

Emotional and Behavioral Problems of Pre-school Children with Autistic Spectrum Disorder Assessed by the Child Behavior Checklist 1½-5

IRWANTO¹, MUHAMAD KAHFI¹, NINING FEBRIYANA²,
SRI HARTINI³, and SATOSHI TAKADA⁴

¹*Department of Child Health, Faculty of Medicine, Universitas Airlangga/Dr. Soetomo Hospital, Indonesia*

²*Department of Psychiatric, Faculty of Medicine, Universitas Airlangga/Dr. Soetomo Hospital, Indonesia*

³*School of Nursing, Faculty of Medicine, Gajah Mada University, Indonesia*

⁴*Graduate School of Health Science, Kobe University, Japan*

Received 19 March 2018 / Accepted 6 November 2018

Keywords: Pre-school Children, Autism Spectrum Disorder, Child Behavior Checklist, Typical developing children

BACKGROUND: Children with Autism Spectrum Disorder (ASD) experience a significant disruption in the ability to communicate and interact socially. Early detection is important; the earlier the child is identified with ASD, the faster the intervention can begin. The Child Behavior Checklist (CBCL) is a screening tool capable of identifying various emotional and behavioral disorders. Research data on the use of the CBCL as a screening tool for ASD are still limited in Indonesia. The present study aimed to evaluate the CBCL's ability to detect emotional and behavioral problems in pre-school children with ASD. **METHODS:** A cross sectional study was conducted in Surabaya, Indonesia. Children aged 1½-5 years old diagnosed with ASD, and typically developing (TD) children were enrolled using total sampling. The CBCL/1½-5 questionnaire for parents, consisting of 99 items, was used in this research to evaluate emotional and behavioral problems. Data were analyzed with the Independent-Sample T-test to compare the CBCL/1½-5 scale between ASD and TD children, while the proportion of gender was evaluated by a chi-square test with a 95% confidence interval. **RESULTS:** Fifty children were included in this research, 25 with ASD and 25 TD. Seventy six percent (38) were male and 24% (12) were female. Six of the seven scales were significantly higher in ASD children than TD in the CBCL/1½-5. Children with ASD had higher internalization ($p < 0.0001$), externalization ($p = 0.001$), and total problem scores ($p < 0.0001$) when compared to TD children. **CONCLUSION:** The CBCL/1½-5 can significantly detect the emotional and behavioral problems in pre-school children with ASD.

INTRODUCTION

Autism Spectrum Disorder (ASD) is a neuro-developmental disorder that is characterized by interference in social interaction and communication with a restricted and repetitive behavioral pattern. Many children with autism have cognitive delay according to The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) (1). The number of children affected by ASD has increased rapidly in the last decade and the cause of ASD is still a mystery and a matter of debate among experts. Diagnosis of children in pre-school with ASD is difficult due to a condition in which pre-school children are still growing, and ASD symptoms themselves depend on developmental level and age. Furthermore, it can be difficult to differentiate children with mild ASD from children who have other behavior problems, such as language delay, social difficulties, anxiety, attention problems, oppositional behavior, or poor impulse control (2).

One of the tools for which there is the strongest evidence of its ability to detect behavioral disorders in children is the Achenbach System of Empirically Based Assessment (ASEBA) Child Behavior Checklist (CBCL). The CBCL, which is widely and often used in clinical research and practice to identify various disorders, has good reliability and validity. This tool is divided into three major scales, consisting of internalization, externalization, and total problem. Internalization is determined by emotionally reactive, anxiety/depression, somatic complaints, and withdrawn syndrome scales. Meanwhile, externalization is characterized by the total scores for the Attention Problems and Aggressive Behaviors syndrome scales. The total problems scale is derived from the sum of all 99 items on the Child Behavior Checklist for ages of 1½ to 5 years old (CBCL/1½-5). The CBCL is known to have excellent psychometric properties and large studies have

EMOTIONAL AND BEHAVIORAL PROBLEMS OF PRE-SCHOOL CHILDREN WITH ASD

demonstrated its reliability and validity both in clinical and non-clinical practice (3,4,5,6,7,8). However, research data on the use of CBCL as a screening tool in ASD are still limited in Indonesia. Therefore, this study aims to investigate the use of CBCL in pre-school children for the early detection of prominent symptoms in children with ASD.

MATERIALS AND METHODS

Methods

A cross sectional study was conducted in Surabaya, from August 1 to December 30, 2015. The sample of this study consisted of 25 children diagnosed with ASD, and 25 typically developing (TD) children as the control group. The sample size was based on total sampling. Children enrolled in the study were those who met the following criteria: aged between 1.5 and 5 years old and having parents or guardians who agreed to sign for informed consent. ASD diagnosis was made by a pediatrician and a psychiatrist confirmed by the DSM-5 (1). The researcher interviewed the parents/caregivers and filled in a CBCL/1½-5 for the parents after they were informed about the study and gave their written consent. Typically developing children were defined as children with a normal development condition in which there is absence of both chief complaints and abnormal clinical findings about children development.

Data were analyzed by Independent-Sample T-test to compare the CBCL/1½-5 between children diagnosed with ASD and TD children, while the proportion of gender was evaluated by a chi-square test with a 95% confidence interval. Statistical data analysis was performed using SPSS 17.0. This study was approved by the Ethics Committee Dr. Soetomo General Hospital, Surabaya, Indonesia.

Materials

The CBCL/1½-5 for parents, as a component of the Achenbach System of Empirically Based Assessment (ASEBA), was used in this study. The CBCL/1½-5 is a widely used questionnaire to assess behavioral and emotional problems, consisting of 99 items and summarized in seven scales, such as emotionally reactive, anxiety, somatic complain, social withdrawal, attention problems, aggressive behavior, and sleep problems. The assessment of each item is based on the child's symptoms over the past two months on a three-point scale: 0 = not true, 1 = somewhat or sometimes true and 2 = very true or often true. Achenbach and Rescorla (2000) described the Internalization scale as being comprised by the reactive emotion, anxiety/depression, somatic complaints, and social withdrawals syndrome scales. The externalization scale was determined by the scores for the attention problems and aggressive behaviors syndrome scales. The Total Problems scale is derived from the sum of all 99 items on the CBCL/1½-5 (2).

RESULTS

Fifty children were included in this research, 25 children with ASD and 25 TD children. Seventy six percent (38) of the children were male and 24% (12) were female (Table I). There was no difference in age between both groups. There was an observed significant occurrence of ASD in male compared to female children. In this study, the prevalence of ASD between male and female is 24:1.

Table I. Subject Characteristics

Participants	Children with ASD (N=25)	TD children (N=25)	<i>P</i>
Age (Months) (Mean ±SD)	48±11.9	48±11.5	NS
Gender			
Male (%)	24 (96.0)	14 (56.0)	*
Female (%)	1 (4.0)	11 (44.0)	

P < 0.05 (Independent Two-sample t test, Chi-square test)

NS: Non-Significant

In this study, the CBCL/1½-5 scale showed significant differences in almost every aspect (*p* < 0.05). However, there is no significant difference between both groups on the anxiety and depression scale. The total problem scale in children with ASD is significantly higher compared to TD children, recorded as high as three times that of the TD counterpart. Among all components, social withdrawal, attention problems, and emotional reactivity were exhibited as the top three highest scores in children with ASD.

Table II. Comparison of CBCL scale in children with ASD and TD children aged 1.5-5 years

	Children with ASD (N=25) Mean±SD	TD children (N=25) Mean±SD	P
Internalization	22.4±8.86	6.3±5.66	*
Reactive Emotion	5.6±3.6	1.6±1.4	*
Anxious/Depression	2.8±2.8	2.2±2.4	NS
Somatic complaints	2.9±2.1	1.1±1.6	*
Social Withdrawals	11.1±3.9	1.3±1.6	*
Externalization	22.7±9.03	8.4±7.26	*
Attention problems	5.8±2.3	1.1±1.5	*
Aggressive behavior	16.9±7.8	7.3±5.9	*
Sleep problems	4.4±2.0	1.8±1.5	*
Total problem score	49.6±15.9	16.6±13.2	*

P< 0.05 (Independent Two-sample t test, Mann-Whitney U test) NS: Non-Significant

DISCUSSION

The results indicate that six of the seven minor scales of the CBCL were significantly higher in children with ASD than TD, consisting of reactive emotional, somatic complaints, social withdrawal, sleep problems, attention problems, and aggressive behavior. Only the anxiety/depression scale showed no significant difference. This result may be due to the difficulty in determining anxiety/depression in children under 5 years old. These results are consistent with previous studies that reported that children with ASD had significantly higher scores on the same six minor CBCL scales (9,10). However, another study found that all CBCL scales were significantly higher in preschool children with ASD than TD children (11). A slightly different result was obtained by Sikora et al. who concluded that only the social withdrawal scale was better at differentiating children with ASD than children without ASD (12). Furthermore, Rescorla in his study observed that when eight prescriptive CBCL preschool profiles showing a variety of psychiatric disorders and development were included in the cluster analysis, children with ASD could be distinguished from children with other behavioral disorders (13).

Our study also revealed that the highest mean scores on the CBCL scales were on the scale of aggressive behavior, withdrawn, and attention problems. These results are similar to previous studies in children with ASD in the United States, who reported that the CBCL scale with the highest percentage of clinically significant scores was the scale of withdrawn, attention problems, and aggressive behavior (14). The results of this study reveal that the internalization, externalization, and total problem scores were significantly higher in children with ASD than in TD children. These findings are consistent with previous studies that reported significantly higher emotional, behavioral problems and total problem scores in children with ASD than TD (6,10,11,15,16).

The scaling of thought problems in that CBCL contains many items related to repetitive or unusual and bizarre behavior that show ASD children to have great difficulty in dealing with others. This makes them withdraw from social interaction (17).

In this study, 38 children (76%) were male and 12 (24%) were female, and several studies have shown that the male to female ratio in ASD was most commonly reported as 4:1. A meta-analysis investigating gender differences in ASD symptoms, showed there was little difference in the severity of symptoms between boys and girls. Boys and girls with ASD showed similar symptom severity in communication and social behavior, but girls showed less interest, behavior limitations, and stereotypes than boys. (18,19). Kristensen demonstrated that the total problems score of CBCL/1½-5, internalization, and externalizing was not significantly different among boys and girls (8).

Overall, our results are very similar to previous studies in the United States, Europe, and Asia. In summary, the CBCL is a good screening tool, but it may be difficult to make a diagnosis of ASD using CBCL alone. Limitations in this study, both gender and socio-economic, were non-adjusted between groups. Only a few cases of ASD could be found because of low society knowledge regarding child behavioral problems.

CONCLUSION

EMOTIONAL AND BEHAVIORAL PROBLEMS OF PRE-SCHOOL CHILDREN WITH ASD

The CBCL/1½-5 can significantly detect the emotional and behavioral problems in pre-school children with ASD.

ACKNOWLEDGEMENT

The authors wish to thank the Director of Dr. Soetomo Hospital, Surabaya, Indonesia

REFERENCES

1. **American Psychiatric Association.** 2013. Diagnostic and statistical manual of mental disorders. 5th ed. Arlington, VA: American Psychiatric Association; pp. 50-9.
2. **Achenbach, T.M., and Rescorla, L.A.** 2000. Manual for the ASEBA Preschool Forms & Profiles. Burlington, VT: University of Vermont, Research Center for Children, Youth, and Families.
3. **Rescorla, L., Kim, Y.A., and Oh, K.J.** 2015. Screening for ASD with the Korean CBCL/1½-5. *J Autism Dev Disord*, **45**(12): 4039-4050.
4. **Hanratty, J., Livingstone, N., Robalino, S., Terwee, C.B., Glod, M., Oono, I.P., Rodgers, J., Macdonald, G., and McConachie, H.** 2015. Systematic Review of the Measurement Properties of Tools Used to Measure Behaviour Problems in Young Children with Autism. *Plos One*, **10**(12): e0144649.
5. **McConachie, H., Parr, J.R., Glod, M., Hanratty, J., Livingstone, N., Oono, I.P., Robalino, S., Baird, G., Beresford, B., Charman, T., Garland, D., Green, J., Gringras, P., Jones, G., Law, J., Le Couteur, A.S., Macdonald, G., McColl, E.M., Morris, C., Rodgers, J., Simonoff, E., Terwee, C.B., and Williams, K.** 2015. Systematic review of tools to measure outcomes for young children with autism spectrum disorder. *Health Technol Assess*, **19**(41): 1-506.
6. **Lee, S.H., Ha, E.H., and Song, D.** 2015. Discriminant Validity of the Child Behavior Checklist for Ages 1.5-5 in Diagnosis of Autism Spectrum Disorder. *J Korean Acad Child Adolesc Psychiatry* **26**(1): 30-37.
7. **Ooi, Y.P., Rescorla, L., Ang, R.P., Woo, B., and Fung, D.S.** 2011. Identification of autism spectrum disorders using the Child Behavior Checklist in Singapore. *J Autism Dev Disord* **41**(9):1147-1156.
8. **Kristensen, S., Henriksen, T.B., and Bilenberg, N.** 2010. The Child Behavior Checklist for Ages 1.5-5 (CBCL/1(1/2)-5): assessment and analysis of parent- and caregiver-reported problems in a population-based sample of Danish preschool children. *Nord J Psychiatry* **64**(3): 203-209.
9. **Pandolfi, V., Magyar, C.I., and Dill, C.A.** 2009. Confirmatory factor Analysis of the child behavior checklist 1.5-5 in a sample of children with autism spectrum disorders. *J Autism Dev Disord* **39**: 986-995.
10. **Muratori, F., Narzisi, A., Tancredi, R., Cosenza, A., Calugi, S., Saviozzi, I., Santocchi, E., and Calderoni, S.** 2011. The CBCL 1.5-5 and the identification of preschoolers with autism in Italy. *Epidemiol Psychiatr Sci* **20**(4): 329-338.
11. **Narzisi, A., Calderoni, S., Maestro, S., Calugi, S., Mottes, E., Muratori, F., and Maris, F.S.** 2013. Child Behavioral Checklist 1½-5 as a tool to identify toddlers with Autism Spectrum Disorders: A case-control study. *Res Dev Disabil* **34**: 1179-1189.
12. **Sikora, D.M., Hall, T.A., Hartley, S.L., Gerrard-Morris, A.E, and Cagel, S.** 2008. Does parent report of behavior differ across ADOS-G classifications: analysis of scores from the CBCL and GARS. *J Autism Dev. Disord* **38**(3): 440-448.
13. **Rescorla, L.A.** 2005. Assessment of young children using the Achenbach System of Empirically Based Assessment (ASEBA). *Ment Retard Disabil Res Rev* **11**: 226-237.
14. **Hartley, S.L., Sikora, D.M., and McCoy, R.** 2008. Prevalence and risk factors of maladaptive behaviour in young children with Autistic Disorder. *J Intellect Disabil Res* **52**(10): 819-29.
15. **Myers, C.L.** 2013. Comparing Results from the Clinical Assessment of Behavior and Child Behavior Checklist with Referred Preschoolers. *Psychology in the Schools* **50**(1): 1-12.
16. **Myers, C.L., Gross, A.D., and McReynolds, B.M.** 2014. Broadband behavior rating scales as screeners for Autism. *J Autism Dev Disord* **44**:1403-1413.
17. **Mazefsky, C.A., Anderson, R., Conner, C.M., and Minshew, N.** 2011. Child Behavior Checklist scores for school-aged children with autism: Preliminary evidence of patterns suggesting the need for referral. *J Psychopathol Behav* **33**(1): 31-37.
18. **Liu, J., Cheng, H., and Leung, P.W.L.** 2011. The Application of the Preschool Child Behavior Checklist and the Caregiver-Teacher Report Form to Mainland Chinese Children: Syndrome Structure, Gender Differences, Country Effects, and Inter-Informant Agreement. *J Abnorm Child Psychol* **39**(2): 251-264.
19. **Van Wijngaarden-Cremers, P.J., van Eeten, E., Groen, W.B., Van Deurzen, P.A., Oosterling, I.J., and Van der Gaag, R.J.** 2014. Gender and age differences in the core triad of impairments in autism spectrum disorders: a systematic review and meta-analysis. *J Autism Dev Disord* **44**(3): 627-635.