

## Emotional Intelligence in Attention Deficit Hyperactivity Disorder

*Dikkat Eksikliği Hiperaktivite Bozukluğunda Duygusal Zeka*

Gamze Yapçı Kaypaklı<sup>1</sup> , Lut Tamam<sup>2</sup> 

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### Abstract

Emotional intelligence refers to comprehending the feelings of oneself and others, utilizing these feelings to cope with daily-life demands, showing empathy, adaptability to change, managing stress, self-motivation and establishing successful relationships. Many authors state that there is a social deficit in children and adolescents with attention deficit hyperactivity disorder (ADHD). Children and adults with ADHD were found to have lower ability in recognizing emotions from mimics and sounds, have more aggressive behavior, lower frustration tolerance and impaired self-control. Therefore, some authors suggest the addition of a new core symptom in the diagnosis of ADHD, which could clearly identify problems at the interpersonal interaction besides attention deficit, hyperactivity, and impulsivity. Considering the fact that abilities associated with emotional intelligence can be learned and improved, developing emotional intelligence can be thought as a target for therapy by individualized education for patients with ADHD.

**Keywords:** Attention deficit hyperactivity disorder, emotional intelligence, emotion regulation.

### Öz

Duygusal zeka, kendisinin ve diğerlerinin duygularını anlayabilme, problem çözerken bu duygulardan faydalananabilme, empati yapabilme, değişikliğe uyum gösterme, stres yönetebilme, motive olabilme ve başlarını ile başarılı ilişkiler yürütebilmeyi tanımlar. Birçok yazar dikkat eksikliği hiperaktivite bozukluğu (DEHB) olan çocuk ve ergenlerde sosyal defisit olduğunu belirtmiştir. DEHB'lı çocuk ve erişkinlerin mimiklerden ve seslerden duygularını tanımda daha kötü performans sergiledikleri, daha fazla agresif davranış gösterdikleri, daha düşük engellenme toleransına sahip oldukları ve özdeneştimlerinin bozulduğu bilinmektedir. Bu nedenle bazı yazarlar, dikkat eksikliği, hiperaktivite ve dürtüselliğin yanında kişiler arası etkileşimdeki problemleri açıkça tanımlayabilecek emosyonel işlev bozukluğunun DEHB'nin çekirdek belirtisi olarak kabul edilmesi gerektiğini ileri sürümlerdir. Duygusal zekâ ile ilişkili yeteneklerin öğrenilip geliştirilebileceği göz önüne alındığında, duygusal zekâının geliştirilmesi için bireyselleştirilmiş eğitimin DEHB hastaları için bir tedavi hedefi olduğu düşünülebilir.

**Anahtar sözcükler:** Dikkat eksikliği hiperaktivite bozukluğu, duygusal zeka, emosyon regülasyonu.

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<sup>1</sup> Hatay State Hospital, Hatay, Turkey

<sup>2</sup> Çukurova University Faculty of Medicine Department of Psychiatry, Adana, Turkey

 Gamze Yapçı Kaypaklı, Hatay State Hospital, Hatay, Turkey  
gamzeyapca@gmail.com

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**EMOTIONS** serve as signals in response to changing conditions and have an impact on behavioral responses to events. Emotional intelligence occurs as a result of the interaction between emotions and cognitions (Mayer and Salovey 1995).

Although there is no consensus on the exact definition of emotional intelligence, major definitions are almost on the same axis. Emotional intelligence refers to comprehending the feelings of oneself and others, utilizing these feelings to cope with daily-life demands, showing empathy, adaptability to change, managing stress, self-motivation and establishing successful relationships (Mayer and Salovey 1995, Bar-On and Parker 2000, İşmen 2001, Mayer et al. 2001). Despite there is a lot of research on emotion regulation in ADHD, there is limited research about emotional intelligence. In this paper, the importance and the effect of emotional intelligence in ADHD will be discussed.

## **Emotional Intelligence**

Mayer and Salovey (2001) described the emotional intelligence as a set of abilities such as;

1. Perception of emotion: Recognizing emotion on faces or pictures,
2. Utilizing emotions: Using emotions at various cognitive activities such as thinking and problem solving,
3. Understanding the emotions and the complex relationship between emotions,
4. Managing emotions.

Furthermore, Bar-On and Parker (2000) explained emotional intelligence in five dimensions:

1. Self Awareness: Independence, self-realization, determination, self-esteem, emotional self-awareness
2. Interpersonal Relationships: Social responsibility, interpersonal relations, empathy
3. Adaptation to the Environment: Flexibility, being realistic, problem-solving,
4. Stress Management: Resistance to stress, impulse control
5. General mood: Happiness, positive mood

Emotional intelligence increases with age until the beginning of young adulthood, as in IQ lost the pace of development rate gradually, it is usually higher in females than in males (İşmen 2001).

## **Emotional Intelligence and Psychiatric Comorbidities**

The relationship between psychiatric comorbidities and emotional intelligence can be thought as bilateral. While some psychiatric comorbidities may result in lower emotional intelligence, low emotional intelligence may lead to several psychiatric comorbidities. High emotional intelligence level is associated with positive coping strategies in adolescents; furthermore, maladaptive coping methods such as self-harm and also the frequency of depression are found to be higher in adolescents with low emotional intelligence (Mikolajczak 2009). College students with higher emotional intelligence have increased ability to cope with challenging life events and they are also less prone to abuse alcohol and tobacco. There is a negative relationship between emotional intelligence and alcohol and tobacco use in adolescents (Trinidad and Johnson 2002). Low

ability on emotion management results peer bullying which further increases the risk of smoking or alcohol use. Anxiety or stressful life events are well known risk factors for smoking or alcohol consumption. Individuals with low emotional intelligence tend to smoke and abuse alcohol to cope with their difficulties in understanding and managing emotions. This may be similar to the increased risk of smoking and alcohol consumption in patients with alexithymia (Kauhanen 1992). Also, lower levels of emotional intelligence were found in patients with mental disorders such as depressive disorder, anxiety disorder, and bipolar disorder (Hertel 2009, Lizeretti 2012).

Emotional intelligence has been shown to be associated with better social relationships, a better degree in academic and work performance, and higher levels of psychological well-being and life satisfaction. On the other hand, low emotional intelligence is more likely to be related with increased stress and anxiety, and more aggressive and addictive behavior (Mayer 2008, Brackett 2011).

Depressive disorder is one of the most common comorbidities in attention deficit hyperactivity disorder (ADHD) (Sobanski et al. 2007). Depressive disorder has a negative impact on the recognition process of facial expressions in children with ADHD and may also lead to failure of emotion recognition. (Williams et al. 2008; Schlipf et all 2013). Quintero et al. (2017) showed that the emotional intelligence levels of patients who have the comorbid disorder with ADHD are lower than healthy controls and the ADHD groups. That study also reported that ADHD severity in childhood or adulthood does not affect current emotional intelligence level.

## **Emotional Intelligence and Related Factors in ADHD**

ADHD is the most common psychiatric disorder among children, and its prevalence is reported to be around %5 in the worldwide (Polanczyk et al. 2007). ADHD is a neuro-developmental disorder which is thought to have multifactorial etiology, such as genetic, biological and environmental factors (Thapar et al. 2016). Total brain volumes in individuals with ADHD were lower than in the control group; this condition is more prominent in the prefrontal cortex, cingulate cortex, basal ganglia, corpus callosum, and cerebellum and there is hypoactivation in these areas (Emond et al. 2009).

ADHD is defined by inattention, hyperactivity and impulsivity symptoms. These behaviors cause inappropriate communication with peers and result in rejection by others along with failure to make or carry on friendships. Many authors state that there is a social deficit in children and adolescents with ADHD (Biederman et al. 1996, Barkley 1997). These children are less successful than their peers in understanding social cues, are not flexible in their responses and are incapable of modifying their behavior according to the demands of environmental changes (Landau and Milich 1988). Children and adolescents with ADHD have conflicts in their interpersonal relations with their parents, peers, siblings, and teachers (Greene et al. 2001). As a result, patients with ADHD usually find themselves facing with social rejection. For appropriate and effective communication, understanding the feelings of others and the ability to respond appropriately to others' feelings is critical for interpersonal relationships (Kinsbourne and Bemporad 1984). Children and adults with ADHD were found to have lower ability in recognizing emotions from mimics and sounds, have more aggressive behavior, lower frustration tolerance and impaired self-control. Consequently, these issues cause interpersonal problems (Cadesky et al. 2000, Pelc et al. 2006,

Yuill and Lyon 2007).

Therefore, some authors suggest that emotional dysfunction should also be considered as another essential feature of ADHD (Barkley 1997, Uekermann et al. 2010, Quintero et al. 2017, Shaw et al. 2014). They also suggest the addition of a new core symptom in the diagnosis of ADHD, which could clearly identify problems at the interpersonal interaction besides attention deficit, hyperactivity, and impulsivity (Uekermann et. al, 2010). It is known that adults with ADHD diagnosis have similar difficulties on emotion management. Although it is not included in the DSM, Wender, et al. (2001) defines some criteria for ADHD as 'emotional lability,' 'irritability, bursting' and 'excessive emotional reactivity' among the Wender Utah Rating Scale (Stein et al. 1995, Wender et al. 2001).

Both the ability to interact with others and adaptability are the areas where the patients with ADHD have difficulties (Barkley 2014). In the natural environment namely the classroom or the playground, patients with ADHD who have low emotional intelligence are not able to inhibit their impulsive responses. In such cases, there is much information that needs to be processed in a short time, such as their own and others' feelings, situational cues. Consequently, they may more frequently react inappropriately. Indeed, when children with ADHD with low emotional intelligence are asked how to "respond" in a particular event, they often give a correct or more appropriate answer. However, at the time of the event, they cannot choose the best option and mostly acts impulsively. When they are given time and opportunity to think their reactions, patients possibly recognize others' feelings better and behave accordingly (Climie et al. 2017).

Inhibition and working memory are impaired in ADHD; as a result, their behaviors are faster than healthy individuals (Barkley 1997). The executive functions define a group of cognitive processes such as planning, problem-solving, organizing the target-directed behaviors. Executive functions play an essential role in the regulation, management, and control of emotions. The regulation of emotion is the behavior of a person after preliminary thinking. In other words, it allows the person to think about the possible outcomes of the emotional response to an event by delaying the emotions occurring as a reflex. Emotions management affects motivation positively which is also associated with emotional responses. Control of emotions and impulses helps a person to achieve long-term goals. If this regulation impairs, clinical findings like over-emotional reactions, non-objective emotional reactions, emotional reactions to the feelings of others and insufficient motivation for initiating and maintaining goal-oriented behaviors could occur (Barkley 1997).

Although most of the executive dysfunctions described by Brown are among the criteria of ADHD, emotion regulation is not included in classification systems such as DSM / ICD for ADHD diagnosis (Brown 2011). Emotional dysfunction may increase the severity of ADHD and reduce the patient's ability to deal with ADHD symptoms. Emotion regulation problems are frequently present in patients with ADHD and significantly affects the performance of children and adults with ADHD (Brown 2011).

There are few studies assessing emotional intelligence in individuals with ADHD. In studies with adolescents, it was reported that there is a relationship between emotional intelligence and academic achievement. Problematic school behaviors (absenteeism, disciplinary punishment, etc.) are negatively, academic achievement and cognitive skills

are positively correlated with emotional intelligence (Petrides et al. 2004). Adolescents with high emotional intelligence are less likely to be faced to peer bullying, and they expected to have better coping strategies to peer bullying. Recognition of students with low emotional intelligence may allow teachers to protect them from peer bullying (Lomas et al. 2012).

Low emotional intelligence was found to be associated with increased ADHD symptom severity in university students (Fleming 2008). There is a relationship between trait-emotional intelligence and ADHD symptomatology besides; stress management is the strongest predictor of ADHD symptoms (Kristensen et al. 2014). There is a single study in the pediatric group which reported that patients with ADHD get lower scores on understanding emotions, interpersonal and adaptation subscales (Climie et al. 2017).

Bisch et al. (2016) reported that patients with ADHD had worse performance in all five emotion categories (neutral, happy, erotic, disgust, and anger) and in all sensory modalities (auditory, visual and audiovisual) than those without ADHD. Thus, these findings clearly demonstrate a general insufficiency in coding of emotional cues. The possible explanation is a deterioration in the initial learning stage in the primary stages of emotion perception (Serrano et al. 2015).

While emotions are in the forefront in infancy, control processes develop in childhood. Control processes such as self-control, acting with responsibility, being conscientious and cognitive processes are heavily based on the prefrontal cortex and anterior cingulate cortex. These processes are associated with acetylcholine, norepinephrine, dopamine, and serotonin (Nigg 2000, Whittle et al. 2006). In a study of children with and without ADHD, children were asked to complete a missing piece of puzzle, children with ADHD focused on negative part of the task and were less adaptable to this unexpected situation. They were observed to have more intensive emotional-behavioral expressions and maladaptive behaviors such as punching and sighing (Melnick and Hinshaw 2000, Walcott and Landau 2004). In another study children with combined type ADHD were found to have more difficulty in emotion regulation than children with inattention type ADHD (Maedgen and Calson 2000).

## Treatment

Single photon emission computed tomography (SPECT) studies demonstrated increased regional blood flow in the prefrontal cortex, caudate nucleus and thalamus with methylphenidate treatment (Kim et al. 2001). Psychostimulants used in the treatment of ADHD specifically inhibit the uptake of dopamine and noradrenaline neurotransmitters to the presynaptic area in the prefrontal cortex and increase the release of monoamines (Hechtman 2005). Previous studies have shown that the use of methylphenidate and atomoxetine was associated with better emotional control in ADHD patients (Reinherr et al. 2005, Reinherr et al. 2007). Considering treatment benefit of these drugs, these regions and neurotransmitters can be thought to play a vital role in the regulation of emotions as well as the etiology of ADHD.

There is a deficiency in recognizing emotions from facial expressions in children and adolescents with ADHD (Yuill and Lyon 2007). In some studies, recognizing emotions from facial expressions was also found to improve with methylphenidate treatment (von Morgenstern et al. 2014). Therapies focusing on emotional skills such

as emotion management is reported to be effective for various psychiatric disorders, including ADHD (Mennin and Farach 2007).

## Conclusion

There are deficits in emotion regulation, recognition and expression in individuals with ADHD. Considering the fact that abilities associated with emotional intelligence can be learned and improved, emotional intelligence can be thought as a target for therapy by individualized education for patients with ADHD who have inadequate abilities compared to the healthy population (Climie and Mastoras 2015). These abilities are also valuable for their lifelong effects on the prognosis of patients with ADHD.

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