

# Interventions for Neurodevelopmental Disorders

Ebert Simon\*

Department of Clinical Psychology, University of Amsterdam, Amsterdam, The Netherlands

**Corresponding author:** Ebert Simon, Department of Clinical Psychology, University of Amsterdam, Amsterdam, The Netherlands, E-mail: ebertsimon@gmail.com

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## Introduction

Increasing evidence suggests the onset of the COVID-19 (SARS-CoV-2) pandemic, along with school closures, stay at home orders, social distancing from peers and teachers, and canceling of extra-curricular activities (collectively known as 'lockdowns' henceforth), had deleterious effects on adolescents' mental health worldwide. In previous disease outbreaks such as SARS and MERS the containment measures imposed led to significant increases in risk of mental illness among adolescents and poorer mental health up to nine years later. Furthermore, an unintended consequence of these containment measures was increased loneliness. Similarly, COVID-19 school lockdowns have generated increased feelings of loneliness and disconnect from friends for many adolescents. In Australia, over 60% of adolescents 'frequently' felt lonely during the COVID-19 period. Conversely, in Peru no changes in adolescent's loneliness were found during lockdowns.

Adolescence is a particularly high-risk period for psychopathological symptoms developing into full-blown mental disorders. It is also the peak period of high risk for loneliness. Some adolescents, such as those with neurodevelopmental disorders (NDDs e.g. Attention-Deficit/Hyperactivity Disorder [ADHD], Specific Learning Disorders [SLD], Autism Spectrum Disorder [ASD]) in mainstream secondary schools are particularly vulnerable to loneliness and heightened risk of developing mental health problems. They also experience greater psychological distress and adverse mental health following disasters and unpredictable events. Daily routines that promote structure, and facilitate social contact with peers and teachers, may be disrupted by COVID-19 school lockdowns and as such put adolescents with NDDs at significantly heightened risk of adversity.

## Social and Communication Difficulties

To date, the impact of COVID-19 school lockdowns on adolescents with NDDs is relatively unknown. Most of the studies that include young people with NDDs have been cross-sectional, focused on ADHD, collected data 'during' the pandemic months, and/or lacked comparison groups. Notwithstanding, findings point to worsening emotional wellbeing and mental health and emotional-mood states during the COVID-19 period. Significant deteriorations have also been

reported during school closures in externalizing, aggressive and challenging behaviors, and emotional health among young people with ADHD, ASD, and SLD. Longitudinal examinations of the impact of COVID-19 on adolescents with NDDs are scarce. Breaux et al. collected data from 238 adolescents aged 15–19 years (118 with ADHD) and found significant increases from pre-COVID-19 levels in depression, anxiety, inattention, sluggish cognitive tempo, and oppositional type symptoms among adolescents with or without ADHD. Adverse changes returned to pre-COVID levels however, once stay at home orders were lifted. Adolescents with ADHD and poor emotion regulation were at greatest risk for sustained elevation in externalizing symptoms. Deteriorations in mental health from prolonged school closures have also been reported in longitudinal studies of neuro-typical adolescents.

Challenges have been created by COVID-19 mitigation policies, especially those known collectively as lockdowns. Consequently, genuine concerns have been expressed for the mental health of vulnerable populations such as adolescents with NDDs. Public debate around these concerns must, however, be informed by further research and reliable data. This study presents findings from a larger four-wave longitudinal study capturing change in the mental health and feelings of loneliness in a matched sample of Australian adolescents with or without NDDs. Our first aim was to examine changes in adolescent's mental health problems (depression symptoms, internalizing and externalizing symptoms, and positive mental wellbeing) and loneliness over time. Our second aim was to examine whether any impact of NDDs status was predictive of change in mental health and feelings of loneliness. We also sought to examine the impact of COVID-19 lockdowns on different NDDs. Given, the increased vulnerability of adolescents with neurodevelopmental risk to adverse mental health and loneliness, the impact of COVID-19 was expected to be greater.

## Medication Management

It has been argued that the unpredictability of COVID-19 school lockdowns may put adolescents with NDDs at greater risk for adverse mental health. However, adolescents with NDDs in this study did not report significant changes in their mental health over time because of school lockdowns. Rather, adolescents without NDDs experienced a significant increase in depressive symptoms from school lockdowns to post schools

reopening. Pre-COVID-19 depression symptoms were already high among adolescents with NDDs prior to school lockdowns and remained so across all waves of data collection. School lockdowns did not excessively exacerbate their problems. This reflects the generally higher rates of depression among adolescents with ADHD, ASD, and SLD and highlights that they continue to be a population at risk. Furthermore, adolescents with NDDs evidenced no change in externalizing symptoms and positive mental wellbeing over time, which contrasts with other studies involving adolescents with ADHD or ASD during COVID-19 restrictions. This may be due to the heterogeneity known to exist within and between NDDs as a collective category, or that lockdowns were fewer and shorter and without major catastrophic health and social crises in WA compared to other parts of the world. Similar to Breaux et al., however, mental health difficulties for adolescents with NDDs returned to, or below, pre-COVID-19 levels post schools reopening.

Taken together, our findings show that COVID-19 school lockdowns did not adversely and excessively impact adolescents with NDDs in WA and any increases in adverse mental health and loneliness that did occur, were not maintained over time. Moreover, adolescents with ADHD appeared to benefit from school lockdowns in terms of their positive mental wellbeing. Although unpredictable, school lockdowns in WA were relatively short (9 weeks). Nevertheless, this was longer than Breaux et al.'s approximate 6 week maximum. Future research should compare the impact of different lengths of COVID-19 school lockdowns, especially with more severely hit areas than in our study, such as New South Wales and Victoria. Future research should also recruit larger samples of adolescents with NDDs in order to more closely examine how changes may differ among adolescents with differing NDD diagnoses.