

The Relationship Between Wisc-R Scores of Children With Attention Deficit and Hyperactivity Disorder and Problem Solving Skills of Their Mothers

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ÖZET

Dikkat eksikliği ve hiperaktivite bozukluğu olan çocukların WISC-R puanları ile annelerinin problem çözme becerileri arasındaki ilişki

Amaç: Çocukluk çağının en sık görülen nöropsikiyatrik rahatsızlığı olan dikkat eksikliği ve hiperaktivite bozukluğu (DEHB), hastalığın şiddetine göre bireyin sosyal yaşama uyum becerileri ve benlik saygısını olumsuz yönde etkilemektedir. Bu çalışmada, DEHB'li çocukların annelerinin gerçek yaşamda problem çözme ya da stresli yaşam olaylarıyla başa çıkabilme kapasiteleri ile çocukların sosyal yaşama uyum becerilerinin karşılaştırılması amaçlanmıştır.

Yöntem: Araştırma, Gazi Üniversitesi Çocuk Nöroloji ve Çocuk Psikiyatrisi polikliniklerine başvuran, yaşları 6 ile 10 (8.11±1.34) arasında değişen, DSM-IV tanı ölçütlerine göre DEHB tanısı konmuş 49 erkek çocuk ve annesi üzerinde yürütülmüştür. Çocuklar; Kovacs Depresyon Ölçeği, Çocuklar İçin Spielberger Sürekli-Durumluk Kaygı Ölçeği ve Wechsler Çocuklar İçin Zeka Ölçeği (WISC-R) ile değerlendirilirken, annelerine Problem Çözme Envanteri uygulanmıştır.

Bulgular: WISC-R'nin sözel, performans ve toplam zeka bölümleri açısından DEHB alt tipleri arasında bir fark görülmüştür. Alt tipler açısından, hem çocukların yargılama hem de annelerin problem çözme becerileri arasında bir fark gözlenmemiştir. Yine, annelerin problem çözme becerileri ile çocukların yargılama becerileri arasında bir ilişki gözlenmemiştir. Annelerden elde edilen sonuçlarda, problem çözme yeteneğinin güven ve kişisel alt parametrelerinde, annelerin kendilerini yetersiz olarak algılamaları ile çocukların yargılama becerileri arasındaki ilişkinin anlamlı olduğu görülmüştür.

Tartışma: DEHB olan çocuklar, yıkıcı davranışları, sosyal ilişkilerdeki zorlukları, problem çözme konusundaki yetersizlikleri nedeniyle çevrelerinden olumsuz karşılık almakta ve çoğunlukla cezalandırılmaktadırlar. Çoğu zaman ne yapmaları gerektiği konusunda bilgi sahibi olmakla beraber, bu bilgiyi uygulamaya dökememeleri nedeniyle ağır eleştirilere maruz kalmaktadırlar.

Sonuç: Çocuklara model olabilecek uygun erişkin davranışlarının olması, çocukların sürekli eleştirilmemeleri, problem çözümlerine dahil edilmeleri DEHB'li olan benlik saygısını yükseltip, uygun davranışlarda bulunmalarını sağlayacaktır.

Anahtar kelimeler: DEHB, problem çözme, yargılama becerileri

ABSTRACT

The relationship between WISC-R scores of children with attention deficit and hyperactivity disorder and problem solving skills of their mothers

Objective: Attention deficit and hyperactivity disorder (ADHD) is a neuropsychiatric disorder which is commonly seen in childhood. Depending on the severity of the disease, ADHD effects negatively in terms of harmony in social life events and self esteem. The aim of this study is that to compare adaptation skills of children with ADHD and their mothers' capacity of coping with stressful events or problem solving in the real life.

Method: The Kovacs Depression Scale, the Spielberger State Trait Anxiety Inventory for Children and the Wechsler Intelligence Scale for Children (WISC-R) were applied to the children while the Problem Solving Inventory was applied to the mothers. The sample was consisted of 49 ADHD children, diagnosed according to the DSM-IV criteria, aged 6 to 9 years (8.11±1.34) and their mothers.

Results: There were no significant differences among ADHD subtypes in terms of WISC-R Verbal, Performance and Total Intelligence sections. In terms of subtypes, there were no significant differences in both children' ability of judgement and their mothers' problem solving skills. Besides that, a high relationship hasn't been observed between problem-solving skills of the mothers and their children's ability of judgement. The relationship between the judgement ability of the children and their mother's perception about feeling insufficient, which was obtained from result of subparameters of the Problem Solving Inventory (confidence and personal) was meaningful.

Discussion: Because of disruptive behaviors, difficulty in social relationship and lack of problem solving skills, children with ADHD get negative reactions from their environment and mostly they are punished. Children with ADHD often get criticized, because they actually know what to do but they can not put that into practice.

Conclusion: In order to improve the self esteem of children with ADHD, there should be appropriate adult behavioral model, also these children should be included in problem solving and should not be criticized constantly. These will allow children with ADHD to adapt themselves to social life.

Key words: ADHD, problem solving, judging skills

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INTRODUCTION

Positive development of child's mental health is closely related with the methods of solving social and interpersonal problems encountered in daily life. Jahoda whom one of the leading researchers that developed a theoretical approach to the relationship between interpersonal problem solving and social-emotional harmony, stressed that psychological well-being is related with problem solving steps such as recognizing and accepting the problem, thinking about possible solutions, decision and getting into action (1).

Researches about interpersonal cognitive problem solving skills in children began in 1970s (2). Shure and Spivack (3) gathered the skills which children used for solving problems into three main topics: alternative-solution thinking, consequential thinking, means-ends thinking. This classification system is important because it points out that developmental stages and cognitive maturity is very important when shaping problem solving behavior. It is necessary to think about different solving methods and to have power to interpret the consequences of the decided behavior after determining the socially acceptable and appropriate one. Cognitive maturity is needed to achieve all these competencies.

It was reported that problem solving skills of children with expressive disorders such as attention and impulse control deficit, hyperactivity and antisocial behaviors are worse than their peers (4). It was proposed that these children show self-mutilation or antisocial behaviors due to inadequate production of alternate thoughts and reactions (2).

Also in studies done with mothers of the children showing destructive conduct problems, it was found that these mothers showed highly prevalent antisocial and histrionic symptoms (5).

Producing alternate ideas is closely related with lingual skills. Pre-operational period between 2-6 years of age and concrete operational period between 7-11 years of age described by Piaget are critical from this point of view. In the pre-operational period child learns to use the language, represents the objects by image and words. Thinking is egocentric. He/she finds it difficult to understand others' points of view and classifies objects

by single feature. When looked at their developmental characteristics, children with ADHD can be considered as being remained at pre-operational period and could not have completed concrete and abstract thinking steps. Because, a healthy child achieves logical thinking about objects and phenomena and problem solving skills at the abstract operational period. Children achieve skills of abstraction and testing hypotheses systematically at the abstract operational period (6). Observing himself, outer world and people around him is important for the children to develop judgment skills and problem solving strategies. Development of children's judgment skills is also important for social intelligence (7-9).

When children's judgment skills are analyzed according to Kohlberg's stages of moral development, it can be seen that all children submitted themselves to rules in order to escape from punishment till 10 years of age and after this age they evaluate their behaviors based on others' opinions. This means that children start to develop adaptive behaviors to get award and to see the reaction of what he/she did. Kohlberg, following Piaget, stated that only children whom achieved the processing level show adaptive behaviors to avoid others' condemnation and also show appropriate behavior to get rid of the authorities' critics and feeling of guilt due to notdoinghis/her "duty" (6). For this reason, developmental stages and cognitive processes should be analyzed in detail in order to understand judgment and problem solving skills of children with ADHD. Because there is a strong relationship between how people use their mental processes effectively and cope with the incidents in their lives. It was frequently reported that children with ADHD have problems in executive functions, using language effectively, visual-spatial skills and time sequencing (10, 11). Due to interaction of impairments in these domains, children with ADHD have problems in correct perception of external phenomena and deciding and implementing of appropriate conduct (12).

It is already known that when healthy children become 12, they pass over to abstract process period and can evaluate by being just and fair according to content of these events. Children with ADHD have information equipment appropriate for moral and cognitive developmental stages when encounter with a problem but

cannot reflect this to their behaviors. Especially parents' approach to the problematic behavior and to what extent they share the strategies used to solve this, lie under this condition (13). In this study, we aimed to compare capacity of mothers of children with ADHD to cope with stressful events or problem solving in the real life and children's judgment and social intelligence capacities.

METHODS

Sample Group and Process

ADHD is a disorder seen 2 to 10 times higher in boys than girls and its reason is not exactly known (14). In our country, it was also found to be 6 times higher than girls (15, 16). According to these data, we decided to conduct our study in boys when planning it.

Forty-nine boys between 6-10 years of age and their mothers whom applied to Gazi University Child Neurology and Child Psychiatry outpatient clinics for attention deficit and hyperactivity were included in the study. Informed consent was taken from mothers before the study.

Participants were evaluated according to DSM-IV criteria. After this, all criteria gathered according to main topic of "Attention Deficit and Destructive Conduct Disorder" of DSM-IV were interviewed with participants and their parents. Participants continuing at least 6 items from each group at least for 6 months were determined from attention deficit dominant type (ADHD-AD), hyperactivity and impulsivity dominant type (ADHD-HD) and combined type (ADHD-C) according to diagnostic criteria. Conners' Parent Rating Scale (CPRS) applied to parents and Conners' Teacher Rating Scale (CTRS) applied to teachers for the grading of ADHD as well. Evaluated participants were also examined for clinical conditions other than ADHD. Participants with ADHD having no other concomitant disease were included in the study.

Data Collection Tools

Wechsler Intelligence Scale for Children-Advanced Form: Wechsler Intelligence Scale for

Children used for determining the intelligence levels of the children participating in the study was developed by Wechsler in 1949 and revised form (WISC-R; Wechsler Intelligence Scale for Children-Revised) was developed in 1974.

WISC-R consists of two sections: verbal and performance. Standardization of WISC-R on Turkish children was done by Savaşır and Şahin (17) in a sample of 1639 children of 6-16 years of age. Two half-test reliability was 0.97 for verbal intelligence section (Verbal IS), 0.93 for performance intelligence section (Performance IS) and 0.97 for total intelligence section (Total IS). Correlation between sub-tests was between 0.51 and 0.86.

Wechsler Intelligence Scale for Children Judgment Sub-test: It is a sub-test containing 17 questions examining what should be done in certain social circumstances. Each question is asked to the child and expected to answer verbally after thinking on it. Test is terminated after 5 consecutive failures. Practical knowledge, social judgment, abstract thinking, organizing information and social adaptation are measured in the judgment sub-test (18). Judgment sub-test reflects problem solving skills about social processes. Judgment sub-test highly correlates with social intelligence by these characteristics (7-9).

WISC-R Social Intelligence Score: Different profiles are obtained by the combination of WISC-R sub-tests (18). Factor analysis studies showed that sum of general knowledge and picture design sub-test scores points out social intelligence (7-9). When general characteristics of two tests pointing out social intelligence are examined, it is widely accepted that general knowledge sub-test measures general culture repertoire which were achieved by learning and linguistic skills, picture design sub-test evaluates comprehension of cause-consequence relationships, synthesis skills, estimating social processes, planning power and humor skills (18).

Kovacs Depression Inventory for Children: Kovacs Depression Inventory for Children (CDE; Children's Depression Inventory) was developed by Kovacs (19). This scale which can be applied to children between 6 and 17 years of age consists of 27 items. In every item, there are three sentences which child reviews his/her last two weeks and select one sentence. Every sentence set contains phrases about symptoms of childhood depression. Three different

phrases in items get 0, 1 or 2 points according to severity of the symptom. Highest score of the scale is 54. Cut-off point is 19. Scale was adapted to Turkish by Öy (20).

Spielberger Continuous-State Trait Anxiety Inventory for Children: This scale (SSTAI) which aimed to measure individual differences in tendency to anxiety was developed by Spielberger et al. (21). It is a self-reporting scale having two sub-scales containing twenty questions for state-trait and continuous anxiety. It is generally used in individuals between 9-18 years of age. Its validity and reliability study was done by Özusta (22). Child is asked how he/she feels him/herself in general and asked to choose the most appropriate choice according to occurrence prevalence of the condition given in the item. For every 20 item, 1, 2 or 3 points are ticked according to the presence and severity of the symptom. Total scale score is between 20 and 60.

Problem Solving Inventory: It is a Likert type scale developed to evaluate individual's self-perception manner on problem solving skills containing 35 items. Scale was developed by Heppner and Petersen (23) by considering problem solving steps such as general orientation, definition of the problem, producing alternatives, decision making and evaluation. Its validity for Turkish was done by Şahin et al. (24). Higher scores from the scale point out inadequate self-perception of problem solving. Four different scores (confidence to problem solving skills, approach-avoidance, personal control and total) are calculated by this scale.

Data Analyses

Version 15.0 of SPSS package software used for statistical analysis of the study data. Definitive statistics, one-way analysis of variance, Pearson multiplication of moments and correlation analysis were used for the analysis of obtained data. Significance level was taken as $p < 0.05$ at all statistical tests.

RESULTS

Results from Sample Group

Mean age of children was 8.11 ± 1.34 (minimum: 6,

maximum: 10). Twenty-three of the patients (46.9%) were determined as attention deficit predominant type, 16 (32.7%) were determined as hyperactivity predominant type and 10 (20.4%) were determined as mixed type of ADHD.

Mothers were between ages of 27-46 (35.46 ± 5.23) and 18 (36.7%) were primary school, 19 were (38.8%) high school and 12 (24.5%) were university graduates; 30 (61.2%) of them were housewives, 17 (34.6%) of them were state employees and 2 (4.1%) were retired. Forty-one (83.7%) of the mothers had no health problems; 4 (8.2%) of them were being treated for major depression and 4 (8.2%) were being treated for ulcer and goiter. None of the mothers had any physical disability. Relevant findings are shown in Table 1 (Table1).

Findings from WISC-R

In this study, scores from the judgment sub-scale of WISC-R test for children were evaluated as one test. General knowledge and picture design sub-test scores to determine social intelligence were added and analyzed as a single score.

Verbal IS mean score was 101.06 ± 8.5 (minimum: 87, maximum: 120); performance IS mean score was 104.59 ± 9.5 (minimum: 88, maximum: 134); total IS mean score was 102.53 ± 8.5 (minimum: 90, maximum: 126) of the children participated in the study. Mean score from judgment sub-test was 10.75 ± 1.6 .

Distribution of intelligence sections according to ADHD subtypes in Wechsler Intelligence Scale for Children (WISC-R) were given in Table 2 (Table 2). One-way analysis of variance showed no significant difference between groups for intelligence sections, judgment skills and social intelligence ($p > 0.05$).

Mean scores, standard deviations and interval scores of all children were 6.91 ± 3.76 (interval: 18) for Kovacs depression scale, 28.06 ± 5.78 (interval: 25) for Spielberger continuous state trait anxiety inventory and 32.97 ± 6.32 (interval: 21) for Spielberger continuous anxiety inventory. Scores taken from clinical scales according to ADHD sub-types are shown in Table 3 (Table 3). No statistically significant difference was found between

Table 1: Characteristics of mothers of participants

Educational Level	n	Profession	n	Health Status	n
Primary	18	Housewife	30	Healthy	41
High School	19	State employee	17	Major Depression	4
University	12	Retired	2	Ulcer and goiter	4

Table 2: Comparison of scores obtained from intelligence sections and judgment sub-test of WISC-R according to ADHD sub-type

WISC-R SUB-TESTS	ADHD Sub-types			F	p
	Attention deficit n=23	Hyperactivity / Impulsivity n=16	Combined sub-type n=10		
Verbal intelligence section	101.43±7.1	104.37±10.2	94.90±5.1	17.75	0.071
Performance intelligence section	102.7±8.4	108.87±10.7	101.9±7.47	9.86	0.063
Total intelligence section	102.1±7.3	105.9±10.4	98±6.01	16.08	0.074
Judgment sub-test	10.52±1.56	10.68±1.44	11.33±2.1	2.23	0.086
Social intelligence	20.41±3.30	21.5±3.05	19.00±2.13	3.931	0.076

F, One-way Analysis of Variance

Table 3: Comparison of scores of participants received from clinical evaluation scales

WISC-R SUB-TESTS	ADHD Sub-types			F	p
	Attention deficit n=23	Hyperactivity / Impulsivity n=16	Combined sub-type tip n=10		
Kovacs Depression Inventory	6.73±3.17	27.82±3.96	33.00±5.90	11.887	0.76
Spielberger State Trait Anxiety Scale	5.75±3.06	28.31±7.70	32.50±6.26	0.084	0.969
Spielberger Continuous Anxiety Scale	9.2±5.18	28.20±6.37	33.70±7.87	0.097	0.741

F, One-way Analysis of Variance

Table 4: Comparison of mothers' problem solving inventory

WISC-R SUB-TESTS	DEHB Sub-types			F	p
	Attention deficit n=23	Hyperactivity / Impulsivity n=16	Combined sub-type n=10		
Confidence in problem solving skills	28.16±8.89	27.75±10.56	29.70±7.40	2.37	0.78
Approach-avoidance	37.12±11.84	34.25±13.02	42.40±12.15	2.31	0.83
Personal control	15.62±4.26	16.93±6.90	14.60±3.09	4.18	0.91
Total score	83.62±15.81	82.00±15.10	81.31±19.82	1.44	2.23

F, One-way Analysis of Variance

ADHD sub-types for depression and anxiety scores by one-way variance analysis ($p>0.05$).

Findings on Mothers' Problem Solving Skills

Scores of mothers taken from problem solving inventory were between 40 and 112 (82.12 ± 15.88). When mean scores of mothers were analyzed according to their children's ADHD sub-types, scores were 83.62 ± 15.81 for ADHD-AD, 82.00 ± 15.10 for ADHD-HD and 81.31 ± 19.82 for ADHD-C. Mean and standard deviation values of the scores which mothers took from

Problem Solving Inventory according to basic factors of confidence to problem solving skills, approach-avoidance and personal control were shown in Table 4 (Table 4). When these scores were compared by one-way analysis of variance, no significant difference was found between groups ($p>0.05$).

When the relationship between children's judgment skills and mothers' problem solving behaviors were examined, a weak correlation in ADHD-AD subtype ($r=0.31$, $p<0.01$) but a strong correlation in ADHD-HD ($r=0.60$, $p<0.01$) and ADHD-C ($r=0.76$, $p<0.01$) subtypes were observed. A positive correlation between

social intelligence and judgment skills was found ($r=0.78$, $p<0.01$). Positive correlation was also found between social intelligence which can be identified as children's problem solving skills and mothers' problem solving skills ($r=0.41$, $p<0.05$).

DISCUSSION

In our study, no significant difference was found between groups at intelligence sections, judgment skills and social intelligence scores which children took from WISC-R. Similarly, no difference was also found in scores taken from depression and anxiety scales in ADHD sub-types. Being the mother of a child with a different sub-type of ADHD did not have an impact on problem solving skills. When the relationship between judgment skills of children and problem solving skills of mothers were examined, a weak correlation was found in ADHD-AD sub-type and a strong correlation was found in ADHD-HD and ADHD-combined sub-types.

According to Wechsler, intelligence is a comprehensive natural tendency of the individual to perceive and cope with his environment (18). Using several high level cognitive processes such as determination, inner control, prediction, enterprising, activeness, sensitivity to social stimuli and values by purposeful behaviors and social judgment skills effectively is also directly related with intelligence section. WISC-R is a tool widely used for the neuropsychiatric evaluation of ADHD (11). However, in a study by Bakar et al. (10) predictive value of WISC-R for ADHD was found low after separate analyses on verbal and performance sub-test scores were performed. Consistently, in our study no difference was found between both general group and ADHD sub-types in a smaller sample population.

Among sub-types of ADHD, no difference was found in judgment sub-type of WISC-R. This is an important finding showing that children with ADHD catch their peers at cognitive maturation but have problems in process of passing to behavior (25). For this reason, method of using information obtained in relevant evaluations in daily life should be reviewed. The most important finding supporting this was; the

absence of difference of social intelligence scores between groups. The most important problem in ADHD is misperception and misinterpretation of environmental clues. Children with ADHD know how to behave at which circumstances but cannot suppress impulsive characteristics and cannot behave properly. During the rehabilitation, focusing on resisting to postpone the award, unrealistic expectations, not monitoring himself and impulsivity can be important in transferring judgment skills to daily life.

Absence of clinical conditions like depression and anxiety which affect judgment and problem solving skills negatively in the sample population, 90 or over IQ levels of all participants and absence of concomitant diseases were factors effective on the indifference between sub-types. When linguistic skills which are effective on problem solving skills were examined, participants were found to be at the same level with their healthy peers at the vocabulary sub-test which evaluates grammatical skills of verbal intelligence directly (5).

Several studies showed that both children with ADHD and their families have deficiency in social skills and consequent difficulties in perception and evaluation of social processes and react properly (26,27). Novotni (28) said that difficulties in evaluating social processes affects interpersonal relations the most and become the focus of problems between mother-child, teacher-child and peer relations. For this reason, in addition to perception and solution of problems by children, problem solving skills and strategies also become important.

Lower quality of life in families of children with ADHD was frequently mentioned in the literature (12). Social and economical losses negatively affect behaviors of solving simple problems encountered in the daily life of families. In our study, although no difference was found in mothers' problem solving behaviors at sub-types of ADHD, prominence of self-confidence and personal control parameters at all sub-types can be a finding which may guide future research. Definition of problems and open feed-back is very important in the treatment of ADHD. It is quite difficult for many parents to live with a child with ADHD in the same house and

control him. Believing that child behaves negatively on purpose lies behind the conflicts. This may cause anger in parents. Continuous wish to control the environment of parents originates from these conflicts. When control increases tension also rises and problems increase. For this reason, methods such as applying of parents control wishes at certain times, increasing child's well-adapted behaviors, giving effective instructions, self-distraction of the child without disturbing the environment and punishment should be encouraged (29). In our study, mothers of hyperactive children consider personal control very important. This was mainly due to clear consequences of hyperactivity, injury and harming the environment. Presence of mothers of hyperactive children in the group with lower self-confidence is an expected finding. Parents increasingly believe not to be able to control the things done by continuously moving child. This reinforces to think that they will not be able to control the current situation.

Murray and Johnston (30) evaluated mothers of 30 children with ADHD and 30 healthy children between 31 and 50 years of age by various scales and laboratory experiments to test problem solving skills. They reported that mothers of children with ADHD have difficulties in evaluating their children and perform less disciplinizing behaviors compared to mothers of healthy children. In this study, problem solving skills of mothers of children with ADHD were found to be lower than mothers of healthy children. In our study, although there were no differences in mothers' problem solving skills among ADHD sub-types, when mean and standard deviation values are examined, it can be seen that problem solving skills of mothers of hyperactive children were lower. It is quite difficult to give proper feedback to an impulsive child continuously moving around and to keep him on a certain task for a long time. For this reason, in children with predominant hyperactivity, discipline problems, difficulties in postponing pleasure and adapting to social rules are seen frequently (31). Social withdrawal and not giving proper feedback are frequent in mothers of these children (32). Mothers of hyperactive children might have received lower scores due to these reasons. Also, some of the mothers included in the sample group were diagnosed as major depression and this might have

negatively reduced the level of their problem solving skills.

Reducing mothers' despair against their children's behaviors and increasing their proper feedback skills should be provided. Barkley et al. (33) pointed out that forming support groups which children can participate with their families in order to increase their problem solving and communication skills after the treatment.

Our study has some limitations. Small sample group and absence of a control group consisting of healthy peers can be considered as methodological limitations. Studying a sample group of girls and investigating the impact of fathers' role model may be important to determine the effects of gender on problem solving skills.

CONCLUSION

In conclusion, children with ADHD get negative response from their environment due to destructive behaviors, difficulties in social communication and deficiency in problem solving and are frequently punished (25). They are generally exposed to heavy criticism due to knowing what to do but cannot implement it into action. Adult behaviors which can be role models to the children, not being always criticized and being included into problem solving will increase self-esteem of children with ADHD and provide them to behave properly (34).

Data from our study showed that there is a relationship between behaviors of children and functionality of their caregivers and rehabilitation of ADHD is possible not only by educating the patient but also educating parents as well. ADHD is a disorder occurring due to genetic and biological factors so its basic treatment is pharmacotherapy. After long years of several researches, it was shown that stimulants are not effective alone in the treatment of ADHD (35). It was clearly shown by clinical studies that education of parents and regulating school conditions increase treatment success alongside with drug treatment (35-37). Contribution of our study to the literature is showing that when boys with ADHD acquire problem solving skills, they may take their mothers as role

models. Defining problems and giving open feedback about them have positive impact on problem solving skills of children with ADHD. Education of families on this issue can be effective to reduce conflicts when parents and children solving their problems.

Doing future studies with wider sample group

including girls and a control group of healthy peers may be important to stress the roles of gender in problem solving skills. Also, examining judgment skills of mothers and children, self-esteem and problem solving skills altogether may provide data which will positively affect treatment process.

REFERENCES

1. Urbain ES, Kendal PC. [Review of social-cognitive problem solving interventions with children. Psychol Bull 1980; 88:109-143.](#)
2. Di Giuseppe R. Cognitive therapy with children: In Freeman A, Simon KM, Beutler LE, Arkowitz H (editors). *Comprehensive Handbook of Cognitive Therapy*. New York: Plenum Press, 1989, 515-533.
3. Shure MB, Spivack G.. [Interpersonal problem-solving in young children: a cognitive approach to prevention. Am J Community Psychol 1982; 10:341-356.](#)
4. Braswell L, Kendal PC, Koehler C, Braith C, Carey MP, Vye CS. ["Involvement" in cognitive-behavioral therapy with children: Process and its relationship to outcome. Cognit Ther Res 1985; 9: 611-630.](#)
5. Öztürk M, Sayar K, Güveli M, Uğurad I, Acar B, Solmaz M. Dikkat eksikliği hiperaktivite bozukluğu olan çocukların annelerinde depresyon ve anksiyete düzeyleri. *Düşünen Adam Psikiyatri ve Nörolojik Bilimler Dergisi* 2000; 13:170-174. (Article in Turkish)
6. Atkinson RL, Atkinson RC, Smith EE. *Psikolojiye Giriş*. Alogan Y (Çeviri Ed.), Ankara: Arkadaş Yayınevi, 1996, 80-89.
7. [Campbell JM, McCord DM. Measuring social competence with the Wechsler Picture Arrangement and Comprehension subtests. Assessment 1999; 6:215-224.](#)
8. [Ott SL, Spinelli S, Rock D, Roberts S, Amminger GP, Erlenmeyer-Kimling L. The New York High-Risk Project: social and general intelligence in children at risk for schizophrenia. Schizophr Res 1998; 31:1-11.](#)
9. [Culbertson FM, Feral CH, Gabby S. Pattern analysis of Wechsler Intelligence Scale for Children-Revised profiles of Delinquent boys. J Clin Psychol 1989; 45: 651-660.](#)
10. Bakar EE, Soysal AŞ, Kiriş N, Şahin A, Karakaş S. Dikkat eksikliği hiperaktivite bozukluğunun değerlendirilmesinde Wechsler Çocuklar için Zeka Ölçeği Geliştirilmiş Formunun yeri. *Klinik Psikiyatri Dergisi* 2005; 8:5-17. (Article in Turkish)
11. Soysal AŞ, İlden-Koçkar A, Erdoğan E, Şenol S, Gücüyener K. Dikkat eksikliği hiperaktivite bozukluğu olan bir grup hastanın WISC-R profillerinin incelenmesi. *Psikiyatri Psikoloji Psikofarmakoloji Dergisi* 2001; 9:205-212. (Article in Turkish)
12. [Biederman J. Attention-deficit/hyperactivity Disorder: A Selective Overview. Biol Psychiatry 2005; 57:1215-1220.](#)
13. Cohen NJ, Thompson L. Perception and attitudes of hyperactive children and their mothers regarding treatment with methylphenidate. *Can J Psychiatry* 1982; 27:40-42.
14. [Kuntsi J, Oosterlaan J, Stevenson J. Psychological mechanisms in hyperactivity: I. Response inhibition deficit, working memory impairment, delay aversion, or something else? J Child Psychol Psychiatry 2001; 42:199-210.](#)
15. Şenol S, Şener S. Dikkat eksikliği hiperaktivite bozukluğu. İçinde: Güleç C, Köroğlu E (editörler). *Psikiyatri Temel Kitabı*. 2. Cilt. Ankara: Hekimler Yayın Birliği, 1999, 1119-1130. (Article in Turkish)
16. Özcan E, Eğri M, Kutlu O, Yakıncı C, Karabiber H, Genç M. Okul çağı çocuklarında DEHB yaygınlığı: Ön çalışma. *Turgut Özal Tıp Merkezi Dergisi* 1998; 5:138-142. (Article in Turkish)
17. Savaşır I, Şahin N. Wechsler Çocuklar için Zeka Ölçeği (WISC-R) El Kitabı. Ankara: Türk Psikologlar Derneği Yayınları, 1995, 13-52. (Article in Turkish)
18. Anastasi A. *Psychological Testing*. Sixth ed., New York: Macmillian Publishing Company, 1990, 125-137.
19. Kovacs M. The Children's Depression Inventory (CDI). *Psychopharmacol Bull* 1985; 21:995-998.
20. Öy B. Çocuklar için Depresyon Ölçeği: Geçerlik ve güvenilirlik çalışması. *Türk Psikiyatri Derg* 1991; 2:132-136. (Article in Turkish)
21. Spielberger CD, Gorsuch RL, Lushene R. *Manual for state-trait anxiety inventory*. Palo Alto, CA: Consulting Psychologists' Press, 1983.
22. Özusta HŞ. Çocuklar için Durumluk-Sürekli Kaygı Envanteri uyarlama, geçerlik, güvenilirlik çalışması. *Türk Psikolojisi Dergisi* 1995; 10:32-44. (Article in Turkish)
23. [Heppner PP, Petersen CH. The development and implications of a personal problem solving inventory. J Couns Psychol 1982; 29:66-75.](#)
24. [Şahin N, Şahin N, Heppener P. Psychometric properties of the Problem Solving Inventory in a group of Turkish university students. Cognit Ther Res 1993; 17:379-396.](#)
25. [Seipp CM, Johnston C. Mother-son interactions in families of boys with attention-deficit/hyperactivity disorder with and without oppositional behavior. J Abnorm Child Psychol 2005; 33:87-98.](#)
26. [Frederick BP, Olmi DJ. Children with attention-deficit hyperactivity disorder: A review of the literature on social skills deficits. Psychol Sch 1994; 31: 288-296.](#)
27. Landau S, Moore LA. Social skills deficits in children with attention-deficit hyperactivity disorder. *School Psych Rev* 1991; 20:501-513.
28. Novotni M. What does everybody else know that I don't? Social skills help for adults with attention-deficit hyperactivity disorder (ADHD). *Plantation, FL: Specialty Press*, 1999, 40-60.

29. Ercan ES. DEHB'de İlaç Dışı Tedavi Yaklaşımları. İçinde: Karakaş S (editör). Kognitif Nörobilimler. Ankara: MN Medikal & Nobel Basım Yayın Şirketi, 2008, 453-470. (Article in Turkish)
30. Murray C, Johnston C. Parenting in mothers with and without attention-deficit/hyperactivity disorder. *J Abnorm Psychol* 2006; 115:52-61.
31. Nigg JT. Neuropsychologic theory and findings in attention-deficit/hyperactivity disorder: the state of the field and salient challenges for the coming decade. *Biol Psychiatry* 2005; 57:1424-1435.
32. Robbins CA. ADHD couple and family relationships: enhancing communication and understanding through imago relationship therapy. *J Clin Psychol* 2005; 61: 565-577.
33. Barkley RA, Edwards G, Laneri M, Fletcher K, Metevia L. The efficacy of problem-solving communication training alone, behavior management training alone, and their combination for parent-adolescent conflict in teenagers with ADHD and ODD. *Journal Consult Clin Psychol* 2001; 69:926-941.
34. Kendall J, Leo MC, Perrin N, Hatton D. Modeling ADHD child and family relationships. *West J Nurs Res* 2005; 27:500-518.
35. MTA Cooperative Group. Moderators and mediators of treatment response for children with attention deficit/hyperactivity disorder: the multimodal treatment study of children with attention deficit/hyperactivity disorder. *Arch Gen Psychiatry* 1999; 56:1088-1096.
36. Barkley RA, Shelton TL, Crosswait C, Moorehouse M, Fletcher K, Baret S, Jenkins L, Metevia L. Multimethod psycho-educational intervention for preschool children with disruptive behaviour: preliminary results at post-treatment. *J Child Psychol Psychiatry* 2000; 41:319-332.
37. Ercan ES, Varan A, Deniz U. Effects of combined treatment in Turkish children diagnosed with attention deficit/hyperactivity disorder: a preliminary report. *J Child Adolesc Psychopharmacol* 2005; 15:203-219.