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著者別名	安梅 勅江
journal or publication title	Psychiatry research
volume	244
page range	185-193
year	2016-10
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URL	http://hdl.handle.net/2241/00144480

doi: 10.1016/j.psychres.2016.07.043

The influence of home-rearing environment on children's behavioral problems 3 years' later

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Abstract

Reduction of children's behavioral problems has the potential to ameliorate parental stress, mental health problems, and family dysfunction. The current study was designed as a 3-year longitudinal study with secondary data. A total of 99 caregivers with preschool aged children were required to complete two self-reported questionnaires: the Index of Child Care Environment and Strengths and Difficulties Questionnaire. It demonstrated that a positive home-rearing environment had a positive influence on children's behavioral problem 3 years' later. Our study suggests that we may reduce behavioural problems in children's later development by providing a positive home rearing environment.

Keywords: longitudinal study; parenting; preschool aged child;
problem behavior

1. Introduction

Because of the traditional loyalty to one's extended family, the child rearing skills used to be taught to young mothers and supported by grandmothers. However, in recent decades, with the popularized working mothers, shortage of child care facilities, and rather limited paternal support, young couples are no longer living with their parents and instead are forming nuclear families; therefore, they have no advisers or consultants in child rearing available at home (Nishimura, 1998).

With the changing child rearing and plentiful material environment, many behavioral problems have appeared among children, such as the popularized verbal attack "Hikikomori" and "Ijime" at school and being overly self-centered (Information Technology Education Center, 2001). Therefore, more attention should be paid to child rearing and behavioral development.

Society expects its member, including children, to behave within certain limits. Consequently, it is of grave concern to parents if their child's behavior does not meet their expectations or those of others. Children's development comes according to a pattern on the foundation of genetic potential and also by the influence of environmental factors (Kim et al., 2004; Venetsanou and Kambas, 2010). Among environmental influences, the family arguably plays a

vital role in the child development (Harden, 2004). The overall quality of the child-care environment affects many aspects of a child's social development (Phillips et al., 1987). In other words, the environment in which children grow up and the quality of provided child-rearing is essential to ensure their healthy development (Anme et al., 2013).

Anthony et al. (2005) pointed out that young children develop social behavior through interactions with others in the two major contexts in which they spend time: home and preschool. However, for young children just entering preschool, such skills are heavily dependent on the family environment. According to previous studies, the family is considered the child's primary surrounding and has become an important risk and safety factor influencing the child's behavior development (Kovachevikj et al., 2009).

Previous studies have elucidated that the reduction of children's behavioral problems has the potential to ameliorate parental stress, mental health problems, and family dysfunction (Herring et al., 2006). Furthermore, after adjusting for confounding variables, behavioral problems are also associated with a child's later academic achievements as a long-term risk factor (Sayal et al., 2015).

A substantial body of research has demonstrated the significant

association between home-rearing environment and children's behavioral problems from risk and safe factors perspectives. Several risk factors in the family context during the development of a child's behavioral problem have been clarified.

Research showed that most children with somatic complaints and somatization disorders are from inconstant families and display misbehavior (Craig et al., 1993; Bolghan-Abadi et al., 2011). An important study also documented that children born to low-income families have significantly higher initial levels of behavioral problems than peers from moderate and high-income families. Among children from low-income families, those exposed to changes in family structure (from a two-biological-parent to single-parent family) showed higher levels of behavioral problems (Ryan et al., 2015). Additionally, family structure changes have shown similar negative effects, in that children came from single parent family or having experienced the parents' divorce had a higher risk in participating in problem behaviors (Garwick, 1996).

Schreyer-Mehlhop and Petermann (2011) stated that punishing parenting behavior was associated with children's behavior problems, while positive parenting behavior was correlated with prosocial behavior. Zuckerman et al. (1987) and Tiesler and Heinrich (2014) also demonstrated that persistent sleep problems and

prenatal nicotine exposure are tied to behavioral problems in children.

On the other hand, the family context can also function as a protective factor. Children from families with higher cohesion had fewer internalizing and attention problems, and this relationship was stable from preschool to school age (Lucia and Breslau, 2006).

Cumulative body of studies strongly suggests that the fathers' involvement in child-rearing is associated with reduced behavioral and psychological problems among children, allowing them to gain better educational achievement and positive personal development (Allen and Daly, 2007; Jorosi-Tshiamo et al., 2013). For example, shared parent-child book reading is an enduring aspect of home literacy that contributes to young children's development of language and early literacy skills (Han and Neuharth-Pritchett, 2014).

The development of adolescent self-regulation can be related to peer and friend relationship quality characteristics and related research shows that young adults who are better emotion self-regulators tend to be more sensitive to others and engage in more prosocial activities (Farley and Kim-Spoon, 2014).

In summary, the findings mentioned above suggest that behavioral problems will have a negative effect on children's later

physical and mental development. For preschool aged children, the home environment plays an important role affecting their behavioral development.

Although various previous studies explored the associations between family and children's behavioral problems using cross-sectional and longitudinal designs, most of them focused on social status, ethnicity, maternal factors, and so forth. Only a mere handful of studies focused on the home-rearing environment, specifically the association between child-rearing environment and children's behavioral problems. Therefore, the aim of the current study was to examine the influence of home-rearing environment on children's behavioral problems 3 years later. It was hypothesized that a positive home-rearing environment would have a positive influence on children's behavioral problems 3 years later.

2. Methods

2.1. Design

The current study was a secondary data analysis with a 3-year longitudinal prospective cohort design using the data from a cohort study named "Community Empowerment and Care for Well-being and Healthy Longevity: Evidence from Cohort Study" (CEC).

Beginning in 1991, conducted in the T village, the CEC Study sought to investigate factors associated with well-being and healthy longevity, with the goal of creating a health-promoting program that would maximize quantity and quality of life for residents. The field of study was a typical community in a suburban area of Japan with a population of almost 5,000. All of the residents were invited to participate and all agreed. Follow-up studies were conducted to investigate factors associated with longevity and life satisfaction. The goal was not just increased longevity but specifically to empower residents in the community to become educated about their own health, to both create and take advantage of options and resources for improving and maintaining their physical and emotional health, so that they could ultimately take charge of their own health choices and activities. The process goal was also to engage them in the inter-generational

empowering process of designing and building community-based resources that they could use in the service of increasing the quantity and quality of their lives.

2.2. Participants

In the current study, 104 caregivers from T village Japan with preschool aged children participated in the baseline year 2011. After the 3-year follow-up, 4 children were excluded due to uncompleted data in the Strengths and Difficulties Questionnaire, 1 child was excluded because of a speaking problem. Therefore, the final available data for analysis consisted of 99 healthy children and their caregivers and the response rate was 95.2 percent.

2.3. Measures

In the current study, the baseline survey was divided into two parts: 1) demographic information was collected, such as age, gender, siblings, and family structure; 2) the home-rearing environment was evaluated using the Index of Child Care Environment (ICCE) for caregivers. The three-year follow-up also contained two parts: 1) demographic information was collected, including age, gender, siblings, and family structure; 2) behavioral problems were evaluated using the Strengths and Difficulties

Questionnaire (SDQ) answered by caregivers. The method used to collect data in the current study was the placement method. Questionnaires were taken to each caregiver's house by volunteers both in the baseline survey and the follow-up survey. Two weeks later, the volunteers went to collect all the questionnaires.

The Index of Child Care Environment (ICCE). This instrument measured home rearing (Anme et al., 2013). It consists of four aspects, which include "human stimulation," "social stimulation," "avoidance of restriction," and "social support."

For five items in "human stimulation," three items in "social stimulation," and the item "talking with spouse about child," response ranges were measured with a five-point scale (1 = rarely, 2 = 1-3/month, 3 = 1-2/week, 4 = 3-4/week, 5 = almost every day). For the item "appropriate response to mistakes" (what will you do if your child spills the milk on purpose?), response ranges were measured with a four-point scale (1 = slap or hit the child, 2 = scold the child, 3 = discipline in another way, 4 = think of other ways how the child can avoid spilling milk). For the item "punishment" (how many times did you slap your child last week?), response ranges were measured with a five-point scale (1 = never, 2 = 1-2 times, 3 = 3-4 times, 4 = 5-6 times, 5 = almost every day). For two items "support for childcare" and "have a consultation," response ranges

were measured in a binary manner (1 = no, 2 = yes).

The Index of Child Care Environment shows a high correlation with the Home Observation for Measurement of the Environment (HOME), which has been used worldwide in research assessing home environment. This supports the notion that the ICCE is an established, valid screening instrument, given the positive correlations observed between ICCE and child development by previous studies (Anme et al., 2013).

The Strengths and Difficulties Questionnaire (SDQ). The SDQ measured the children's behavioral problems and is a brief behavioral screening questionnaire, which includes 25 items divided into five subscales of five items each. The scale assesses: conduct problems, hyperactivity/inattention, emotional symptoms, peer relationship problems, and prosocial behavior.

Each item can be marked "not true," "somewhat true," and "certainly true." For all of the items except "generally obedient, usually does what adults request," "thinks things out before acting," "sees tasks through to the end, good attention span," "has at least one good friend," and "generally liked by other children," the items are scored 0 for "not true," 1 for "somewhat true," and 2 for "certainly true." The remaining five items are scored 2 for "not true," 1 for "somewhat true," and 0 for "certainly true."

The score for each subscale is generated by summing the total scores for the five items comprising that subscale, thereby generating a subscale score ranging from 0 to 10. The scores for conduct problems, hyperactivity/inattention, emotional symptoms, and peer relationship problems can be summed as total difficulties score (TDS) ranging from 0 to 40. Higher scores represent more behavioral problems.

The Japanese translation of the SDQ proved to be as reliable and useful as the original English questionnaire (Doi et al., 2014), and the parent version of the SDQ is a reliable instrument to evaluate children's behavioral problems (Becker et al., 2004). Furthermore, the parents are more informed about any problems with their child's behavior in different environments than what we would expect from the teachers. Although teachers are aware of what happens in school, they might not be aware of what happens in the child's home or with friends (Kristoffersen and Smith, 2013). Thus, in the current study, the parent-rated Japanese version of the SDQ was used to assess children's behavioral problems 3 years later.

2.4. Statistical analysis

2.4.1. Value assignment

In the current study, the subjects were divided into 2 groups: the

normal and risk group both in the ICCE and SDQ. In the ICCE, those who selected rarely in each item were classified as the rarely group; the other selections were classified as the over 1-3 times/month group.

In terms of the responses, a 10% cut-off percentile (measured from the negative region of the spectrum) depending on the distribution of each subscale was used in the SDQ.

2.4.2. Data analysis

The Statistical Analysis System (version 9.1) was used for all statistical analyses. Fisher's exact test was used to examine the potentially related factors for five aspects of children's behavioral problems. Finally, multiple logistic regressions were performed to examine the relationships between children's behavioral problems and home-rearing environment. Only the factors that met the statistical significance level in Fisher's exact test were put into the multiple logistic regression models. The independent variable was the home-rearing environment in the baseline year. The dependent variable was the children's behavioral problems three years later. Gender, age, family structure, and siblings in the baseline year were selected as control variables. P-values less than 0.05 were considered to be statistically significant.

2.5. Ethical considerations

The current study was authorized by the ethics committee of the University of Tsukuba. The data used in the current study included no identifiable information about the 99 participants. All the caregivers and their children agreed.

3. Results

3.1. Sample characteristics

A total of 99 caregivers and preschool aged children pairs took part in the current study. Table 1 shows that the distribution of boys (54, 54.5%) and girls (45, 45.5%) was fairly even, and the majority of the children were from extended families.

Table 1

Demographic background in baseline year

n = 99			
Items	Category	n	%
Age of child (years)	3	26	26.3
	4	39	39.4
	5	34	34.3
Gender of child	Girl	45	45.5
	Boy	54	54.5
Sibling	Single child	16	16.2
	Having siblings	83	83.8
Family structure	Nuclear family	35	35.4
	Extended family	64	64.6

3.2. Factors associated with behavioral problems in preschool aged children

The Fisher's exact test confirmed that the associations between some individual characteristics (gender, age, family structure) of preschool aged children and behavioral problems were not evident in the current study. Table 2 shows the associations between demographic characteristics and behavioral problems three years later. Table 3 shows the associations between 13 items and behavioral problems three years later

Table 2

The associations between demographic characteristics and behavioral problems three years later

		n=99															
Items	Categories	Conduct problems					Hyperactivity					Emotional symptoms					
		Total	Risk Group		Normal Group		P	Risk Group		Normal Group		P	Risk Group		Normal Group		P
			n	%	n	%		n	%	n	%		n	%	n	%	
Age of child (years)	3	26	2	7.7	24	92.3		3	11.5	23	88.5		1	3.9	25	96.2	
	4	39	4	10.3	35	89.7	0.873	2	5.1	37	94.9	0.637	6	15.4	33	84.6	0.321
	5	34	4	11.8	30	88.2		3	8.8	31	91.2		5	14.7	29	85.3	
Gender	Boy	54	6	11.1	48	88.9	0.752	7	13.0	47	87.0	0.068	3	5.6	51	94.4	0.034
	Girl	45	4	8.9	41	91.1		1	2.2	44	97.8		9	20.0	36	80.0	
Siblings	Single child	16	1	6.3	15	93.8	1.000	1	6.3	15	93.8	1.000	3	18.8	13	81.3	0.405
	Having siblings	83	9	10.8	74	89.2		7	8.4	76	91.6		9	10.8	74	89.2	
Family structure	Nuclear family	34	5	14.7	29	85.3	0.305	3	8.8	31	91.2	1.000	7	20.6	27	79.4	0.101
	Extended family	65	5	7.7	60	92.3		5	7.7	60	92.3		5	7.7	60	92.3	
		Peer relationship problems					Prosocial behavior					TDS					
		Total	Risk Group		Normal Group		P	Risk Group		Normal Group		P	Risk Group		Normal Group		P
			n	%	n	%		n	%	n	%		n	%	n	%	
Age of child (years)	3	26	2	7.7	24	92.3		1	3.9	25	96.2		1	3.9	25	96.2	
	4	39	4	10.3	35	89.7	0.873	1	2.6	38	97.4	0.451	3	7.7	36	92.3	0.533
	5	34	4	11.8	30	88.2		3	8.8	31	91.2		4	11.8	30	88.2	
Gender	Boy	54	6	11.1	48	88.9	0.752	4	7.4	50	92.6	0.373	6	11.1	48	88.9	0.286
	Girl	45	4	8.9	41	91.1		1	2.2	44	97.8		2	4.4	43	96.6	
Siblings	Single child	16	5	31.3	11	68.8	0.009	1	6.3	15	93.8	1.000	2	12.5	14	87.5	0.612
	Having siblings	83	5	6.0	78	94.0		4	4.8	79	95.2		6	7.2	77	92.8	
Family structure	Nuclear family	34	4	11.8	30	88.2	0.733	2	5.9	32	94.1	1.000	3	8.8	31	91.2	1.000
	Extended family	65	6	9.2	59	90.8		3	4.6	62	95.4		5	7.7	60	92.3	

Table 3

The associations between 13 items and behavioral problems three years later

Items	Categories	Conduct problems						Hyperactivity						Emotional symptoms					
		Total	Risk Group		Normal Group		P	Total	Risk Group		Normal Group		P	Total	Risk Group		Normal Group		P
			n	%	n	%			n	%	n	%			n	%	n	%	
Play with child (n=99)	Rarely	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	
	Over 1-3 times/month	99	10	10.1	89	89.9		8	8.1	91	91.9		12	12.1	87	87.9			
Read to child (n=99)	Rarely	14	0	0.0	14	100.0	0.349	1	7.1	13	92.9	1.000	0	0.0	14	100.0			0.207
	Over 1-3 times/month	85	10	11.8	75	88.2		7	8.2	78	91.8		12	14.1	73	85.9			
Sing songs together (n=98)	Rarely	22	1	4.6	21	95.5	0.449	1	4.6	21	95.5	0.679	0	0.0	22	100.0			0.063
	Over 1-3 times/month	76	9	11.8	67	88.2		7	9.2	69	90.8		12	15.8	64	84.2			
Eat meals together (n=98)	Rarely	4	1	25.0	3	75.0	0.355	0	0.0	4	100.0	1.000	0	0.0	4	100.0			1.000
	Over 1-3 times/month	94	9	9.6	85	90.4		8	8.5	86	91.5		11	11.7	83	88.3			
Talk with spouse (n=98)	Rarely	5	1	20.0	4	80.0	0.423	1	20.0	4	80.0	0.353	1	20.0	4	80.0			0.487
	Over 1-3 times/month	93	9	9.7	84	90.3		7	7.5	86	92.5		11	11.8	82	88.2			
Go shopping together (n=99)	Rarely	4	1	25.0	3	75.0	0.351	0	0.0	4	100.0	1.000	1	25.0	3	75.0			0.409
	Over 1-3 times/month	95	9	9.5	86	90.5		8	8.4	87	91.6		11	11.6	84	88.4			
Go to park together (n=98)	Rarely	18	0	0.0	18	100.0	0.200	0	0.0	18	100.0	0.345	3	16.7	15	83.3			0.690
	Over 1-3 times/month	80	10	12.5	70	87.5		8	10.0	72	90.0		9	11.3	71	88.8			
Visit friends or relative (n=98)	Rarely	18	3	16.7	15	83.3	0.385	3	16.7	15	83.3	0.160	2	11.1	16	88.9			1.000
	Over 1-3 times/month	80	7	8.8	73	91.3		5	6.3	75	93.8		10	12.5	70	87.5			
Response to mistakes (n=84)	Hit the child	4	1	25.0	3	75.0	0.335	2	50.0	2	50.0	0.044	1	25.0	3	75.0			0.370
	Other ways	80	7	8.8	73	91.3		6	7.5	74	92.5		8	10.0	72	90.0			
Punishment (n=97)	Over 1-3 times/month	50	7	14.0	43	86.0	0.320	5	10.0	45	90.0	0.716	8	16.0	42	84.0			0.359
	Never	47	3	6.4	44	93.6		3	6.4	44	96.3		4	8.5	43	91.5			
Over 2 people help in childcare (n=96)	No	10	1	10.0	9	90.0	1.000	1	10.0	9	90.0	0.549	3	30.0	7	70.0			0.109
	Yes	86	8	9.3	78	90.7		6	7.0	80	93.0		9	10.5	77	89.5			
Have a consultation (n=97)	No	4	0	0.0	4	100.0	1.000	0	0.0	4	100.0	1.000	0	0.0	4	100.0			1.000
	Yes	93	10	10.8	83	89.3		8	8.6	85	91.4		12	12.9	81	87.1			
Support for childcare (n=97)	No	0	0	0.0	0	0.0		0	0.0	0	0.0		0	0.0	0	0.0			
	Yes	97	10	10.3	87	89.7		8	8.3	89	91.8		11	11.3	86	88.7			

Items	Categories	Peer relationship problems						Prosocial behavior						TDS					
		Total	Risk Group		Normal Group		P	Total	Risk Group		Normal Group		P	Total	Risk Group		Normal Group		P
			n	%	n	%			n	%	n	%			n	%	n	%	
Play with child (n=99)	Rarely	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	
	Over 1-3 times/month	99	10	10.1	89	89.9		5	5.1	94	95.0		8	8.1	91	91.9			
Read to child (n=99)	Rarely	14	1	7.1	13	92.9	1.000	1	7.1	13	92.9	0.541	0	0.0	14	100.0			0.596
	Over 1-3 times/month	85	9	10.6	76	89.4		4	4.7	81	95.3		8	9.4	77	90.6			
Sing songs together (n=98)	Rarely	22	4	18.2	18	81.8	0.225	3	13.6	19	86.4	0.073	1	4.6	21	95.5			0.679
	Over 1-3 times/month	76	6	7.9	70	92.1		2	2.6	74	97.4		7	9.2	69	90.8			
Eat meals together (n=98)	Rarely	4	1	25.0	3	75.0	0.324	1	25.0	3	75.0	0.192	0	0.0	4	100.0			1.000
	Over 1-3 times/month	94	8	8.5	86	91.5		4	4.3	90	95.7		8	8.5	86	91.5			
Talk with spouse (n=98)	Rarely	5	0	0.0	5	100.0	1.000	1	20.0	4	80.0	0.235	1	20.0	4	80.0			0.326
	Over 1-3 times/month	93	10	10.8	83	89.3		4	4.3	89	95.7		7	7.5	86	92.5			
Go shopping together (n=99)	Rarely	4	1	25.0	3	75.0	0.351	0	0.0	4	100.0	1.000	1	25.0	3	75.0			0.290
	Over 1-3 times/month	95	9	9.5	86	90.5		5	5.3	90	94.7		7	7.4	88	92.6			
Go to park together (n=98)	Rarely	18	2	11.1	16	88.9	1.000	1	5.6	17	94.4	1.000	0	0.0	18	100.0			0.345
	Over 1-3 times/month	80	8	10.0	72	90.0		4	5.0	76	95.0		8	10.0	72	90.0			
Visit friends or relative (n=98)	Rarely	18	5	27.8	13	82.2	0.017	4	22.2	14	77.8	0.004	5	27.8	13	72.2			0.005
	Over 1-3 times/month	80	5	6.3	75	93.8		1	1.3	79	98.8		3	3.8	77	96.3			
Response to mistakes (n=98)	Hit the child	4	0	0.0	4	100.0	1.000	1	25.0	3	75.0	0.180	2	50.0	2	50.0			0.044
	Other ways	80	9	11.3	71	88.8		3	3.8	77.0	96.3		6	7.5	74	92.5			
Punishment (n=97)	Over 1-3 times/month	50	5	10.0	45	90.0	1.000	3	6.0	47	94.0	1.000	4	8.0	46	92.0			1.000
	Never	47	5	10.6	42	89.4		2	4.3	45	95.7		4	8.5	43	91.5			
Over 2 people help in childcare (n=96)	No	10	1	10.0	9	90.0	1.000	0	0.0	10	100.0	1.000	2	20.0	8	80.0			0.155
	Yes	86	9	10.5	77	89.5		4	4.7	82	95.4		5	5.8	81	94.2			
Have a consultation (n=97)	No	4	1	25.0	3	75.0	0.358	0	0.0	4	100.0	1.000	1	25.0	3	75.0			0.295
	Yes	93	9	9.7	84	90.3		5	5.4	88	94.6		7	7.5	86	92.5			
Support for childcare (n=97)	No	0	0	0.0	0	0.0		0	0.0	0	0.0		0	0.0	0	0.0			
	Yes	97	9	9.3	88	91.7		5	5.2	92	94.9		8	8.3	89	91.8			

As indicated in Table 2 and Table 3, having a sibling or not is significantly associated with a child's peer relationship problems ($P = 0.009$). "Response to mistake" was found to be significantly associated with the hyperactivity/inattention subscale ($P = 0.044$)

and the TDS ($P = 0.044$). "Go to visit friend's house" was found to be significantly associated with peer relationship problem ($P = 0.017$), prosocial behavior problem ($P = 0.004$), and the TDS ($P = 0.017$).

3.3. Multiple logistic regression analysis: factors contributing to behavioral problems of preschool aged children

Tables 4-7 indicate the results from the multiple logistic regression analyses after controlling for age, gender, sibling, and family structure in the baseline year.

Table 4 presents the association between "go to visit friend's house" and peer relationship problem. In particular, this means that according to the peer relationship problem subscale, children who rarely have a chance to visit a friend's house have 8.41 fold higher odds of peer relationship problems (95%CI: 1.69-41.88) than children who regularly visit their friend's house. Furthermore, a single child has an 12.20 fold higher odds (95%CI: 2.27-65.65) for peer relationship problem than children who have a sibling.

Table 4

Association between visit friend's house and peer relationship problem subscale

n = 98				
Variables	OR	95% CI		P
Rarely visits a friend's house	8.41	1.69	41.88	0.009
Age of child (years)	1.46	0.55	3.92	0.449
Sibling	12.20	2.27	65.65	0.004
Gender	0.67	0.15	3.13	0.613
Family structure	2.30	0.48	11.02	0.297

Table 5 indicates that “go to visit friend’s house” was significantly associated with the TDS (RR= 10.43, 95% CI: 2.06–52.87). Children who have fewer chances to visit a friend’s house have 10.43 fold higher odds compared with others in total difficulties.

Table 5

Association between visit friend’s house and total difficulties score

n = 98				
Variables	OR	95% CI		P
Rarely visits a friend's house	10.43	2.06	52.87	0.005
Age of child (years)	1.97	0.65	6.02	0.233
Sibling	0.35	0.05	2.52	0.296
Gender	0.38	0.07	2.25	0.287
Family structure	1.57	0.28	8.84	0.608

Table 6-7 indicate that no significant associations were found between related subscales.

Table 6

Association between response to mistake and

hyperactivity/inattention

				n=84
Variables	OR	95% CI		<i>P</i>
Response to mistake	17.92	1.36	236.00	0.03
Age of child (years)	0.61	0.20	1.84	0.38
Sibling	1.41	0.14	14.15	0.77
Gender	0.16	0.02	1.49	0.11
Family structure	0.71	0.13	4.06	0.70

Table 7

Association between visit friend's house and prosocial behavior subscale

				n=98
Variables	OR	95% CI		<i>P</i>
Rarely visits a friend's house	23.10	2.26	236.49	0.01
Age of child (years)	2.01	0.48	8.45	0.34
Sibling	0.44	0.03	6.86	0.55
Gender	0.33	0.03	3.53	0.36
Family structure	1.72	0.19	15.83	0.63

4. Discussion

Multiple previous studies have explored the associations between family environment and a child's behavioral problems. In the current 3-year follow-up study, the association between home-rearing environment and children's behavioral problems was examined. The results suggested that social stimulation and avoidance of restriction have effects on children's behavioral problems, such as hyperactivity and peer relationship problem.

4.1 Social isolation and children's behavioral problems

The lack of opportunity to visit a friend's house indicates that both the caregivers and children have poor communication and few friends in their social contacts. A previous study suggested that having friends may play an important role in protecting children against the debilitating cycle of isolation and maladjustment (Laursen et al., 2007). The fewer friends that mothers have, the lonelier they will feel during their child-rearing (Baba et al., 2012).

Social isolation concerns the objective characteristics of a situation and refers to a lack of social relationship with other people (De Jong Gierveld et al., 2006); it is associated with poor social and emotional functioning in preschool, and is further directly associated with prosocial skills development and emotional

symptoms, the development of peer relationships, and the skills to successfully negotiate these early childhood relationships, which are also associated with other areas of social and emotional functioning (Marryat et al., 2014).

4.2. Social isolation and caregiver's mental health

The current study was implemented as a longitudinal study of children in T village. The SDQ have parents-rated version, teacher-rated version and self-rated version (Youth in mind, 2013), and they are proved to be of validity and reliability (Stone et al., 2010). In the current study, SDQ was completed by the caregivers, in contrast to many previous studies, which required the children themselves to complete the questionnaire. It is an advantage that the caregivers live with the children and understand them much better than the children themselves at their age; furthermore, they can observe the children from an adult perspective.

As the SDQ was completed by the caregivers, considering the unique housewife culture in Japan, the caregivers spent most of their time with their children in the daily life, and also stimulated by the same home-rearing environment, so it not only assessed the children's difficulties but also reflected the caregivers' problems. Thus, the results not only indicated that the children who rarely

have a chance to visit a friend's house are more likely to have a higher risk than others in peer relationship problems and total difficulties, but also suggested that their caregivers have difficulties in social interaction and are in emergent need of childcare support from the community due to lack of social communication. Social support was defined as "the degree to which a person's basic social needs are gratified through interaction with others" (Thoits, 1982). The mothers of preschool age children with low spousal and community support—the main two components of social support—tend to exhibit high levels of anxiety, depression, anergia, and distress (D'Arcy and Siddique, 1984). A previous study suggested that following the intervention from a social support service, both children and their families presented with significant improvement in some areas, such as child behavior and family interaction (Anderson et al., 2005).

4.3. Demographic factors

Even though previous studies suggested that family structure and gender are related to children's behavioral problems, these two factors did not show any significant association with SDQ in the current study. The current study was conducted in an area that is famous for its superior facility service. In the Sukoyaka center,

children and older people can swim together in the pool and regular activities are held in the Sukoyaka center to promote communication between children and older people. Therefore, even though 34.3% of the children are from nuclear families, they still have many chances to communicate with people from different ages. Thus the family structure did not influence very much in the current study.

Bongers (2004) stated that boys are more likely to display troublesome behavior and conduct problems than girls. However, the association was not evident in the current study, the lack of statistically significant results in the current study could be due to the limited sample size. If gender is a predictive factor in the current study, with a larger sample size and a continual follow-up period, significant associations might have been emerged.

Additional factors that previous studies pointed out to be associated with children's behavioral problems, such as economic status of the family or caregivers' educational background, were not available in the current study. Further study with more comprehensive assessments including these factors is needed in the future.

4.4. Limitations

The interpretation of the results should take into account the following limitations. Firstly, only one suburban area was investigated; therefore, a wider geographical survey should be conducted in the future.

Secondly, the current study was designed as a 3-year longitudinal study. However, the influence of the home-rearing environment on behavioral problems may not be apparent after an interval of only 3 years; a continual follow-up is therefore warranted.

Thirdly, the current study generally provided wide confidence intervals, and the limited sample size can be considered as main reason.

Finally, in the current study, only data from preschool aged children were collected in the baseline year, therefore, implications for practice need careful consideration.

4.5. Originality

The originality of the current study can be summarized as twofold: Firstly, many previous studies examined the association between home environment and children's behavior problems and put emphasis on the caregivers' mental health status or harmony and stability of the family environment. However, in the current study, a specific assessment of the home-rearing environment,

which focused on the child-rearing behaviors throughout daily life was applied. This will provide a daily child-rearing guidance to caregivers in order to prevent future behavioral problems. Secondly, all the caregivers with preschool aged children participated in the current study.

Acknowledgments

We are deeply grateful to Mr. Kuno (Mayor of Tobishima), Mr. Hattori (Deputy Mayor), and all the research participants and staff.

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