

学位論文

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in Japan

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Original Article

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Abstract *Background:* The Japanese government has established a law encouraging early detection and treatment of developmental disorders in children. Child behavior problems (CBP) tend to be recognized at school as a result of developmental disorders. The aim of this study was to identify factors associated with CBP in Japan. We hypothesized that factors other than developmental disorders are important in explaining CBP.

Methods: The study was conducted between February and March 2015. Parents of 3,515 children aged 2–5 years attending one of 34 public nursery schools in Takamatsu, Kagawa, Japan received self-administered questionnaires addressing parental socioeconomic factors, mental health, parenting style (i.e. hostile, overreactive, or lax), developmental disorders in children, and CBP. A multiple regression analysis was applied to explore associations between CBP and possible factors.

Results: Overall, 1,410 mothers were eligible to participate in the study. Children diagnosed with developmental disorders accounted for 7.8% of the sample, while on the Eyberg Child Behavior Inventory 17% of children had behavior problems needing clinical intervention. After adjustment for confounding factors, as well as for the diagnosis of developmental disorders, poor mental status and all three dysfunctional parenting styles had strong associations with CBP, and hostile, overreactive, and lax parenting had standardized β -values (β) of 0.29, 0.28, and 0.15, respectively ($P < 0.01$). A problematic relationship between the parents was also significantly associated with CBP ($\beta = -0.29$, $P < 0.01$).

Conclusion: When CBP are identified, parenting skills, mental health status and parental relationships should be considered along with the possibility of developmental disorders in the development of interventions.

Key words child behavior problem, dysfunctional parenting, Eyberg Child Behavior Inventory, parenting style, interparent relationship.

Recently, developmental disorders have attracted much attention from the public as well as from the government in Japan. The “Law to Support Persons with Developmental Disabilities”, introduced in 2004, declares that the Japanese local governments are responsible for providing information on developmental disorders to communities, including their early detection and treatment.¹ Some local governments have started a 5 year checkup plan in which 5-year-old children are gathered at a local health center and health professionals check their physical and mental development with the aim of

detecting developmental disorders in children. In schools, special support classes have also been prepared for these children since the law was introduced. Educational institutions as well as local governments encourage people working with children to identify and actively support children in need.²

Teachers commonly have children with behavior problems in class. In research conducted by the Ministry of Education, Culture, Sports, Science and Technology in 2012, involving a teacher questionnaire, 6.0% of first graders had marked behavior problems and a need for special support, while students in the higher grades tended to have fewer behavior problems (4.0% for sixth graders and 2.7% for ninth graders).³ We aim to identify such children as early as possible, and if they are officially diagnosed by professionals as having developmental disorders, they then qualify to receive special support from schools and clinics.

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There are problems, however. First, a large number of children are suspected to have developmental disorders, which creates anxiety and stress in parents.² A total of 20–50% of children have suspected developmental disorders because they present behavior problems while at preschool or at the 5 year checkup.^{4,5} Second, there are too many “problem” children to be sufficiently cared for by professionals, and these children are the most likely to be monitored through a “wait and see” approach.^{4,6} Today, we are likely to be sensitive to child behavior problems (CBP) and tend to suspect that children have developmental disorders.

Child behavior problems have been investigated by many researchers in developed countries. A large body of literature provides empirical support for the hypothesis that factors other than the children themselves are responsible for behavior problems; these factors include dysfunctional parenting, maltreatment, an adverse relationship between the child’s mother and father, and high stress in the parents.^{7–14} Dysfunctional parenting, such as harsh or excessively lax discipline, is significantly associated with CBP.¹⁵ This dysfunctional parenting aggravates CBP, which are likely to increase over time.¹⁶ Physically maltreated children tend to develop more aggressive and disruptive behaviors than non-maltreated children.^{17,18} Additionally, psychological maltreatment prevents children from developing attachments to caregivers and achieving appropriate development and socialization skills, which leads to disruptive behavior.¹¹ Parenting stress is among the most prominent causes of stress for parents.¹⁹ Children with behavior problems contribute to increased parental stress, and, in turn, highly stressed parents can aggravate behavior problems in children.¹³ The escalation of frustration and anger between parents and children creates a vicious cycle of parenting and behavior problems.

The aim of this study is to identify factors associated with CBP in Japan. Our hypothesis is that factors other than developmental disorders are important in explaining CBP. The factors associated with behavior problems have been discussed in many previous studies in developed countries, but large-scale, population-based studies that include both the aforementioned factors and parental socioeconomic factors are rare in Japan. We carried out a comprehensive study with a sample of preschoolers in Takamatsu, Japan.

Methods

Subjects

The study area was the city of Takamatsu, which has a population of approximately 400 000 and is located in western Japan. The city has a total of 34 public nursery schools, which have been established for working parents in particular. We contacted the Department of Preschool Education of the Kagawa Prefectural Government and received permission to conduct this research. All directors of the public nursery schools received self-administered questionnaires at the monthly meeting and distributed them to the parents of 3,515

children aged between 2 and 5 years attending their schools. We collected the questionnaires that the school directors returned to the Department of Preschool Education. The investigation was conducted between February and March 2015. In the present study, we included only mothers and excluded participants who did not provide data regarding the parents’ demographic and socioeconomic status, and CBP.

Measurements

We measured five main parameters: CBP; parenting style; relationship between the mother and father; parental stress; and demographic background. The questionnaire was designed for the purposes of this study as follows.

Child behavior

The Eyberg Child Behavior Inventory (ECBI) assesses CBP.²⁰ The inventory is a 36-item measure of parent-reported CBP in children aged 2–16 years. Parents must rate the frequencies of various behaviors on a 7-point Likert scale ranging from 1 (never) to 7 (always), and the summed scores from their responses are used for the evaluation (minimum, 36; maximum, 252). The cut-off point is 131; scores at and above this point indicate the need for clinical intervention. The ECBI has good test–retest reliability and good internal consistency.²⁰ The Japanese version of the ECBI was obtained through Psychological Assessment Resources (Lutz, FL, USA). In this study, the ECBI scores are used as a continuous variable.

Parenting style

The Parenting Scale was used to evaluate parenting style. This scale, which was developed by Arnold *et al.* in 1993, is a 30-item tool measuring dysfunctional parenting^{21,22} with the following three-factor structure: hostility (use of verbal or physical force); overreactivity (harsh, emotional, authoritarian discipline and irritability); and laxness (permissive, inconsistent discipline).²³ The scale has adequate internal consistency and test–retest reliability.²³ Each item is associated with a 7-point Likert scale, with 1 and 7 representing the most and least effective discipline strategies, respectively. After some of the items were reverse-coded, a score of 1 indicated good parenting, and a score of 7 indicated bad parenting.²³ The Japanese version of the Parenting Scale was developed and standardized.²²

Parental adjustment

To evaluate the relationship between the parents, sections of the Parent Problem Checklist developed by the University of Queensland were used. This list can evaluate conflicts between the mother and father over discipline practices; the ability of the parents to manage their family in a cooperative manner was rated.²⁴ The checklist includes 16 items, four of which were used in this study: (i) disagreement over the type of

discipline; (ii) fights in front of the children; (iii) inability to resolve disagreements about child care; and (iv) lack of discussion about anything. Each item was scored on a 7-point Likert scale (1, not at all; 7, very much).²⁴ Additionally, sections of the Relationship Quality Index were used to measure marital satisfaction. This instrument contains six items, one of which was used in the present study: “we have a good relationship”. The item was scored on a 7-point Likert scale (1, strongly disagree; 7, strongly agree).²⁵ We chose five questions to explore relationships between the mother and father, especially regarding discipline, child care and family processes. Low scores indicated a poor relationship, and high scores indicated a good relationship in terms of parenting processes.

We used the K6 to evaluate mental status.²⁶ The K6 is a short version of a questionnaire developed to detect general psychological distress. It contains six questions scored on a 5-point Likert scale (0, not at all; 4, always); scores ≥ 13 are indicative of a serious psychological disorder,²⁶ whereas scores ≥ 5 are indicative of a mood or anxiety disorder. We applied the latter as the cut-off score to categorize mothers with psychological distress. Validation studies of the Japanese version showed that the screening performance of the K6 was equal to or better than that of the Depression and Suicide Screening tool and the Center for Epidemiologic Studies – Depression Scale.²⁷

Demographic and socioeconomic variables

Demographic characteristics included mothers' age, and socioeconomic characteristics included marital status and education background. The education background was divided into the following three categories: junior high school (grades 7–9); senior high school (grades 10–12); and higher education beyond high school, including vocational school, junior college, undergraduate studies, and graduate school. The annual household income was also divided into three categories: <2.5 million yen (< approx. \$US23k), 2.5–5 million yen (approximately \$US23k–46k), and >5 million yen (>approx. \$US46k). Other variables included the number of children, the children's ages, the availability of parenting support (“Do you have anybody to support you when necessary?”), the mothers' weekly work hours, and whether any of the children in the family required regular clinical visits. The survey also asked whether the respondent's child enrolled in the target public nursery school had ever been diagnosed with a developmental disorder.

Statistical analysis

First, we calculated the frequency distribution of the baseline items and mean and SD ECBI score for each category. *t*-test was also used to analyze variance. Second, the ECBI score and other continuous variables were analyzed to explore correlations with each characteristic. Third, multiple regression analysis was applied to explore the associations between CBP

and the mothers' demographic and socioeconomic status, number of children, availability of parenting support, weekly work hours, health status, parenting style, the presence of developmental disorders in their children and relationships between parents, first without adjusting for various confounding factors and then after adjusting for those factors. All analyses were performed using JMP Pro 13.2.1 for Windows (SAS Institute, Cary, NC, USA), and $P < 0.05$ was considered significant.

The study was approved by the Kagawa University Faculty of Medicine Ethics Committee Registry (Heisei 27-210, February 24, 2016) and conducted in accordance with the principles described in the Declaration of Helsinki. All participants indicated informed consent by submitting the questionnaire.

Results

Out of the parents of the 3,515 children, 1,917 (55%) returned the questionnaire, and 1,410 mothers (74%) were eligible for statistical analysis following the exclusion of those lacking demographic or socioeconomic factors and ECBI scores. Table 1 lists the demographic characteristics with the mean \pm SD ECBI score for each category. A total of 222 mothers (15.7%) were under the age of 30 years, and 152 (10.8%) were single. There were 252 families (17.9%) with low annual incomes (<2.5 million yen, \$US23k), and 922 (65.4%) obtained higher education after graduating from high school. There were 333 families (23.6%) with one child, and parenting support was available for most families (1,324, 93.9%). There were 459 (32.5%) mothers who worked full-time. The mean ECBI score of mothers in good health and that in poor health were significantly different (103.0 vs 114.8, respectively, $P < 0.0001$). Moreover, 110 children (7.8%) had developmental disorders, and their mean ECBI score was significantly higher than that of children who did not have developmental disorders (112.3 vs 104.6, respectively, $P < 0.01$). The average ECBI score was 105.2 ± 27.1 , and 17.0% had a score greater than the cut-off point, implying that clinical intervention was needed for their behavior problems. No significant difference was observed in mean ECBI scores when other characteristics, such as age, marital status, annual household income, educational level, the number of children, availability of parenting support and work hours, were considered.

We examined correlations between the clinical parameters (Table 2). We observed weak correlations between ECBI score and continuous parameters such as the K6, all the components of the parenting styles, and the relationship between the parents.

We also examined the association between CBP and other characteristics using multiple regression analysis (Table 3). Model 1 is an unadjusted model, while model 2 is adjusted for mothers' age, education, weekly work hours, health status, annual household income, the number of children, the availability of parenting support, and presence of developmental disorders. In model 1, low education level was significantly associated with CBP, but after adjusting for the

Table 1 Descriptive statistics of mothers of children with behavior problems

Characteristics (<i>n</i> = 1,410)	<i>n</i> (%)	ECBI score Mean ± SD	<i>P</i> -value [†]
Age (years)			
≤29	222 (15.7)	108.4 ± 27.3	
30–34	430 (30.5)	104.3 ± 28.2	
35–39	488 (34.6)	104.8 ± 26.1	
≥40	270 (19.1)	104.7 ± 26.9	0.28
Marital status			
Married	1,258 (89.2)	105.0 ± 27.1	
Single	152 (10.8)	106.8 ± 27.6	0.44
Annual household income (million yen)			
<2.5	252 (17.9)	106.3 ± 28.8	
2.5–5	604 (42.8)	105.0 ± 27.0	
>5	554 (39.3)	104.9 ± 26.4	0.78
Education			
Junior high school	70 (5.0)	111.4 ± 37.3	
Senior high school	418 (29.6)	104.8 ± 26.4	
Beyond senior high school [‡]	922 (65.4)	104.9 ± 26.5	0.15
No. children			
One	333 (23.6)	103.5 ± 25.6	
Two	683 (48.4)	106.0 ± 26.5	
Three or more	394 (27.9)	105.2 ± 29.4	0.38
Parenting support			
Yes	1,324 (93.9)	104.9 ± 26.7	
No	86 (6.1)	109.6 ± 32.8	0.12
Weekly work hours			
0	103 (7.3)	110.5 ± 32.5	
<20	138 (9.8)	102.9 ± 26.3	
20–40	710 (50.4)	104.6 ± 26.8	
>40	459 (32.5)	105.6 ± 26.4	0.14
Health status			
Good	894 (63.4)	103.0 ± 25.6	
Average	400 (28.4)	107.2 ± 27.2	
Bad	116 (8.2)	114.8 ± 34.6	<0.0001
Presence of developmental disorders			
Yes	110 (7.8)	112.3 ± 30.1	
No	1,300 (92.2)	104.6 ± 26.8	<0.01

[†]*t*-test. [‡]Vocational school, junior college, undergraduate and graduate school. ECBI, Eyberg Child Behavior Inventory.

mentioned confounders, statistical significance was attenuated. In contrast, age <29 years, no weekly work hours, and presence of developmental disorders were significantly associated with CBP (standardized $\beta = 0.07$, $P < 0.05$; $\beta = 0.09$, $P < 0.05$; $\beta = 0.07$, $P < 0.01$). Working <20 h per week and good health status had negative associations with CBP ($\beta = 0.09$, $P < 0.05$; $\beta = -0.12$, $P < 0.01$, respectively). Moreover,

significant psychological distress according to the K6 was significantly associated with CBP ($\beta = 0.30$, $P < 0.01$), and all three dysfunctional parenting styles had a strong association with CBP as follows: hostile, $\beta = 0.29$ ($P < 0.01$); overreactive, $\beta = 0.28$ ($P < 0.01$); and lax parenting, $\beta = 0.15$ ($P < 0.01$). A problematic relationship between the parents was also significantly associated with CBP ($\beta = -0.29$, $P < 0.01$). When adjusting confounders, presence of developmental disorders was attenuated: their standardized β were from 0.03 to 0.06 ($P > 0.05$).

Discussion

This large-scale comprehensive study investigated the association between CBP and parental factors in Japan. Previously, many studies examined CBP before and after specific parenting programs were implemented; those studies used the ECBI or other behavior scales. The association between the parents' socioeconomic background and CBP has not been well investigated, and no previous studies in Japan have discussed how these factors are associated.

In the present study of 2–5-year-old children and their mothers in Japan, CBP were not significantly associated with mothers' socioeconomic background, including marital status, household income, or education background. A socially and financially disadvantaged family environment, therefore, was not significantly responsible for CBP. In contrast, CBP was significantly associated with mothers' age <29 years and no weekly work hours. This implies that younger maternal age and lack of employment may be risk factors for CBP. A lack of employment refers to mothers who always stay at home to take care of babies or elderly parents. This may be more stressful than working outside the home. Isolation and constant work at home can aggravate mental stress, inducing irritation and dysfunctional parenting, leading to CBP. In contrast, having a part-time job <20 h per week may give mothers an appropriate amount of time to both work and socialize and to provide upkeep for the household and care for the children.

Moreover, we found significant associations between dysfunctional parenting and CBP. Many previous studies have examined the association between inappropriate parenting and CBP in other countries, and similar findings have been observed.^{7,10,14,28} Moreover, in the present study, parents who had fewer conflicts and more consensus regarding parenting were likely to have children with fewer behavior problems.

Table 2 Correlations between the clinical parameters

Characteristics	1	2	3	4	5	6
1 ECBI	1					
2 K6	0.31**	1				
3 Hostile parenting	0.29**	0.18**	1			
4 Overreactive parenting	0.29**	0.28**	0.52**	1		
5 Lax parenting	0.14**	0.02	-0.06*	-0.06*	1	
6 Relationship between parents	-0.30**	-0.31**	-0.24**	-0.28**	-0.07**	1

* $P < 0.05$; ** $P < 0.01$. ECBI, Eyberg Child Behavior Inventory.

Table 3 Multivariate indicators of child behavior problems

Characteristics (<i>n</i> = 1,410)	Model 1		Model 2	
	Standardized β	<i>P</i> -value	Standardized β	<i>P</i> -value
Age (years)				
≤ 29	0.06	0.05	0.07	0.04
30–34	–0.03	0.28	–0.03	0.26
35–39	–0.02	0.51	–0.02	0.55
≤ 40	Reference		Reference	
Annual household income (million yen)				
<2.5	0.02	0.48	0.01	0.85
2.5–5	–0.01	0.66	–0.01	0.75
>5	Reference		Reference	
Education				
Junior high school	0.09	0.05	0.05	0.30
Senior high school	–0.08	0.12	–0.06	0.24
Beyond senior high school	Reference		Reference	
No. children				
One	–0.04	0.21	–0.04	0.15
Two	0.03	0.25	0.04	0.18
Three or more	Reference		Reference	
Parenting support				
Yes	–0.04	0.12	–0.03	0.35
No	Reference		Reference	
Weekly work hours				
0	0.10	0.03	0.09	0.04
<20	–0.07	0.11	–0.09	0.04
20–40	–0.04	0.27	–0.02	0.55
>40	Reference		Reference	
Health status				
Good	–0.13	<0.0001	–0.12	<0.0001
Average	–0.02	0.36	–0.02	0.43
Bad	Reference		Reference	
Presence of developmental disorders				
Yes	0.08	<0.01	0.07	<0.01
No	Reference		Reference	
Psychological distress scale K6	0.31	<0.0001	0.30	<0.0001
Hostile parenting	0.29	<0.0001	0.29	<0.0001
Overreactive parenting	0.29	<0.0001	0.28	<0.0001
Lax parenting	0.14	<0.0001	0.15	<0.0001
Relationship between parents	–0.30	<0.0001	–0.29	<0.0001

Model 1, unadjusted model. Model 2, adjusted for mothers' age, education, weekly work hours, health status, annual household income, the number of children, the availability of parenting support, and children with developmental disorders. The dependent variable was Eyberg Child Behavior Inventory score.

Another study also noted a strong correlation between marital problems and child aggression in both children with developmental disorders and those without such disorders.⁸ This indicates that a good relationship between parents might be necessary to stabilize children's minds: a cooperative and peaceful family environment might prevent children from becoming aggressive and enable them to remain calm.¹⁰

In the present study, presence of developmental disorders was a significantly important factor for CBP compared with other factors such as mothers' age, education, weekly work hours, annual household income. On multiple regression analysis examining dysfunctional parenting, psychological distress, and relationship between parents, however, after adjusting for confounders, presence of developmental disorders was no longer significant. This implies that dysfunctional parenting, psychological distress, and relationship between parents had a

stronger association with CBP than presence of developmental disorders.

Several limitations of this study need to be considered. First, the response rate was only 55%; at some schools, 80% of the families returned the questionnaire, whereas other schools had only a 10% return rate. Therefore, the results may not represent the target population. It is not known why the response rate differed so greatly between the schools. Second, this study used a cross-sectional design; therefore, we cannot report any conclusions regarding the causality of the observed association between CBP and dysfunctional parenting or psychological distress. Third, the questionnaire was self-administered by the mothers, and the diagnoses were not confirmed by pediatricians for individual cases in this study. Therefore, the respondents' claims regarding the diagnosis might not be medically accurate, although a "diagnosis" in Japan is generally supposed to be

made by medical professionals specialized in child neurology. Finally, further research is needed to determine whether the present results are applicable to other populations and areas. The research must specifically include parental socioeconomic factors, CBP, and parenting style to investigate the association between these factors and disruptive behavior.

Despite these limitations, this study provides useful information for parents whose children have behavior problems and for adults working with these children in schools. The children with behavior problems far outnumbered the children with developmental disorders. Behavior problems were associated with dysfunctional parenting, especially hostile and over-reactive parenting, rather than parent socioeconomic background. Government policies in Japan regarding early intervention focus on clinical and educational support for children in Japan,¹ but support for parents may require greater consideration. Previous studies claimed that a parenting program was the most effective means of coping with CBP, changing parents' behavior toward their children and consequently decreasing children's non-compliance and aggression.^{9,29-34} This evidence encourages us to focus on parental interventions to address problems with children's behavior. Future studies should include whether parenting programs for the parents of children with behavior problems can decrease problems at home and at school, ease parents' stress, and improve relationships between mothers and fathers.

In conclusion, CBP were not significantly associated with developmental disorders or parental socioeconomic factors but were closely associated with parental stress, dysfunctional parenting, and poor relationships between parents. Parental support and interventions are needed to address problems in children's behavior.

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Disclosure

The authors declare no conflict of interest.

Author contributions

H.S. conceptualized and designed the study, conducted the analysis, and drafted the initial manuscript; T.Y., K.K. and K.Y. designed the data collection instruments, analyzed the data, critically reviewed and revised the manuscript; N.N. analyzed the data, critically reviewed and revised the manuscript; N.M., Y.K., T.N. and T.K. critically reviewed the manuscript and approved the final manuscript as submitted; T.H. designed the study, coordinated and supervised the data collection, and

critically reviewed and revised the manuscript. All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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