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Effectiveness of Japan's extended/night child care: A five-year follow up

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Abstract

Background: With increasing numbers of women joining the evening/nighttime and extended-hour workforce, there is a need for quality childcare during these hours.

Methods: This project, conducted in Japan, sought to compare the effects of expanded child-care on the development and adaptation of 185 young children after five years in care. Parents completed a survey on the childrearing environment at home, their feelings of self-confidence, and the presence of support for childcare. Childcare professionals evaluated the development of children.

Results: The results of multiple regression analysis indicate that factors in the home environment, not length of center-based care, explained developmental risks five years later.

Conclusion: High quality center-based childcare provides good condition of children's development after five years. For further evidence to study children's development, it is important to follow up to evaluate various features of longer duration.

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Keywords: Center-based childcare; cohort study; development; parenting.

1. Introduction

The increased number of working mothers in Japan has led to the dramatic expansion of center-based child night and extended-hour care. High-quality center-based night care is essential to provide a safe and comfortable environment for children whose parents are employed in long hours include the evening and night hours. Forty-one authorized night care facilities, centers that are licensed by the national government as meeting quality care standards, have been established since 1981, after the several highly publicized involuntary homicides (cases of neglectful death) in the existing low-quality "Baby Hotels." Baby Hotels are facilities that provide childcare

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services 24 hours-a-day for children from birth to seven years of age. With the continued shortage of authorized facilities, over 120,000 children use non-authorized, sub-standard Baby Hotels (Anme, 1996).

Quality of care must be considered if the effects of early childcare are to be understood [National Institute of Child Health and Human Development (NICHD), 1999a]. Children from higher-quality centers have been found to be less anxious and have less problematic transitions to school. However, in a longitudinal study, such positive effects of high quality center care facilities were not discernible among all children sampled at age 13 years (Andersson, 1992). NICHD (2001; 2002a) further found that the quality of maternal caregiving was the strongest predictor of development but that the quality of nonmaternal caregiving was also associated with children's development. Contrary to the NICHD's expectations, family risk factors were the strongest predictors of behavior problems, prosocial behavior, and language skills in another longitudinal study and there was limited evidence that child care experiences moderated the negative associations between family risk and the child outcomes under investigation (NICHD, 2002b).

A recent issue of *Child Development* [2003, Volume 47(4)] was devoted to articles assessing the correlation between child care and child development. The NICHD (2003) and Langlois and Liben (2003) identified three conclusions: (1) the cumulative quantity of child care during the first four years of life predicts some problematic behaviors of children between ages 4.5 and 5 years, but these behaviors were correlated with reports by parents and teachers, not with observed behaviors and were usually low to moderate, not large; (2) maternal sensitivity and family income were stronger predictors than quantity of care; and (3) the problem behaviors indicated were not at clinical levels.

Watamura, Donzella, Alwin, and Gunnary (2003) reported on some physiological correlates of child care, suggesting that toddlers in nonparental care may experience more stress by the afternoon hours than do those who are in maternal care, yet, that the effects of nonparental care may be mitigated by the quality of peer interaction they experience. Lamb (1996) reviewed the literature on the effects of nonparental care on children almost a decade ago and found that evidence was inconclusive and that nonparental care does not necessarily have either positive or detrimental effects on infants and children. The quality of the relationship between the care provider and the child substantially affects development. The findings of three different studies, one in Australia, another in Israel, and a third in the United States, were discussed by Love et al (2003) to highlight that quality of care, rather than quantity, was a better predictor of children's outcomes, and in fact, when children are in non parental child care, parents compensate by increasing the intensity and amount of attention they devote to their children when they are together (Ahnert & Lamb, 2003). On a different note, Crockenberg (2003) suggests that is not only the quality and quantity of care a child receives (either parental or nonparental) but also a child's temperament and gender, including its tolerance for stress, that influence its development.

As the literature citations indicate, much of the study of child development in light of center-based child care has occurred in Western countries. Less is known about it in other countries such as Japan. Furthermore, traditionally, in Western countries, children are placed in nonparental care for between eight and ten hours during the workday. Despite the need for child care for children after 6:00 pm, there are few, if any, facilities that provide this service in most nations. Japan has responded to the need of working mothers, many of whom work long hours or during the nighttime hours, by establishing governmentally authorized night care facilities. This formalization of center-based night care is rare in nations outside Japan. Even in Japan, few studies have assessed the influence of center-based night care on child development (Anme, 1998). This study sought to identify correlations between (1) extended-hour center-based, including night, care and young children's social competence, vocabulary/motor/intelligence development, and (2) the childrearing environment provided by parents and children's development after two years in care.

2. Methods

2.1. Participants

All authorized child-day-care and child-night-care centers across Japan participated in the study. Centers unauthorized by the government were excluded as they often do not cooperate with external investigators. The subjects were all parents and service providers in the authorized facilities. Parents were surveyed regarding the

home environment, and service providers evaluated the development of each child in the facility. The baseline return rate was 74.6% for a return of 1,957 completed questionnaires for parents and service providers for 648 children between the ages of 0-6 years). Five years later, only 185 of the 648 child-parent dyads were available or appropriate for study. Children, who at time one were between the ages of 3-6 years, had graduated out of the child care system and were not accessible. Of the 310 children who at baseline were between the ages of 0-2, 185 were still associated with the child care facilities that served as the setting for the study after five years later and were potential subjects for study. The remaining 125 children had either relocated with their families or were identified by physicians as having medical (cognitive or physical) disabilities and were excluded from the study. Parents and caregivers of children with disabilities were excluded from this second analysis as the needs and outcome measures of the children with disabilities differed substantially from those of children without disabilities. There was no refusal to participate, and there were not drop-outs. This is not unusual in Japan where the pervasive culture is of cooperation, particularly with studies conducted by people with an established record (or recognized) expertise or legitimate, formal authority. The final usable set of follow-up responses was 185, substantially lower than would have been preferred, yet sufficiently large to provide some meaningful findings.

Table 1 provides the gender and age composition of the child population that was evaluated and the occupations of the parents. The distribution of boys, 100 (54.1%), and girls, 85 (45.9%), was fairly even. The largest number of children was one year of age at baseline time [91 (49.2%)], with 30 (16.2%) being one year and 64 (34.6%) being two years of age.

3. Measures

Indicators of child-care quantity (length of time in care), stability (regularity of attendance—regular or irregular), and type (normal vs. long) along with measures of family background [socioeconomic status (determined by requirement to pay income tax), family composition], the child's demographic characteristics, and child adaptation to center-based care (willingness to go to center-based care) were obtained from questionnaires completed by the parents responsible for the children in the first six years of their lives. Parents completed Japanese versions of questionnaires on the child-rearing environment (HOME, Caldwell & Bradley, 1984, J-HOME, Anme, 1991; 1996) and on self confidence (regarding ability to adequately parent) and support for childcare (Anme, 1995). Self confidence was evaluated by parental response on the item "I am convinced of my capability to provide quality childcare." Support for childcare was determined by whether they reported assistance from a spouse or others.

Childcare professionals evaluated children's social competence, communication, and development in vocabulary/motor/intelligence for each child in 1998 and again in 2003 using developmental scales standardized in Japan (Tumori, 1974). This scale was standardized in Japan and identified that 10% of all Japanese children were below the normal level of cognitive development for their age group.

The social competence subscale includes items such as, "ability to respond appropriately to others' behavior" at 11 months and, "cooperatively playing in building a sand castle" at 56 months. The communication subscale includes items such as, "smiles in response to caregiver's voice" at 4 months, "takes a particular role in playing 'house'" at 36 months, etc. The vocabulary subscale includes "is able to say at least one word" at 12 months, and "follows story telling" at 60 months, etc. The motor subscale includes "is able to walk without assistance" at 14 months, "is able to draw an 'X'" at 45 months, etc. The intelligence subscale includes "understands 'eyes,' 'mouth,' 'nose' etc" at 21 months and can "count to three" at 42 months.

All childcare professionals, already qualified in child development, were provided with a minimum of eight hours of training to translate children's development into the measures indicated on the child development scale. These variables, selected to be consistent with earlier studies by the NICHD (1999a), were then used to explore the relationship between length of care and child development.

The two categories of childcare were identified by the time at which children left the center-based care: "normal care" (use of center-based care for under 11 hours), and "extended care" (use of center-based care for 11 hours or more). Of the 185 subjects, 157 (84.9%) were enrolled in "normal care," and 28 (16.1%) in "extended care".

Family and child variables included the child's gender and age, child development along the Tumori (1974) scale, the child rearing environment at home, the caregiver's self confidence regarding care, and the existence of childcare support. Professional caregivers measured child development along six variables (gross and fine motor, social competence, communication, vocabulary, and intelligence development) that were categorized into 2-point

items [(normal, delayed) Tumori, 1974]. Table 2 indicates the number of children whose development was evaluated by service providers as being delayed. Service providers in the center-based childcare facilities also identified the health and disabilities of the children based on descriptions by physicians. As indicated earlier, children with disabilities were excluded from the data analysis.

The child rearing environment was assessed based on parental responses (yes/no) to activities in the home environment. These included the four categories of (1) “intellectual stimulation” (which assessed whether parents interacted with the child in a manner that could stimulate development), (2) “use of discipline” (with discipline being appropriate response to the child’s behavior and punishment being less appropriate), (3) “social stimulation” (that encouraged activities with others), and (4) “support” (support from spouse or others for child care). Table 3 describes correlations between parental responses regarding the child rearing environment and children’s development.

In addition, caregivers’ self reports on the five-point scale, (where 1=always, 2=often, 3=sometimes, 4=rarely, 5=never) measured parental self confidence regarding their child caring abilities (Anme, 1998). For analysis, the 25th percentile point was used as a cut-off for non-nominal items. Of the 185 respondents, 84 (45.4%) were not confident about their abilities in caring for the children. Finally, adaptation for center based care was evaluated by service providers based on whether the child was acclimatized to the center based environment using yes or no response options. In the service providers’ assessment, only four (2.2%) of the children had not adjusted to being in center based care.

4. Results

The difference between the two categories of care (“normal” and “extended”) was examined by using items of child development, positive qualities in parental behavior, parent efficacy for care, and existence of care support. The Statistical Analysis System (SAS) statistical package was used for analysis. Multiple regression analysis was used to predict child development (delayed, or normal) and child adaptation to center-based care (adapted or not) after five years with independent variables such as types of care (“long care” or else), positive qualities of parents’ behavior (13 items), parent self confidence regarding care, and existence of support for child care. An odds ratio was calculated to clarify the magnitude of effects. The odds ratio was calculated by multiple logistic analyses to estimate the strength of relations. All results that were assessed significant at the $p < .01$ or $p < .05$ level, however, the variable “type of care” was not always selected as a related variable in all analyses. Tables 2 report the number of children who were developmentally delayed five years after baseline.

As indicated in Table 4, logistic analysis, which excluded the effects of age and gender, was employed to explain child development five years after baseline. Length of time in center-based care was not significantly related to children development, however, a few correlations were evident based on the child’s home environment. Gross motor development five years later was significantly positively related to children eating at least one meal a day with their parents (odds ratio 14.6, $p < .05$). Fine motor development was positively related to whether parents had someone with whom to consult [resource for guidance and advice (5.4, $p < .05$)] as was social competence (24.1, $p < .05$). The development of communication skills five years later was significantly related to having the opportunity to go to the grocery store with parents (18.3, $p < .05$). Interestingly, the only variable with which adaptation five years later was significantly related was whether parents had someone with whom to consult (5.8, $p < .05$).

In addition, a multiple logistic regression analyses, input all factors in the following categories: (1) demographic variables, (2) the child rearing environment, (3) parental self-confidence in child rearing abilities, and (4) adaptation to care, as well as (5) age at entry into center-based care and (6) length of time daily in center-based care. This logistic analysis revealed that neither age at entry into center-based care nor length of time in care on a daily basis (< 11 hours or ≥ 11 hours) was correlated with gross or fine motor development, social competence, communication, or vocabulary or intellectual development. However, an absence of a consultative resource for parents was significantly correlated with risks to fine motor development five years later (odds ratio 115.7, $p \leq .05$, $r = 4.75$). Eating at least one meal daily with parents was significantly correlated with social competence (75.0, $p \leq .05$, $r = 4.32$) and with intelligence development (43.7, $p \leq .05$, $r = 3.78$) five years later.

5. Discussion

Center-based extended-hour care through midnight is unique in Japan, reflecting the increase in the number of parents who work late into the night. This investigation explored the influence of extended-hour center-based care (11 hours or more of care per day, including night care), in comparison to normal care (less than 11 hours). In Japan, the usual length of time parents leave their children in center-based child care is between 10 and 11 hours. Thus, the government has defined “extended” care as being 11 hours or over. The aim of this project was to determine whether there were significant differences in the development of children based on the length of time (either “usual” or “extended”) they were in center-based care. All night care centers in this study had passed governmental standards and attempted to ensure that the natural circadian rhythms for children, such as sleeping, eating, and playing, were well maintained.

This is the first nation-wide study of center-based care that focuses on the effects of extended-hour care, including night care, and that assesses child development and adaptation based on the complex relations among factors, including the quality of parent behavior. Several relatively recent large-scale, center-based childcare studies conducted outside Japan have documented relations between early and/or extensive childcare experience, noncompliance, and problem-behavior, even after controlling for selection effects (Bates et al., 1994; Baydar & Brooks-Gunn, 1991; Belsky & Eggebeen, 1991; Borge & Melhuish, 1995; Park & Honig, 1991; Vandell & Corasaniti, 1990). Divergent results emerged from the current investigation, which found little evidence that the amount of time children spent in non-parental care in the first 2 or 3 years of life is, in and of itself, systematically related to children's self-control, compliance, or problem behavior by age three years.

In light of prior studies and contemporary theory about the complex ecology of child development, the general absence of strong or consistent effects of the variable “type of care,” by itself, may not be surprising. The compensatory-process, and lost-resource perspectives outlined in the introduction led to the anticipation of findings that highlight interactions between quality and quantity of care and child development more than main effects of the length of center-based care. Although quality was the most consistent predictor of child development, the amount of explained variance was modest, and standardized regression coefficients never exceeded 0.26 in the cumulative-experience analysis and/or 0.16 in the lagged-and-concurrent analysis.

On the basis of analyses employed to identify selection-effect variables, several of the caregivers’ and family characteristics that distinguished between families that participated in this study, and those who did not, may be systematically related to childcare quality. Nevertheless, the high rate of return and the highly homogeneous nature of Japanese society may minimize these effects. That the home environment was more strongly related to child development and adaptation than was length of center-based care is consistent with results of prior examinations of the effects of childcare on infant-mother attachment (NICHD, 1998b) and child development (Langlois & Liben, 2003). The principal conclusion of this large-scale, multisite research project is that child rearing behavior by the caregiver may be more important in explaining children's early social, vocational, motor and intelligence development and adaptation than whether parents routinely use the services of high quality center-based care facilities or the length of time children spend in these facilities. Items strongly related to child development, such as “going to the store,” may serve as a proxy items for a number of factors at home, because they indicate the opportunity to engage in activities outside the home, with other children, and in proximity of their caregivers.

Literature does suggest, however, that center-based care exerts some influence upon children. Studies report that the quality of care is the most consistent child-care predictor, with higher quality of care relating to greater social competence and cooperation and less problem behavior at both two and three years of age (NICHD, 1998a). More time in low-quality care and more numerous care arrangements (i.e., less stable care) are predictors of negative outcomes for children at 2 years of age (NICHD, 1999b). Furthermore, greater experience in groups with other children predicted more cooperation and fewer problems at both 2 and 3 years of age.

While there are several limitations to the study, its strengths include its context, a relatively homogenous society, the 100% response rate of those who were still accessible at time two, and inclusion of both parental and service provider responses. On the other hand, there are no data on those families who have left the system (rather than graduated from it). Furthermore, the incidence number on some items is small and may not appear to be highly meaningful. However, this is the first five-year longitudinal study in Japan to evaluate the effects of extended care. That no differences emerged in development between those children who were in center-based care for less than 11 hours a day and those in care for extended periods of time is an interesting finding. This reinforces extant literature

that suggests that may not be the quantity of care a child spends at home, but the quality of care. Likewise, developmental differences may be attributed also to the quality of center-based care, not the quantity. Further follow-up research with the current sample will investigate less obvious effects of child-care that may emerge later in development.

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Items	Extended hours (>11)	Regular hours (<11)	Total
gender			
male	15	85	100
female	13	72	85
age in years (at baseline)			
less than one year	5	25	30
one year	14	77	91
two years	9	55	64
family type			
nuclear family			
parents	22	121	143
mother only	2	6	8
extended family			
parents, grandparents	3	19	22
mother, grandparent	0	4	4
father, grandparent	0	1	1
other	1	6	7
siblings			
yes	16	87	103
no	12	70	82
age at entry into center based care			
less than one year	7	54	61
other	21	103	124
respondent			
mother	28	156	184
father	0	1	1

Area of Child's Development	Level of Development			
	Delayed		Not delayed	
	N	%	N	%
gross motor	24	13.0	161	87.0
fine motor	20	10.8	165	89.1
social competence	2	1.1	183	98.9
communication	16	8.7	169	91.3
vocabulary	30	16.2	155	83.8
intellectual	18	9.7	167	90.3

Experiences in Environment	Level of Development			
	Delayed		Not delayed	
	N	%	N	%
Intellectual stimulation by parent				
plays with child	2	1.1	183	98.9
reads books with child	29	15.7	156	84.3
sings songs with child	16	8.7	169	91.3
eats at least one meal with child	3	1.6	182	98.4
Use of discipline				
discipline	23	12.4	162	87.6
punishment	96	51.9	89	48.1
Socially stimulating experiences				
going to grocery store with parent	3	1.6	182	98.4
going to park with parent	39	21.1	146	78.9
going to friends' houses	71	38.4	114	61.6
Parental support for child care				
support for child care	60	32.4	125	67.6
having resource for guidance	8	4.3	177	95.7
support from spouse	2	1.1	183	98.9
talking with spouse about child	4	2.2	181	97.8

Table 4 Significant risks to child development

Environmental risk	Areas of development*									
	gross motor		fine motor		social competence		communication		adaptation	
	odds ratio	p	odds ratio	p	odds ratio	p	odds ratio	p	odds ratio	p
Not having meal with parent	14,626	0,05								
Not going to grocery store with parent							18,310	0,05		
No parental resource for guidance			5,372	0,05	24,093	0,05			5,829	0,05

*absence of score indicates insignificance