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Investigating the impact of at-home learning on secondary school-aged children with ADHD: a qualitative study

Brad Hatton  and Lauren Powell

University of Sheffield

Key words: Attention Deficient Hyperactivity Disorder, ADHD, home learning, COVID-19 lockdown, secondary School.

Students with ADHD can benefit from at-home learning in terms of managing their symptoms; however, lockdown restrictions due to the pandemic are having negative impacts on the student population. This study was designed to ascertain how students with ADHD have been impacted by at-home learning under lockdown restrictions. An interpretative phenomenological analysis was conducted using semi-structured interviews from students, parents and teaching staff. These interviews were used to identify three main themes (anxiety caused by at-home learning, change in social interaction and academic impact of at-home learning) that best identified the participants' experiences. The results suggested that whilst supportive home environments helped students with ADHD to better manage their symptoms, social anxiety was a significant problem, and not all schools allowed students with ADHD to take full advantage of at-home learning for their students with ADHD.

Introduction

What is ADHD?

An educational need such as attention deficit hyperactivity disorder (ADHD) may impact how a child is affected by the abrupt change in a sustained period of at-home learning. A meta-regression analysis by Polanczyk et al. (2007) concluded that the prevalence of ADHD worldwide was 5.29%. In England, that makes just over 470 000 children in school with ADHD or 170 500 children with ADHD in secondary state schools. ADHD is classed as a neurodevelopmental disorder that is particularly common in children (Centre for Disease Control and Prevention, 2021) and whilst some symptoms can

gradually disappear with age, some still experience ADHD into adulthood.

The three core symptoms of ADHD are developmentally inappropriate levels of hyperactivity, impulsivity and inattention (American Psychiatric Association, 2013), according to the Diagnostic and Statistical Manual for Mental Disorders, which is also used in the UK.

Secondary school-aged children with ADHD are a particular concern due to the possibility of disengaging with medication and provided services (Charach et al., 2014) which in turn can have a detrimental effect on academic achievement (Pliszka, 1998). With exams during secondary school having the capability of impacting on future life choices, children with ADHD are in turn at risk of under-achieving (Ek et al., 2011).

With the significant impact that the pandemic and lockdown restrictions will have had on the lives of young people, our interviews showed that anxiety became a frequently reoccurring topic in various aspects of student's lives.

Children and adolescents with ADHD are more likely to experience a range of comorbid conditions, particularly forms of anxiety. Clinical studies have found a comorbid association between ADHD and anxiety of approximately 25% in children (Spencer, 2006). In a study by Jensen and colleagues (Jensen, 1993) of 47 referred children, 28% of children with ADHD were diagnosed with comorbid anxiety and children with predominantly inattentive ADHD were more likely to have comorbid anxiety than those with hyperactive ADHD. Of particular note to this study is the relationship between children and adolescents with ADHD, anxiety and social media. References to social media were made in a majority of this study's interviews with regard to an increase in usage with both positive and negative outcomes. As children with ADHD rely on school for a larger amount of their socialisation (Marton et al., 2015) than children without ADHD, they

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are much more likely to turn to social media to meet their social needs. However, there is also a noticeable increase in the levels of anxiety in children with ADHD who use social media excessively (Shuai et al., 2021) as well as an increase in severity of ADHD symptoms and a negative impact on parent–child relationships.

With the difficulty posed by the sudden shift in education, anxiety in relation to academic achievement was a quickly identified theme in this study.

It has been frequently documented that children with ADHD face more difficulties in school than their peers (Rabiner and Coie, 2000), as symptoms that include inattentiveness, disruptive behaviour and problems with working memory and organisation will make achievement in a school setting difficult (Daley and Birchwood, 2010). In conjunction with the imposed lockdown and new demands around online learning academic-related anxiety also appeared frequently in the studies interviews.

With pandemic restrictions having had such an impact on social interaction with family and peers as well as their academic situation, the comorbidity between ADHD and self-esteem also became relevant. A study of 85 children and adolescents (Mazzone, et al., 2013) showed that children with ADHD are much more likely to suffer with lower self-esteem than their counterparts. This comorbidity is irrespective of academic ability, with more able students with ADHD demonstrating lower levels of self-esteem than their academically congruent peers (Foley-Nicpon et al., 2012).

At-home learning

To better accommodate the needs of children with ADHD, some families have decided that home schooling is a better option (Arora, 2006). With control over philosophical and pedagogical practice, parents are able to individualise approaches to their child's education that can take into consideration their ADHD symptoms (Duvall, Delquadri, and Ward, 2004).

Whilst making the decision to home school does provide freedom from the national curriculum and classroom pedagogy, it does mean that the parent is unable to access any in-school support and expertise for special education needs such as ADHD. Whilst at-home learning for children with ADHD is by its nature going to vary based on the child, parent and resources, children with ADHD have shown that they can perform better in this environment (Duvall, et al., 2004).

On 18 March 2020, the Prime Minister of England announced that due to concerns of an emerging pandemic, schools across England were too close to all students excluding those of key workers. With a majority of school children now at home, schools continued to provide education for their students remotely. Utilising

education software and video communication platforms, at-home learning suddenly became the normal form of education for 8.89 million children, 3.41 million of those children being in secondary education (gov.uk).

Significance of the problem

Since the beginning of the COVID-19 lockdown, studies have highlighted the impact of the lockdown on various aspects of society (Chandola, et al., 2020). With the varying effects lockdown has had on families, on children and adolescents with ADHD and months of at-home learning and uncertainty over exams and possible educational reforms (bbc.co.uk), the impact at-home learning has had on children with ADHD should be considered.

Understanding how children with ADHD have experienced at-home learning during lockdown would have implications for an effective and structured return to classroom-based learning. Negative experiences during lockdown could be investigated further to provide appropriate support to both children, teachers and parents and could also highlight future avenues for effective at-home learning strategies for children with ADHD.

Whilst current research on the topic is understated due to the timeframe of COVID-19 and the difficulties of conducting research in lockdown situations, the area of research is not untouched. Studies on how lockdown has affected education, as well as more specifically on children with ADHD in various countries, have been completed. Onyema et al. (2020) conducted a study on how coronavirus has affected education in more than one hundred countries. These results are corroborated by Thorell et al. (2021) which investigated the impact of COVID-19 pandemic on at-home learning, although more positive in its conclusions. Yet, this can be contradicted (Bobo et al., 2020) with results that showed children with ADHD experienced increased stability and sense of well-being during the lockdown.

There is a variability in how coronavirus and the corresponding lockdown have affected children and their education. A potential explanation for the variety of results could lie within the countries studied. Onyema et al. (2020) criticism of the delivery of online education is based predominantly on surveys from Nigeria, Bangladesh, Saudi Arabia and India. Thorell et al. (2021) investigation which yielded some positive results for at-home learning was based predominantly in European countries and Bobo et al. (2020) was focused on France. A factor to be considered with regard to these differing outcomes is the different impacts and timeframes the pandemic has had on different countries as well as individual country's different responses to the pandemic.

Whether it is explained by country, by socio-economic background or available technological infrastructure and literacy, assumptions cannot be made about the impact at-

home learning during a pandemic has had on the school population with ADHD.

Taking into consideration the economic, educational and mental and physical health in England, the hypothesis of this study is that children with ADHD will have experienced increased levels of anxiety, in particular, with regard to their academic circumstances.

Melegari et al. (2021) confirmed the worsening of ADHD symptoms during lockdown conditions, and similar results have been reported in previous studies (Lee, 2020) and imply that sudden interruptions in familiar relationships and activities could have caused difficulties with adaptation to new conditions.

There are various studies into the environmental factors that can impact ADHD (Hoza, 2007) that affirm the social stressors such as bullying, rejection, friendship difficulties and isolation can explain this change in higher severity cases of ADHD.

Melegari et al.'s (2021) research, on a simplistic level, provides the paradoxical results that confirm the need for the current study: that lockdown circumstances can have both a positive and negative effect on children with ADHD. There was also a significant relationship shown between the improvements of online study at home and longer time to study with a decrease in ADHD symptoms, a relationship confirmed by Zhang et al. (2020).

Bobo et al. (2020) conducted a similar study based on the results of a questionnaire completed by 538 parents in France. The results displayed an almost antithetical set of results, showing an improvement in children's anxiety, possibly caused by the lockdown's unintentional impact of greater flexibility with at-home learning. Improved self-esteem was another outcome from the study, which was linked with less exposure to negative feedback from within a school environment. In conjunction with a change from a school environment, sufficient space at home sometimes including having a garden was seen to compensate for ADHD symptoms.

COVID-19 lockdown has had a detrimental impact on the mental health on the general population of England (Banks and Xu, 2020). This has had a more intricate impact on those with SEN, including England's population of children with ADHD (Bobo et al., 2020; Melegari et al., 2021; Shah et al., 2021). The impacts of lockdown have allowed for families to have greater control of flexibility and routine in the home, providing some positive outcomes on mental health and familial relationships (Bobo et al., 2020; Shah et al., 2021). The general outcome, however, is that the ramifications of a nationwide lockdown include the general increase in the symptoms of ADHD and perhaps surprisingly in children whose

symptoms were more manageable in school before lockdown.

Research question and rationale

Previous research provides us with varying possibilities of the impact of at-home learning on children with ADHD. At-home learning in and of itself demonstrates possible benefits (Arora, 2006) for children with ADHD, yet also comes with its own downsides like being unable to access in-school specialists. However, it could be possible that the implementation of teaching timetables via online platforms undermine the flexibility that ADHD students had previously.

With this being the current circumstance, it is not possible to make an accurate or informed hypothesis about what we can expect from children's experiences of at-home learning. With this in mind, this study aims to review the at-home learning experiences of UK-based secondary school-aged students with ADHD during the COVID-19 lockdown.

Methods

Procedure

In designing the questions for the semi-structured interview, areas and topics that may be discussed were considered, as was ensuring enough leeway for the participant's personal reflections. Whilst there was some structure to the interview, it was an opportunity for the participants to share their interpretation of their experiences through lockdown and with education during that time, along with possibly other, complex experiences.

To investigate the impact of lockdown on school-age children with ADHD, two sets of participants were approached, both for semi-structured interviews. The first group was secondary school-aged children with ADHD (aged 11–16) and their parents. The study was targeting approximately ten children to take part in the study to gain a variety of experiences of lockdown but not provide an overwhelming level of data for the IPA. The second group of participants, to provide an alternative view, was teachers of children with ADHD.

Schools were emailed, asking if they would send on an email written by the researcher to parents who had children with ADHD to take part in a semi-structured interview, the email included an information sheet outlining the process and purpose of the study. From there, parents were able to contact the researcher to organise a time for the interview and read an online consent form. A list of questions for the semi-structured interview was also included, to be viewed by both parent and child before the interview itself. During the semi-structured interview, the parent was required to be present for their child's interview.

Schools were also asked for permission for their teachers of children with ADHD to take part in the study. An email was sent to teachers outlining the purpose and process of the study and were then able to contact the researcher via email to organise a time for the interview and read the online consent form.

At the beginning of each interview, the researcher confirmed with those he was interviewing that they had read and understood the participant information sheet and consent form and that they understood they could stop the interview at any time if they felt uncomfortable.

With the aim of the present study being the impact of at-home learning on children with ADHD, IPA was felt to be an appropriate method of analysis. Previous studies have completed quantitative studies on the impacts of COVID-19 lockdown; however, the nature of a quantitative study does not allow for a developed understanding of the reasons behind their experiences that an IPA would. An IPA will allow for an investigation into the experiences of the volunteers, this is particularly important as volunteers experiences of ADHD, and children with ADHD are based within their own experiences and interpretations.

The ethical approval for this study was obtained from the University of Sheffield's School of Education ethics committee, approval number: 038222.

The data that support the findings of this study are openly available in 'civicleads' at <https://doi.org/10.3886/E154721V1>.

Results

Through the recruiting methods described in the methodology, a collection of a school-aged participant (age = 13) with ADHD, and educational professionals were recruited to be interviewed. The collection consisted of males (n = 1) and females (n = 8). Particular details about the participants can be seen in Table 1.

Progressing through the transcripts of the interviews presented several recurrent themes, some of these themes were overarching of subthemes and so have been appropriately broken down appropriately as detailed in Figure 1.

The three main themes were anxiety caused by at-home learning, the change in social interaction and the academic impacts of at-home learning.

Theme 1: anxiety caused by at-home learning

Sub-theme 1: academic related anxiety.

'They've found that a challenge, particularly some of our SEN students, specifically are ADHD ones. Some have found it, particularly with the run up to the

Table 1: Participant details

Participant pseudonym(s)	Role
Gwen (Parent) and David (Student)	Parent and Year 9 Student (13–14 years of age)
Penelope (Teacher)	Teacher and Deputy Head of Learning (Year 7–11 to 12 years of age)
Samantha (Teacher)	Teacher and Head of Year (Year 10–14 to 15 years of age)
Juliet (Teacher)	Secondary School Teacher
Matilda (LSC)	Learning Support Coordinator
Sandra (HTLA)	Higher Level Teaching Assistant
Lily (Teacher)	Secondary School Teacher
Andrea (SENCO)	Special Educational Needs Coordinator

mocks, a big shock and a source of concern, because there's not access to learning or not be able to access it well.'

(Samantha - Teacher)

Samantha highlights the difficulty in accessing learning resources and the impact this has particularly on ADHD students. 'Access to learning' referred to the availability of learning resources that are readily available when in school and 'access it' related to both sufficient IT resources for families as well as encountering IT problems in accessing the relevant materials, which is developed further in the 'academic impacts of at-home learning' theme.

'The teacher is going to tell me if the teacher is going to give [my] grade, they know what I can do'... And we're saying no, we've got to have the evidence we've got to see. And it does cause anxiety amongst a lot of students, including those with ADHD...'

(Matilda – LSC)

As Matilda explains, grades are assigned by teachers for key exams such as GCSE's. However, 'we've got to have the evidence' means that teachers have to be able to evidence the grades that they are assigning normally on consistent achievement and cannot base a final grade on one particularly good piece of work.

Four of the eight interviewees discussed how at-home learning, particularly online learning, had caused higher levels of anxiety in students with ADHD.

Sub-theme 2: social-related anxiety.

'It's kind of maybe a little bit more feel fearful about the outdoors a little bit more... the library's my go to place when I was like wanting to relax or calm down things.'

(David - Student)

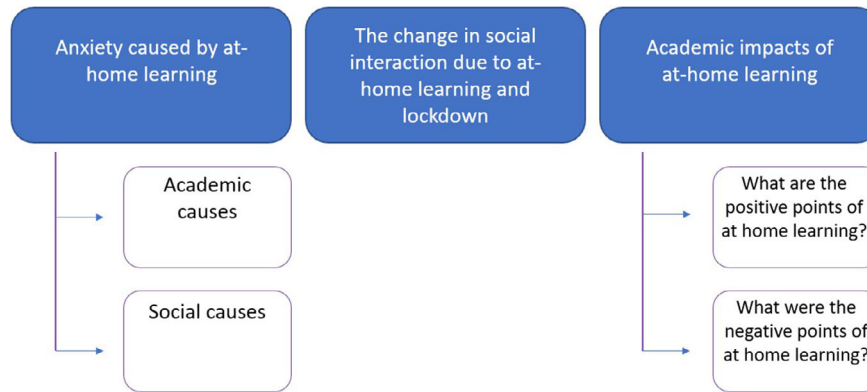


Figure 1: Illustration of theme breakdown for this study

As a young man with ADHD, David outlines how an already present level of anxiety was amplified by living in lockdown conditions. This was further exacerbated on his return to school when the library was no longer accessible to him at lunch time due to COVID-19 restrictions.

‘We’ve had quite a lot of students that just don’t want to come in, don’t like the idea of coming into the school building. Once they’re in generally, they’re fine. . . we’ve like, had to make like buddy systems.’
(Penelope - Teacher)

As Deputy Head of Learning for Year 7, Penelope encountered social anxiety as a difficulty for students on their return to school. Whilst echoing David’s sentiments about being wary of ‘the outdoors’, there are clear implications for the mental health of students’ during their return to school.

Theme 2: the change in social interaction caused by at-home learning and lockdown

‘. . . particularly those students that perhaps more vulnerable or don’t have a strong friendship group outside of school, have been very isolated at home and not been able to really see anybody other than the family that’s within the home.’
(Samantha - Teacher)

Samantha highlights vulnerable students may be further impacted, perhaps more so than their peers, by being isolated at home.

Including Samantha’s point, similar experiences on the impact of social isolation or difficulty in readjusting to social situations were discussed during seven of the eight interviews.

Lockdown restrictions have made in-person social interaction a near impossibility, so many students have turned to social media to help combat the feelings of isolation.

‘With mobile phones, they’ve been able to keep in contact with mobile phones and also over Xbox and

PlayStation, there’s been lots of interaction there.’
(Matilda - LSC)

The interaction that Matilda references though, has often exacerbated feelings of isolation or anxiety. Three of the eight interviewees discussed the negativity of social media and it’s impacts on students during lockdown.

‘The biggest bullying incidents or any crazy things that are actually happening online.’
(Andrea - SECNO)

Six of the eight interviewees discussed the social importance of school and the difficulties that were manifesting without it. The social aspect was one of, if not the, most important reason behind children wanting to come back to school. Seven of the eight interviews discussed the school’s importance as a source of social stimulation and interaction for the students, as well as a source of enjoyment and normalcy.

‘And one of the main things, the positives of coming back to school have been being able to meet the friends or talk to other people their age.’
(Samantha - Teacher)

The increased reliance on social media, in some cases exclusively, for social interaction has also had impacts on students that have been felt when returning to learning at school. Three of the interviewees discussed how the influence from social media had become very negative, amounting in some cases to series levels of online bullying.

‘And people with ADHD especially, there were a couple of incidents where students were very, very friendly online. But externally, they would never hang around with that person. And so, when it came to them trying to make friendships with them, they were often rejected. . .’
(Juliet - Teacher)

Juliet's observation of one student, whilst specific, was indicative of a more general problem when students returned to learning at school. Friendships and experiences over social media were not necessarily translating into real-life relationships which in turn was impacting students personally as well as academically.

Theme 3: academic impacts of at-home learning

Learning at home is a very different educational model to the one that students in England are familiar with. As such, its fairly rapid implementation was going to bring with it both positive and negative elements, especially when paired with lockdown restrictions which hampered social interaction for students.

Sub-theme 1: positive impacts of at-home learning. A familiar set of surroundings for students often meant that at-home learning was a more comfortable experience than learning in a classroom. Five of the eight interviews discussed the familiar surroundings as a benefit for students, as well as two participants saying that these environments contributed to a lack of disruption that would otherwise have been notably present for a student with ADHD in a classroom.

'... to have their own space have their own music on if they find that helps them to be in their own clothes to be comfortable in their own environment.'
(Juliet - Teacher)

For students with ADHD being able to learn in their own space also provided the ability to exercise a little control over some of their ADHD symptoms which would not be possible in a classroom setting.

'A lot of them loved it. A lot of them really, really like positive about it preferred being at home, they like the freedom of it.'
(Penelope - Teacher)

Studies have shown (Cook et al., 2013) that ADHD students can benefit from at-home learning because of the ability to cater to an individual timetable that best suits that particular student. Whilst this has not always been possible due to school timetabling of at-home learning, there has been a level of freedom which can be seen through three of the eight interviews.

'I think in terms of being at home, it's benefited them because they can move around. If they are impulsive, they can do what they need to do and get that out without feeling constrained, frustrated, feeling shamed for feeling that they can't.'
(Samantha - Teacher)

In these more comfortable, familiar environments, teachers were starting to see a new type of confidence coming

across in the work of their students, particularly those with ADHD.

'... some of them a bit more creative, have a go a bit more, because they're not going to show themselves up in front of everybody in class.'
(Matilda - LSC)

This new level of confidence was further supported by supportive at-home relationships. Positive support from home being a clear factor for a positive and successful at-home learning experience was discussed by two educators. Some students with SEND were being supported at home well enough that there was no benefit in them attending school as vulnerable children during lockdown restrictions.

'... and they were absolutely fine at home with supporting parents and there was, there was really no need to attend.'
(Lily - Teacher)

In some cases, the new level of confidence was less because of familiar surroundings and familial support, but because of a rise in self-confidence due to a lessening in social anxiety and expectations.

'I think they miss the idea that there is no peer pressure. I think the ones that struggle, loved it, you know, like that struggle with everybody thinks of what I wear and what I look like and what my hair looks like and everything.'
(Lily - Teacher)

All of the participants expressed positive impacts of at-home learning, with three saying specifically that the environment was better, two saying there was more freedom and control and three saying there was less social pressure.

Sub-theme 2: negative impacts of at-home learning. Whilst there were strategies in place to monitor the level of a student's work and its quality, not being physically present with their work meant that not all students were going to engage as fully as they would have done in-person.

'I don't think they've done as much at home as they would in school. We just had to filter it down a little bit to make sure they get the basics done.'
(Penelope - Teacher)

Three of the eight participants discussed how many students were negatively impacted by the physical environment in which they had to study. Whether this was a bedroom that had previously been a safe place for them away from social or academic pressures, a kitchen or

living room surrounded by siblings or working parents, or accommodation with no easy access to an outside area such as a garden or patio.

‘... a lot of them have had to work in their bedrooms, which has been quite a negative thing. Because they associate their bedroom with sleep and chill out and they’ve had to change it into a library and a classroom and that’s been quite disconcerting for them.’

(Juliet - Teacher)

Students with siblings, especially siblings of school age, may have been negatively impacted by the busy environment they were now expected to work in. In addition, some families may not have had sufficient IT provision to be able to provide independent access to online learning to multiple siblings as well as for parents that need to work from home.

‘So, the difficulty they had was to sit in front of the computer for five hours at home when the environment is not very learning friendly because they have younger siblings or mom is also working or dad is also working.’

(Andrea - Teacher)

Perhaps, one of the main differences between at-home and at-school learnings is the presence of education staff along with an established and set routine. Both of these factors have an influence on the quality of learning provided to students that, despite efforts from schools, cannot be replicated in an at-home environment.

‘But I think our ones with like, urges and ADHD... really struggling with the idea that you have to be regimented... You know, sorting out your own stuff is really difficult.’

(Lily - Teacher)

Three (teachers) of the eight interviewees discussed the quality of work declining during at-home learning, and five of the eight mentioned problems with the learning environments at home because of family circumstances or lack of resources.

Discussion

The change in social interaction caused by at-home learning and lockdown

Whilst children with ADHD do not differ in the number of friendships they have from their peers (Marton et al., 2015), they are less likely to spend time with their friends outside of school, and their friendship lengths are generally shorter than their neurotypical peers. With lockdown restrictions, this means that students with ADHD are deprived of their main source of social interaction. This is particularly concerning when many of their friendships

are shorter-lived, so less likely to survive their periods of isolation. This also runs aside potentially worsening relationships with their siblings or parents as was observed in this study.

As Marton et al. (2015) established, socialising for children with ADHD primarily happens in a school environment. This in turn has meant that continuing as a social hub for students, particularly those with ADHD, has featured strongly as the main reason students are eager to return to at-school learning. This suggests that as children with ADHD have a higher need for the social interaction that is presented in school, they are in turn more likely to be affected by the social restrictions imposed as part of lockdown.

Anxiety caused by at-home learning

As previous studies have shown (Banks and Xu, 2020) anxiety levels of the population have started to rise due to lockdown restrictions first imposed in March 2020. With lockdown restrictions meaning an end to predictable at-school education students were to be confronted with various additional sources of anxiety.

This theme is particularly relevant as anxiety caused during, and because of, the lockdown and at-home learning is an ongoing factor in the developing concerns for the mental health of school-aged children (Townsend, 2020).

Academic-related anxiety

As has been highlighted, access to learning resources was particularly difficult for students, particularly those with SEND, specifically ADHD. The sudden change of educational provision during the first lockdown was frequently different to the often more structured and organised education provision offered during the second lockdown. This meant that not being able to access, or being unsure of how to access, educational support and supplies that would have otherwise been readily available at school was an unexpected barrier for students. This anxiety was linked with and exacerbated by assessments and exams being held in school, especially for GCSE year students.

With traditional exams not being an option this year due to lockdown restrictions, additional assessments have been required to provide an appropriate level of evidence for final GCSE grades. Shiels and Hawk (2010) documented that those children with ADHD are less able to evaluate situational errors that allow them to appropriately self-regulate their attention and behaviour, whilst Mulligan (2001) demonstrates the effectiveness of routine and structure improving the educational experience of children with ADHD. Consistently working at a level that reflects their best effort relies on an individual’s ability to self-regulate their time and attention which puts students with ADHD at a significant disadvantage and higher levels of academic anxiety.

Demonstrating consistent level of attention and effort is incredibly difficult for students with ADHD in normal educational circumstances. However, with varying factors such as IT accessibility, appropriate work environment and parental support, there was no guarantee that this would be possible for students with ADHD.

Social-related anxiety

The increased use of social media during lockdown restrictions was perhaps to be expected, as too should its effects on socially isolated students. Juliet (teacher) explained that students trying to make friends through social media were not necessarily translating to in-person friendships. Lily (teacher) had also observed that there had been an increase in unpleasant behaviour across social media platforms. Andrea (SENCO) could also report that the biggest incidents of bullying were consistently happening online.

For socially isolated students, particularly students with ADHD who do not have a strong social circle, social media could often be a source of further anxiety and isolation than a solution to meeting any level of social need.

Andrea's (SENCO) interview highlighted the importance of sufficient space, particularly a garden, which helped students with ADHD moderate some of their symptoms and provide some space from other household members. In line with Bobo et al.'s (2020) conclusions, there were also elements of relief at being removed from the socially judgemental element of the school environment.

Academic impacts of at-home learning

With lockdown restrictions meaning that schools would have to implement educational provision that was to be primarily accessed from home, different situations at home were going to present students with ADHD various challenges and advantages.

Positive impacts of at-home learning

Having a learning environment in their own home allowed for ADHD students to be familiar with the surroundings which in turn provided less distraction for them. This also applied to the distractions often caused by their peers in lessons. In the instances where the at-home learning environment was suitable, many of the students enjoyed the levels of freedom that it afforded them, whether that was to simply wear their own clothes or listen to music. Also, as these students were not in a classroom, they had the opportunity to manage some of their ADHD symptoms in a way that would not have been possible if they were at school. The ability to physically manage ADHD symptoms whilst in their educational setting is an opportunity that many students with ADHD will not have had before. In conjunction with them being able to manage these symptoms in the privacy of their own space, removed from fears of judgement from their

peers or consequences from teaching staff, this was a positive experience for many students.

Many schools, in the implementation of their at-home learning, kept to some form of routine with the school day, with students being expected to log-in to lessons at their normal times. There was however an understanding, however, that it was not always possible to complete work or log-in to lessons, and an element of flexibility in completing and submitting work remained. This set-up provided an appropriate amount of structure for students with ADHD, but also provided some level of flexibility which allowed for managing ADHD symptoms.

The prospect of learning at-home presented a variety of difficulties for students with ADHD, it was, however, not without its advantages. It is important to note that these advantages required an appropriate at-home learning environment which was not always possible and were also generally dependent on a supportive parental figure to assist in routine and praise of school achievements.

Negative impacts of at-home learning

Whilst many schools had strategies in place to assess students work and its quality, not being physically present whilst completing tasks made this a much more difficult task for teaching staff. This could be further complicated by at-home environments not well suited for learning. This could mean that there was not sufficient IT provision for all children in the home to be online at the same time, a large number of distractions in the home, not a sufficient amount of space or insufficient support from a parental figure in the home.

For many students with ADHD, following a timetabled school day from home was not manageable with the support they had available to them. Andrea's (SENCO) observations developed this further, with students responding to teacher authority in educational situations much better than they did to parental figures.

A frequently referenced factor for a successful at-home learning experience was the role of a supportive parental figure. Andrea (teacher) implies that a lack of authority at home can have a detrimental impact on the quality of at-home learning.

Limitations of the present study

The COVID-19 pandemic and the social restrictions imposed as part of lockdown procedures meant that it would be incredibly difficult to do any interviews in person. Whilst conducting online interviews made matters of ethical approval and child protection easier it also inhibits the ability to observe a participant's surroundings and ability to respond to observed body language and emotional cues (Cater, 2011). The impact this had on the ability to ask questions is not quantifiable but was

unavoidable when taking appropriate safety measures into account.

Implications for future research

The findings of this study demonstrated that parental support and authority during at-home learning was one of the key factors to a successful period of at-home learning. Acknowledging this and developing the ideas around how parents can be effectively supportive with at-home learning open up the possibility for successful at-home learning strategies in the future that may be beneficial for students with ADHD.

There is also the opportunity for at-home learning to allow for the opportunity of practical ADHD symptom management strategies, contributing to an effective and safe learning environment.

In the wake of lockdown restrictions and at-home learning, government agencies, including the department for education, are investigating courses of action to address the impacts of prolonged periods of at-home learning. This includes discussions about adding extra time onto the end of the school day as part of a 'COVID-19 catchup' (The Guardian, 2020). The findings of this study could be useful in informing decisions made regarding supporting ADHD students in particular on their return to school-based learning and also strategies for the incorporation of at-home learning for certain ADHD students.

Future research directions

To further research in this area, three main areas present themselves. The social impact of lockdown restrictions on children with ADHD is believed to have been more severe than on other children without an ADHD diagnosis (Marton et al., 2015). To this end, an investigation into how students with ADHD have reintegrated themselves into a school environment and any possible longer-term impacts would provide a peace of mind to educational professionals and parents alike.

Many students with ADHD who struggle to self-regulate (Shiels and Hawk, 2010) and were absent of supportive and effective home learning environments may have felt the impact of at-home learning more than their non-ADHD counterparts. To this end, a study on the academic impacts of at-home learning on students in England, taking SEND into account, would be hugely beneficial in helping the educational community and government agencies moving forward.

This study has touched on effective at-home learning environments for students with ADHD. It is possible that this research could be developed further to create strategies for at-home and maybe independent learning that could be implemented to support students with ADHD with appropriate access to effective home learning environments.

Conclusion

The first theme discussed was the change in social interaction for students with ADHD. This included developments of social isolation, changes in relationships with family in the same household and an increased use of social media. The study's findings corroborated previous research (Shah et al., 2021) on increased challenges being presented to familial relationships in the home. These were particularly challenging for students with ADHD who were now absent of many social outlets provided by an in-school environment, as well as social outdoor activities. Particularly concerning for students with ADHD is that they are less likely to be social with students outside of school, so were already disadvantaged with social interaction during lockdown restrictions. Furthermore, this study agreed that homes with a garden were better able to effectively accommodate students with ADHD during lockdown restrictions.

Students with ADHD faced a rise in anxiety from two main points: changes in social interaction (particularly negativity through social media) and academic anxiety. Academic anxiety presented itself less than its social counterpart in the interviews that were conducted. When it was discussed, the increased levels of anxiety were centred primarily around the change in education provision and the seeming difficulty in accessing educational resources that were more readily available during at-school learning. Social media was referenced a number of times by educational staff as becoming more negative and causing increased levels of anxiety in students who were studying at home, and was still having a negative impact when students were returning to in-person learning.

Finally, students with ADHD were impacted, both positively and negatively, by the implementation of at-home learning. Students with ADHD were more able to manage their physical symptoms of ADHD whilst in their own learning environment and were able to do this anxiety-free and without fear of judgement from their peers. In addition to this freedom, students with ADHD were able to take advantage of a slightly more relaxed system of submitting work, allowing them to work at their own pace. This, however, was very dependent on the home environment and parental support and was not experienced by all students with ADHD. The negative impacts that were of a particular concern for educational staff were the rise in incomplete or unsubmitted work, which due to an inability to self-regulate without teacher or parental support, disproportionately affect students with ADHD. Essentially, parental support was a large factor in positive at-home learning experiences, and social anxiety was a notable concern for children with ADHD, especially with regard to social media.

Discussing the student population as one entity when investigating the impact at-home learning and lockdown restrictions will at best lead to being overly generalised,

in turn effecting the effectiveness of any conclusions. At worst, it ignores essential aspects of many students needs and places some of our most vulnerable students at a disadvantage that could have long-reaching consequences for their development. The impact at-home learning has had on students with ADHD is multifold and from an understanding of these impacts, we would not only be able to successfully reintegrate into school socially and address areas of academic concern but also maybe in the future develop at-home learning strategies that can be used in conjunction with in-school learning to best suit our students with ADHD.

Address for correspondence

Brad Hatton,
School of Education,
University of Sheffield,
Sheffield,
UK.
Email: brad_hatton@hotmail.co.uk.

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