

ORIGINAL ARTICLE

SCREENING INFANTS WITH SOCIAL AND EMOTIONAL PROBLEMS: A PILOT STUDY OF THE BRIEF INFANT TODDLER SOCIAL AND EMOTIONAL ASSESSMENT (BITSEA) IN NORTHERN FINLAND

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ABSTRACT

Objectives. To compare 3 questionnaires used to evaluate early developmental problems, emotional disturbances and competence in 18-month-old infants.

Study design. A follow-up study with parents of infants 8 to 36 months of age who responded to a developmental questionnaire.

Methods. Fifty infants (18 months of age) were evaluated through 3 questionnaires: (1) the Brief Infant and Toddler Social and Emotional Assessment (BITSEA), (2) the Child Behavior Checklist (CBCL) and (3) the MacArthur Communicative Development Inventories (MCDI).

Results. The BITSEA-questionnaire results (total problem scores) had a strong correlation with the most CBCL subscales and the MCDI (total scores) and gave more precise information concerning the infants' developmental problems.

Conclusions. The BITSEA questionnaire identifies developmental problems in the early stages and screens infants' social-emotional competence.

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Keywords: Early communication, interaction development, social and emotional problems, questionnaires

INTRODUCTION

In northern Finland, health care services are more widely scattered than in the southern parts of the country, partly because of long distances and a low population density. The average population density in northern Finland is 2.8 inhabitants/km² (1), while in the capital area in southern Finland the population density is 70 inhabitants/km² (2).

Providing health care services in different settlements demands transferable and adaptable assessments. Questionnaires, that do not necessarily need educated personnel to administer them, constitute one useful tool for this kind of situation. In research and in clinical settings, it is important to find evaluative tools that can identify and diagnose, for example, developmental disturbances (e.g., language-delay and social-emotional deficit or delay) early enough, so that intervention and rehabilitation can be started at the very early stages and targeted at specific problems (e.g., attention problems and autism spectrum disorders). Children, especially those younger than 5 years of age, who are not in contact with a formal school system are dependent on their parents' initiatives to seek out services when they are needed (3).

Parents have proven to be reliable observers (4–7) of their children's communication skills. It is probable that parents observe how their children's interaction and communication skills develop in everyday life. Most infants' developmental questionnaires deal with interaction, language, play and the routines of everyday life (e.g., eating and sleeping).

In this study, we wanted to evaluate the usefulness of the BITSEA (8) in northern Finland and its comparability with the two

most commonly used evaluative questionnaires, the CBCL and the MCDI. The BITSEA's competence items identify the positive signs of development and makes the questionnaire more convenient for parents to fill out.

MATERIAL AND METHODS

This follow-up study was approved by the Ethical Committee of the University Hospital of Oulu and the Municipal Boards of the Social and Health Care Units of the city of Oulu in 2006. At the routine 6-month visit (autumns 2006 and 2007), the children's healthcare nurses in 5 different Children's Health Care Centres in the city of Oulu, in northern Finland, distributed developmental questionnaires to 103 families who had infants born at full-term gestation and without any abnormalities. Completed questionnaires with parental consent were mailed back from 53 families, the total response rate being 51.4%. At the present phase of the study, follow-up questionnaires were mailed to the earlier 53 participants, and parents were advised to fill out the forms when the infants reached the age of 18 months and to mail the questionnaires to the researchers. Fifty (16 boys and 34 girls, 94.3%) follow-up questionnaires were returned with all items answered.

The families' educational levels varied from students to professionals, and their households' educational level varied from lower secondary level (21, 4% of the sample) to tertiary levels (32, 9% of the sample), which are typical educational levels for the Oulu region. All infants had both Finnish-speaking parents living with them and had between 0 and 2 siblings. At the age of 18 months, the

questionnaires their parents answered were the Brief Infant and Toddler Social and Emotional Assessment (BITSEA) (8), the Child Behavior Checklist (CBCL) (9) and the Finnish version of MacArthur Communicative Developmental Inventories (MCDI) (5).

BITSEA (8) is a tool with 42 items and has been shown by Briggs-Gowan to be a valid screening method for identifying social-emotional and behavioural problems and/or delays or deficits in social-emotional competence in children aged from 12 months to 35 months (10). The BITSEA can be used as a self-administered questionnaire or as a structured interview with parents. The BITSEA responses range from 0–2, the response options being: 0 = Not true/rarely, 1 = Somewhat true/Sometimes and 2 = Very True/Often.

In the BITSEA, there are 6 items, which address (1) externalizing problems (difficulties with activity/impulsivity, aggression/defiance and peer aggression), (2) internalizing problems (fearfulness, worry, nervousness and distress upon separation, anxiety and social withdrawal), (3) dysregulation of problems (negative emotionality, sleep, eating and sensory sensitivities), (4) competency (positive features of behaviour that include attention skills, mastery motivation, imitation/play behaviour, pro-social interaction with peers and emerging empathy), (5) autism spectrum disorder items (repetitive behaviours, social competence and joint attention), and (6) red flag items (clinically significant problems such as runs away in public places, hurts self on purpose or gags or chokes on food) (8). Red flag items are important to healthcare professionals because they indicate that the infant's development should be followed more closely. In the U.S., the cut-off scores (highest 25%) at the age of 18 and

23 months for problem and competence were 13 for girls and 15 for boys. BITSEA (8) was translated into Finnish by educational psychologist Dr. Varpu Penninkilampi-Kerola and back translated by an official translator. The original and the back translated version were compared by Dr. Alice Carter, and according to her suggestions minor changes were made to the Finnish version.

The Child Behaviour Checklist for 1.5 to 5 years of age (9) is a part of the Achenbach System of Empirically Based Assessment (ASEBA) and evaluates the psychiatric problems of children. Every item is rated on a 0–2 point scale, where the ratings are “not true” (0), “somewhat or sometimes true” (1) and “very true or often true” (2). There are 7 problem subscales (emotionally reactive, anxious/depressed, somatic complaints, withdrawn, sleep problems, attention problems and aggressive behaviour subscales) and the ratings can be summarized as internalizing subscale (emotionally reactive, anxious/depressed, somatic complaints and withdrawn items), externalizing subscale (attention problems and aggressive behaviour items) and the total problems score-scales. The ASEBA-method has been used in 24 countries in clinical and research work in the psychiatric assessment of children and adolescents (9). In the U.S., the clinical cut off scores for problem items are 93% (T-score 65) of the sample.

The MCDI (11), originally planned by professor Fenson and his colleagues, provides a method that combines the parents' close knowledge of their infant with their monitoring of the infant's communication and language development. The Finnish version of the MCDI (5) evaluates early communica-

tion and the development of vocabulary and language. MCDI is a continuous, positive scale; the higher the scores, the better the performance. The Finnish MCDI has been used for 2 decades and it seems to be a reliable and easy method for screening infants aged 8–30 months (5). Because the aim of this study was not to study language and vocabulary production and because there were many other informative and detailed developmental questionnaires (BITSEA, CBCL and background form), we selected 17 questions of MCDI that concerned a practical items: first signs of understanding, first communicative gestures and first actions with objects for infants who were 18 months old. Originally, the Finnish version of MCDI for 8–30 months (5) included the first signs of understanding, understanding questions and directions, vocabulary production and understanding, and communicative gestures and actions — altogether more than 600 items.

Data-analyses

In the BITSEA, the cut-off score values indicating the Possible Problem correspond approximately to the 75th percentile ranking or more for the Total problem score. Because the BITSEA also includes social-emotional competence, assessment of competence is critical to the identification of infants whose developmental expectations are not meeting the social emotional domain (8). In the CBCL, the cut-off scores are 93% and can be individualized to certain areas of behavioural problems (e.g., attention problems and sleeping problems).

The analyses were produced with the SPSS version 15.0 for Windows. As the variables were not normally distributed, the non-parametric Spearman's correlation coefficients (r)

were used to compare the BITSEA, CBCL and MCDI and to study the criterion validity. The reliability of the measures was studied by Cronbach alpha. All correlation tests were 2-tailed and p-values of less than .05 were considered as statistically significant. Comparisons between genders were also studied by Mann-Whitney U-test.

RESULTS

All questionnaires gave quite consistent views of the infants' development in this sample. The reliability and internal consistency (Cronbach α) of the BITSEA, the CBCL and the MCDI had values from 0.43 to 0.91, which means, that in this sample the BITSEA Total problem score (Cronbach $\alpha=0.75$) had very good internal consistency and reliability. Also in the CBCL there were subscales, that had very good reliability and internal consistency (Sleeping problems, Cronbach $\alpha=0.74$; Aggressive behaviour, Cronbach $\alpha=0.86$; and Total problem, Cronbach $\alpha=0.91$). In this study, 61 girls (7%) and 87 boys (5%) scored clinical cut-offs in the BITSEA, CBCL or MCDI. The results of reliability tests and screened infants are reported in Table I.

The BITSEA had significant correlation with Emotionally reactive, Anxious/Depressed, Sleeping problems, Attention problems, Aggressive behaviour subscales in the CBCL in this sample. In this study, there was also strong correlation between the BITSEA Problem total scores and Internalizing and Externalizing sum scores in the CBCL. There was also a significant correlation in this study between MCDI total scores and the Competence scores in the BITSEA.

Correlations and p-values between the questionnaires are reported in Table II.

The questionnaires results (scores: means and standard deviations and clinical cut-off points) are presented in the Table III. The cut-off scores of 75th percentile for problems and 85th percentile for competence for the BITSEA were used (8). The CBCL used the 93% cut-off according to the U.S. manual. When comparing the cut-

off scores in this sample to the mean scores and cut-off scores used in the U.S. (8), we noticed that in this Finnish sample the scores were a bit higher overall. The Competence scores were 17.98 (mean) in our sample, when in the U.S., the same scores were 17.5 (mean) (8). In the BITSEA Total problem score, our study group had 7.21 (mean), but in the U.S. the same scores were 9.6 (mean) (8).

Table I. Screened infants (gender g=girl, b=boy) and the reliability and internal consistency (Cronbach α) of the BITSEA, the CBCL and the MCDI in the sample of 18-month-old infants (n=50, 34 girls, 16 boys).

Measure	Screened infants	Cronbach α
BITSEA		
Problem total scores	(5 girls, 2 boys)	0.75*
Competence	(2 girls, 3 boys)	0.57
CBCL (problem subscale)		
Emotionally reactive	(2 girls)	0.43
Somatic complaints	(1 girl)	0.68
Sleeping problems	(1 girl, 1 boy)	0.74*
Aggressive behaviour	(2 girls)	0.86*
Total problem	(1 girl)	0.91*
MCDI Total scores	(7 girls, 8 boys)	0.47

*Cronbach α is confident when the value is more than 0.7.

Table II. BITSEA and significant correlation to the CBCL and the MCDI in 18-month-old infants (n=50).

BITSEA	CBCL, problem subscale	Spearman correlation coeff.	p-value	MCDI	p-value	Spearman correlation coeff
Problem total scores	Emotionally reactive	0.408**	0.004	Total scores	0.740	0.050
	Anxious/depressed	0.337*	0.022			
	Somatic complaints	0.239	0.105			
	Withdrawn	0.08	0.957			
	Sleeping problems	0.575**	0.000			
	Attention problems	0.408**	0.004			
	Aggressive behaviour	0.520**	0.000			
	Total scores	0.596**	0.000			
	Internalizing	0.405**	0.005			
Competence	Externalizing	0.545**	0.000	Total scores	0.003	0.425**
	Withdrawn	-0.301*	0.039			

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table III. Means (points), standard deviations (SD) and range and clinical off cut-off points (c) according to the BITSEA manuals (c: 25%), in competence (c: 15%), CBCL (c: 93%) in U.S. and MCDI total scores in our sample of 18-month-old infants.

Measures	All (n=50) Mean (SD)	Boys (n=16) Mean (SD)	Girls (n=34) Mean (SD)	All (n=50) Range (c)	Boys (n=16) Range (c)	Girls (n=34) Range (c)
BITSEA (max scores)						
Competence (positive) (22)	17.98(2.21)	17.31 (2.35)	18.31 (2.08)	14-21(<14)	14-20(<14)	16-21(<14)
Problem total scores (62)	7.21 (4.75)	7.50 (5.23)	7.06 (4.60)	0-18	0-18(>15)	1-16(>13)
CBCL (max scores)						
Emotionally reactive (18)	1.84 (1.53)	1.31 (1.08)	2.12 (1.67)	0-6(>5)	0-3	0-6
Anxious/depressed (16)	0.76(0.95)	0.47 (0.52)	0.90(1.07)	0-4(>6)	0-1	0-4
Somatic complaints (22)	0.68 (1.39)	0.50 (0.73)	0.77 (1.63)	0-2(>4)	0-2	0-2
Withdrawn (16)	0.32 (0.69)	0.44 (0.73)	0.26 (0.68)	0-2(>4)	0-1	0-2
Sleeping problems (14)	1.90(2.27)	2.20 (2.70)	1.74(2.06)	0-10(>7)	0-10	0-8
Attention problems (10)	2.04 (1.20)	1.50 (1.09)	2.32 (1.16)	0-4(>5)	0-3	0-4
Aggressive behaviour (38)	8.74 (5.09)	7.84 (4.10)	9.21(5.54)	0-25(>20)	1-15	0-25
Externalizing problems (48)	10.80 (5.95)	9.34 (4.73)	11.53 (6.43)	0-29(>21)	1-16	0-29
Internalizing problems (72)	3.57 (3.27)	2.60 (1.76)	4.05(3.73)	0-13(<14)	0-5	0-13
Total problem scores (200)	21.95 (12.64)	19.13(10.20)	23.32 (13.61)	0-66(>52)	1-39	0-66
MCDI (max scores)						
Total scores (17)	14.82(1.25)	14.43 (1.41)	15.03 (1.13)	12-17(<15)	13-16(<15)	12-17(<15)

DISCUSSION

In Finland, the BITSEA has not been used before, and there is a need for early screens for social-emotional problems and language development in the Finnish population. Accordingly, there are no studies of the BITSEA in comparison to other developmental questionnaires used with the Finnish population. In this study, the cut-off scores of different items were a bit higher than samples in the U.S. (8). The BITSEA Competence scores difference was not so remarkable, but our study group had 7.21 (mean) in the BITSEA Total problem score compared with the U.S. mean scores of 9.6 for the same items (8). One reason that could have lowered the BITSEA Total problem

score in our sample could be the high levels of education and the efficient health care system that are available to everyone in Finland. In this sample, the BITSEA Total problem scores screened 7 infants (14.6%) and CBCL screened only 1 infant with a possible developmental deficit or delay. The difference between these 2 questionnaires needs a more careful examination, but one explanation could be the BITSEA's cut-off, which is 18% lower than the CBCL cut-off. Early detection of social-emotional deficit or delay is very important when considering parents support and early rehabilitation for the infant. Therefore, the BITSEA seems to be more sensitive than the CBCL to these concerns. Also, we noticed in this study that there were more social-emotional problems

reported for girls than there were for boys, but because there were altogether more girls than boys in this sample, results are not comparable.

Professor Lyytinen (5,12) has been studying children's language development in the Finnish population using the MCDI, and the results have been equal to other linguistic measures like the Reynell Developmental Language Scales (RDLS). Also Paavola et al. (13,14) have used the MCDI with good coherence alongside other measures, such as the RDLS. In our study, the BITSEA (Competence) correlated with the MCDI (Total scores), although the target was not vocabulary development. However, the MCDI screened 15 infants (7 girls and 8 boys) with possible language development problems in this sample. Based on this, it seems that the BITSEA is as competent as the other measures used, especially when comparing it with the CBCL.

According to the BITSEA (8) 10%–15% of children who are 1–2 years old in the U.S. have been shown to have social-emotional or behavioural problems. Therefore, it is important to have screens that can be used in different cultural and educational settings. In clinical work, questionnaires, tests and observation results are indicators of whether intervention or rehabilitation is required. Especially in rural areas, where there can be a lack of health care services, it is very beneficial to develop a variety of ways to evaluate infants' developmental stages with precision. The use of screening tools like the BITSEA may improve the identification of infants and toddlers with possible social-emotional problems (e.g., autism spectrum disorder) or delays (8). In this study we noticed that

there were differences between scores in our Finnish sample and in the sample for the U.S. (8). Rescorla's study concerning the CBCL from 24 countries pointed out that also in the CBCL there is a difference between Finnish samples and other countries (15). The distribution of scores obtained in this quite small sample suggest that the cut-offs derived from the U.S. sample may set the threshold too high for the Finnish population. Further research with BITSEA using a larger and broader sample of Finnish children from different settings is needed to determine appropriate cut-offs.

If attention behaviours (which can be screened with the BITSEA Total problem scores) are present, it is important to discuss with the parents whether there is a need for intervention or closer follow-ups (8). Many times parental worry is the primary trigger for initiating contact with a health care provider for their children with behaviour problems (16).

Assessment tools like BITSEA, CBCL and MCDI yield information that cannot be gained from brief clinical encounters. While the MCDI evaluates only infants' language development and the CBCL screens only for behavioural problems, the BITSEA can evaluate an infant's development, problems and competence more fully. Limitations in this study were the small sample size and the lack of clinical validity for the use of the BITSEA with the Finnish population, because it has not been yet validated in Finland. However, the BITSEA has strong psychometric properties, as seen when comparing it to other questionnaires that are commonly used in the screening for these types of problems (8,17).

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