

Metacognitive awareness and emotional resilience in children with Attention Deficit Hyperactivity Disorder

Hatice Ünver^{1*}, Ayşe Rodopman Arman², Şerife Nur Akpunar³

¹Marmara University, Pendik Research and Training Hospital, Child and Adolescent Psychiatry Clinic, Istanbul, Turkey;

²Marmara University School of Medicine, Department of Child and Adolescent Psychiatry, Istanbul, Turkey;

³Marmara University School of Medicine, Istanbul, Turkey.

*Corresponding author: drhaticeunver@gmail.com

Abstract

Background: This study explored the metacognitive awareness and emotional resilience levels of children suffering from attention deficit hyperactivity disorder (ADHD) (n=60) with typically developing children (n=30).

Methods: Measures included Metacognitive Awareness Inventory and Resiliency Scales for Children and Adolescents filled out by participants, the List of Adverse Life Events, Turgay DSM-IV-Based Disruptive Behavior Disorders Scale, and Revised Child Anxiety and Depression Scale—Parent Form filled out by parents.

Results: Metacognitive awareness and emotional resilience were found to be low in the children with ADHD. Emotional resilience increases as metacognitive awareness increases. Metacognitive awareness decreased in the presence of heightened ADHD, anxiety, and/or depression symptoms expressed by the parents' questionnaires ($p < 0.001$, $r = -0.438$; $p < 0.001$, $r = -0.403$; and $p < 0.001$, $r = -0.421$).

Conclusions: Findings identified that metacognitive skills and emotional resilience are affected in ADHD.

Keywords: Attention deficit hyperactivity disorder; child; adverse life events; metacognitive awareness; emotional resilience

Background

Attention deficit hyperactivity disorder (ADHD) is seen in 12.4% of the children in Turkey according to the Turkish nationwide epidemiological data (1). In this disorder, a developmental immaturity resulting in a deficiency of executive functions is typical. In addition, the development of metacognitive skills, which is evaluated as one of the executive functions, is negatively affected (2,3). Metacognition is expressed as a high-level cognitive component that enables an individual to notice, monitor, and examine his or her own thought process (4). The development of metacognitive processes begins between the ages of 3 and 5 years simultaneously with the development of theory of mind and can continue for a lifetime. While the concept of theory of mind includes metacognitive skills, it is an important social-cognitive skill that includes the ability to think about the mental states of oneself and also the others. The development of

metacognition and theory of mind accelerates in parallel with the development of cognitive processes, especially during school age. The level of this development has an effect on the academic achievement, motivation, interpersonal interactions, and social relations of the child (5).

Having a higher metacognitive knowledge and awareness would help regulate cognition and increase adaptability skills (6). Metacognitive capacity provides monitoring and examining cognitive processes, such as learning, comprehension, memory, reasoning, and problem-solving (2). Children with ADHD may have difficulties in these areas. Also, the lower levels of awareness about metacognition in patients with ADHD may affect noticing, monitoring, and examination of these difficulties. This may result in deficits of problem-solving, adaptive skills, and social competencies in the family and school systems (5,7).

The term “emotional resilience” is expressed as the capacity to use coping skills (such as changing the schema of thinking, diverting attention to something else, seeking support, and looking for new ways) in regulating the intense negative emotions that children feel in the face of adverse life events (8). Considering their definitions, the two terms metacognition and emotional resilience may be related to each other, affecting each other in a bidirectional way (7). Children who have higher cognitive awareness may also have higher emotional resilience.

Adverse life events, which are also included in the concept of emotional resilience, are events that cause intense stress and disruptions in emotional-behavioral adjustment. Continuous exposure to these events during the developmental years may lead to psychiatric problems, such as ADHD and depression. Similarly, impulsive behaviors seen in ADHD may also pave the way for experiencing adverse life events (9). Increasing emotional resilience can reduce problem behaviors and reduce the frequency of adverse life events related to individual. It is considered that the increase of metacognitive awareness may strengthen emotional resilience. This may result in a lower risk of exposure to adverse life events such as experiencing serious injuries, legal problems, dependence, leaving home, expulsion from school that may be caused by the individual him/herself (10,11).

Any deviation in the metacognition system is believed to have a significant impact on the formation and maintenance of many psychopathologies (12). The problems in metacognitive functions may cause dysfunctional thoughts and coping styles. This may lead to internalization problems, such as depression and anxiety, and externalization problems, such as conduct and impulse control disorders (4,13). According to the literature, studies investigating the role of metacognition in disorders such as depression, anxiety, and substance abuse in adults are emerging (14-16). There is a limited number of studies on metacognition in children, which are mainly based on the effects of metacognition on learning skills and academic study strategies (7,17). Furthermore, the number of studies conducted in the pediatric psychiatric clinical sample is also limited (18,19). There is no study investigating the relationship between metacognition and adverse life events, ADHD, anxiety and depression symptoms in children with ADHD, either.

The primary aim of this study was to compare the metacognitive awareness and emotional resilience levels of children suffering from ADHD with typically developing children. The secondary aim was to investigate the relationship between metacognitive awareness and emotional resilience, as well as their relationship with the frequency of adverse life events

and ADHD, anxiety, and depression symptoms expressed by the parents in the children with ADHD. With this study, it is also aimed to contribute to the literature in this field.

Methods

Participants

In this single-center case-control study, the case group included children with ADHD who were administered Kiddie Schedule for Affective Disorders and Schizophrenia-present and lifetime version (K-SADS-PL). The inclusion criteria for the children with ADHD were as follows: (1) chronological age between 7 and 14 years and (2) diagnosed with ADHD. Children presenting with a diagnosis or history of other physical, comorbid psychiatric, or neurological disorders and/or intellectual disability and/or visual-hearing impairment were excluded. The control group consisted typically developing children of the hospital staff who admitted to the hospital for routine check-ups but they were not diagnosed with any psychiatric disorders included ADHD after clinical examination and psychometric tests. The inclusion criteria for the children who comprised the control group were as follows: (1) chronological age between 7 and 14 years and (2) had no history of psychopathology, intellectual development disorders, neurological and chronic physical disorders. Cognitive evaluation of all participants was made during the clinical interview by obtaining information about their age-appropriate tangible and intangible thinking skills, reasoning, problem solving, judgment, academic and adaptation skills in daily life. The control subjects presenting with a diagnosis of physical, psychiatric, or neurological disorders and/or intellectual disability and/or visual-hearing impairment were excluded.

Procedure

The study was carried out between December 2018 and August 2019 at the Department of Child and Adolescent Psychiatry, Marmara University School of Medicine, Pendik Research and Training Hospital. The ethical approval was obtained from the Clinical Research Ethics Committee of Marmara University School of Medicine (Protocol no.: 09.2018.741). The participants and their parents were informed about the study, and both written and verbal consent were obtained. The participants were directed to complete the socio-demographic form and were screened for psychopathology using the Kiddie Schedule for Affective Disorders and Schizophrenia-Present and Lifetime Version (K-SADS-PL) by researchers. The children with ADHD and control group completed the Metacognitive Awareness Inventory for Children (Jr. MAI) and Resiliency Scales for Children and Adolescents (RSCA). The parents

were asked to fill out the List of Adverse Life Events (LALE), Turgay DSM-IV-based Disruptive Behavior Disorders Screening and Evaluation Scale (T-DSM-IV-S), and Revised Child Anxiety and Depression Scale—Parent Form (RCADS-P).

Measures

Sociodemographic Form

It is a form created by the researchers where the participants' age and gender and the parents' education level, age, and monthly income were recorded.

Kiddie schedule for affective disorders and schizophrenia—present and lifetime version (K-SADS-PL)

The K-SADS-PL is a semi-structured diagnostic interview created by Kaufman et al. (1997)

(20) The Turkish version underwent validity and reliability studies performed by Gökler et al. (2004) (21).

Jr. MAI

It is a Likert-type measurement inventory developed in 2002, including A and B forms for different age groups. It aims to measure the level of metacognitive skills. The scale aims to measure metacognitive skills regardless of the educational field just about reading or problem-solving skills (22). In this study, only A form was used because of the average age of the sample group. The form consists of 12 questions. It is a 3-point Likert-type scale that includes “always, sometimes, and never.” The scale score is calculated by adding the total of the item scores. The higher level of the total score indicates the higher level of metacognitive skills. The highest score for A form is 36 and the lowest 12. The Cronbach's alpha value for the internal consistency coefficient of the scale was 0.74 for the A form. The validity and reliability study of the scale in Turkish was carried out by Karakelle and Saraç (2007) (23).

RSCA

Developed by Prince-Embury (2007), it is a 5-grade Likert-type scale consisting of 20 items that can be applied to children and adolescents aged 7–14 years. The scale score is calculated by adding the total of the item scores (24). The low score indicates that emotional resilience is high, whereas the high score indicates that emotional resilience is low. The scale consists of three subdimensions: (i) *sensitivity*, which expresses emotional responses and their intensity; (ii) *healing–recovery*, which measures the state of reaching homeostasis after an emotional response; and (iii) *impairment*, which examines the negative reactions that the individual may give in the case of emotional balance deterioration. The Cronbach's alpha value for the internal consistency coefficient of the scale was found to be .92 for the total scale. In the subdimensions; it was 0.85 for the 'sensitivity' sub-dimension,

0.92 for the 'healing-recovery' sub-dimension, and 0.90 for the 'impairment' sub-dimension. The validity and reliability study of the scale in Turkish was conducted by Kurtoglu and Doğan (2016) (25).

LALE

It is a scale developed by Akin and Berkem (2013) using studies that examine the relationship between adverse life events and suicidal behavior (26,27). The scale consists of 33 questions. In our study, a short version including 24 questions was used. The parents were asked to fill out the scale. It is scored as yes (1 point) or no (0 point). As the total score increases, it is thought that the patient is exposed to more adverse life events.

RCADS-P

It was developed to determine anxiety and depression in children according to the DSM-IV (28). The separate forms for children and parents are available. The parent form was used in our study. It consists of 47 questions. Each item is scored between 0 and 3 points. Ten questions are about major depressive disorder and 37 about different anxiety disorders, such as generalized anxiety and obsessive–compulsive disorders. In our study, the total scores of major depressive and anxiety disorders were evaluated. The Cronbach's alpha coefficient was found to be 0.80. The validity and reliability study of the Turkish version of the scale was performed by Görmez et al. (2017) (29).

T-DSM-IV-S

This scale was developed by Turgay (1995) for the screening and evaluation of disruptive behavior disorders in children according to the DSM-IV diagnostic criteria. The validity and reliability study of the scale was conducted by Ercan et al. (2001) (30,31). The scale is filled out by the parents and teachers of the child. The DSM-IV scale scores that meet the diagnostic criteria are used in the evaluation of the scale. It is accepted that there is no problem in the “none” and “a little” markings in the evaluation of the scale scores. In our study, the mean scores of the first 18 questions that investigated ADHD symptoms with 0 (none), 1 (a little), 2 (much), and 3 (excessive) were used to determine the level of ADHD symptoms.

Statistical Analysis

Analyses were made using the Statistical Package for Social Sciences (SPSS, v.24.0; IBM Corporation, Armonk, NY, USA). Continuous variables were expressed as mean \pm standard deviation and categorical data as numbers and percentages. In the intergroup analysis of continuous variables, normality analyses were performed using the Kolmogorov–Smirnov

goodness-of-fit test. Categorical data were compared using the chi-squared test. For continuous and parametric variables, *Independent T* test was used to compare means. *Mann Whitney U* test was used for the difference analysis of nonparametric continuous variables of groups' medians. The linear relationship between the scales was performed by the Pearson correlation coefficient between the variables in the normal distribution and the Spearman correlation coefficient between the variables that did not fit the normal distribution. The statistical significance level was considered to be $p \leq 0.05$.

Results

Demographics

The case group included 60 children with ADHD, and the control group consisted of 30 typically developing children. Of the children with ADHD, 41 (68.3%) were boys and 19 (31.7%) girls. The average age was 10.93 ± 2.24 years. There were 16 (53.3%) boys and 14 girls (46.7%) in the control group. The average age was 10.45 ± 1.99 years ($p = 0.164$ for gender and $p = 0.302$ for age).

The mean ages of the mothers in the case and control groups were 37.48 ± 5.61 and 39.27 ± 5.40 years, respectively ($p > 0.05$), and the mean ages of the fathers were 40.55 ± 6.14 and 41.90 ± 5.16 years. There was no statistically significant difference between the two groups in terms of age, education level, and monthly income of the parents ($p > 0.05$).

TABLE 1. Comparison of the scale scores between groups

	Children with ADHD	Control Group	<i>p</i>
	Mean \pm SD	Mean \pm SD	
LALE total score	1.96 \pm 2.32	1.48 \pm 1.97	0.500*
MAI total score	13.51 \pm 4.72	17.80 \pm 3.04	<0.001**
RSCA sensitivity score	12.71 \pm 5.18	7.90 \pm 4.80	<0.001**
RSCA recovery score	4.93 \pm 3.11	3.03 \pm 3.32	0.001*
RSCA impairment score	15.25 \pm 7.93	9.17 \pm 7.82	0.001*
RSCA total score	32.90 \pm 13.42	19.70 \pm 13.95	<0.001**
T-DSM-IV-S total score	34.83 \pm 16.93	11.30 \pm 9.17	<0.001*
RCADS-P depression score	9.17 \pm 6.41	2.76 \pm 3.75	<0.001*
RCADS-P anxiety score	31.03 \pm 21.14	14.53 \pm 11.91	<0.001*
RCADS-P total score	40.20 \pm 25.94	17.30 \pm 15.24	<0.001*

* *Mann Whitney U Test* ** *T Test*

ADHD: Attention deficit hyperactivity disorder, MAI: Metacognitive Awareness Inventory for Children, RSCA: Resiliency Scales for Children and Adolescents, LALE: List of Adverse Life Events, T-DSM-IV-S: Turgay DSM-IV-Based Disruptive Behavior Disorders Screening and Evaluation Scale, RCADS-P: Revised Child Anxiety and Depression Scale-Parent Form

Comparison of Scale Scores

The comparison of the scale scores between groups was shown in Table 1. The mean score of adverse life events was 1.96 ± 2.32 and 1.48 ± 1.97 in the children with ADHD and typically developing children, respectively ($p > 0.05$). The score of the ADHD group (34.83 ± 16.93) of T-DSM-IV-S was statistically significantly higher than that of the control group (11.30 ± 9.17 ; $p < 0.001$). In RCADS-P, depression, anxiety, and total scores in the children with ADHD (9.17 ± 6.41 , 31.03 ± 21.14 , and 40.20 ± 25.94) were statistically significantly higher than the scores in the control group (2.76 ± 3.75 , 14.53 ± 11.91 , and 17.30 ± 15.24 ; $p < 0.001$; Table 1).

Correlation Analysis in the Children with ADHD

Correlations between the Scores of MAI and RSCA Subscales

There was a statistically significant negative correlation

between the scores of MAI and RSCA-sensitivity, RSCA-recovery and RSCA-impairment in the children with ADHD ($p = 0.001$ and $r = -0.335$; $p < 0.001$ and $r = -0.401$; $p < 0.001$ and $r = -0.392$, respectively). The negative correlations between the scores show that the score of metacognitive awareness increases, whereas that of emotional resilience decreases, which means emotional resilience increases.

Correlations Between the Scores of MAI and Total Scores of RSCA, LALE, RCADS-P, and T-DSM-IV-S

Statistically significant negative correlations were determined between the total MAI score of the children with ADHD and the total scores of RSCA, T-DSM-IV-S, RCADS-P anxiety, RCADS-P depression, and RCADS-P total ($p < 0.001$, $r = -0.404$; $p < 0.001$, $r = -0.438$; $p < 0.001$, $r = -0.403$; $p < 0.001$, $r = -0.421$; and $p < 0.001$, $r = -0.426$, respectively; Table 2).

TABLE 2. Correlations between the scores of MAI and total scores of RSCA, LALE, RCADS-P and T-DSM-IV-S

		MAI total score	RSCA total score	LALE total score	T-DSM-IV-S total score	RCADS-P depression score	RCADS-P anxiety score	RCADS-P total score
MAI total score	<i>r</i>	1.000						
	<i>p</i>	.						
RSCA total score	<i>r</i>	-.404	1.000					
	<i>p</i>	0.000**	.					
LALE total score	<i>r</i>	-.158	.101	1.000				
	<i>p</i>	.144	.352	.				
T-DSM-IV-S total score	<i>r</i>	-.438	.434	.145	1.000			
	<i>p</i>	0.000*	0.000*	.183*	.			
RCADS-P depression score	<i>r</i>	-.403	.308	.281	.725	1.000		
	<i>p</i>	0.000*	0.003*	0.009*	0.000*	.		
RCADS-P anxiety score	<i>r</i>	-.421	.338	.281	.624	.785	1.000	
	<i>p</i>	0.000*	0.001*	0.009*	0.000*	0.000*	.	
RCADS-P total score	<i>r</i>	-.426	.356	.283	.684	.887	.977	1.000
	<i>p</i>	0.000*	0.001*	0.008*	0.000*	0.000*	0.000*	.

* Spearman Correlation Test, ** Pearson Correlation Test

MAI: Metacognitive Awareness Inventory for Children, RSCA: Resiliency Scales for Children and Adolescents, LALE List of Adverse Life Events, T-DSM-IV-S: Turgay DSM-IV-Based Disruptive Behavior Disorders Screening and Evaluation Scale, RCADS-P: Revised Child Anxiety and Depression Scale-Parent Form.

Discussion

On the basis of the results of present study, metacognitive awareness and emotional resilience were lower in the children with ADHD compared to the control group. Emotional resilience was found to increase as metacognitive awareness increased. Metacognitive awareness decreased in the presence of heightened ADHD, anxiety, and/or depression symptoms expressed by the parents' questionnaires.

It has been reported that the frequency of adverse life events is higher in children with ADHD (32). However, unlike our prescience, there is no statistically significant difference between the groups in the frequency of adverse life events. According to our hypothesis, children with higher metacognitive awareness might also have higher emotional resilience, so they may encounter adverse life events less frequently. Although metacognitive awareness and emotional resilience were higher in the control group, the frequency of negative life events was similar, suggesting that there could be many factors affecting emotional resilience in the context of ADHD.

The lower metacognitive awareness and emotional resilience levels in the children with ADHD are in accordance with the data obtained from other studies in the literature (7,17). The deficiency of executive functions or a maturational delay in the development of metacognitive functions may result in these low levels. Low metacognitive awareness may negatively affect emotional resilience by causing dysfunctional thoughts and coping styles to continue (33). Emotional resilience can also mean acquiring the ability to

think positively, gaining emotional control, making rational decisions against challenging events, and gaining the ability to manage the difficulties of life (24). These skills, which are included in the definition of emotional resilience, can be achieved with metacognitive skills, the results of our study supported this hypothesis. In correlation analyses, we found a statistically significant negative correlation between metacognitive awareness and the subscales of emotional resilience. In addition, it was determined that the level of emotional resilience had a negative and significant effect on the level of metacognitive awareness. This bidirectional relationship between metacognitive awareness and emotional resilience deserves attention for future studies.

In this study, depression and anxiety symptoms were higher in number in the children with ADHD, which is in accordance with the data obtained from the parents. Academic failure, negative environmental conditions, and social adjustment problems can predispose to anxiety and depression symptoms in children with ADHD. There may be an epiphenomenological comorbidity between ADHD, anxiety, and depression symptoms (34,35). Furthermore it has been reported that the deficiency of metacognitive functions causes externalization problems, such as hyperactivity and impulsivity, and internalization problems, such as anxiety and depression (4,13).

In addition, as the result of this study, metacognitive awareness levels decrease as ADHD, depression, and anxiety symptoms increase. There is a correlation

between metacognitive characteristics and awareness levels and mental disorders, and this correlation can affect the severity of mental disorders (14). Inadequacy in metacognitive awareness can block the control and correction of erroneous cognition. This situation might increase vulnerability to the development of depression and anxiety symptoms (36). Also, perseverative negative thoughts and rumination in depression and anxiety are supported by metacognitive beliefs, and this has an impact on maintaining depression and anxiety symptoms (37). A longitudinal study carried out with a large sample of children can help clinicians to better understand the causal relationship between metacognitive awareness and ADHD, depression, and anxiety symptoms.

Strengths and limitations

This study has several limitations. It is a case-control study with a small and unequally -sized groups, and the samples were obtained from a single center. These factors prevent the generalization of the results of our study. Because the patients with ADHD who participated had their treatments continuing during the study, the scales might have been affected by the treatment process. Also, the children with ADHD were not divided into subgroups. There was no statistical difference between the patient and control groups in terms of age, education level, and monthly income of the parents, so the effect of these factors was excluded from the study, and the evaluation was made only on the basis of the levels of scale scores. Lack of data on individual, family, or academic factors that may affect metacognitive awareness and emotional resilience is also considered a limitation. The main factors are assessed using self-report. Since metacognitive awareness may have decreased in children with ADHD, it was thought that including self-report tools might have affected the results of the study. It would also be interesting to evaluate the impact of early adverse life events and not only adverse life events across the lifespan. Despite these limitations, it is considered that this study carried out on metacognitive awareness and emotional resilience expresses relatively new terms in the field of child mental health in Turkey, and we hope it contributes significantly to the literature and paves the way for new studies.

Clinical significance

The children in Turkey are exposed to a long and difficult struggle in negative living conditions, such as natural disasters (earthquakes), poverty, inland migration, crowded families, and education in achievement-oriented academic settings with many children in similar countries. These individuals who face social, emotional, and psychological barriers may have trouble. The fact that the study was carried out in this

clinical group makes it unique. In addition, it is thought that new studies in this field are required. With new studies, it would be possible to detect factors that may affect metacognitive awareness and emotional resilience at an early stage. Strategies can be implemented to improve metacognitive awareness and emotional resilience, and academic programs specific for children with ADHD can be created by considering the effects of metacognitive awareness on learning skills.

Conflict of interest

The authors declared no potential conflicts of interest.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Acknowledgement

None

Ethical approval

The ethical approval was obtained from the Clinical Research Ethics Committee of Marmara University School of Medicine (Protocol no.: 09.2018.741).

References

1. Ercan ES, Polanczyk G, Akyol-Ardıç Ü, Yüce D, Karaçetin G, Başgöl S. The prevalence of childhood psychopathology in Turkey: a cross-sectional multicenter nationwide study. *Nordic J Psych* 2019; 73(2):132-40
2. Flavell JH. Development of children's knowledge about the mental world. W. W. Hartup ve R. K. Silbersiesien, (Ed.), In *Growing Points in Developmental Science*. NY: Psychology Press, ISSBD Publication, 2002.
3. Irak M. Üst-biliş mi? Yönetici işlev mi? Bilme hissini nöropsikolojik testlerle ölçülen dikkat süreçlerinden yordanması. *Türk Psikoloji Dergisi* 2005; 20:97-116 (In Turkish).
4. Smith KE, Hudson JL. Metacognitive beliefs and processes in clinical anxiety in children. *J. Clin Child Adolesc Psychol* 2013; 42:590-602.
5. Pezzica S, Vezzani C, Pinto G. Metacognitive knowledge of attention in children with and without ADHD symptoms. *Research Dev Disabil* 2018; 83:142-52.
6. Livingstone JA. Metacognition: An overview. ERIC Resource Center. 2003.
7. Basile A, Toplak ME, Andrade BF. Using metacognitive methods to examine emotion recognition in children with ADHD. *J Atten Disord* 2018; 16:1-13.
8. Bernard M, Pires D. Emotional resilience in children and adolescence: implications for rational-emotive behavior therapy. A. Ellis and ME. Bernard, (Ed.), In *Rational Emotive Behavioral Approaches To Childhood Disorders: Theory, Practice And Research*. NY: Springer. 2006.

9. Flouri E, Kallis C. Adverse life events and mental health in middle adolescence. *J Adolesc* 2011;34: 371–7.
10. Metin GT, Harma H, Gökçay G. Düşük sosyoekonomik düzeydeki ergenlerde olumsuz yaşam olayları, özdenetim becerisi ve problem davranışlar. *Türk Psikolojisi Dergisi* 2017;32(79): 1-14 (In Turkish).
11. Vohs KD, Baumeister RF. Understanding self-regulation: An introduction. RF. Baumeister and KD. Vohs (Ed.), In *Handbook of Self-Regulation: Research, Theory and Applications* (pp.1–9). New York: Guilford Press. 2004.
12. Wells A, Cartwright-Hatton S. A short form of the metacognitions questionnaire: properties of the MCQ 30. *Behav Res Ther* 2004; 42: 385–96.
13. Wells A. Meta-Cognition and worry: a cognitive model of generalized anxiety disorder. *Behav Cogn Psychother* 1995; 23:301-20.
14. Papageorgiou C, Wells A. An empirical test of a clinical metacognitive model of rumination and depression. *Cognitive Therapy and Research* 2003; 27: 261–73.
15. Toneatto T. Metacognition and substance use. *Addict Behav* 2005;24:167–74.
16. Wells A. The metacognitive model of GAD: assessment of meta-worry and relationship with DSM-IV generalized anxiety disorder. *Cognitive Therapy and Research* 2005;29:107–21.
17. Guerten M, Willems S. Metacognition in early childhood: fertile ground to understand memory development. *Child Development Perspectives* 2016;10(4):263-8.
18. Tamm L, Paul AN. Metacognitive executive function training for young children with ADHD: A proof-of-concept study. *ADHD Attention Deficit and Hyperactivity Disorders* 2015;7(3):183-90.
19. Capodiceci A, Re AM, Fracca A, Borella E, Carretti B. The efficacy of a training that combines activities on working memory and metacognition: Transfer and maintenance effects in children with ADHD and typical development. *Journal of clinical and experimental neuropsychology* 2019;41(10):1074-87.
20. Kaufman J, Birmaher B, Brent D, Rao U, Flynn C, Moreci P, William on D, Ryan N. Schedule for affective disorders and schizophrenia for school-age children-present and lifetime version (K-SADS-PL): initial reliability and validity data. *J Am Acad Child Adolescent Psychiatry* 1997;36:980-8
21. Gökler B, Ünal F, Pehlivan Türk B, Kültür EÇ, Akdemir D, Taner Y. Okul çağı çocukları için duyulanım bozuklukları ve şizofreni görüşme çizelgesi-şimdi ve yaşam boyu şekli-Türkçe uyarlamasının geçerlik ve güvenilirliği. *Çocuk ve Gençlik Ruh Sağlığı Dergisi* 2004. (In Turkish).
22. Sperling RA, Howard BC, Miller LA, Murphy C. Measures of children's knowledge and regulation of cognition. *Contemporary Educational Psychology* 2002;27:51-79.
23. Karakelle S, Saraç S. Validity and Factor Structure of Turkish Versions of The Metacognitive Awareness Inventory for Children (Jr. MAI)- A and B Forms. *Turkish Psychological Articles* 2007; 10 (20):87-103.
24. Prince-Embury S. *Resiliency Scales For Children And Adolescents: A Profile Of Personal Strengths Manual*, San Antonio: PsychCorp Harcourt. 2007.
25. Kurtoğlu G, Doğan S. Adaptation of Emotional Resilience Scale to Turkish: Reliability and Validity Study. *FSM Scholarly Studies Journal of Humanities and Social Sciences* 2016; 8:223- 39.
26. Akın E, Berkem M. Adverse life events in adolescent suicide attempters: a case control study. *Firat Med J* 2013;18(1):26-9.
27. Johnson JG, Cohen P, Gould M, Kasen S, Brown J, Brook JS. Childhood adversities, interpersonal difficulties, and risk for suicide attempts during late adolescence and early adulthood. *Arch Gen Psych* 2002;59(8):741–9.
28. Ebesutani C, Chorpita BF, Higa-McMillan CK, Nakamura BJ, Regan J, Lynch RE. Research network on youth mental health. A psychometric analysis of the revised child anxiety and depression scale-parent version in a clinical sample. *J Abnorm Child Psychol* 2010;38(2):249–60.
29. Görmez V, Kilincaslan A, Orençul AC, Ebesutani C, Kaya İ., Chorpita BF. Psychometric properties of the parent version of the revised child anxiety and depression scale in a clinical sample of Turkish children and adolescents. *Child Psychiatry Hum Dev* 2017;48:922–33.
30. Turgay A. *DSM-IV-based Disruptive Behavior Disorders Screening and Evaluation Scale for children and adolescents*. Integrative Therapy Institute, Toronto: Canada. 1995.
31. Ercan ES, Amado S, Somer O, Cikoğlu S. Dikkat eksikliği ve hiperaktivite bozuklukları için bir test bataryası geliştirme çabası. *Çocuk ve Gençlik Ruh Sağlığı Dergisi* 2001; 8:132-44 (In Turkish).
32. Tiet QQ, Bird HR, Hoven CW, Moore R, Wu P, Wicks J, Cohen P. Relationship between specific adverse life events and psychiatric disorders. *J Abnorm Child Psychol* 2001;29:153–64
33. Makris HP. *Educational resilience: mediating factors of adolescents*. (Unpublished Doctoral Dissertation), The University of Chicago, Illinois. 1999.
34. Karaman D, Türker T, Kara K, Durukan İ, Fidancı MK. Depression and anxiety levels in children with ADHD. *Güllhane Medical Journal* 2013;55:36-41 (In Turkish)
35. Toros F, Tataroğlu C. Dikkat eksikliği hiperaktivite bozukluğu: Sosyodemografik özellikler, anksiyete ve depresyon düzeyleri. *Çocuk ve Gençlik Ruh Sağlığı Dergisi* 2002;9:23-31 (In Turkish).
36. Teasdale JD, Moore RG, Hayhurst H, Pope M, Williams S, Segal ZV. Metacognitive awareness and prevention of relapse in depression: empirical evidence. *Journal of Consulting and Clinical Psychology* 2002;70(2):275-287.
37. Papageorgiou C, Wells A. Metacognitive beliefs about rumination in recurrent major depression. *Cognitive and Behavioral Practice* 2001;8(2):160-164.