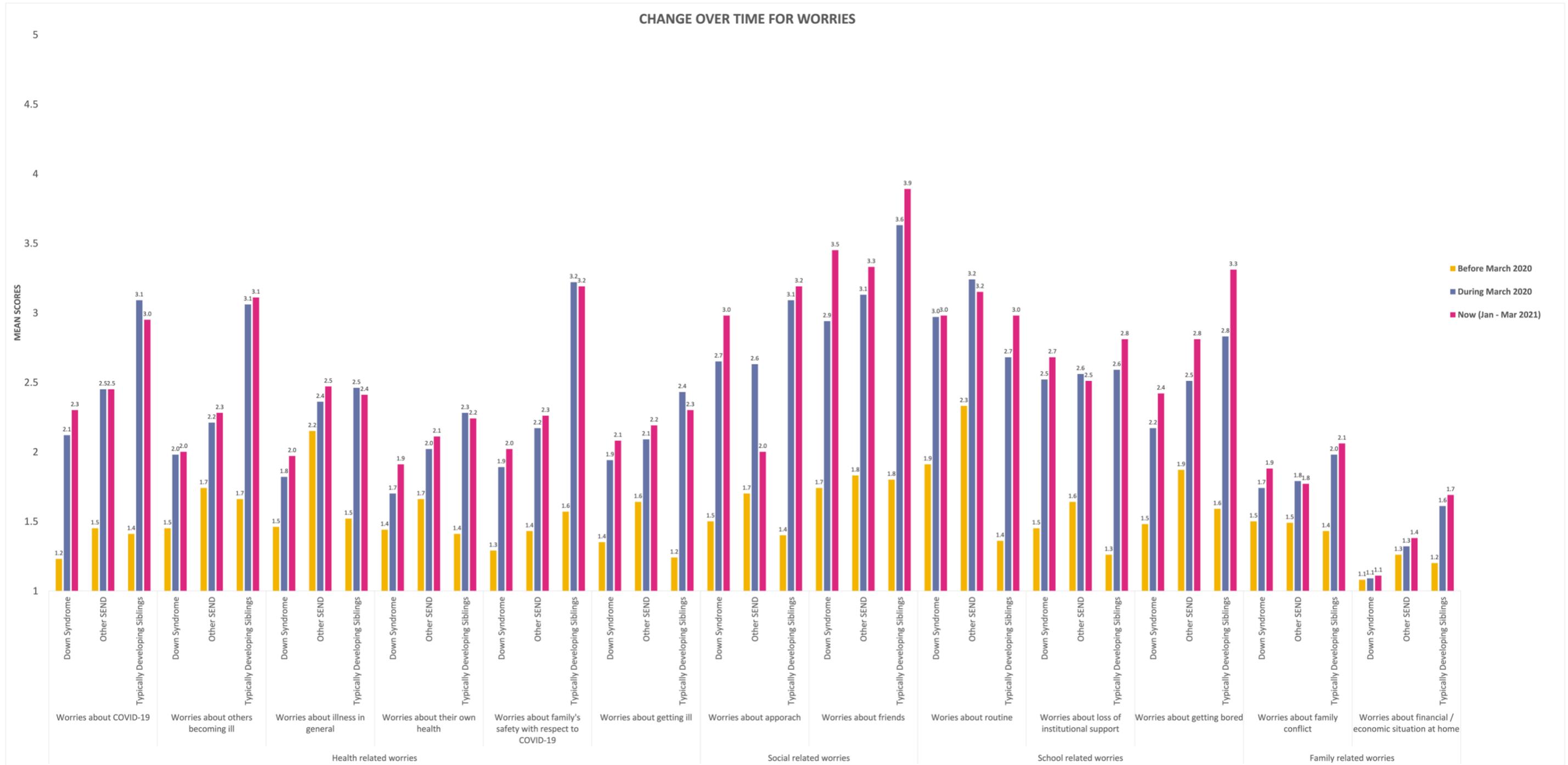


Table 1S. Sphericity violations and ANOVA output for Worries

Type of concern	Test of Sphericity Checks	Adjustment Method and ϵ level	Source	d1	d2	F	p	η^2_p	
Health-related worries	Worries about COVID-19	$\chi^2(2) = 39.28, p < .001$	Huynh-Feldt correction ($\epsilon = .84$)	Group	38.12	164	5.4	<.006*	.061
				Time	1.68	275.86	107.22	<.001***	0.40
				Group x Time	3.36	275.86	3.78	<.008*	.044
	Worries about others becoming ill	$\chi^2(2) = 56.12, p < .001$	Huynh-Feldt correction ($\epsilon = .79$)	Group	2.00	163	6.44	<.002*	0.07
				Time	1.58	257.25	63.45	<.001***	0.28
				Group x Time	3.16	257.25	8.51	<.001***	.095
	Worries about illness in general	$\chi^2(2) = 29.30, p < .001$	Huynh-Feldt correction ($\epsilon = .88$)	Group	2.00	165	3.71	<.027*	0.04
				Time	1.76	289.77	38.43	<.001***	0.19
				Group x Time	3.51	289.77	5.16	<.001***	0.06

	Worries about their own health	$\chi^2 (2) = 23.03, p < .001$	Huynh-Feldt correction ($\epsilon = .90$)	Group	2.00	164	1.43	<.243	0.02
				Time	1.81	296.31	37.68	<.001***	0.19
				Group x Time	3.61	296.31	3.70	<.008***	0.04
	Worries about family's safety with respect to COVID-19	$\chi^2 (2) = 54.53, p < .001$	Huynh-Feldt correction ($\epsilon = .79$)	Group	2.00	164	11.48	<.001***	0.12
				Time	1.59	260.53	82.66	<.001***	0.34
				Group x Time	3.18	260.53	7.49	<.001***	0.08
	Worries about getting ill	$\chi^2 (2) = 50.29, p < .001$	Huynh-Feldt correction ($\epsilon = .81$)	Group	2.00	163	0.61	.543	0.01
				Time	1.61	262.61	61.81	<.001***	0.28
				Group x Time	3.22	262.61	4.18	<.005**	0.05
Social-related worries	Worries about friends	$\chi^2 (2) = 23.29, p < .001$	Huynh-Feldt correction ($\epsilon = .90$)	Group	2.00	162	2.10	.126	0.03
				Time	1.80	292.01	164.43	<.001***	0.50

				Group x Time	3.61	292.01	2.42	.055	0.03
	Worries about approach	$\chi^2 (2) = 81.40, p < .001$	Huynh-Feldt correction ($\epsilon=.73$)	Group	2.00	162	0.44	.644	0.01
				Time	1.46	236.33	138.04	<.001***	0.46
				Group x Time	2.92	236.33	3.30	<.022*	0.04
School-related worries	Worries about loss of routine	$\chi^2 (2) = 21.49, p < .001$	Huynh-Feldt correction ($\epsilon=.91$)	Group	2.00	11.86	2.90	0.058	0.04
				Time	1.82	292.61	88.97	<.001***	0.36
				Group x Time	3.64	292.61	2.70	<.036**	0.03
	Worries about loss of institutional support	$\chi^2 (2) = 61.73, p < .001$	Huynh-Feldt correction ($\epsilon=.77$)	Group	2.00	162	0.00	.966	0.00
				Time	1.55	250.64	91.71	<.001***	0.36
				Group x Time	3.09	250.64	1.92	.126	0.02
	Worries about getting bored	$\chi^2 (2) = 42.06, p < .001$	Huynh-Feldt correction ($\epsilon=.83$)	Group	2.00	164	3.83	<.024**	0.05

				Time	1.66	272.83	98.37	<.001***	0.38
				Group x Time	3.33	272.83	4.77	<.002***	0.06
Family-related worries	Worries about family conflict	$\chi^2 (2) = 42.90, p < .001$	Huynh-Feldt correction ($\epsilon=.83$)	Group	2.00	164	0.27	.764	0.00
				Time	1.66	271.93	30.65	<.001***	0.16
				Group x Time	3.32	271.93	2.12	<.091	0.03
	Worries about financial / economic situation at home	$\chi^2 (2) = 81.40, p < .001$	Huynh-Feldt correction ($\epsilon=.73$)	Group	2.00	163	4.97	<.008***	0.06
				Time	1.53	249.82	10.04	<.001***	0.06
				Group x Time	3.07	249.82	4.80	<.003***	0.06

Note. * $p < .05$, ** $p < .01$, *** $p < .001$