Predictors in the treatment of ADHD in racial and ethnic minorities and the significance of physical activity through apps

Preditores no tratamento do TDAH em minorias raciais e étnicas e a importância da atividade física por meio de aplicativos

Predictores en el tratamiento del TDAH en minorías raciales y étnicas y la importancia de la actividad física a través de aplicaciones

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Abstract
A sizable portion of nations' populations nowadays are multicultural, according to current statistics. The design of therapy materials, practice models, evaluation tools, and client collaboration are all thought to be greatly influenced by culture. Also, current writings discuss the significance of comprehending a child's needs in light of the prevailing society as well as the relationship between a therapist and a client. Ethnic minority youths and teens still trail behind their non-minority peers in terms of diagnosis and treatment rates, despite major improvements in the creation and implementation of effective services for kids with ADHD. This study aims to analyze the literature on factors predicting treatment for children from ethnic minorities who have ADHD and the efficacy of employing mobile apps to recognize and treat the disorder's symptoms. The prognostic factors that affect how minority children with ADHD are treated are the focus of this literature review, which tries to address the issue. Last but not least, it is discussed how approaches, assessments, and interventions need to be modified to account for minority children's use of mobile devices and, in particular, physical activity.
Keywords: ADHD; Ethnic minorities; Physical activity; Mobile applications; Metacognitions skills.

Resumo
Uma parcela considerável da população das nações hoje é multicultural, de acordo com as estatísticas atuais. Acredita-se que o design de materiais de terapia, modelos de prática, ferramentas de avaliação e colaboração do cliente sejam muito influenciados pela cultura. Além disso, os escritos atuais discutem a importância de compreender as necessidades de uma criança à luz da sociedade vigente, bem como a relação entre um terapeuta e um cliente. Jovens e adolescentes de minorias étnicas ainda estão atrás de seus pares não pertencentes a minorias em termos de taxas de diagnóstico e tratamento, apesar das grandes melhorias na criação e implementação de serviços eficazes para crianças com TDAH. Este estudo tem como objetivo analisar a literatura sobre fatores preditivos de tratamento para crianças de minorias étnicas com TDAH e a eficácia do emprego de aplicativos móveis para reconhecer e tratar os sintomas do transtorno. Os fatores prognósticos que afetam como as crianças minoritárias com TDAH são tratadas são o foco desta revisão da literatura, que tenta abordar a questão. Por último, mas não menos importante, é discutido como abordagens, avaliações e intervenções precisam ser modificadas para levar em conta o uso de dispositivos móveis por crianças de minorias e, em particular, atividade física.
Palavras-chave: TDAH; Minorias étnicas; Atividade física; Aplicativos móveis; Habilidades de metacognição.

Resumen
Una parte considerable de las poblaciones de las naciones hoy en día son multiculturales, según las estadísticas actuales. Se cree que el diseño de los materiales de terapia, los modelos de práctica, las herramientas de evaluación y la colaboración del cliente están muy influenciados por la cultura. Además, los escritos actuales discuten la importancia de comprender las necesidades de un niño a la luz de la sociedad imperante, así como la relación entre un

terapeuta y un cliente. Los jóvenes y adolescentes de minorías étnicas todavía van a la zaga de sus pares que no pertenecen a minorías en términos de índices de diagnóstico y tratamiento, a pesar de las importantes mejoras en la creación e implementación de servicios efectivos para niños con TDAH. Este estudio tiene como objetivo analizar la literatura sobre los factores que predicen el tratamiento de niños de minorías étnicas que tienen TDAH y la eficacia del uso de aplicaciones móviles para reconocer y tratar los síntomas del trastorno. Los factores pronósticos que afectan la forma en que se trata a los niños de minorías con TDAH son el foco de esta revisión de la literatura, que trata de abordar el problema. Por último, pero no menos importante, se analiza cómo deben modificarse los enfoques, las evaluaciones y las intervenciones para tener en cuenta el uso de dispositivos móviles por parte de los niños pertenecientes a minorías y, en particular, la actividad física.

Palabras clave: TDAH; Minorías étnicas; Actividad física; Aplicaciones móviles; Habilidades metacognitivas.

1. Introduction

Most immigrants deal with the acculturation process when they first arrive in a different nation or cultural setting (Schwartz et al., 2010). Understanding the experiences of minority children requires an understanding of the process of acculturation. Berry's two-dimensional model, which concentrates on acculturation at the person basis, is one of the most frequently referenced acculturation theories (Berry, 1980). This model states that a person's degree of acculturation may be determined along two dimensions: his direction toward his community and the preservation of his native culture as well as his direction toward other communities and a desire for engagement with the new environment (Berry, 2006). It's important to note that these directions are not fixed nor limited. According to Berry's (2003) definition of biculturalism, people are deemed to be bicultural if they are able to keep their native native ethnic heritage through language, conduct, and knowledge while still establishing good connections to and involvement in the host society's culture. Biculturalism is a notion that LaFromboise et al. (1993) explicitly articulated. A variety of studies in recent decades has determined that it is the most adaptable and "ideal" stage of the acculturation process in terms of both children's and adults' mental health levels (Berry1997,2017). Acculturation must be seen as a complex process driven by a variety of factors, including socioeconomic position, location, and significant experiences (e.g., immigration-related legislation and political climate). With the aforementioned in mind, it has the ability to speed up or slow down the healing process (Lopez-Class et al., 2011).

Attention Deficit Hyperactivity Disorder is one of the neurological conditions that affect children and adolescents the most (ADHD). Even yet, it still has a complex character, and we don't yet have a complete knowledge of how it works. Lack of concentration and impulsivity are the primary signs and symptoms of ADHD, which are brought on by a disruption in the executive functions of the parts of the brain that control particular skills. An individual's socioemotional health depends on their ability to use executive functions like short-term memory, flexible thinking, and self-regulation (Drigas & Driga, 2019). Moreover, cognitive capacity is a known predictor of academic achievement, but a child's poor academic achievement as a result of individual flaws appears to be a factor in low self-esteem (Karabatzaki et al., 2018). Early management and improvement of these abilities, laying the framework for later development of focus, organization, task-specific focus, emotion regulation, and self-evaluation (Drigas & Driga, 2019). Emotional intelligence is also linked to self-regulation, a crucial area where children with ADHD struggle. The control panel for perceiving, thought, learning, problem-solving, and judgment is emotional intelligence. It also highlights the characteristics of self-control, such as the ability to delay satisfaction, put up with irritants, and control desires (power of the ego). According to their study, Drigas and Papoutsi (2018) suggest a hierarchically leveled approach for the improvement of emotional intelligence that shows how a person develops through time. This approach can be used in real-world settings as a therapeutic tool for dealing with issues in special education, social interactions, and other areas of daily life. These levels are more precisely associated with receiving and identifying emotional cues, self-awareness, self-control, empathy, social abilities, and self-actualization. Maslow's theory states that the greatest form of self-actualization is the pursuit of one's own well-being, fulfillment of one's own potential, and self-actualization (1943;1987). The "center" of metacognitive skills, according to Drigas and Mitsea's (2020;2021) multilevel metacognition model, is attention,

which they claim is involved in processes like selecting, filtering, suspension, processing, storage, retrieval, prediction, monitoring, adjustment, adaptation, recognizing, distinguishing, remembering, and knowledge transformation. Each level in this aproach explains a higher-ranking managment system that shows the person's metacognitive growth. The development of a more complicated control system results from the shift in self-awareness and self-observation that occurs as one advances from the lowest to the highest levels of metacognition. Individuals won't be able to include the necessary cognitive and socioemotional abilities that will allow them to participate in the sociocultural settings unless they have developed these metacognition pillars. The most important instrument for self-education, self-growth, and self-healing is metacognition. Therefore, it ought to serve as the focal point of a unique intervention program that encourages holistic learning. By fostering metacognitive abilities, medication is regarded as the first line of treatment for easing ADHD symptoms. However, because of the side effects and addiction risk, it has a number of drawbacks. On the other hand, modern technology-based intervention techniques like mobile applications have shown to be as successful. This study aims to analyze the literature on factors predicting treatment for children from ethnic minorities who have ADHD and the efficacy of employing mobile apps to recognize and treat the disorder's symptoms.

2. Methodology

The method followed in this research is meta-analysis through a literature review. Specifically, studies were identified using search engines, including PsychInfo, ERIC, Pubmed, Academic Search Premier, Science Direct, and GateResearch. The keywords used in the search were "ADHD", "Ethnic minorities", "Physical activity", "Mobile applications", and "Metacognition skills," with publication years between 1994 and 2022. The number of articles used in this bibliography review was 213. All are related to the treatment of ethnic minority children with ADHD and the development of their metacognitive functions using mobile applications that utilize physical exercise as a means.

3. Treatment for ADHD and Racial Inequalities

Research from school samples show that ADHD treatment rates are lower among ethnic minorities, despite the fact that the frequency of ADHD among minority youth is thought to be equivalent to or somewhat greater than that of non-minority youth (Canino et al., 2004; Rowland et al., 2002). According to research by Rowland and colleagues, 76% of white youth with ADHD were getting treatment, contrasted to only 56% of African American youth and 53% of Latino youth (Rowland et al., 2002). In a previous research, treatment for ADHD rose from 0.9% in 1987 to 3.4% in 1997, based on two comprehensive, nationwide surveys of the US overall populace (Olfson et al., 2003). The frequency of visits for psychosocial therapy dramatically dropped over this time, whereas pharmacological treatment (mostly psychostimulant medications) greatly rose. Throughout these 10 years, there were more ethnic minority youth treated for ADHD, but their treatment rates remained substantially lower than those of non-minority youth (Olfson et al., 2003).

Significant racial/ethnic inequalities in ADHD treatment have been found in national samples, and these differences are likely due to both personal and social factors, including insufficient information about ADHD and its treatments, stigmatization, insufficient trust in the health industry, lack of medical healthcare, fragmented support, difficulty finding transportation, and lack of knowledge about specific treatments (Bussing et al., 1998; Bussing, et al., 2003; Kendall & Hatton, 2002; Woodward et al., 1992). It may be necessary to conduct research to pinpoint the causes of service inequalities in order to enhance resource efficiency and boost the potency of treatments to close the service gap. Investigating the assistance-seeking behavior of persons who require the resources is a beneficial strategy for discovering indicators of service utilization. Theoretical underpinnings for the study of assistance-seeking behavior in ADHD are currently in their infancy. In addition to assisting in the identification of the underlying causes that either make it easier or more difficult for people to access services,

an approach of assistance-seeking behavior for ADHD could also support with the development of policies and programs that aim to close the service gap for racial and ethnic minorities.

4. Stages and Predictors of Requesting Assistance

The variables that affect family assistance-seeking for their kids should be the main focus of research into predictors of treatment used for ADHD-affected kids. In order to decide how, where, and when people receive treatment for mental illnesses, several models have been created (e.g., Andersen, 1995; Goldsmith et al., 1988; Pescosolido,1991,1992; Power et al., 2005). The Behavioral Model of Health Service Usage has a significant impact on research on how people access healthcare and behave when they need assistance (Andersen, 1995; Andersen & Newman, 1973). According to Andersen, the need for care, the propensity to use services, and the conditions that allow or restrict their use all influence the availability of health services (Andersen & Newman, 1973). Andersen's model advanced our knowledge of the assistance-seeking mechanism by concentrating on certain, quantitative aspects connected to these characteristics, such as health beliefs, coping skills, environment, educational status, and recognized need. It also assisted in identifying predictors of treatment use. Problem identification, help-seeking choice, resource choosing, and resource use are the specific steps of help-seeking (Veroff et al., 1981). Teachers play a significant role in many elements of seeking assistance, including diagnosing children's problems, advising parents on potential solutions, and helping with initiatives. As a result, the model needs to incorporate the many responsibilities that teachers play. The model ought to take into consideration the developmental variations in ADHD. Over the course of a person's life, the primary signs of ADHD change in expression and severity (Barkley, 1997). As a result, age may affect certain traits that predict problem recognition. Moreover, the trajectory will probably change when kids enter puberty because they start getting more autonomous and engaged in the assistance-seeking mechanism.

The four phases of seeking assistance are connected. Families are presumptively going one way along the trail. More specifically, they opt to seek assistance after first realizing the issue. Ultimately they, chose and use services. The four main steps of the help-seeking pathway are thought to be affected by the majority of variables in each category. The respective significance of every component in determining progression through the steps within the model is uncertain for parents of kids with ADHD. Social networks, for instance, can help or hinder the identification of issues. The similar influence might be discernible while deciding to seek treatment or ask for assistance.

4.1 Problem identification

Before parents can decide on how to handle a child who exhibits symptoms of ADHD, they must acknowledge that the child's behaviors are a serious issue. There is broad consensus that a thorough evaluation of ADHD should comprise a multi-method assessment procedure that includes physicals, clinical observations with kids and their parents, parent and educator rating scales, behavioral evaluations, and occasionally kid testing (Barkley & Edwards,1998; Power & Eiraldi,1999). Moreover, a functional impairment assessment linked to symptoms of ADHD is necessary (American Psychiatric Association, 2000). The correlation between the degree of disability and assistance-seeking behavior has been examined in a number of studies. For instance, studies have revealed that dysfunction is favorably correlated with identifying a problem and requesting assistance (Anastopoulos & Shelton, 2001; Bussing, et al., 2003; Kataoka et al., 2002). Additionally, significant epidemiological research using samples of non-minority, Latino, and African American children have demonstrated that the demand for mental health care grows as functional handicap increases (Canino et al., 2004; Kataoka et al., 2002).

has been recognized for years that kids with ADHD behave differently due to elevated pressure and parental responsibility (Breen & Barkley, 1988; Podolski & Nigg, 2001). Also, research has shown that families experiencing high levels of stress and load are more likely to recognize problems (Teagle, 2002). Regarding parental traits, the number of

children living at home, single parent status, and maternal distress/depression appear to affect difficulty identification (Dulcan et al., 1990; Verhulst & Van der Ende, 1997). Other structural and relational factors, such as parental education level, parent-child relationships, marital conflict, and family disorganization, may also influence whether an issue is recognized (Barkley et al., 1991; Cunningham et al., 1988). Finally, educators have become one of the most popular referral sources for ADHD, second only to families, because the majority of children with ADHD struggle academically, behaviorally, or socially (DuPaul & Stoner, 2003). Teacher traits, such as experience and education in the field of ADHD, may improve their capacity to identify a child exhibiting symptoms and direct parents to start the process of obtaining help.

4.2 The choice to get assistance

Parents must determine whether to seek treatment after learning that their child has ADHD. The decision to seek assistance is typically made voluntarily and logically. Parents' decisions to seek treatment for their children are influenced by a number of risk factors. Specific population characteristics, such as age or gender, as well as generally constant psychological and cultural elements can predispose someone to seeking treatment (Srebnik et al., 1996). Mental side of a person's character can affect how willing they are to get treatment for a mental health illness. The phrase additionally describes one's understanding of the system of mental health care and ideas regarding their capacity to fulfill certain expected duties related to obtaining care (Goldsmith et al., 1988). This would be relevant in the instance of ADHD and the parents' role in helping their kids get services.

Parents' decisions to seek assistance are also influenced by the age and gender of their children. In general, when a kid starts to experience functional impairment in academic work in preschool or early school, hyperactivity and impulsivity (symptoms that appear to lead to assistance-seeking behavior) are typically noted. Throughout elementary and middle school, signs of inattention that may have gone unnoticed in earlier years are frequently noted (Barkley & Biederman, 1997). It is commonly known that boys experience ADHD diagnosis and treatment at a considerably higher incidence than girls, typically at a younger age (Arnold, 1996). Both children from minorities and non-minorities share this (Bauermeister et al., 2003; Bussing, et al., 2003; Rowland et al., 2002).

According to study (Fernández & Arcia, 2004; Risher & Fitts, 2002), many ethnic minority parents worry about what other people would say if their child is given an ADHD diagnosis. There is anxiety that a psychiatric classification, like ADHD, may result in unfavorable assessments and attitudes toward persons who have the term (Corrigan, 2004; Link & Phelan, 1999). Moreover, traits indicative of a mental illness, such as lack of emotion regulation and poor impulse control, may result in attitudes comparable to these (Fernández & Arcia, 2004). Particularly among parents with little awareness of ADHD and its treatments, fear of stigma is probably going to have a substantial effect on parents' decisions to get care for their child with ADHD.

Also, it has been discovered that the degree of acculturation is associated to people seeking care for both themselves and their children. Bicultural persons, or those who simultaneously participate in the mainstream culture and their native culture, have been shown to utilize mental wellness and health resources more regularly and adhere to treatment more closely than people who are less acculturated (Pachter & Weller, 1993; Wells, Golding, & Hough, 1989). For instance, among a population of Mexican American individuals with varying levels of acculturation, those in the lower acculturation group were much less likely than those in the higher acculturation group to visit a doctor for health-related issues (Wells et al., 1989). In another research, bicultural Latina families who cared for asthmatic kids adhered to treatment plans more frequently than parents from low-acculturation backgrounds (Pachter & Weller, 1993). No research has been done to determine how culture affects parents' choices to seek ADHD treatment. In contrast to parents who show low levels of acculturation, acculturated and bicultural parents may be more inclined to get therapy for ADHD.

4.3 Selecting a service

As soon as parents decide to get help, they must study what programs are available and what services the child needs. The decision to choose a particular service is impacted by a number of things. Healthcare experts are typically don't listen to parents' issues first, when kids and teens encounter psychological and social challenges (Srebnik et al., 1996). First, people in the community such as friends, family, teachers, and others are contacted. Research suggests that social connections in parents might differ in size, composition, and degree of influence. Bussing and colleagues analyzed social network features and the usage of services related to mental health while conducting interviews with a sample of parents of kids who were thought to be at risk for ADHD (Bussing, et al., 2003). Caucasian families indicated significantly greater connections with higher percentages of spouses, family members, and healthcare experts, compared to African American families. Moreover, higher levels of treatment utilization were linked to the social network participation of Caucasian parents' health professionals.

4.4 Patterns of service use

Chronic conditions like attention deficit/hyperactivity disorder need ongoing monitoring and care. The majority of kids with ADHD benefit from comprehensive diagnostic testing, parent education on emotional regulation, treatment, and special school adaptions (APA, 1997). Throughout time, a number of variables, such as care quality and service integrity, may increase or decrease service use and adherence.

The degree to which an intervention is carried out according to plan is known as service integrity (Gresham et al.,1993, P. 254). The degree to which services adhere to ADHD practice standards has been evaluated in a number of studies. For instance, in a research examining the use of clinical guidelines established by the American Academy of Pediatrics (AAP, 2001) for the diagnosis and therapy of ADHD, only 25.8% of services adhered to all diagnostic recommendations, while 53.1% adhered to all treatment recommendations. (Rushton et al., 2004). The low follow-up rates for psychiatric medication efficacy were one issue raised in one of these research (Zima et al., 2005). Since that mental health services are used to treat at least 50% of children with ADHD (Hoagwood, 1998), the standard of care offered by pediatricians and family doctors (such as diagnosis, therapy planning, and pharmaceutical monitoring) is crucial to the efficient control of this illness (Leslie et al., 2004).

According to studies on care quality, racial and ethnic groups in this country consider they obtain less effective treatment for mental illnesses than non-minority groups (Lillie-Blanton et al., 2000). Resources for ADHD in urban areas are often highly dispersed and disjointed, according to parents, educators, medical professionals, and therapists (Guevara et al., 2005). No professional organization is in charge of coordinating the services offered across all systems, according to survey respondents. The lack of resources, inadequate training of mental health professionals, frequent provider and teacher changes, and a breakdown in collaboration between providers, teachers, and parents, according to participants, all seem to be factors in the provision of subpar healthcare (Guevara et al., 2005).

5. ADHD and Physical Activity

In order to enhance physical activity in teenagers with ADHD, Schoenfelder et al. (2017) assessed a novel treatment employing a mHealth mobile app, a Fitbit Flex, and a Facebook group. Exercise enhances executive skills like working memory and behavioral inhibition as well as ADHD symptoms in both kids and adolescents (Gapin et al., 2011; Medina et al., 2010). Short bouts of moderate to vigorous exercise given to children with ADHD during the school day (e.g., 30 minutes of games) improved their symptoms isnd general conduct (Hoza et al., 2014). Exercise has a positive impact on mood regulation (Byrne and Byrne, 1993), lessens fatigue and depressive symptoms, and increases motivation in ADHD patients (Fritz and O'Connor, 2016). Yet, there is limited information on the effects of routine exercise, such jogging (Ainsworth et al., 2011).

A fast expanding and optimistic method for interactive and tailored interventions in the field of illness prevention is the use of mobile health apps (mHealth apps) (Patrick et al., 2008). Social media platforms are excellent for connecting with other users and sharing mHealth application data with adolescents. In 2013, Facebook (FB), the most popular website for social networking, was used by more than 80% of youngsters (Madden et al., 2013). This is employed in numerous initiatives to promote health (Cavallo et al., 2012). Teens assessed their involvement and online interactions as pleasurable and helpful, according to a research of 30 youngsters using a mHealth app, a mobile activity monitor, and another group who utilized Facebook (Pumper et al., 2015). The present work closes a significant gap in the body of knowledge. It uses a Fitbit Flex (wearable activity monitor) and a Facebook group to assess the viability, acceptance, and outcomes of a behavior therapy to promote everyday physical exercise for youngsters with ADHD. Schoenfelder et al (2017) study included 11 ADHD-diagnosed teenagers between the ages of 14 and 18. Individuals were instructed to wear a Fitbit for four weeks, sync the device twice weekly, join a Facebook group, and complete online questionnaires once every two weeks, same like in a prior pilot project (Pumper et al., 2015). The Fitbit Flex wristband records information on physical activity, such as steps taken, calories burned, and distance traveled. A mobile device's Fitbit mHealth app syncs data to produce data graphs and feedback for the achievement of individualized goals. Teenagers received a unique goal for a week and allowed to interact with other students, learn more about the study, and get assistance by joining a private Facebook group. At baseline and throughout the trial, parent and teenager reports were used to gauge the severity of ADHD symptoms. Parents appraised the severity of their adolescent's symptoms using the Vanderbilt ADHD Diagnostic Parent Rating Scale (VADPRS) (Wolraich et al., 2003). The Positive and Negative Affect Schedule for Children (PANAS-C) was used by adolescents to assess their mood as they completed the VADPRS measures (Yen et al., 2007; Ebesutani et al., 2012).

During the course of 30 days, step counts significantly increased, and adolescent- and parent-reported symptoms of inattention and hyperactivity/impulsivity significantly decreased. The mood's quality didn't change much, though. All survey items were well-received, according to interviews. The app, according to participants, raised awareness of activity levels and ADHD symptoms. The most frequently recommended enhancements included raising the frequency of reminders, including more tasks or workout objectives, and utilizing other social networks. Adolescents with ADHD found the Fitbit and Facebook mHealth treatment to be beneficial and well-liked. Also, it appears to be a successful method for encouraging people to become more active and enhance their wellness and function (Schoenfelder et al., 2017).

Young et al. (2014) created the Snappy smartphone app to manage the primary signs of Attention Deficit Hyperactivity Disorder (attention, impulsivity, and hyperactivity). For 11 healthy adults, the app was initially tested over the course of three sessions. The current study's smartphone app for Android phones and a web app that is compatible with other devices both incorporate the AX-CPT test (Cohen et al., 1999) (e.g., iPhone). The software records 3D movement data from mobile device sensors, which is used to calculate how much physical activity was involved in the CPT (Continuous Performance Test). paired with sensor readings. Information on the three ADHD behaviors can be obtained from the test (attention, impulsivity, and hyperactivity). Participants were 11 University of Nottingham students and employees. The app to implement the CPT-AX test was initially developed on an Android platform with OS version 2.2 and higher using the Eclipse IDE (Integrated Development Environment) for Java development. The same functions were later implemented using a web application created in JavaScript. Participants gave their time spent using the app a favorable overall rating. The activity via smartphone was proven to be simple and comfortable for the participants based on feedback forms provided by the researchers. Also, the majority of participants felt that utilizing the application was not demanding and that they received prompts to finish the work on time. The impacts of the Snappy on a group of persons with ADHD must thus be studied in more detail through future research (Young et al., 2014).

6. Final Considerations

Recent decades have seen significant social changes that are related to how technology and artificial intelligence (AI) are employed in daily life. The most important of these are the capacity to connect, distribute, handle, assimilate, and utilise newly learned information. We must emphasize that digital technologies play a very beneficial and effective role in the education sector as well as in all areas of daily life. They support and enhance decision, treatment, evaluation, teaching practices, and all other scientific and productive procedures via mobile devices (Stathopoulou, et al., 2018, 2019, 2020, Kokkalia, et al., 2016, Drigas, et al., 2015, 2020, 2022, 2022,Vlachou et al.,2017, Papoutsi et al.,2017, 2018, Karabatzaki et al.,2018, Alexopoulou et al.,2020, Stavridis et al. 2020), various ICTs applications (Drigas et al., 2004, 2005, 2006, 2009, 2010, 2011, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, Pappas, et al., 2015,2016,2017,2018,2019, Papanastasiou, et al., 2014,2017, 2018, 2020, Alexopoulou, et al., 2019, Kontostavlou, et al., 2019, Charami et al., 2014, Bakola et al.,2019, Kontostavlou et al.,2019, Alexopoulou et al.,2019, Papoutsi, et al., 2016,2017,2018,2019,2020,2021,2022, Kokkalia, et al., 2014,2015,2016,2017,2018, 2019, Karyotaki, et al., 2014,2015, 2016,2017,2018,2019,2020,2021, Bravou et al., 2019,2022, Lytra et al., 2021), via AI Robotics & STEM (Drigas et. al, 2004, 2005,2009,2013,2014, Vrettaros, I., et al., 2009, Anagnostopoulou, et al., 2020, Lytra, et al.,2021, Pappas et al., 2016, Mitsea et al.,2 020, Chaidi et al., 2021), and games (Chaidi, et al., 2022, Kokkalia, et al., 2017, Drigas, et al., 2021). The New Technologies (NT), particularly the Digital Technologies, offer the tools for information dissemination, processing, and exchange as well as for its administration and application to newfound knowledge. The advancement of the information society is accelerated by information and communication technology (ICT), the most cutting-edge technological capabilities of humanity (Pappas, M., et Drigas, A., 2015, 2016, Drigas, et Koukiannakis, 2004, 2006, 2009, Drigas, & Kontopoulou, 2016, Theodorou, & Drigas, 2017, Drigas, & Kostas, 2014, Bakola, et al., 2019, 2022, Drigas, & Politi-Georgousi, 2019, Karyotaki, et al., 2022). Also, by fostering a more inviting and engaging learning atmosphere, utilizing videogames and gaming tactics and methods in general and special education improves the learning process. (Drigas et al., 2014, 2015, Papanastasiou et al.,2017, 2017, Kokkalia et al.,2016, 2017, Doulou et al., 2022, Chaidi et al., 2022, Kefalis et al. 2020, Papoutsi et al. 2016).

This study aims to analyze the literature on factors predicting treatment for children from ethnic minorities who have ADHD and the efficacy of employing mobile apps to recognize and treat the disorder's symptoms. Ethnic minority youths still lag far behind in the incidence of evaluation and treatment for attention deficit hyperactivity disorder (ADHD), despite large increases in the number of children and adolescents receiving professional treatments for the disease. Accessibility issues for individuals as well as cultural and societal variables contribute to racial/ethnic differences in service utilization. It is understood that providing care that is culturally sensitive is crucial for addressing patients' needs, minimizing health care inequities among minorities, and raising service standards (Cuccaro et al., 1996; Bussing et al. 2003). Being a dynamic process, cultural competency allows healthcare providers to adapt their methods to the unique cultural peculiarities and needs of children. Regardless of a child's history, ethnicity, or cultural quirks, understanding and successful communication are crucial. This involves a variety of factors, including cultural awareness, knowledge, and abilities (Cuccaro et al., 1996; Bussing et al., 1998). A study of the literature on cultural competence abilities reveals the need to modify techniques, evaluations, and interventions to the cultural context of minority children.

Through the application of new technology, mobile applications are prepared to play an important role in therapeutic interventions, particularly in the treatment of ADHD symptoms. Symptoms of ADHD in children are present. Inattention, hyperactivity, and impulsivity are the disorder's primary signs and symptoms. Angelopoulou and Drigas (2021) assert that memory and attention are intertwined throughout task performance. They play a critical role in treating the cognitive functioning of people with ADHD since longer attention spans are associated with increased working memory levels. Moreover, working memory issues are more common in children with ADHD. It's crucial to always hold ADHD children's

attention because they grow bored easily. This is made feasible through mobile applications, which make the intervention more engaging for the user by requiring the youngster to be engaged and focused the entire time while also remaining vigilant to their surroundings.

Finally, it's crucial to remember that the application of ICTs in conjunction with models and theories of metacognitive skills, awareness, mindfulness, and emotional intelligence improvement expedites and enhances more than educational, creative, and decision-making methods and results. (Drigas, et al. 2014,2015,2016,2017,2018,2019,2020,2021,2022, Kokkalia. et al., 2014,2015,2016,2017,2018,2019, Pappas, et al., 2015,2016,2017,2018,2019, Papoutsi, et al., 2016,2017,2018,2019,2020,2021,2022, Karyotaki, et al., 2014,2015, 2016,2017,2018,2019,2020,2021,2022, Chaidi, et al., 2020,2021,2022, Mitsea, et al., 2019,2020,2021,2022, Angelopoulou, et al., 2021, Tourimpampa, et al., 2018, Kapsi, et al., 2020, Galitskaya, et al., 2021, Bakola et al, 2020, Bamicha et al., 2022). Last but not least, Driga et al. (2019; 2019), Stavridou et al. (2021), and Zavitzanou et al., (2021) demonstrate that a variety of environmental and nutritional factors may either restrict or promote the development of mental skills and capacities.

Researchers and experts should also endeavor to create a perfect framework that schools may use to offer medical and educational services to pupils with ADHD in regular settings. Finally, further research is required to raise public awareness, which can be a component of an all-encompassing strategy for ADHD education in ethnic populations.

References

Ainsworth B.E., Haskell W.L., Herrmann S.D., et al. (2011). Compendium of Physical Activities: a second update of codes and MET values. Med. Sci. Sports Exerc., 43 (8), 1575-1581.

Alexopoulou A, Batsou A, & Drigas A, (2020) Mobiles and cognition: The associations between mobile technology and cognitive flexibility iJIM 14(3) 146-156

Alexopoulou, A., Batsou, A., & Drigas, A. (2019). Resilience and Academic Underachievement in Gifted Students: Causes, Consequences and Strategic Methods of Prevention and Intervention. *International Journal of Online & Biomedical Engineering*, *15*(14). 78.

American Academy of Child and Adolescent Psychiatry Official Action. (1997). Summary of the Practice Parameters for the assessment and treatment of children, adolescents, and adults with ADHD. Journal of the American Academy of Child and Adolescent Psychiatry, 36(Suppl. 10), 85S–121S.

American Academy of Pediatrics. (2001). Clinical practice guideline: Practice of the school-age child with attentiondeficit/hyperactivity disorder. Pediatrics, 108, 1033–1044.

American Psychiatric Association (2000). Diagnostic and statistical manual of mental disorders (4th ed., Text Revision). Washington, DC: Publishers.

Anagnostopoulou, P., Alexandropoulou, V., Lorentzou, G., Lykothanasi, A., Ntaountaki, P., & Drigas, A. (2020). Artificial intelligence in autism assessment. *International Journal of Emerging Technologies in Learning (iJET)*, *15*(6), 95-107.

Anastopoulos, A. D., & Shelton, T. L. (2001). Standardization of assessment procedures for AD/HD. New York: Kluwer Academic/Plenum.

Andersen, R. M. (1995). Revisiting the behavioral model and access to medical care: Does it matter? Journal of Health and Social Behavior, 36, 1–10.

Andersen, R. M., & Newman, J. F. (1973). Societal and individual determinants of medical care utilization in the United States. Milbank Memorial Fund Quarterly Journal, 51, 95– 124.

Angelopoulou E. & Drigas, A. (2021). Working memory, attention and their relationship: A theoretical overview. Research, Society and Development, *[S. l.]*, 10(5), e46410515288. 10.33448/rsd-v10i5.15288. https://rsdjournal.org/index.php/rsd/article/view/15288.

Angelopoulou, E., & Drigas, A. (2021). Working memory, attention and their relationship: A theoretical overview. *Research, Society and Develo*pment, 10(5),1-8, e46410515288-e46410515288.

Arnold, L. E. (1996). Sex differences in ADHD: Conference summary. Journal of Abnormal Child Psychology, 24, 555– 569.

Bakola, L. N., Rizos, N. D., & Drigas, A. (2019). ICTs For Emotional and Social Skills Development for Children with ADHD And ASD Co-existence. *Int. J. Emerg. Technol. Learn.*, *14*(5), 122-131.

Bakola, L., & Drigas, A. (2020). Technological development process of emotional Intelligence as a therapeutic recovery implement in children with ADHD and ASD comorbidity. International Association of Online Engineering, 16 (3), 75-85.

Bakola, L., Chaidi, I., Drigas, A., Skianis, C., & Karagiannidis, C. (2022). Women with Special Educational Needs. Policies & ICT for Integration & Equality. *Technium Soc. Sci. J.*, *28*, 67.

Bamicha V, Drigas A 2022 ToM & ASD: The interconnection of Theory of Mind with the social-emotional, cognitive development of children with Autism Spectrum Disorder. The use of ICTs as an alternative … Technium Social Sciences Journal 33, 42-72

Bamicha V, & Drigas A. (2022) The Evolutionary Course of Theory of Mind - Factors that facilitate or inhibit its operation & the role of ICTs Technium Social Sciences Journal 30, 138-158

Barkley, R. A., & Biederman, J. (1997). Toward a broader definition of the age-of-onset criterion for attention-deficit hyperactivity disorder. Journal of the American Academy of Child and Adolescent Psychiatry, 36, 1204–1210.

Barkley, R. A., & Biederman, J. (1997). Toward a broader definition of the age-of-onset criterion for attention-deficit hyperactivity disorder. Journal of the American Academy of Child and Adolescent Psychiatry, 36, 1204–1210.

Barkley, R. A., & Edwards, G. (1998). Diagnostic interview, behavior rating scales, and the medical examination. In R. A. Barkley (Ed.), Attention-Deficit Hyperactivity Disorder: A handbook for diagnosis and treatment (2nd ed.). New York: The Guilford Press.

Barkley, R. A., Fischer, M., Edelbrock, C., & Smallish, L. (1991). The adolescent outcome of hyperactive children diagnosed by research criteria-III. Mother-child interactions, family conflicts and maternal psychopathology. Journal of Child Psychology and Psychiatry, 32, 233–255.

Bauermeister, J. J., Canino, G., Bravo, M., Ramirez, R., Jensen, P., Chavez, L. et al. (2003). Stimulant and psychosocial treatment of ADHD in Latino/Hispanic children. Journal of the American Academy of Child and Adolescent Psychiatry, 42, 851–855.

Berry, J. W. (1980). Acculturation as varieties of adaptation. In A. M. Padilla (Ed.) Acculturation: Theory, models, and some new findings. (9–25). Boulder, CO: Westview.

Berry, J. W. (1997). Immigration, acculturation, and adaptation. Applied Psychology, 46(1), 5–34. https://doi.org/10.1111/j.14640597.1997.tb01087.x.

Berry, J. W. (2003). Conceptual approaches to acculturation. In K. M. Chun, P. B. Organista & G. Marín (Eds.), Acculturation: Advances in theory, measurement, and applied research (17–38). Washington, DC: American Psychological Association.

Berry, J. W. (2006). Contexts of acculturation. In D. Sam & J. Berry (Eds.), Cambridge handbook of acculturation psychology (27–42). Cambridge, MA: Cambridge University Press.

Berry, J. W. (2017). Theories and models of acculturation. In S. J. Schwartz & J. B. Unger (Eds.), Oxford handbook of acculturation and health (15–28). New York, NY: Oxford University Press.

Bravou V, & Drigas A. (2019) A contemporary view on online and web tools for students with sensory & learning disabilities iJOE 15(12) 97

Bravou V, Oikonomidou D, & Drigas A. (2022) Applications of Virtual Reality for Autism Inclusion. A review Retos 45, 779-785

Breen, M. J., & Barkley, R. A. (1988). Child psychopathology and parenting stress in girls and boys having attention deficit disorder with hyperactivity. Journal of Pediatric Psychology, 13, 265–280.

Bussing R, Gary F, Mills T, et al. Parental explanatory models of ADHD: gender and cultural variations. Soc Psychiatry Epidemiol. 2003;38(10):563-575.

Bussing R, Schoenberg N. E, & Perwien A. R. (1998) Knowledge and information about ADHD: evidence of cultural differences among African-American and white parents. Soc Sci Med. 1998;46(7):919-928.

Bussing, R., Gary, F. A., Mills, T. L., & Garvan, C. W. (2003). Parental explanatory models of ADHD gender and cultural variations. Social Psychiatry and Psychiatric Epidemiology, 38, 563–575.

Bussing, R., Schoenberg, N. E., & Perwien, A. R. (1998). Knowledge and information about ADHD: Evidence of cultural differences among African-American and White parents. Social Science and Medicine, 46, 919–928.

Bussing, R., Zima, B. T., Gary, F. A., Mason, D. M., Leon, C. E., Sinha, K. et al. (2003). Social networks, caregiver strain, and utilization of mental health services among elementary school students at high risk for ADHD. Journal of the American Academy of Child and Adolescent Psychiatry, 42, 842–850.

Byrne A., Byrne D.G. (1993). The effect of exercise on depression, anxiety and other mood states: a review. J. Psychosom. Res., 37 (6), 565-574.

Canino, G., Shrout, P. E., Rubio-Stipec, M., Bird, H. R., Bravo, M., Ramı´rez, R. et al. (2004). The DSM-IV rates of child and adolescent disorders in Puerto Rico: Prevalence, correlates, service use, and the effects of impairment. Archives of General Psychiatry, 61, 85–93.

Canino, G., Shrout, P. E., Rubio-Stipec, M., Bird, H. R., Bravo, M., Ramı´rez, R. et al. (2004). The DSM-IV rates of child and adolescent disorders in Puerto Rico: Prevalence, correlates, service use, and the effects of impairment. Archives of General Psychiatry, 61, 85–93.

Cavallo D.N., Tate D. F., Ries A.V., Brown J. D., DeVellis R. F., Ammerman A.S. (2012). A social media-based physical activity intervention: a randomized controlled trial. Am. J. Prev. Med., 43 (5), 527-532.

Chaidi E, Kefalis C, Y Papagerasimou, A Drigas (2021) Educational robotics in Primary Education. A case in Greece. Research, Society and Development 10 (9), e17110916371-e17110916371

Chaidi I, Drigas A, (2022) "Parents' views Questionnaire for the education of emotions in Autism Spectrum Disorder" in a Greek context and the role of ICTs Technium Social Sciences Journal 33, 73-91

Chaidi I, Drigas A, C Karagiannidis (2021) ICT in special education Technium Soc. Sci. J. 23, 187

Chaidi, I., & Drigas, A. (2020). Autism, expression, and understanding of emotions: literature review. Int. J. Online Biomed. Eng., 16(2), 94–111

Chaidi, I., & Drigas, A. (2020). Parents' Involvement in the Education of their Children with Autism: Related Research and its Results. *International Journal Of Emerging Technologies In Learning (Ijet)*, *15*(14), 194-203.

Chaidi, I., & Drigas, A. (2022). Digital games & special education. *Technium Soc. Sci. J.*, *34*, 214.

Charami, F., & Drigas, A. (2014). ICTs in English Learning and Teaching. International Journal of Engineering and Science. Vol. 2(4):4-10. DOI: 10.3991/ijes.v2i4.4016

Corrigan, P. (2004). How stigma interferes with mental health care. American Psychologist, 59, 614–625.

Cuccaro M, Wright H, Rownd C, et al. Brief Report: professional perceptions of children with developmental difficulties: the influence of race and socioeconomic status. J Autism Developmental Disorders. 1996;26(4):461-469.

Cunningham, C. E., Benness, B. B., & Siegel, L. S. (1988). Family functioning, time allocation, and parental depression in the families of normal and ADDH children. Journal of Clinical Child Psychology, 17, 169–177.

Demertzi E, Voukelatos N, Papagerasimou Y, Drigas A (2018) Online learning facilities to support coding and robotics courses for youth International Journal of Engineering Pedagogy (iJEP) 8 (3), 69-80

Doulou, A., & Drigas, A. (2022). Electronic, VR & Augmented Reality Games for Intervention in ADHD. *Technium Soc. Sci. J.*, *28*, 159.

Driga, A.M., and Drigas, A.S. (2019) "ADHD in the Early Years: Pre-Natal and Early Causes and Alternative Ways of Dealing." International Journal of Online and Biomedical Engineering (IJOE), 15(13), 95. 10.3991/ijoe.v15i13.11203

Driga, A.M., & Drigas, A.S. (2019) "Climate Change 101: How Everyday Activities Contribute to the Ever-Growing Issue", International Journal of Recent Contributions from Engineering, Science & IT, vol. 7(1), 22-31, https://doi.org/10.3991/ijes.v7i1.10031

Drigas A, DE Dede, S Dedes (2020) Mobile and other applications for mental imagery to improve learning disabilities and mental health International Journal of Computer Science Issues (IJCSI) 17 (4), 18-23

Drigas A, & Karyotaki M (2017) Attentional control and other executive functions. Int J Emerg Technol Learn iJET 12(03):219–233

Drigas A, & Karyotaki M (2014). Learning Tools and Application for Cognitive Improvement. International Journal of Engineering Pedagogy, 4(3): 71-77. From (Retrieved on 13 May 2016)

Drigas A, & Karyotaki M (2019) Attention and its Role: Theories and Models. International Journal of Emerging Technologies in Learning 14 (12), 169-182

Drigas A, & Karyotaki M (2019) Executive Functioning and Problem Solving: A Bidirectional Relation. International Journal of Engineering Pedagogy (iJEP) 9 (3)

Drigas A, Karyotaki M, & Skianis C. (2017) Success: A 9 layered-based model of giftedness International Journal of Recent Contributions from Engineering, Science & IT 5(4) 4-18

Drigas A, & Petrova A (2014) ICTs in speech and language therapy International Journal of Engineering Pedagogy (iJEP) 4 (1), 49-54

Drigas A, Vrettaros J, Tagoulis A, & Kouremenos D. (2010) Teaching a foreign language to deaf people via vodcasting & web 2.0 tools World Summit on Knowledge Society, 514-521

Drigas A., & Koukianakis L. (2006) An open distance learning e-system to support SMEs e-enterprising. In proceeding of 5th WSEAS Internationalconference on Artificial intelligence, knowledge engineering, data bases (AIKED 2006). Spain

Drigas AS, Argyri K, & Vrettaros J (2009) Decade review (1999-2009): artificial intelligence techniques in student modeling. In: World Summit on Knowledge Society. Springer, pp 552–564

Drigas, A. & Ioannidou, R. E. (2013). Special education and ICT's. International Journal of Emerging Technologies in Learning 8(2), 41– 47.

Drigas, A. Mitsea, E. & Skianis C. (2022) Subliminal Training Techniques for Cognitive, Emotional and Behavioural Balance. The role of Emerging Technologies Technium Social Sciences Journal 33, 164-186

Drigas, A. Mitsea, E. & Skianis C. (2022) Virtual Reality and Metacognition Training Techniques for Learning Disabilities SUSTAINABILITY 14(16), 10170

Drigas, A. S. & Driga, M. A. (2019). ADHD in the Early Years: Pre-Natal and Early Causes and Alternative Ways of Dealing. International Journal of Emerging Technologies in Learning (iJET), 15(13): 95–102. https://doi.org/10.3991/ijoe.v15i13.11203

Drigas, A. S. & Mitsea, E. (2020). The 8 Pillars of Metacognition. International Journal of Emerging Technologies in Learning (iJET), 15(21): 162–178. https://doi.org/10.3991/ ijet.v15i21.14907

Drigas, A. S. & Mitsea, E., (2021). 8 Pillars X 8 Layers Model of Metacognition Educational Strategies, Exercises & Trainings. International Journal of Online and Biomedical Engineering (iJOE), 17(8): 115–134. https://doi.org/10.3991/ijoe.v17i08.23563

Drigas, A. S. & Mitsea, E. (2021). Metacognition, Stress–Relaxation Balance & Related Hormones. International Journal of Recent Contributions from Engineering Science & IT (iJES), 9(1): 4–15. https://doi.org/10.3991/ijes.v9i1.19623

Drigas, A. S. & Papoutsi C. (2018). A New Layered Model on Emotional Intelligence. Behav Sci (Basel), 8(5): 45. https://doi.org/10.3390/bs8050045

Drigas, A. S., & Ioannidou, R. E. (2011), September). ICTs in special education: A review. In World Summit on Knowledge Society (357-364). Springer, Berlin, Heidelberg

Drigas, A. S., & Koukianakis, L. G. (2006). An open distance learning e-system to support SMEs e-enterprising. *WSEAS Transactions on Information Science and Applications*, *3*(3), 526-531.

Drigas, A. S., & Kouremenos, D. (2005). An e-learning management system for the deaf people. *WSEAS Transactions on Advances in Engineering Education*, *1*(2), 20-24.

Drigas, A. S., & Papanastasiou, G. (2014). Interactive White Boards in Preschool and Primary Education. *International Journal of Online Engineering*, *10*(4). 46–51

Drigas, A. S., Ioannidou, R. E. (2013) A Review on Artificial Intelligence in Special Education, Information Systems, Elearning, and Knowledge Management Research Communications in Computer and Information Science Volume 278, pp 385-391,

Drigas, A. S., Karyotaki, M. (2019). " A Layered Model of Human Consciousness". *Int. J. Recent Contributions Eng. Sci. IT*, *7*(3), 41-50.

Drigas, A. S., Karyotaki, M., & Skianis, C. (2018). An integrated approach to neuro-development, neuroplasticity and cognitive improvement. *International Journal of Recent Contributions from Engineering, Science & IT (iJES)*, *6*(3), 4-18.

Drigas, A. S., Kokkalia, G. K. (2014). ICTs in Kindergarten. International Journal of Emerging Technologies in Learning, 9(2). https://doi.org/10.3991/ijet.v9i2.3278

Drigas, A. S., & Pappas M., (2017) "The Consciousness-Intelligence-Knowledge Pyramid: An 8x8 Layer Model," International Journal of Recent Contributions from Engineering, Science & IT (iJES), 5(3), 14-25, https://doi.org/10.3991/ijes.v5i3.7680

Drigas, A. S., & Pappas M.A. (2015) "On line and other Game-Based Learning for Mathematics." International Journal of Online Engineering (iJOE) 11.4, 62-67, https://doi.org/10.3991/ijoe.v11i4.4742

Drigas, A. S., Pappas, M. A., & Lytras, M. (2016). Emerging technologies for ICT based education for dyscalculia: implications for computer engineering education. *International journal of engineering education*, *32*(4), 1604-1610.

Drigas, A. S., Stavridis, G., & Koukianakis, L. (2004). A Modular Environment for E-learning and E-psychology Applications. *WSEAS Transactions on Computers*, *3*(6), 2062-2067.

Drigas, A. S., Vrettaros, J., Stavrou, L., & Kouremenos, D. (2004). E-learning Environment for Deaf People in the E-commerce and New Technologies Sector. *WSEAS Transactions on Information Science and Applications*, 1(5), 1189-1196.

Drigas, A. & Sideraki A (2021_ Emotional Intelligence in Autism Technium Soc. Sci. J. 26, 80

Drigas, A., & Bakola, L. N. (2021). The 8x8 Layer Model Consciousness-Intelligence-Knowledge Pyramid, and the Platonic Perspectives. *Int. J. Recent Contributions Eng. Sci. IT*, *9*(2), 57-72.

Drigas, A., & Kontopoulou, M. T. L. (2016). ICTs based physics learning. *International Journal of Engineering Pedagogy (iJEP)*, *6*(3), 53-59.

Drigas, A., & Kostas, I. (2014). On Line and other ICTs Applications for teaching math in Special Education. *International Journal of Recent Contributions from Engineering, Science & IT (iJES)*, *2*(4), 46-53.

Drigas, A., & Koukianakis, L. (2009). Government online: an e-government platform to improve public administration operations and services delivery to the citizen. In *World Summit on Knowledge Society* (523-532). Springer, Berlin, Heidelberg.

Drigas, A., & Mitsea, E. (2022). Breathing: a Powerfull Tool for Physical & Neuropsychological Regulation. The role of Mobile Apps. *Technium Soc. Sci. J.*, *28*, 135.

Drigas, A., & Papoutsi, C. (2019). Emotional Intelligence as an Important Asset for HR in Organizations: Leaders and Employees. *International Journal of Advanced Corporate Learning*, *12*(1).

Drigas, A., & Papoutsi, C. (2020). The Need for Emotional Intelligence Training Education in Critical and Stressful Situations: The Case of Covid-19. *Int. J. Recent Contributions Eng. Sci. IT*, *8*(3), 20-36.

Drigas, A., & Politi-Georgousi, S. (2019). Icts as a distinct detection approach for dyslexia screening: A contemporary view. International Journal of Online and Biomedical Engineering (iJOE), 15(13):46–60.

Drigas, A., & Vlachou, J. A. (2016). Information and communication technologies (ICTs) and autistic spectrum disorders (ASD). *International Journal of Recent Contributions from Engineering, Science & IT (iJES)*, *4*(1), 4-10.

Drigas, A., & Dourou, A. (2013). A Review on ICTs, E-Learning and Artificial Intelligence for Dyslexic's Assistance. International Journal of Emerging Technologies in Learning (iJET), 8(4), 63-67.

Drigas, A., & Kokkalia, G. (2017). ICTs and Special Education in Kindergarten. International Journal of Emerging Technologies in Learning 9 (4), 35–42.

Drigas, A., Kokkalia, G., & Lytras, M. D. (2015). Mobile and multimedia learning in preschool education. *Journal of Mobile Multimedia*, 11(1-2) 119-133.

Drigas, A., Koukianakis, L., & Papagerasimou, Y. (2006) An e-learning environment for nontraditional students with sight disabilities. In *Proceedings. Frontiers in Education. 36th Annual Conference* (23-27). IEEE.

Drigas, A., Koukianakis, L., & Papagerasimou, Y. (2011) Towards an ICT-based psychology: Epsychology, Computers in Human Behavior, 27:1416–1423. https://doi.org/10.1016/j.chb.2010.07.045

Drigas, A., & Leliopoulos, P. (2013). Business to consumer (B2C) e-commerce decade evolution. International Journal of Knowledge Society Research (IJKSR), 4(4), 1-10.

Drigas, A., & Mitsea, E. (2020). A Metacognition Based 8 Pillars Mindfulness Model and Training Strategies. *Int. J. Recent Contributions Eng. Sci. IT*, *8*(4), 4-17.

Drigas, A., & Mitsea, E. (2020). The Triangle of Spiritual Intelligence, Metacognition and Consciousness. *Int. J. Recent Contributions Eng. Sci. IT*, *8*(1), 4-23.

Drigas, A., & Mitsea, E. (2021). 8 Pillars X 8 Layers Model of Metacognition: Educational Strategies, Exercises &Trainings. *International Journal of Online & Biomedical Engineering*, *17*(8).

Drigas, A., Mitsea, E. (2021). 8 Pillars X 8 Layers Model of Metacognition: Educational Strategies, Exercises &Trainings. International Journal of Online & Biomedical Engineering, 17(8). https://doi.org/10.3991/ijoe.v17i08.23563

Drigas, A., & Mitsea, E. (2021). Metacognition, Stress-Relaxation Balance & Related Hormones. *Int. J. Recent Contributions Eng. Sci. IT*, *9*(1), 4-16.

Drigas, A., & Mitsea, E. (2021). Neuro-Linguistic Programming & VR via the 8 Pillars of Metacognition X 8 Layers of Consciousness X 8 Intelligences. *Technium Soc. Sci. J.*, *26*, 159.

Drigas, A., Mitsea, E. & Skianis C (2022) Neuro-Linguistic Programming, Positive Psychology & VR in Special Education. Scientific Electronic Archives 15 (1)

Drigas, A., Mitsea, E., & Skianis, C. (2021). The Role of Clinical Hypnosis and VR in Special Education. *International Journal of Recent Contributions from Engineering Science & IT (iJES)*, *9*(4), 4-17.

Drigas, A., Mitsea, E., & Skianis, C. (2022). Clinical Hypnosis & VR, Subconscious Restructuring-Brain Rewiring & the Entanglement with the 8 Pillars of Metacognition X 8 Layers of Consciousness X 8 Intelligences. *International Journal of Online & Biomedical Engineering*, *18*(1).

Drigas, A., & Mitsea, E. (2022) Conscious Breathing: a Powerful Tool for Physical & Neuropsychological Regulation. The role of Mobile Apps Technium Social Sciences Journal 28, 135-158

Drigas, A., & Pappas, M. (2015). ICT based screening tools and etiology of dyscalculia. International Journal of Engineering Pedagogy, 5(3), 61-66.

Drigas, A., & Vrettaros, J. (2004): An Intelligent Tool for Building e-Learning Contend-Material Using Natural Language in Digital Libraries. WSEAS Transactions on Information Science and Applications 5(1) 1197–1205

Drigas, A.S., Vrettaros, J. & Kouremenos, D. (2004a) 'Teleeducation and e-learning services for teaching English as a second language to deaf people, whose first language is the sign language', WSEAS Transactions on Information Science and Applications, Vol. 1, No. 3, pp.834–842.

Drigas, A.S., Vrettaros, J., Koukianakis, L.G. & Glentzes, J.G. (2005). A Virtual Lab and e-learning system for renewable energy sources. Int. Conf. on Educational Tech.

Dulcan, M. K., Costello, E. J., Costello, A. J., Edelbrock, C., Rent, D., & Janiszewski, S. (1990). The pediatrician as gatekeeper to mental health care for children: Do parents' concerns open the gate? Journal of the American Academy of Child and Adolescent Psychiatry, 29, 453–458.

DuPaul, G. J., & Stoner, G. (2003). ADHD in the schools: Assessment and intervention strategies. New York: The Guilford Press.

Ebesutani C., Regan J., Smith A., Reise S., Higa-McMillan C., & Chorpita B.F. (2012). The 10-item positive and negative affect schedule for children, child and parent shortened versions: application of item response theory for more efficient assessment. J. Psychopathol. Behav. Assess., 34 (2), 191-203.

Ferna´ndez, M. C., & Arcia, E. (2004). Disruptive behaviors and maternal responsibility: A complex portrait of stigma, selfblame, and other reactions. Hispanic Journal of Behavioral Sciences, 26, 356–372.

Fritz K.M., & O' Connor P.J., (2016). Acute exercise improves mood and motivation in young men with ADHD symptoms. Med. Sci. Sports Exerc., 1648-1655.

Galitskaya, V., & Drigas, A. (2021). The importance of working memory in children with Dyscalculia and Ageometria. *Scientific Electronic Archives*, *14*(10).

Gapin J.I., Labban J.D., & Etnier J.L. (2011). The effects of physical activity on attention deficit hyperactivity disorder symptoms: the evidence. Prev. Med., 52 (Suppl. 1), S70-S74.

Goldsmith, H., Jackson, D., & Hough, R. (1988). Process model of seeking mental health services: Proposed framework for organizing the research literature on help-seeking. In H. Goldsmith, E. Lin, R. Bell, & D. Jackson (Eds.), Needs assessment: It's future (4 9–64). (DHSS Publication No. ADM 8 8-1550). Washington, DC: U.S. Government Printing Office.

Gresham, F. M., Gansle, K. A., Noell, G. H., Cohen, S., & Rosenblum, S. (1993). Treatment integrity of school-based behavioral intervention studies: 1980–1990. School Psychology Review, 22, 254–272.

Guevara, J. P., Feudtner, C., Romer, D., Power, T., Eiraldi, R., Nihtianova, S., Rosales, A., Ohene-Frempong,J., & Schwarz, D.F. (2005). Fragmentedcareforinner-cityminoritychildren with attention-deficit/hyperactivity disorder. Pediatrics, 116, e512–e517. http://www.pediatrics.org/cgi/content/full/116/4/ e512.

Hoagwood, K. (1998). A national perspective on treatments and services for children with attention deficit hyperactivity disorder. In: Proceedings of the NIHG consensus conference on diagnosis and treatment of ADHD (211–219). Bethesda, MD: National Institutes of Health.

Hoza B., Smith A.L., Shoulberg E.K., et al. (2014). A randomized trial examining the effects of aerobic physical activity on attention-deficit/hyperactivity disorder symptoms in young children. J. Abnorm. Child Psychol., 112-124.

Kapsi, S., Katsantoni, S., & Drigas, A. (2020). The Role of Sleep and Impact on Brain and Learning. *Int. J. Recent Contributions Eng. Sci. IT*, *8*(3), 59-68.

Karabatzaki, Z. (2018). Female entrepreneurship and employability in the digital era: The case of Greece. *Journal of Open Innovation: Technology, Market, and Complexity*, *4*(2), 15.

Karabatzaki, Z., Stathopoulou, A., Kokkalia, G., Dimitriou, E., Loukeri, P. I., Economou, A., & Drigas, A., (2018). Mobile Application Tools for Students in Secondary Education. An Evaluation Study. International Journal of Interactive Mobile Technologies (iJIM), 12(2): 142–161. https://doi.org/10.3991/ijim.v12i2.8158

Karabatzaki, Z., Stathopoulou, A., Kokkalia, G., Dimitriou, E., Loukeri, P., Economou A., & Drigas, A. (2018). Mobile Application Tools for Students in Secondary Education. An Evaluation Study. International Journal of Interactive Mobile Technologies (iJIM), 12(2), 142-161

Karyotaki M, & Drigas A. (2016) Online and Other ICT-based Training Tools for Problem-solving Skills. International Journal of Emerging Technologies in Learning 11 (6)

Karyotaki, M., & Drigas, A. (2015). Online and other ICT Applications for Cognitive Training and Assessment. *International Journal of Online Engineering*, *11*(2). 36-42.

Karyotaki, M., & Drigas, A. (2016). Latest trends in problem solving assessment. *International Journal of Recent contributions from Engineering, Science & IT (iJES)*, *4*(2), 4-10.

Karyotaki, M., Bakola, L., Drigas, A., & Skianis, C. (2022). Women's Leadership via Digital Technology and Entrepreneurship in business and society. Technium Soc. Sci. J., 28, 246.

Kataoka, S. H., Zhang, L., & Wells, K. B. (2002). Unmet need for mental health care among U.S. children: Variation by ethnicity and insurance status. American Journal of Psychiatry, 159, 1548–1555.

Kefalis C, Kontostavlou E. Z, & Drigas A. (2020) The Effects of Video Games in Memory and Attention. Int. J. Eng. Pedagog. 10 (1), 51-61

Kendall, J., & Hatton, D. (2002). Racism as a source of health disparity in families with children with attention deficit hyperactivity disorder. Advances in Nursing Science, 25, 22– 39.

Kokkalia, G., Drigas, A. S., & Economou, A. (2016). Mobile learning for preschool education. International Journal of Interactive Mobile Technologies, 10(4).

Kokkalia, G., Drigas, A. S., Economou, A., & Roussos, P. (2019). School readiness from kindergarten to primary school. *International Journal of Emerging Technologies in Learning (Online)*, *14*(11), 4.

Kokkalia, G., Drigas, A., & Economou, A. (2016). The role of games in special preschool education. *International Journal of Emerging Technologies in Learning* (iJET), 11(12), 30-35.

Kokkalia, G., Drigas, A., Economou, A., Roussos, P., & Choli, S. (2017). The Use of Serious Games in Preschool Education. *International Journal of Emerging Technologies in Learning*, *12*(11).

Kontostavlou, E. Z., & Drigas, A. S. (2019). The Use of Information and Communications Technology (ICT) in Gifted Students. *Int. J. Recent Contributions Eng. Sci. IT*, *7*(2), 60-67.

LaFromboise, T., Coleman, H. L., & Gerton, J. (1993). Psychological impact of biculturalism: Evidence and theory. Psychological Bulletin, 114(3), 395–412.

Leslie, L. K., Weckerly, J., Plemmons, D., Landsverk, J., & Eastman, S. (2004). Implementing the American Academy of Pediatrics Attention-Deficit/Hyperactivity Disorder diagnostic guidelines in primary care settings. Pediatrics, 114, 129–140.

Lillie-Blanton, M., Brodie, M., Rowland, D., Altman, D., & McIntosh, M. (2000). Race, ethnicity, and the health care system: Public perceptions and experiences. Medical Care Research and Review, 57, 218–235.

Link, B. G., & Phelan, J. C. (1999). Labeling and stigma. In C. S. Aneshensel, & J. C. Phelan (Eds.), Handbook of the sociology of mental health (481–494). New York: Kluwer Academic/Plenum Publishers.

Lopez-Class, M., González Castro, F., & Ramirez, A. G. (2011). Conceptions of acculturation: A review and statement of critical issues. Social Science & Medicine, 72(9), 1555–1562.

Lytra, N., & Drigas, A. (2021). STEAM education-metacognition–Specific Learning Disabilities. Scientific Electronic Archives, 14(10).

Madden M., Lenhart A., Duggan M., Cortesi S., & Gasser U. (2013). Teens and Technology 2013. Pew Research Center's Internet & American Life Project, http://www.pewinternet.org/Reports/2013/Teens-and-Tech.aspx

Maslow, A. H. (1943). A Theory of Human Motivation. Psychological Review, 50, 370–396. https://doi.org/10.1037/h0054346

Maslow, A. H., (1987). Motivation and personality (3rd ed.), Boston, MA: AddisonWesley.

Medina J.A., Netto T.L., Muszkat M., et al. (2010). Exercise impact on sustained attention of ADHD children, methylphenidate effects. Atten. Defic. Hyperact. Disord., 2 (1), 49-58.

Mitsea E, Drigas A, & Skianis C. (2022) ICTs and Speed Learning in Special Education: High-Consciousness Training Strategies for High-Capacity Learners through Metacognition Lens Technium Soc. Sci. J. 27, 230

Mitsea E, Drigas A,, C & Skianis (2022) Breathing, Attention & Consciousness in Sync: The role of Breathing Training, Metacognition & Virtual Reality Technium Social Sciences Journal 29, 79-97

Mitsea, E., & Drigas, A. (2019). A journey into the metacognitive learning strategies. International Journal of Online & Biomedical Engineering, 15(14). https://doi.org/ 10.3991/ijoe.v15i14.11379

Mitsea, E., Drigas, A., & Mantas, P. (2021). Soft Skills & Metacognition as Inclusion Amplifiers in the 21 st Century. International Journal of Online & Biomedical Engineering, 17(4).

Mitsea, E., Lytra, N., Akrivopoulou, A., & Drigas, A. (2020). Metacognition, Mindfulness and Robots for Autism Inclusion. Int. J. Recent Contributions Eng. Sci. IT, 8(2), 4-20.

Ntaountaki P, et al (2019) Robotics in Autism Intervention. Int. J. Recent Contributions Eng. Sci. IT 7 (4), 4-17

Olfson, M., Gameroff, M. J., Marcus, S. C., & Jensen, P. S. (2003). National trends in the treatment of attention deficit hyperactivity disorder. American Journal of Psychiatry, 160, 1071–1077.

Pachter, L. M., & Weller, S. C. (1993). Acculturation and compliance with medical therapy. Journal of Developmental and Behavioral Pediatrics, 14, 163–167.

Papanastasiou, G. P., Drigas, A. S., & Skianis, C. (2017). Serious games in preschool and primary education: Benefits and impacts on curriculum course syllabus. International Journal of Emerging Technologies in Learning, 12(1), 44–56. https://doi.org/10.3991/ijet.v12i01.6065

Papanastasiou, G., Drigas, A., Skianis, C., & Lytras, M. (2020). Brain computer interface based applications for training and rehabilitation of students with neurodevelopmental disorders. A literature review. *Heliyon*, *6*(9), e04250

Papanastasiou, G., Drigas, A., Skianis, C., & Lytras, M. D. (2017). Serious games in K-12 education: Benefits and impacts on students with attention, memory and developmental disabilities. Program, 51(4), 424-440. https://doi.org/10.1108/prog-02-2016-0020

Papanastasiou, G., Drigas, A., Skianis, C., Lytras, M., & Papanastasiou, E. (2018). Patient-centric ICTs based healthcare for students with learning, physical and/or sensory disabilities. *Telematics and Informatics*, *35*(4), 654-664.

Papoutsi C, Drigas A, C Skianis 2021 Virtual and augmented reality for developing emotional intelligence skills Int. J. Recent Contrib. Eng. Sci. IT (IJES) 9 (3), 35-53

Papoutsi C., Drigas, A. S., & Skianis, C. (2018) "Mobile Applications to Improve Emotional Intelligence in Autism – A Review," Int. J. Interact. Mob. Technol. (iJIM); Vol 12, No 6,

Papoutsi, C., & Drigas, A. (2016). Games for empathy for social impact. International Journal of Engineering Pedagogy 6(4), 36-40.

Papoutsi, C., & Drigas, A. S. (2017). Empathy and Mobile Applications. *International Journal of Interactive Mobile Technologies*, *11*(3).

Papoutsi, C., Drigas, A., & Skianis, C. (2019). Emotional intelligence as an important asset for HR in organizations: Attitudes and working variables. *International Journal of Advanced Corporate Learning*, *12*(2), 21.

Pappas, M & Drigas, A., (2015). ICT based screening tools and etiology of dyscalculia. International Journal of Engineering Pedagogy, 3, 61-66.

Pappas, M. A., & Drigas, A. S. (2019). Computerized Training for Neuroplasticity and Cognitive Improvement. *Int. J. Eng. Pedagog.*, *9*(4), 50-62.

Pappas, M. A., Demertzi, E., Papagerasimou, Y., Koukianakis, L., Voukelatos, N., & Drigas, A. (2019). Cognitive-based E-learning design for older adults. Social Sciences, 8(1), 6.

Pappas, M. A., Demertzi, E., Papagerasimou, Y., Koukianakis, L., Kouremenos, D., Loukidis, I., & Drigas, A. S. (2018). E-learning for deaf adults from a user-centered perspective. Education Sciences, 8(4), 206.

Pappas, M. A., Drigas, A. S., Papagerasimou, Y., Dimitriou, H., Katsanou, N., Papakonstantinou, S., Pappas, M., & Drigas, A. (2016). Incorporation of artificial intelligence tutoring techniques in mathematics. International Journal of Engineering Pedagogy, 6(4), 12–16. https://doi.org/10.3991/ijep.v6i4.6063

Patrick K., Griswold W.G., Raab F., Intille S.S. (2008). Health and the mobile phone. Am. J. Prev. Med., 35 (2), 177-181.

Pescosolido, B. A. (1991). Illness, careers and network ties: A conceptual model of utilization and compliance. Advances in Medical Sociology, 2, 161–184.

Pescosolido, B. A. (1992). Beyond rational choice: The social dynamics of how people seek help. American Journal of Sociology, 97, 1096–1138.

Podolski, C. L., & Nigg, T. J. (2001). Parent stress and coping in relation to child ADHD severity and associated child disruptive behavior problems. Journal of Clinical Child Psychology, 30, 503–513.

Power, T. J., & Eiraldi, R. E. (1999). Using interviews and rating scales to collect behavioral data. In M. Mercugliano, T. J. Power, & N. J. Blum (Eds.), The clinicians' practical guide to attention-deficit/hyperactivity disorder (53–70). Baltimore, MD: Paul Brookes Publishing Co.

Pumper M.A., Mendoza J.A., Koehler A. Arseniev, Holm M., Waite A., & Moreno M.A. (2015). Using a Facebook group as an adjunct to a pilot mHealth physical activity intervention: a mixed methods approach. Stud. Health Technol. Inform., 219, 97101.

Risher, P., & Fitts, V. (2002). Cultural attitudes and perceptions about attention deficit hyperactivity disorder (ADHD). Rochester, NY: Harris Interactive Inc.

Rowland, A. S., Umbach, D. M., Stallone, L., Naftel, J., Bohlig, M., & Sandler, D. P. (2002). Prevalence of medication treatment for attention deficit-hyperactivity disorder among elementary school children in Johnston County, North Carolina. American Journal of Public Health, 92, 231–234.

Rushton, J. L., Fant, K. E., & Clark, S. J. (2004). Use of practice guidelines in the primary care of children with attentiondeficit/hyperactivity disorder. URL: http://www.pediatrics.org/cgi/content/full/114/1/e23

Schoenfelder Erin, Moreno Megan, Wilner Molly, Whitlock Kathryn B., & Mendoza Jason A. (2017). Piloting a mobile health intervention to increase physical activity for adolescents with ADHD. Preventive Medicine Reports Volume 6, Pages 210-213.

Schwartz, S. J., Unger, J. B., Zamboanga, B. L., & Szapocznik, J. (2010). Rethinking the concept of acculturation: implications for theory and research. American Psychologist, 65, 237–251.

Srebnik, D., Cauce, A. M., & Baydar, N. (1996). Help-seeking pathways for children and adolescents. Journal of Emotional and Behavioral Disorders, 4, 210–220.

Stathopoulou, A., Karabatzaki, Z., Kokkalia, G., Dimitriou, E., Loukeri, P. I., Economou, A., & Drigas, A. (2018). Mobile Assessment Procedures for Mental Health and Literacy Skills in Education. International Journal of Interactive Mobile Technologies, 12(3). 21-37,

Stathopoulou, A., Karabatzaki, Z., Tsiros, D., Katsantoni, S., & Drigas, A. (2019). Mobile apps the educational solution for autistic students in secondary education. International Journal of Interactive Mobile Technologies, Vol. 13 Issue 2, p89-101

Stathopoulou, A., Loukeris, D., Karabatzaki, Z., Politi, E., Salapata, Y., & Drigas, A. (2020). Evaluation of mobile apps effectiveness in children with autism social training via digital social stories. Int. J. Interact. Mob. Technol. (iJIM); 14(3).

Stavridis S, D Papageorgiou, L Droukas, Z Doulgeri 2022 Bimanual crop manipulation for human-inspired robotic harvesting arXiv preprint arXiv:2209.06074

Stavridis S, D Papageorgiou, Z Doulgeri 2017 Dynamical system based robotic motion generation with obstacle avoidance, IEEE Robotics and Automation Letters 2 (2), 712-718

Stavridis S, P Falco, Z Doulgeri 2020 Pick-and-place in dynamic environments with a mobile dual-arm robot equipped with distributed distance sensors IEEE-RAS 20th International Conference on Humanoid Robots (Humanoids)

Stavridis S, Z Doulgeri 2018 Bimanual assembly of two parts with relative motion generation and task related optimization 2018 IEEE/RSJ International Conference on Intelligent Robots and Systems …

Stavridou Th., Driga, A.M., Drigas, A.S., 2021. Blood Markers in Detection of Autism, International Journal of Recent Contributions from Engineering Science & IT (iJES) 9(2):79-86.

Teagle, S. E. (2002). Parental problem recognition and child mental health service use. Mental Health Services Research, 4, 257–266.

Theodorou, P., & Drigas, A. S. (2017). ICTs and Music in Generic Learning Disabilities. International Journal of Emerging Technologies in Learning, 12(4).

Tourimpampa, A., Drigas, A., Economou, A., & Roussos, P. (2018). Perception and Text Comprehension. It's a Matter of Perception!. International Journal of Emerging Technologies in Learning, 13(7).

Verhulst, F. C., & Van der Ende, J. (1997). Factors associated with child mental health service use in the community. Journal of the American Academy of Child and Adolescent Psychiatry, 36, 901–909.

Veroff, J., Kulka, R. A., & Donovan, E. (1981). Mental health in America: Patterns of help-seeking from 1957–1976. New York: Basic Books.

Vlachou J.and Drigas, A. S., 2017 "Mobile technology for students and adults with Autistic Spectrum Disorders (ASD)," International Journal of Interactive Mobile Technologies, vol. 11(1), 4-17,

Vrettaros, J., Tagoulis, A., Giannopoulou, N., & Drigas, A. (2009). An empirical study on the use of Web 2.0 by Greek adult instructors in educational procedures. In World Summit on Knowledge Society (164-170). Springer, Berlin, Heidelberg.

Wells, K. B., Golding, J. M., & Hough, R. L. (1989). Acculturation and the probability of use of health services by Mexican Americans. Health Services Research, 24, 237–257.

Wolraich M.L., Lambert W., Doffing M.A., Bickman L., Simmons T., Worley K. (2003). Psychometric properties of the Vanderbilt ADHD diagnostic parent rating scale in a referred population. J. Pediatr. Psychol. 28 (8), 559-567.

Woodward, A. M., Dwinell, A. D., & Arons, B. S. (1992). Barriers to mental health care for Hispanic Americans: A literature review and discussion. The Journal of Mental Health Administration, 19, 224–236.

Yen J.Y., Ko C.H., Yen C.F., Wu H.Y., Yang M.J. (2007). The comorbid psychiatric symptoms of Internet addiction: attention deficit and hyperactivity disorder (ADHD), depression, social phobia, and hostility. J. Adolesc. Health, 41 (1), 93-98.

Young Zoe, Craven Michael P., Groom Maddie & Crowe John (2014). Snappy App: A Mobile Continuous Performance Test with Physical Activity Measurement for Assessing Attention Deficit Hyperactivity Disorder. Human-Computer Interaction. Applications and Services, pp 363–373.

Zavitsanou, A., & Drigas, A. (2021). Nutrition in mental and physical health. Technium Soc. Sci. J., 23, 67.

Zima, B. T., Hurlburt, M. S., Knapp, P., Ladd, H., Tang, L., Duan, N., et al. (2005). Quality of publicly-funded outpatient specialty mental health care for common childhood psychiatric disorders in California. Journal of the American Academy of Child and Adolescent Psychiatry, 44, 130–144.