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Educating students with Attention Deficit Hyperactivity Disorder (ADHD) through ICT during the COVID-19 pandemic

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Abstract: This study examined the problems and barriers faced by students with ADHD and their families during the pandemic. The implementation of distance education has deprived these students of the structured environment and support they need leading to significant problems. The use of technology did not work in support of them, acting in many cases as another reason for their distraction. It is necessary for these students to formulate interventions that can support their participation in distance education.

Keywords: ADHD, pandemic, distance education.

1. Introduction

Since December 2019, the entire world has witnessed the 2019 Corona virus (COVID-19) pandemic that has affected all aspects of life, including education (Wendel et al., 2020; Daniel 2020; Breaux et al., 2021). COVID-19 is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) belonging to the family Coronaviridae and genus Beta-coronavirus (Shereen et al., 2020; Ciotti et al., 2020). SARS-CoV-2 is a rapidly spreading viral disease that particularly affects the respiratory system and can lead to multi-organ failure and ultimately death. As a measure to deal with the ever-increasing cases, universal lockdowns were considered, which were also extended to schools. This led to distance learning in the education system. As distance learning is not compatible or accessible to everyone, many students have experienced difficulties in their studies, especially students with attention deficit hyperactivity disorder (ADHD). ADHD is a neurobehavioral disorder, and scientists specializing in special education and psychology argue that students who suffer from it perform poorly due to poor concentration.

2. The education of students with Attention Deficit Hyperactivity Disorder (ADHD)

ADHD is a neurodevelopmental disorder characterized by a specific deficit in brain functions underlying attention, motor and behavioral self-regulation, and impulse control (Wolraich et al., 2019). It is a very common disorder in the world and is present in 1.4% of the pediatric population, considering only those with a diagnosis confirmed by clinical evaluation (Reale & Bonati, 2018).

Teachers play an important role in the initial detection of children with ADHD based on their behavior in the classroom (Pearcy et al., 1993). Starting school is therefore the defining moment for the suspicion and diagnosis of ADHD (Sax & Kautz, 2003).

One of the most important areas of intervention for ADHD is the school. Poor academic functioning and academic underachievement, such as cognitive problems (working memory, planning, and inhibition) are associated with ADHD (Willcutt et al., 2005). The use of psychoeducational techniques at school is one of the cornerstones of treatment, not only in terms of improving symptoms, but also in terms of being able to offer adequate schooling, supporting their self-esteem and motivating them to study, and in general, to promoting their psychosomatic well-being (Cortese et al., 2020). Reduced motivation in relation to academic tasks has been identified as one of the risk factors associated with ADHD and can reduce academic functions (Morsink et al., 2021). In some countries children with moderate to severe

ADHD or comorbidity have a support teacher and/or a professional pedagogue to guarantee them the support they need, but this is not always possible in school settings, where the number of children is often quite high.

3. Students with Attention Deficit Hyperactivity Disorder (ADHD) during the pandemic

In many countries, the COVID-19 pandemic has led to the closure of schools or limited access to them (World Health Organization, 2020). In the following months, in some cases after the usual summer closure, schools were closed and/or opened at different times depending on the prevalence of COVID-19 infection nationally and government public health decisions. The closure of schools had an impact on the educational aspects of children, who were no longer surrounded by the main contexts of learning, socialization and development (Segre et al., 2021). This is especially true for children with ADHD and children with special needs, for whom daily routine and the structure it provides is an important coping mechanism (Zhang et al., 2020). For parents this period had an impact on practical aspects due to the fact that they found themselves working from home and at the same time having to monitor and support their children (Lee, 2020; UNESCO, 2020).

According to the literature, the pandemic caused, in both adults and children, numerous emotional and behavioral symptoms of anxiety, depression, post-traumatic stress, circadian rhythm alteration and general psychosomatic distress (Brooks et al., 2020; Fegert et al., 2020; Mukhtar, 2020; Orgilés et al., 2020; Wang et al., 2020). The closure of schools, imposed by the lockdown during the pandemic, and the strict restrictions related to leaving the house mainly affected children (Spinelli et al., 2020; Zhang et al., 2020). Socio-emotional complications, insufficient physical activity and play have been reported as major concerns in children due to the COVID-19 pandemic (Graber et al., 2021; López-Bueno et al., 2021).

Distance education was quickly implemented in many countries, although in many cases children may not be able to learn due to lack of skills in teachers, lack of support from parents or lack of necessary technology at home. Children with ADHD and their parents had more difficulties than others with distance learning during the pandemic (Becker et al., 2020). Quarantine and social distancing were also an obstacle to direct access to mental health services for children (Newlove-Delgado et al., 2021).

The pandemic has created an urgent need to integrate technology into innovative models of mental health care. Conditions related to COVID-19 have fueled a renewed interest and use of telehealth, with opportunities to transform psychiatry (Torous & Wykes, 2020). Also, ADHD clinical services needed to be reorganized in response to the pandemic to ensure care and telemedicine and telepsychology were introduced to reach children and their parents during the pandemic (Evans et al., 2020; Fogler et al.., 2020).

According to the literature, the main psychological and emotional consequences of all these changes were the increasing level of worry, anxiety and aggression (Brooks et al., 2020; Wang et al., 2020; Zhang et al., 2020). Distance education was insufficient to replace in-person education, both for practical reasons and in relation to student motivation and objective difficulties that arose. Providing routine and teaching work scheduling are key strategies to help students with ADHD feel safe, organize their work, and attend classes more effectively. However, parents and educators were unable to fully ensure these conditions despite existing guidelines for the management of children with ADHD during the COVID-19 pandemic (Cortese et al., 2020).

Children's use of electronic media, including the Internet and video games, is part of the daily lives of children living in medium- and high-resource environments. Frequent screen use has a greater effect on children with ADHD than without ADHD, although high frequency use increased the risk of ADHD symptoms overall, and youth with ADHD are more prone to internet addiction (Enagandula et al., 2018; Ra et al., 2018; Weiss et al., 2011). In this regard, it is widely recognized that the clinician evaluating children with ADHD should regularly ask about these activities. Several mechanisms may explain their association with executive function, cognitive mechanisms, and emotional dysregulation mechanisms.

These are all factors that promote adolescent executive functioning and well-being through activities such as sleep, physical activity, uninterrupted homework, and positive interactions with family and friends. To explore new mechanisms, hyperfocus, intense fixation on an interest or activity for an extended period of time, is common in children and adults with ADHD when working intently on matters of interest (Ashinoff & Abu-Akel, 2021).

For children, the object of hyperfocus may be a video game, a program on television, or the Internet. Like distraction, hyperfocus is thought to result from abnormally low levels of dopamine that make it difficult to shift attention from one thing to another. If there is no restriction, intense focus is usually a cause that can lead to failure in school (Goodwin & Oberacker, 2011). It is possible that the use of the same tools necessary for homeschooling may encourage excessive internet use, reducing parental control and changing parents' feelings about their children's screen time.

Distance learning may have been a way out during the pandemic but that doesn't mean it has only had positive benefits. This educational method was found to be insufficient, at least as implemented, to ensure students' learning and to protect their right to education, especially for the most vulnerable students (Vouglanis, 2020; Vouglanis & Driga, 2023). Even among children without special difficulties, distance education led to deterioration in both school effectiveness and behavior and psychological well-being, with aspects of functioning that were very similar to those of children with ADHD, particularly in younger children. A percentage of students did not have access to any teaching tools, with the consequence that all school learning activities were canceled during the quarantine. In this context, distance education can exacerbate inequalities instead of preventing or neutralizing them sufficiently (UNESCO, 2020).

The loss of social, spatial and temporal context increased children's instability. The social distance between children and teachers created problems in the relationship and level of trust built over the years and precluded visual and verbal feedback (eye and body contact). Technological tools and the massive use of screens have led to an increase in attention deficit and anxiety.

In the context of COVID-19, there is considerable concern about the academic engagement and performance of children with ADHD during home and hybrid education. Children with ADHD perform best in structured environments with clear routines and behavioral supports. Homeschooling is inherently less structured than going to a school building every day, following a predetermined and curriculum-directed curriculum, participating in scheduled breaks, and following that daily routine with a consistent group of classmates. Additionally, the time management, planning, and organizational skills required for independent success are not easy to maintain at home for students with ADHD because of the distractions they may have in this environment (Booster et al., 2012; Langberg et al., 2013). In fact, many children with ADHD have experienced increased inattention and hyperactive/impulsive symptoms during pandemic restrictions (Melegari et al., 2021; Shah et al., 2021; Wendel et al., 2020).

The evidence is not yet clear about the effects of school closures on the academic learning of students with ADHD. Overall, it appeared that there may have been reduced learning outcomes. The authors caution, however, that learning loss may be underestimated, as students with lower achievement scores at earlier assessment points may not have been accounted for. Among children with ADHD attending elementary school, no differences in achievement growth were found among a sample that experienced 3-4 months of home education compared to the pre-COVID-19 period (Lupas et al., 2021).

A key consideration and potential source of between-student variability in distance education/home learning success is parental management of daily academic engagement. Parents were burdened by the need to engage more with distance education (Misirli & Ergulec, 2021) and parents of students who needed additional educational support to provide learning were unlikely to have the ability to help their child to the same extent as a specialized general or special education teacher (Brandenburg et al., 2020; Masonbrink & Hurley, 2020).

Parents of children with ADHD report significantly more difficulty keeping their child engaged in instruction and study during home education compared to parents of children

without ADHD (Roy et al., 2022). Research has shown that a lack of consistent routines during the COVID-19 school closures is associated with increased difficulty in distance learning for individuals with ADHD (Becker et al., 2020). Parents of children with ADHD have also reported changes in parenting, such as increased irritability and shouting during the pandemic (Shah et al., 2021).

Parents of children with ADHD need support more than ever, and treatments should target the primary, immediate concerns of managing home education and enhancing caregiver well-being to promote children's academic engagement. Behavioral parent training, in which parents learn strategies to support positive behavior and strategies for prudent and consistent behavior, is an evidence-based treatment for ADHD that has been shown to improve parenting skills and child behavior (Evans et al., 2018; Fabiano et al., 2021; Pelham & Fabiano, 2008). Education modified to target learning at home through parental management may be critical to alleviating increased problems among children with ADHD and improving family functioning during COVID-19. Fortunately, it has been successfully adapted to target homework through the incorporation of specific task management techniques (Power et al., 2001). This program includes sessions focused on structuring homework routines, setting homework goals, and providing reinforcement contingent on academic engagement during homework. This program has been shown to improve homework performance (Merrill et al., 2017) and reduce work problems (Power et al., 2012) in children with ADHD in controlled trials.

4. Conclusions

Finally we have to underline the role of digital technologies in education domain that is very productive and successful, facilitates and improves the assessment, the intervention and the educational procedures via Mobiles [56-60], various ICTs applications [61-81], AI & STEM ROBOTICS [82-96], and games [97-100]. Additionally the combination of ICTs with theories and models of metacognition, mindfulness, meditation and emotional intelligence cultivation [101-138] as well as with environmental factors and nutrition [52-55], accelerates and improves more over the educational practices and results, especially for the students with ADHD.

More specifically students with ADHD and their parents had more difficulties than others with distance learning during the pandemic. Students with ADHD often have academic difficulties, and difficulties with interpersonal learning are likely to extend to distance learning. In addition, parents of students with ADHD were particularly likely to have difficulty providing learning support during distance education. it is imperative for schools and communities not only to provide the necessary support to students themselves, particularly those with mental health and/or learning disabilities, but also to parents as they navigate the uncharted territory of distance education. The findings of this study indicate the importance of building parental confidence in managing distance learning, promoting student routines, and reducing negative emotions as ways to mitigate difficulties with distance learning, particularly for students with ADHD . This is an important area for research and clinical attention, as numerous school-based interventions have been developed for students with ADHD but none have been modified or tested in the context of distance learning..

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