

Familial Features and Comorbid Psychiatric Disorders in Children with Encopresis

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ÖZET:

Enkoprezis tanısı alan çocukların komorbid psikiyatrik bozuklukları ve aile özellikleri

Amaç: Enkoprezisin aile özellikleri ile ilişkisi hakkında literatürde sınırlı çalışma bulunmaktadır. Ayrıca enkoprezisin hangi psikopatolojiler ile birlikte görülebileceği ile ilgili araştırmalar da oldukça sınırlıdır. Bu çalışmada enkoprezis tanısı almış çocukların aile özellikleri ve ek psikopatolojilerinin değerlendirilmesi amaçlanmıştır.

Yöntem: Otuz enkoprezis tanısı almış çocuk ve otuz sağlıklı çocuk, anne-babaları ile birlikte çalışma grubunu oluşturmuşlardır. Çocukların anne ve babalarına Aile Değerlendirme Ölçeği (ADÖ), Mizaç-Karakter Envanteri (MKE) ve Belirti Tarama Listesi (BTL-90) uygulanmış ve çocukların ek psikopatolojileri Okul Çağı Çocukları İçin Duygulanım Bozuklukları ve Şizofreni Görüşme Çizelgesi Şimdi ve Yaşam Boyu Versiyonu (Kiddie-SADS-PL) ile belirlenmiştir.

Bulgular: ADÖ puanlarına göre hasta grubunda tüm aile işlevlerinin kontrol grubunun aile işlevlerine göre daha kötü olduğu belirlenmiştir. BTL-90'a göre iki grup arasında istatistiksel anlamlı farklılık bulunmamıştır. MKE puanlarına göre ise hasta grubunun annelerinin işbirliği yapma ve acıma puanlarının kontrol grubundan daha düşük olduğu belirlenmiştir. Babaların MKE puanlarına göre ise dürtüsellik ve yabancılardan çekinme puanlarının hasta grubu babalarında daha yüksek olduğu, işbirliği yapma, empati duyma, kendini aşma ve kişiler ötesi özdeşim ölçeklerinin ise hasta grubu babalarında daha düşük olduğu belirlenmiştir. Hasta grubundaki çocukların kontrol grubu çocuklarına göre daha yüksek oranda karşıt olma-karşı gelme bozukluğu tanısı aldıkları belirlenmiştir.

Sonuç: Bu çalışmanın sonuçları, aile işlevleri ve belirli ebeveyn kişilik özelliklerinin enkoprezis belirtilerinin oluşumu veya sürdürülmesinde etkili olabileceğini, ayrıca enkoprezis tanılı çocuklarda bazı psikiyatrik rahatsızlıkların daha fazla görülebileceğini göstermektedir.

Anahtar sözcükler: Enkoprezis, gayta kaçırma, aile, ebeveyn, kişilik, psikopatoloji

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ABSTRACT:

Familial features and comorbid psychiatric disorders in children with encopresis

Objective: Information about the relationship between encopresis and parental and familial features is very limited. In addition, only a limited number of studies have examined the psychopathology of children with encopresis. In this study, we aimed to investigate the familial and parental features and also the comorbid psychopathology of children with encopresis.

Method: Thirty patients with a diagnosis of encopresis and 30 healthy controls were included in the study. The Family Assessment Device (FAD), the Temperament and Character Inventory (TCI) and the Symptom Check List (SCL-90-R) were administered to parents. Psychiatric diagnoses of the children were determined using the Schedule for Affective Disorders and Schizophrenia for School-Aged Children, Lifetime Version (Kiddie-SADS-PL).

Results: In all dimensions of the FAD, parents of the patients indicated worse family functioning compared to controls. Scores of the SCL-90-R did not reveal any significant difference between the two groups. According to the TCI, mothers of the patients scored lower on cooperativeness and compassion measures, and fathers of the patients scored lower on cooperativeness, empathy, self-transcendence, and transpersonal identification measures. Fathers of the patients also scored higher on impulsiveness and shyness measures. The children with encopresis had higher rates of comorbid oppositional defiant disorder according to the Kiddie-SADS-PL.

Conclusion: This study indicates that impaired family functioning, particularly personality traits of the parents, may play an important role in the etiology or persistence of encopresis and that some other psychiatric conditions may accompany this disorder in children.

Key words: Encopresis, fecal incontinence, family, parents, personality, psychopathology

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INTRODUCTION

Encopresis occurs frequently and is a disturbing childhood disorder for both child and family. According to the DSM-IV-TR criteria, encopresis is described as repeated passage of feces in inappropriate places (e.g., clothing or floor) voluntarily or unintentionally. To diagnose encopresis, such events should occur at least once a month for at least 3 months, the chronological age of the child should be at least 4 years (or equivalent developmental level), and the behavior should not be exclusively due to the physiological effect of a substance (e.g., laxatives) or a general medical condition, except through a mechanism involving constipation (1).

In the etiology of encopresis, biological and developmental mechanisms may be responsible as well as psychosocial and environmental factors. Some etiological studies of encopresis have focused on physiological mechanisms, such as a decrease in anal tone and increase in rectal volume, while others focus on psychosocial and familial factors (2). However, in the literature, encopresis is stated to begin usually after a stress factor (3) and impair the relationship between child and parents (4). There are some studies in the literature that have investigated the link between the child-parent relationship and encopresis (5-7) and the link between psychopathology and encopresis (8-11). However, because of their paucity and inadequacy, these links have not been adequately described. Most of these studies focused on the mother-child relationship or on toilet training only. Thus, the effects of fathers or family features have not been studied adequately. Also, many of the studies about encopresis have not included a healthy control group.

In the present study, the temperamental traits and psychiatric symptom severity of the parents of children with encopresis were investigated. Also, family features and comorbid psychiatric diagnoses of these children were investigated in comparison to a healthy control group. Parental psychopathology and temperamental status of children with various psychopathologies, as well as family functioning, have been studied in several investigations. However, as far as we know, there is no study in the literature, which compares the personality traits and psychopathology of the parents of children with encopresis in addition to familial features with those of healthy controls. The four hypotheses of the present study are:

- Family functioning of children with encopresis is more disturbed than that of healthy subjects.
- Personality traits of the parents of children with encopresis display some discrepancies from those of parents of healthy subjects.
- Parents of children with encopresis have more severe psychiatric symptoms than those of healthy subjects.
- Children with encopresis have more psychiatric disorders than healthy subjects.

METHODS

Subjects

Participants in the patient group were recruited from 50 patients with a diagnosis of encopresis who were admitted consecutively to the Child Psychiatry Clinic of Ankara University School of Medicine between April 2008 and July 2009. Thirty of these patients, who met the inclusion criteria, did not meet any of the exclusion criteria and agreed to participate in the study, formed the patient group along with their parents. The inclusion criteria for the patient group were: 1- meeting the diagnosis of secondary encopresis according to the DSM IV TR criteria, 2- being between 6 and 10 years old, 3- being treatment naïve for encopresis, 4- living with both parents. Because secondary encopresis is associated with psychosocial problems in the literature, we included only children with secondary encopresis (11). The control group consisted of children without encopretic symptoms who were admitted to the eye diseases clinic of the same university with diagnoses of diseases that can be cured completely (e.g. refractive error, conjunctivitis). The inclusion criteria for the control group were: 1- not having encopretic symptoms, 2- being between 6 and 10 years old, 3- living with both parents. Thirty children and their parents, who met the inclusion criteria, did not meet any of the exclusion criteria and agreed to participate in the study, formed the control group. In both patient and control groups, the exclusion criteria were: 1- having a diagnosis of any neurological disease (e.g. epilepsy, cerebral palsy), 2- having a diagnosis of any chronic disease (e.g. diabetes mellitus, asthma), 3- having a diagnosis of pervasive developmental disorder, psychotic disorder or mental retardation (full scale IQ<85), 4- having encopresis caused by an organic etiology (e.g. spinal cord injury or spina bifida) (for the patient group

only). All participants and their parents were informed about the study and informed consent was obtained from both parents of the subjects according to the Helsinki Declaration as revised in 1996. The study was approved by the ethics committee of the university.

Measures

A socio-demographic questionnaire was developed by the authors and administered to the participants to obtain socio-demographic data (e.g. age, sex, number of siblings, school performance, age and education of parents, family income).

Schedule for Affective Disorders and Schizophrenia for School-Aged Children, Lifetime Version (Kiddie-SADS-PL). The Kiddie-SADS-PL is a semi-structured diagnostic interview that was designed by Kaufman et al. (1997) to assess current and past episodes of psychopathology in children and adolescents according to the DSM-III-R and DSM-IV criteria (12). The K-SADS-PL is administered by interviewing the parent(s) and the child, and a summary rating is calculated using all sources of information (parent, child, school, chart, and other). When there are discrepancies between different sources of information, the rater has to use his/her best clinical judgment. Since the K-SADS-PL has been established as a useful clinical and diagnostic tool in English, a Turkish version of the instrument was developed, and its validity and reliability were established by Gökler et al. (2004) (13).

Family Assessment Device (FAD). The FAD is based on the McMaster Model of Family Functioning, a clinically oriented conceptualization of families. It describes structural and organizational properties of the family group and patterns of transactions among family members that have been found to distinguish between healthy and unhealthy families. The model identifies six dimensions of family functioning: problem-solving, communication, roles, affective responsiveness, affective involvement, and behavioral control. The FAD has seven subscales: a general functioning scale, which assesses the overall health and pathology of the family, and one subscale for each of the six dimensions. The FAD consists of 60 items, which are rated in a 4-point likert response format. High scores indicate bad functioning and low scores indicate good functioning for each dimension. The validity and reliability of the Turkish version were determined by Bulut (1990) (14).

Temperament and Character Inventory (TCI). Cloninger developed a dimensional psychobiological model of personality that accounts for both normal and abnormal variation in the two major components of personality: temperament and character (15,16). The model elaborates on four dimensions of temperament and three dimensions of character. The temperament dimensions represent traits that are moderately heritable and moderately stable throughout life. Temperament refers to individual differences in basic emotional responses, such as anger, fear, and disgust. The character dimensions reflect traits that are weakly heritable, moderately influenced by social learning and mature in a stepwise pattern. Character refers to individual differences in goals, values, and self-conscious emotions, like shame, guilt, and empathy. Each of the main dimensions of temperament and character is composed of subordinate facets. Cloninger's TCI has been translated into Turkish, and a validity and reliability study was conducted by Köse et al. (2004) (17).

Symptom Checklist (SCL-90-R). The SCL-90-R is a self-report instrument intended to measure the severity of psychiatric symptoms on a number of different subscales, with a time reference of "the past 7 days including today." The checklist consists of 90 items that are postulated to yield 9 subscale scores: somatization, obsessive-compulsive behavior, interpersonal sensitivity, depression, anxiety, anger/hostility, phobic anxiety, psychoticism, and paranoid ideation. For each subscale, four is the maximum score, indicating the highest symptom severity, and zero indicates no symptom (18). The reliability and validity of the Turkish version of SCL-90-R were determined by Dağ (1991) (19).

Procedure

Physical and neurological examinations were performed on all participating children by a child psychiatrist. In cases in which signs of organically caused encopresis were detected, the pediatrics clinic was consulted. If organic etiology was proven, such cases were excluded. The Wechsler Intelligence Scale for Children-Revised (WISC-R) intelligence test was administered to all participant children by an experienced psychologist, and children with low IQ (full scale IQ < 85) according to this inventory were excluded. The tests were administered

to all children by the same psychologist. Kiddie-SADS was administered to the children by an experienced child psychiatrist and present psychiatric diagnoses according to the DSM IV (20) were determined thorough interviews with the mothers. The Kiddie-SADS and physical and neurological examinations were administered to all the children by the same child psychiatrist. Both mothers and fathers were encouraged to complete the FAD, TCI, and SCL-90-R inventories.

All statistical analyses were performed using SPSS version 11.5 software (Statistical Product and Service Solutions). The Mann Whitney U test was used for the comparison of quantitative values and chi-squares or Fischer's exact tests were used for qualitative values. A p value of less than 0.05 was regarded as statistically significant.

RESULTS

Demographic features of the overall population along with comparisons between the patients and controls can be seen in table 1. No significant differences were observed between patients and controls on any of demographic features except for the children's school performance ($Z=-2.0$, $p=0.04$).

In a comparison analysis of the FAD scores, all family functioning scores were significantly higher in the patient group, as seen in Table 2. Additionally, in a comparison of the comorbid psychiatric disorders detected in the children, the number of psychiatric disorders in the patient group (min:1, max:7, median:3) was significantly higher than that of the control group (min:0, max:4, median:1; $Z=-4.9$, $p<0.001$). The patient group children received significantly

Table 1: Comparison of demographic characteristics between patients and controls

Variables	Patient group (n=30) (Min-max/median)	Control group (n=30) (Min-max/median)	Z	p
Age of children (year)	6-11/9	6-11/8	-1.7	0.07
Age of mothers (year)	27-55/33.5	24-47/34	-0.4	0.64
Age of fathers (year)	34-65/39	26-51/37.5	-1.6	0.09
*Education levels of mothers	5-15/6.5	5-15/5	-1.3	0.17
*Education levels of fathers	5-15/8	5-15/11	-0.3	0.74
Estimated income of family (Turkish Lira)	550-3000/1000	500-3000/830	-1.3	0.16
†School performance	2-5/4.5	3-5/5	-2.0	0.04

*Total education duration as year, †School performance indicates mean of all lesson grades at the last school report, ‡Maximum grade is 5.00

Table 2: Family Assessment Device subscale scores of parents and psychiatric diagnoses of children according to DSM IV criteria

Subscales	Mothers				Fathers			
	Patient group (n=30) (Min-max/median)	Control group (n=30) (Min-max/median)	Z	p	Patient group (n=30) (Min-max/median)	Control group (n=30) (Min-max/median)	Z	p
Problem solving	1.0-4.0/2.6	1.0-3.8/2.0	-2.7	0.005	1.3-4.0/2.8	1.1-3.6/1.9	-3.1	0.002
Communication	1.0-3.8/2.7	1.0-4.0/1.7	-2.4	0.016	1.1-4.0/2.5	1.1-3.8/1.8	-2.4	0.013
Roles	1.7-3.6/2.8	1.0-3.4/2.0	-2.5	0.011	1.3-3.9/2.8	1.2-3.6/2.1	-2.6	0.008
Affective responsiveness	1.0-4.0/2.7	1.1-4.0/1.8	-2.4	0.016	1.2-4.0/2.6	1.1-4.0/1.8	-2.9	0.003
Affective involvement	1.5-3.4/2.5	1.0-3.4/2.0	-3.0	0.003	1.7-3.5/2.7	1.4-3.4/2.1	-2.9	0.003
Behavior control	1.4-3.7/2.8	1.1-3.6/2.0	-2.8	0.004	1.3-3.7/2.9	1.1-4.0/1.8	-2.8	0.004
General family functioning	1.2-4.0/2.7	1.0-3.9/1.7	-2.8	0.004	1.2-4.0/2.7	1.0-3.9/1.8	-3.0	0.002
	Patient group (n=30)	Control group (n=30)	p	χ^2				
Depression	7	2	0.14	F				
*Anxiety disorders	12	10	0.59	0.28				
ADHD	11	5	0.08	3.06				
ODD	12	1	<0.001	11.08				
Enuresis nocturna	5	6	0.73	0.11				
Enuresis diurna	7	1	0.052	F				

F: Fisher's exact test

*Anxiety disorders include Panic Disorder, Generalized Anxiety Disorder, Obsessive-Compulsive Disorder, Specific Phobia and Separation Anxiety Disorder.

Table 3: Temperament and Character Inventory subscale scores

Mother				
Subscales	Patient group (n=30) (Min-max/median)	Control group (n=30) (Min-max/median)	Z	p
Cooperativeness	19-38/30	23-37/32	-2.5	0.011
Compassion	2-10/8	5-10/9	-2.4	0.013
Father				
Subscales	Patient group(n=30) (Min-max/median)	Control group (n=30) (Min-max/median)	Z	p
Impulsiveness	1-8/3.5	0-7/3	-2.0	0.037
Shyness	0-11/4	0-7/2	-3.0	0.002
Cooperativeness	8-36/28	21-41/31.5	-2.0	0.038
Empathy	2-6/3	1-16/4.5	-3.2	0.001
Self-transcendence	9-28/16.5	15-30/21.5	-2.6	0.009

more oppositional defiant disorder (ODD) diagnoses than the control group children ($\chi^2=11.8$, $p<0.001$). A between-groups comparison of the children's comorbid psychiatric disorders can be seen in Table 2.

According to the comparison of the SCL 90-R, scores of both parents revealed no significant difference between the two groups. According to the comparison of the TCI scores, the mothers' cooperativeness and compassion scores were found to be significantly lower in the patient group than in the control group. A comparison analysis of the fathers' TCI subscale scores produced more differences; impulsiveness and shyness scores were significantly higher in the patient group than in the control group, but cooperativeness, empathy, self-transcendence, and transpersonal identification scores were significantly lower. No other subscale scores differed significantly between the two groups. Table 3 represents the significantly different results of the fathers' and mothers' TCI scores. Because there are so many TCI subscales, other subscale scores are not presented to avoid confusion.

DISCUSSION

In this study, comorbid psychiatric disorders and family features of children with encopresis were compared to those of healthy individuals. Additionally, temperamental traits and psychiatric symptom severity of the children's parents were compared. The findings of the present study support the hypothesis that the etiology of encopresis cannot be described only in terms of physiological mechanisms. Thus, the treatment of these children will be

inadequate in cases focusing only on physiological methods. The psychiatric evaluation of child and family will contribute to the treatment.

The present study indicated important differences in family functioning between patient and healthy groups. Both the mothers' and fathers' FAD scores indicated poorer family functioning in families of children with encopresis. Epstein asserts that each function comprises a component of the entire family system and that each function is associated with all other dimensions. The most important family function is communication, and other functions are estimated to deteriorate when communication is poor (21). Thus, impairment in overall functioning may be a result of impairment of communication in patients.

Some features of families of children with encopresis were described in previous studies. Cox et al. (2002) stated that organization skills and expressiveness are poorer in these families (22). Additionally, Lisboa et al. (2008) stated that children with encopresis describe an aggressive and hostile atmosphere in their homes and depict their parents as furious figures (7). Our findings are compatible with these data. According to the findings from the present study, we suggest that problems in the distribution of roles or problem-solving may result in feelings of confusion in the child. Moreover, inadequate affective involvement, affective responsiveness, and communication problems may produce feelings of insufficient care (not feeling loved) in the child. These familial problems may be a trigger of a conflict between child and family, and because of the conflict, the child may feel stress that may evolve into unconscious anger, which is stated to be responsible for encopretic

symptoms (23). We may conclude that an organized environment and sufficient affective support are important features for families to avoid producing stress in children.

The SCL-90-R results did not reveal any significant differences between the two groups in all subscales. Our hypothesis that parents of children with encopresis would have more severe psychiatric symptoms than those of healthy subjects was not supported by the results of this study. Our findings suggest that development of encopretic symptoms are linked to family functioning and parents' personality traits rather than parental psychopathology. Thus, we may interpret that, long term features of the parents, such as personality or family characteristics, may be effective in producing encopretic symptoms, rather than short term stresses such as the psychopathology of the parents.

According to comparison analyses of the two groups regarding TCI scores, mothers of the patient group scored significantly lower on the cooperativeness and compassion dimensions. Individuals with low cooperativeness scores are described as intolerant, insensitive, hostile, revengeful, and opportunistic people. These individuals primarily look out for themselves and tend to be inconsiderate of others' rights or feelings. Individuals who score low on the compassion subscale are described as enjoying getting revenge on people who hurt them (16,24). These traits in mothers may manifest as feelings of anger and revenge toward the child and encopretic symptoms may be a result of these feelings. Like mothers, the cooperativeness scores of fathers of the patient group were lower than those of the control group fathers.

According to the TCI scores of the fathers, impulsivity scores were found to be significantly higher in the patient group, indicating that the fathers of children with encopresis are more impulsive than the fathers of normal children. Impulsivity is a dimension of temperament that is considered to be highly heritable. Thus, we can predict that impulsive fathers may have impulsive children, and an impulsivity-encopresis relationship in children, which will be detailed below, may occur. The finding that children with encopresis received more Attention Deficit and Hyperactivity Disorder (ADHD) diagnosis supports this prediction.

Empathy scores were significantly lower for the fathers of the patient group compared to those of the control group. Low scorers on the empathy subscale are described as insensitive individuals. They do not seem to be concerned about others' feelings (16,24). This finding is compatible with the affective responsiveness and affective

involvement subscale scores of the FAD, mentioned above. Fathers without enough empathy may not perceive their children's affective needs; consequently, their affective response and involvement may not be sufficient. This situation may induce stress in children, which may produce anger.

Self-transcendence and transpersonal identification scores of the fathers of the patient group were significantly lower than those of the fathers of the control group. Low scorers on the self-transcendence subscale are described as contrived, controlling, and materialistic. Low scorers on the transpersonal identification subscale are described as individualistic people, who feel that they are neither directly nor indirectly responsible for what is going on with other people or the rest of the world (16,24). These findings indicate that fathers who tend to be individualistic and are not altruistic may foster unconscious anger in their children.

Studies investigating personality of the parents of children with encopresis are very limited in the literature. Kayaalp & Akçaoğlu (1995) stated that mothers of children with encopresis may exhibit over-involvement, withholding of affection and humiliation toward their children (6). In another study, Morrow et al. (1997) suggested that children with encopresis usually have overly involved and overly anxious mothers (8). These findings are substantially consistent with the findings of the present study.

In the present study, personality differences were found to be more pronounced in the fathers than in the mothers. Drawing from this finding, we assert that fathers, as well as mothers, may play an important role in eliciting encopretic symptoms. There are very few studies that have investigated the father-child relationship as it pertains to encopresis (6,25).

In the literature, children with encopresis are found to suffer from learning disabilities, have poorer school performance, and skip school more commonly (8,22,26). The finding that children in the patient group showed lower school performance is compatible with the literature. Moreover, as mentally retarded children were excluded from this study, this finding further bolsters previous findings. Low school performance may be linked to other comorbid psychiatric disorders or may result from skipping school in order to avoid dealing with socially disagreeable encopresis symptoms.

A number of psychiatric disorders were found to be more common in the patient group than in the control

group. This is consistent with findings in the literature. Existence of one or more comorbid psychiatric disorders is stated to be between 74% and 95% in children with encopresis (9,27,28) and the proportion was found to be 76% in our study sample.

Studies show that children with encopresis may have various comorbid disorders (9,10,22,23,27,29,30). Within these disorders, enuresis, ODD, and ADHD most commonly accompany encopresis, and this was reflected in our findings. Although there were no statistical differences between the two groups with respect to ADHD, depression and anxiety disorders, children with encopresis suffered much more commonly from ADHD (37%), depression (23%) and anxiety disorders (40%) than the normal population. The point prevalence of pediatric depressive disorders in the normal population is estimated to be 1-2%, whereas the ratio is 5-10% for pediatric anxiety disorders and 5% for ADHD (31-33).

Whether these disorders are the cause or consequence of encopresis remains a point of disagreement. For ADHD children, it was proposed that, because they suffer from attentional problems and impulsivity, they may not recognize internal cues associated with bowel movements, and thus they may not spend enough time in the bathroom to empty their bowels. Somewhat related to this condition, they would hold stool in their bowel, resulting in constipation and, consequently, encopresis (22). On the other hand, stressful life events may enhance both ADHD (34) and encopresis (3) symptoms and may be a common promoting factor for both disorders.

As with biological and structural factors, environmental factors are asserted to play an important role in the etiology

of ODD. In the literature, ODD is associated with inadequate family care, conflicts and violence in the family, child abuse and psychiatric disorders of family members (35). In light of this knowledge, ODD may be assumed to emerge as a reaction to stressful events in the family. Likewise, encopresis is considered to be a manifestation of an emotional disturbance in children, representing an impulsive action triggered by unconscious anger (23). Therefore encopresis and ODD may originate from the same source of stress in the family. Likewise, findings from this study indicate that family environment and parental characteristics may play an important role in the emergence or persistence of encopretic symptoms.

Although there was no statistically significant difference, diurnal enuresis was 7 times more frequent in the patient group than in the control group (23.3% versus 3.3%). This comorbidity has been noted before and was related to fecal mass exerting pressure on the bladder in encopresis with constipation (23).

Some psychiatric disorders, such as ADHD, anxiety disorders and depression, were found to be more frequent in the control group of this study than in the normal population (31-33). This situation may be related to small sample size.

Despite the limitations of the present study, such as the small sample size and the reliance on self-report measures, the findings suggest that environmental factors, including familial and parental variables, may play an important role in the etiology of encopresis. Thus, these factors should be considered in the treatment of these children. In the future, investigating the effects of environmental factors on encopretic symptoms with larger samples may contribute to our knowledge on etiology in addition to intervention options.

References:

1. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th edition, Text Revision, Washington, DC: American Psychiatric Press; 2000.
2. Mikkelsen EJ. Modern Approaches to Enuresis and Encopresis. In Lewis M (editor). Child and Adolescent Psychiatry. New Haven, Connecticut: Lippincott Williams & Wilkins; 2002.p.700-10.
3. Butler RJ. Wetting and soiling. In Rutter's Child and Adolescent Psychiatry, Rutter M, Bishop D, Pine D, Scott S, Stevenson J, Taylor E, Thapar A (editors). 5th ed., Massachusetts: Blackwell Publishing; 2008.p.922-9.
4. Collis DR, Norton LN, Wallis MC. Childhood constipation in children: an innovative community-based parent education group program. Aust Occup Ther J. 2007; 54(4):307-9.
5. Joinson C, Heron J, von Gontard A, Butler U, Golding J, Emond A. Early childhood risk factors associated with daytime wetting and soiling in school-age children. J Pediatr Psychol. 2008;33(7):739-50.
6. Kayaalp ML, Akcaoglu F. Parent-Child Interactions and Paternal Function in Encopresis. Archives of Neuropsychiatry. 1995;32(3):151-6 (Turkish).
7. Lisboa VCA, Felizola MCM, Martins LAN, Tahan S, Neto UF, de Moraes MB. Aggressiveness and hostility in the family environment and chronic constipation in children. Dig Dis Sci 2008;53(9):2458-63.
8. Morrow J, Yeager CA, Lewis DO. Encopresis and sexual abuse in a sample of boys in residential treatment. Child Abuse Negl. 1997;21:11-18.

9. Unal F, Pehlivanurk B. Comorbid psychiatric disorders in 201 cases of encopresis. *Turk J Pediatr* 2004;46(4):350-3 (Turkish).
10. Hulten I, Jonsson J, Jonsson CO. Mental and somatic health in a non-clinical sample 10 years after a diagnosis of encopresis. *Eur Child Adolesc Psychiatry* 2005;14(8):438-45.
11. Foreman DM, Thambirajah MS. Conduct disorder, enuresis and specific developmental delays in two types of encopresis: a case-note study of 63 boys. *Eur Child Adolesc Psychiatry* 1996;5(1):33-7.
12. Kaufman J, Birmaher B, Brent D, Rao U, Flynn C, Moreci P, et al. 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 Adolesc Psychiatry* 1997;36(7):980-8.
13. Gokler B, Unal F, Pehlivanurk B, Kultur EC, Akdemir D, Taner Y. Reliability and Validity of Schedule for Affective Disorders and Schizophrenia for School Age Children-Present and Lifetime Version-Turkish Version (K-SADS-PL-T). *Turkish Journal of Child and Adolescent Mental Health* 2004;11(3):109-16 (Turkish).
14. Bulut I. Handbook of Family Assessment Scale. Ankara: Özgüzelis Matbaası; 1990 (Turkish).
15. Cloninger CR. A systematic method for clinical description and classification of personality variants. A proposal. *Arch Gen Psychiatry* 1987;44(6):573-88.
16. Cloninger CR, Przybeck TR, Svrakic DM, Wetzel RD. The Temperament and Character Inventory (TCI): A guide to its development and use. St. Luis: Washington University Center for Psychobiology of Personality; 1994.
17. Köse S, Sayar K, Ak I, Aydın N, Kalelioğlu Ü, Kırpınar I, Reeves RA, Przybeck TR, Cloninger CR. Turkish version of the Temperament and Character Inventory (TCI): Reliability, validity, and factorial structure. *Bulletin of Clinical Psychopharmacology*. 2004;14(3):107-131 (Turkish).
18. Derogatis LR. SCL-90-R administration, scoring, and procedures manual II. Towson, MD: Clinical Psychometric Research; 1983.
19. Dag I. Symptom Check List (SCL-90-R); A reliability and Validity Study. *Turkish Journal of Psychiatry* 1991;2(1):5-12 (Turkish).
20. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th edition, Washington, DC: American Psychiatric Press, 1994.
21. Epstein NB, Bolwin LM, Bishop DS. The McMaster Family Assessment Device. *J Marital Fam Ther* 1983;9(2):171-80.
22. Cox DJ, Morris JB Jr, Borowitz SM, Sutphen JL. Psychological differences between children with and without chronic encopresis. *J Pediatr Psychol* 2002;27(7):585-91.
23. Di Lorenzo C, Benninga MA. Pathophysiology of pediatric fecal incontinence. *Gastroenterology* 2004;126(Suppl 1):33-40.
24. Cloninger CR, Svrakic DM, Przybeck TR. A psychobiological model of temperament and character. *Arch Gen Psychiatry* 1993;50(12):975-90.
25. Vernon S, Lundblad B, Hellstrom AL. Children's experiences of school toilets present a risk to their physical and psychological health. *Child Care Health Dev* 2003;29(1):47-53.
26. van der Wal MF, Benninga MA, Hirasing RA. The prevalence of encopresis in a multicultural population. *J Pediatr Gastroenterol Nutr* 2005;40(3):345-48.
27. Unal F, Pehlivanurk B. Encopresis: long-term clinical outcome of 67 cases. *Turk J Pediatr* 2005;47(1):53-7.
28. van Everdingen-Faasen EQ, Gerritsen BJ, Mulder PG, Fliers EA, Groeneweg M. Psychosocial co-morbidity affects treatment outcome in children with fecal incontinence. *Eur J Pediatr* 2008;167(9):985-9.
29. Young MH, Brennen LC, Baker RD, Baker S.S. Functional encopresis: symptom reduction and behavioral improvement. *J Dev Behav Pediatr* 1995;16(4):226-32.
30. Joinson C, Heron J, Butler U, von Gontard A. Psychological differences between children with and without soiling problems. *Pediatrics* 2006;117(5):1575-84.
31. Brent D, Weersing VR. Depressive Disorders in Childhood and Adolescence. In Rutter's Child and Adolescent Psychiatry, Rutter M, Bishop D, Pine D, Scott S, Stevenson J, Taylor E, Thapar A (editors). 5th ed., Massachusetts: Blackwell Publishing; 2008.p.587-612.
32. Swanson JM, Sergeant J, Taylor E, Sonuga-Barke E, Jensen PS, Cantwell D. Attention deficit hyperactivity disorder and hyperkinetic disorder. *Lancet* 1998;351(9100): 429-433.
33. Pine DS, Klein RG. Anxiety disorders. In Rutter's Child and Adolescent Psychiatry, Rutter M, Bishop D, Pine D, Scott S, Stevenson J, Taylor E, Thapar A (editors). 5th ed., Massachusetts: Blackwell Publishing; 2008.p.628-47.
34. Sadock BJ, Sadock VA. Attention-Deficit Disorders. In Synopsis of Psychiatry, Behavioral Sciences/Clinical Psychiatry, Sadock BJ, Sadock VA (editors). 9th ed., Philadelphia USA: Lippincott Williams & Wilkins; 2003.p.:1223-32.
35. Loeber R, Burke JD, Lahey BB, Winters A, Zera M. Oppositional defiant and conduct disorder: a review of the past 10 years, part I. *J Am Acad Child Adolesc Psychiatry* 2000;39(12):1468-84.