

## RESEARCH ARTICLE

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## The Predictive Social and Emotional Measures in Toddlerhood for Psychiatric Morbidity in Adolescence

### ABSTRACT

**Objective:** We aimed to determine the predictive factors for psychiatric problem severity and/or clinical approval 10 years after first assessment between ages 1-4 years.

**Methods:** The children that were assessed with the CBCL and the BITSEA in their 1-4 years of age were included. The follow-up assessments were made by telephone interviews 10 years later by child psychiatry residents. The primary caregivers responded the follow-up questionnaire items, such as social/academic/behavioral functioning and self-esteem and the items regarding the psychiatric approval, diagnosis, and treatment history.

**Results:** The CBCL-Internalizing scores in toddlerhood were found to be significantly inversely correlated with social and behavioral functioning level and self-esteem scores. The paternal and maternal BITSEA-Competence scores were found to be positively correlated with social and academic functioning. The CBCL Withdrawn/Depressed points at first evaluation were determined to be statistically significantly predictive for psychiatric diagnosis.

**Conclusions:** The study revealed that some measures including CBCL and BITSEA completed in toddlerhood significantly indicate the children under risk of psychiatric morbidity in adolescence. Therefore, we conclude that the widespread use of this assessment measures in toddlers and the referral of the group under risk to the psychiatry units for further investigations could be useful preventive interventions.

**Keywords:** Early Childhood, Assessment, Follow-Up, Psychiatric Application

## Ergenlik Çağındaki Psikiyatrik Morbiditeyi Öngörmeye Yönelik Bebeklerde Sosyal Ve Duygusal Ölçümler

### ÖZET

**Amaç:** 1-4 yaş arasındaki bebeklerin, ilk değerlendirmeden 10 yıl sonra psikiyatrik morbidite ve/veya klinik başvurusunu öngörmeye yönelik ölçümlerin tespit edilmesi amaçlanmıştır.

**Gereç ve Yöntem:** 1-4 yaşları arasında CBCL ve BITSEA ile değerlendirilen çocuklar çalışmaya dahil edildi. Takip değerlendirmeleri 10 yıl sonra çocuk psikiyatri asistanları tarafından telefon görüşmeleri ile yapılmıştır. Birincil bakıcılar, sosyal / akademik / davranışsal işlevsellik ve benlik saygısı, psikiyatrik başvuru, tanı ve tedavi öyküsü ile ilgili anketlere cevap vermişlerdir.

**Bulgular:** Yürüme çağındaki CBCL-İçevurum puanların sosyal ve davranışsal işlevsellik düzeyi ve benlik saygısı puanları ile anlamlı derecede ters orantılı olduğu bulunmuştur. Baba ve anne BITSEA-Yeterlilik puanlarının sosyal ve akademik işlevsellikle pozitif ilişkili olduğu bulunmuştur. Yapılan ROC analizinde ilk değerlendirmede CBCL İçe çekilme/Depresyon puanlarının psikiyatrik tanı açısından istatistiksel olarak anlamlı bir şekilde belirlendiği belirlenmiştir.

**Sonuç:** Çalışmamız bebeklikte yapılan sosyal ve duygusal ölçümlerin ergenlik döneminde psikiyatrik bozukluk/morbidite riski altında olan çocukları öngörebildiğini tespit edilmiştir. Bu nedenle, bu değerlendirme ölçüklerinin bebeklerde yaygın olarak kullanılmasının ve daha ileri araştırmalar için psikiyatri birimlerine risk altındaki grubun sevk edilmesinin, yararlı önleyici müdahaleler olabileceği sonucuna varılmıştır.

**Anahtar Kelimeler:** Erken Çocukluk, Değerlendirme, Takip, Psikiyatrik Başvuru

## INTRODUCTION

The first 3 years of life are the most rapid and complex stage of development. The development of mental disorders in infancy leads to multi-dimensional processes affecting later stages of development. The period of early childhood is defined as infancy (0-12/18 months) and toddlerhood (12/18 months – 36/48 months) and is stated to be the “critical period” in almost every psychiatric concept. All of the theories, including Freud’s psychoanalytical theory, Erikson’s psychosocial development stages, Bowlby’s attachment theory, Piaget’s cognitive development stages, the basic learning theories of learning hypotheses and the theories of developmental neurobiology see this early stage of life as the “sensitive period” in respect of the formation or development of psychopathological processes(1). However, most theoretical assumptions are based on retrospective investigations.

It is thought that the vast majority of mental disorders are continued through to adulthood from childhood with various routines (2). The relationship of behavioural problems in infancy and the psychiatric problems that can develop from these problems at later stages has been researched in very few follow-up studies. The first studies to include the period of early childhood consisted of short-term follow-up and it was shown that behavioural problems in infancy continued into early childhood (3-7). long-term studies have shown that internalising and externalising problems in infancy could be related to behavioural problems in adolescence and various functional impairments (8-10). Although these studies showed that there could be a relationship between behavioural and social problems identified in infancy and general functionality and risky behaviour in adolescence, there is no study in literature that has defined in detail the risky behaviour problems for psychiatric disorders.

It can be assumed that identification, diagnosis and treatment of precursors of mental disorders at as early a stage as possible will have a positive effect on an individual’s mental health in the long-term (11).

Behavioural problems seen in adolescence could be symptoms of possible psychiatric disorders.

The aim of this study was to investigate factors predictive of psychiatric disorders and functionality in adolescence through interviews with parents whose children were psychiatrically evaluated at the age of 1-3 years, 10 years previously and to whom behavioural evaluation scales were applied.

**Participants and Study Design:** The children included in the study were those who had been evaluated by child psychiatry residents at the age of 1-4 years with the Child Behaviour Check

## MATERIAL AND METHODS

List (CBCL) by mothers and the Brief Infant-Toddler Social and Emotional Assessment (BITSEA) scale by mothers and fathers at 2006-2007 years. The follow-up evaluations were made by child psychiatry residents with telephone calls 10 years later. Of the 139 caregivers who could be contacted, 116 (83.5%) agreed to participate in the study.

**The Brief Infant-Toddler Social and Emotional Assessment (BITSEA):** This scale was developed for the scanning of psychosocial development problems and the severity of psychiatric symptoms in children aged 1-3 years (12). The scale consists of a total of 42 items, 31 evaluating psychiatric problems (PP) and 11 psychosocial development (PD). Each item is scored from 3 options (0: not true/occasionally; 1: partly true/sometimes; 2: extremely true/often). Higher PP points indicate a higher level of psychiatric problems and higher PD points indicate a better level of psychosocial development. Validity and reliability studies of the BITSEA were made by Karabekiroğlu et al (13).

**Child Behavior Checklist for Ages 2-3 (CBCL/2-3):** This scale, which is in widespread use throughout the world, scores the behavioural and emotional problems of the child as an internalising problem score, an externalising problem score and the total score (14). It has sub-scales of anxiety/depression, somatic complaints, social internalising, sleep problems, aggression and attention problems. It has a high level of 1-week ( $r=0.88$ ) and 1-year ( $r=0.73$ ) test-re-test reliability. The CBCL/2-3 was translated and confirmed for Turkish populations by Erol et al (15). The Cronbach alpha coefficient of internal consistency obtained from the points of 635 children was calculated as 0.77 for internalising problems, 0.76 for externalising problems and 0.82 for the total scores.

**Telephone Interview:** Telephone interview done by child psychiatry residents with primary caregivers at 2018 year. The primary caregivers responded to the follow-up questionnaire items, of social/academic/behavioral functioning and self-esteem (1-5 Likert type, poor-fair-good-very good-excellent), and items related to the history of psychiatric presentation, diagnosis, and treatment.

**Data Analysis:** All the data were evaluated using SPSS 21.0 statistics software. The distribution of the continuous variables obtained from the scales applied were examined with the one-sample Kolmogorov-Smirnov test and histograms. The T-test was applied to the BITSEA and CBCL/2-3 sub-scale points evaluated with normal distribution. The analysis of the first evaluation scale data and the functional evaluation after 10 years was made with Pearson correlation analysis. ROC analysis was applied to determine

the relationship between the scale points and receiving a psychiatric diagnosis. The area under the curve (AUC) values for the ROC analysis were accepted as 0.90-1.00: very good; 0.80-0.89: good; 0.70-0.79: moderate; 0.51-0.69: poor; 0 -0.59 insignificant. The cutoff point was calculated according to the Youden Index ( $J = \text{sensitivity} + \text{specificity} - 1$ ). The size of the effect was accepted as 0.10-0.30: small, 0.30-0.50: moderate and 0.50-1.00: large for the Pearson r coefficient. A value of  $p < 0.05$  was accepted as statistically significant.

**Ethics and conflict of interest:** Approval for the study was granted by the Clinical Research Ethics Committee of Ondokuz University with approval no OMUUKAEK 2018/27. Verbal informed consent was obtained from the patient and the parent or legal guardian of the child. This study

received no funds from any agency. The authors have no affiliations or financial interests that might pose a conflict of interest.

**RESULTS**

The study included a total of 116 children, comprising 65 (56%) males and 51 (44%) females, who were aged mean  $27.4 \pm 7.7$  months (range, 13-42 months) at the time of the first evaluation. The mothers were aged mean  $34.7 \pm 5.7$  years and the fathers, mean  $37.5 \pm 5.5$  years. At 10 years after the first evaluation, 40.5% of the children had presented at a psychiatric unit, of which 9.5% were in the previous 6 months. Of the total sample, 35 (30.2%) children had a reported psychiatric diagnosis, and 13.8% were currently receiving psychopharmacological treatment. The sociodemographic characteristics of the sample are shown in Table 1.

**Table 1.** Sociodemographic and clinical data

Study parameter		
Age at first evaluation (months)	$27.4 \pm 7.7$ (13-42)	
Gender (%)	Male	56.0% (n: 65)
	Female	44.0% (n: 51)
Mother's age (years)	$34.7 \pm 5.7$	
Father's age (years)	$37.5 \pm 5.5$	
Mother's level of education	Primary school	32.9% (n: 38)
	Middle school	12.9% (n: 15)
	High school	25.9% (n: 30)
	University	26.7% (n: 31)
Father's level of education	Primary school	20.7% (n: 24)
	Middle school	14.7% (n: 17)
	High school	30.2% (n: 35)
	University	31.0% (n: 36)
Patients presenting at a psychiatric unit within the last 10 years	40.5% (n: 47)	
Patients presenting at a psychiatric unit within the last 6 months	9.5% (n: 11)	
Patients being followed-up with a psychiatric diagnosis	30.2% (n: 35)	
Patients currently receiving psychopharmacological treatment	13.8% (n: 16)	

The points of the BITSEA and the CBCL sub-scales applied at the first evaluation and the family functional evaluation points obtained in the

telephone interview 10 years later are shown in Table 2. Correlation analysis was applied to the points of the first and second evaluations.

**Table 2.** Family evaluation and scale data

Study parameter		
CBCL points at the first evaluation	Anxiety /depression	$5.1 \pm 2.6$
	Social internalising	$3.2 \pm 3.2$
	Sleep problems	$4.3 \pm 3.1$
	Somatic problems	$3.2 \pm 2.6$
	Aggressive behaviours	$13.4 \pm 7.0$
	Attention problems	$3.5 \pm 1.8$
	Total internalising problems	$8.3 \pm 4.9$
	Total externalising problems	$17.0 \pm 8.0$
BITSEA points at the first evaluation	Maternal problem total points	$17.8 \pm 7.9$
	Maternal competence total points	$15.4 \pm 4.1$
	Paternal problem total points	$17.5 \pm 7.4$
	Paternal competence total points	$14.7 \pm 4.0$
Functional evaluation 10 years after the first evaluation	Academic	$3.9 \pm 0.9$
	Social	$3.9 \pm 1.0$
	Behavioural	$3.7 \pm 0.9$
	Self-esteem	$3.8 \pm 1.0$

A negative correlation was found between the social internalising points of the CBCL and academic function ( $r=-0.218$ ), social function ( $r=-0.406$ ), behavioural function ( $r=-0.222$ ) and self-esteem points ( $r=-0.305$ ). A negative correlation was found between the CBCL anxiety/depression points and behavioural function ( $r=-0.255$ ). A negative correlation was found between the CBCL total internalising problem points and academic

function ( $r=-0.145$ ), social function ( $r=-0.308$ ), behavioural function ( $r=-0.279$ ) and self-esteem points ( $r=-0.300$ ). A significant negative correlation was found between the BITSEA maternal competence total points and academic function ( $r=-0.218$ ), and social function ( $r=-0.406$ ) and between the BITSEA paternal competence total points and social function ( $r=-0.406$ ). The results of the correlation analyses are shown in Table 3.

**Table 3.** Correlation analysis of the scale data of the first evaluation and the functional evaluation after 10 years

		Academic function	Social function	Behavioural function	Self-esteem
<b>CBCL</b>	Anxiety /depression	-0.018	-0.056	-0.255*	-0.172
	Social internalising	-0.218*	-0.406**	-0.222*	-0.305*
	Sleep problems	0.127	0.097	0.080	0.044
	Somatic problems	0.113	0.030	0.046	-0.013
	Aggressive behaviours	-0.130	0.031	-0.126	-0.091
	Attention problems	-0.069	0.008	0.001	0.0151
	Total internalising problems	-0.145*	-0.308**	-0.279*	-0.300**
	Total externalising problems	-0.124	0.028	-0.161	0.108
<b>BITSEA</b>	Maternal problem total points	-0.105	-0.098	-0.100	-0.078
	Maternal competence total points	0.198*	0.228*	0.167	0.017
	Paternal problem total points	-0.269	-0.098	-0.069	-0.130
	Paternal competence total points	0.276	0.448**	0.111	0.107

\* $p<0.05$  \*\* $p<0.01$

The patients were separated into 2 groups as those who received a psychiatric diagnosis and those who did not in the 10 years since the first evaluation, and the CBCL and BITSEA points were compared between the groups. In the group of patients who had received a psychiatric diagnosis, the CBCL social internalising ( $p:0.007$ ), and total

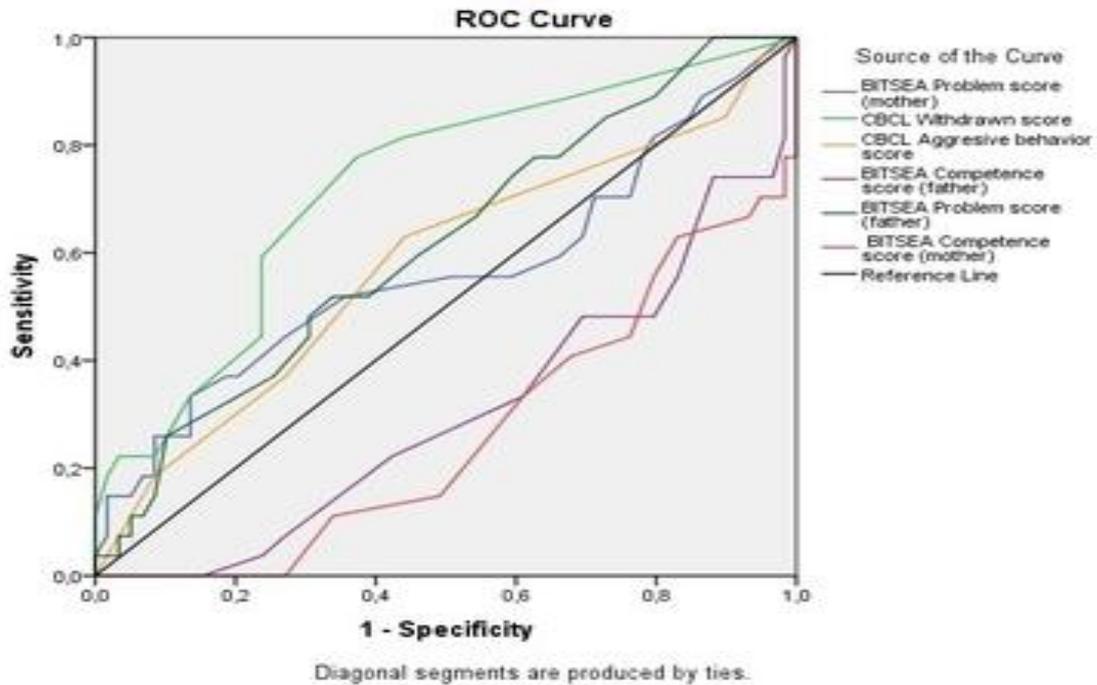
internalising problems ( $p:0.031$ ) points and the BITSEA paternal problem points ( $p:0.026$ ) were found to be high. In the group of patients with a psychiatric diagnosis, the BITSEA mother's competence ( $p:0.007$ ) and father's competence ( $p:0.010$ ) total points were determined to be low (Table 4).

**Table 4.** Comparison of the first evaluation scale data of patients with and without a psychiatric diagnosis within 10 years

		Patients with a psychiatric diagnosis (n: 35)	Patients without a psychiatric diagnosis (n: 81)	T	p
<b>CBCL</b>	Anxiety/Depressed	5.3 ± 2.8	5.6 ± 2.5	0.505	0.626
	Withdrawn/Depressed	4.7 ± 3.8	2.5 ± 2.7	3.150	<b>0.007</b>
	Sleep problems	3.5 ± 2.8	4.7 ± 3.2	1.850	0.054
	Somatic problems	2.8 ± 2.5	3.1 ± 2.6	1.054	0.284
	Aggressive behaviours	14.7 ± 8.0	12.9 ± 6.5	1.202	0.268
	Attention problems	3.7 ± 2.0	3.6 ± 1.7	0.758	0.479
	Total internalising problems	10.0 ± 5.4	7.5 ± 4.6	2.339	<b>0.031</b>
	Total externalising problems	18.5 ± 9.5	16.3 ± 7.9	1.172	0.281
<b>BITSEA</b>	Maternal problem total points	18.9 ± 9.5	17.2 ± 7.1	1.032	0.356
	Maternal competence total points	13.6 ± 4.8	16.2 ± 3.5	3.157	<b>0.007</b>
	Paternal problem total points	20.2 ± 8.0	16.3 ± 6.9	2.443	<b>0.026</b>
	Paternal competence total points	13.0 ± 4.2	15.5 ± 3.7	2.830	<b>0.010</b>

ROC analysis was made of the CBCL and BITSEA sub-scale points determined in the first evaluation in respect of the procedure of receiving a psychiatric diagnosis. The CBCL Withdrawn/Depressed points (AUC:0.724) were determined to

be statistically significantly predictive for psychiatric diagnosis. When the cut-off point was taken as 2.5, the possibility of receiving a psychiatric diagnosis within 10 years was determined with 81.5% sensitivity and 66.0% specificity.



**Figure 1.** ROC analysis was made of the CBCL and BITSEA sub-scale points determined in the first evaluation in respect of the procedure of receiving a psychiatric diagnosis.

**DISCUSSION**

In this study, an evaluation was made of psychiatric diagnosis and treatment received in adolescence and the functionality points of children evaluated 10 years previously with the CBCL and BITSEA when they were aged mean 27.4±7.7 months (range, 13-42 months). A negative correlation was determined between a high level of CBCL social internalising and externalising problems and all the functional areas measured in adolescence (academic, social, behavioural) and CBCL social internalising points were determined to be statistically significantly predictive of a psychiatric diagnosis. Most studies in literature that have examined infancy have included short-term follow-up and have shown that behavioural problems in infancy have continued into early childhood (4,6,16). In recent long-term studies, it has been shown that internalising and externalising problems in infancy, affected by environmental factors in some cases, are predictive of behavioural problems in adolescence (9,10,17). Sitnick et al (8) evaluated males infants at 18 and 36 months and reported that the externalising problem points and maternal depression points were related to high-risk sexual behaviour at age 15 years. In the study by Malti et al (9), a relationship was shown between the way infants were treated, emotional regulation and the family income level of infants evaluated at

18 – 42 months and criminal behaviour in adolescence (15-18 years). Lewis et al <sup>10</sup> reported that anxiety and behavioural problems measured at the age of 4 years were predictive of academic success at 16 years old. There has been seen to be a relationship between behavioural problems in infancy and adolescence and the link with various biological, psychological and social reasons that affect that relationship is still a significant deficiency in developmental literature.

The current study can be considered of importance as the first study to evaluate the long-term routine features of the BITSEA, which was developed to screen the social, emotional and developmental problems in early childhood. According to the findings of this study, when the BITSEA points measured in infancy were examined, there was determined to be a positive correlation between the total competence points of the mother and father and the social function in adolescence and between the competence points of the mother and academic function. Furthermore, the paternal problem points were found to be high and both the mother’s and father’s total competence points were low in the group who received a psychiatric diagnosis. In a longitudinal, 2-year follow-up study of 1082 infants aged 0-28 months, Briggs-Gowan et al (19), reported that of the infants

with a BITSEA problem level >90th percentile at the end of the first year, 49.9% continued to show psychopathology at the end of the second year. In another study of 1004 infants aged 12-36 months, it was reported that CBCL problem points were predictive of psychiatric symptoms and behavioural problems reported by teachers in primary school (20). The majority of shorter studies have reported that generally both internalising and externalising problems are chronic (7,21). Whether examination has been made of high risk groups (6), or groups determined with psychiatric disorders (22), it has been shown that a significant proportion of psychiatric problems seen in the early years continued in follow-up evaluations.

There are some limitations to this study. Developmental evaluations were not made during infancy and no analysis was made of environmental and social factors that could be related to behavioural problems. It has been shown that retarded development (language, fine motor skills,

social skills etc) in the early years is one of the problems related to psychiatric problems and is related to academic function in adolescence (23). Maternal depression in infancy (8), and environmental factors such as poverty and poor living conditions (9) are predictive of psychiatric problems in adolescence. Nevertheless, despite these limitations, the results of this study indicate that behavioural problems in infancy are predictive of loss of function in adolescence. As the behaviour of both infants and parents can be changed more easily in early childhood rather than later, this is an extremely significant age for community mental health and protective, preventative measures (23). In the light of these studies, it can be said that precursors can be seen in childhood of many psychiatric and behavioural problems which could develop in adolescence and by identifying these risk groups, these measurements could be of guidance for preventative measures to be taken.

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