SciMedCentral

Annals of Pediatrics & Child Health

Short Communication

Associated Factors for Maintaining Infants' Daily Life Rhythm

Eri Osawa[1]*, Tomosa Hayashi[2] and Tomoko Kodama Kawashima[1]

[1]Department of International Health and Collaboration, National Institute of Public Health, Japan

[2]PhD program, Graduate School of Medicine, Toho University, Japan

*Corresponding author

Eri OSAWA, National Institute of Public Health, 2-3-6 Minami Wako-shi, Saitama 351-0197, Japan, Tel:+81-48-458-6239; Fax: +81-48-469-2768; Email: eriosawa@niph.go.jp

Submitted: 03 December 2014

Accepted: 02 February 2015

Published: 07 April 2015

Keywords

- Child rearing
- Parental awareness
- Infant
- Daily life rhythm
- Population-based survey

Abstract

Introduction: This study aimed to examine factors associated with the attitudes of parents of 6-month-old infants, with respect to maintaining a daily life rhythm for their child.

Methods: Cross-tabulated data from nationwide cross-sectional surveys (the Longitudinal Survey of Newborns in the 21st Century), conducted in 2001 and 2010 by the Ministry of Health, Labour and Welfare of Japan, were used for analysis using a logistic regression model.

Results: We analyzed data of 47,010 infants from 2001 (response rate 87.7%) and 38,554 infants (response rate 88.1%) from 2010. The percentage of parents with positive attitudes towards maintaining a daily life rhythm for their baby was 53.7% in 2001, and increased to 63.1% in 2010. In both years, higher annual family income (over 6 million yen) was associated with parents' attitude towardstheir infant's daily life rhythm (odds ratio [OR] 1.43, 1.58; 95% confidence interval [CI] 1.29–1.58, 1.38–1.80; $p<0.001$, in respective years). Working mothers under childcare leave were more inclined to maintain their baby's daily rhythm as compared with nonworking mothers (OR 1.22, 95% CI 1.15–1.30, $p < 0.001$;OR 1.16, 95% CI 1.10–1.22, $p < 0.001$, respectively). In situations where there were older sibling(s), parents were less likely to maintain a daily rhythm for their infant (OR 0.80, 95% CI 0.77–0.83, $p < 0.001$;OR 0.49, 95% CI 0.47–0.51, $p < 0.001$, respectively).

Conclusion: Family income and the working status of mothers were associated with parental attitudes towards maintaining infant's daily life rhythm in this study.

INTRODUCTION

It is believed that keeping a daily rhythm of life for children improves their development. Indoor entertainment, such as online gaming or using computer programs, reduces physical activity among children and can sometimes affect their sleep–wake cycles. Evidence suggests that sleep disruption affects children's cognitive development, regulation of affect, attention, health outcomes, and overall quality of life. It is suggested that practical measures for good sleep and behavioral treatments have beneficial effects on secondary outcomes such as child daytime functioning and parental well-being [1,2]. It has been reported that sleep disruption in early stages of infancy (within 1 year old) has associations with sleep difficulties at 6 months and night waking at 12 months [3]. Another study showed anassociation between sleep disturbance and bedtime settling strategies in the first 12 months, and affective and externalizing disorders at 5 years of age [4].

Regarding the association between child-rearing practices at home and child development, maternal employment outside the home has an influence on a child's life in areas such as child health, socioemotional behavior, and learning achievement. There are studies reporting that the employment status of mothers was not associated with their children's health [5]. Some studies imply only small differences in preschool development between children of working mothers and nonworking mothers [6,7], while other studies report that early maternal employment produced a negative impact on child development [8]. Since the 1980s, the number of women working outside the home who are in their late 20s and early 30s has increased in Japan [9]. Therefore, parental awareness of the benefits of keeping a daily life rhythm in early infancy is essential to benefit their child's

daily functioning and development. This study aims to examine the factors associated with the attitudes of parents of infants about 6 months of age, with respect to maintaining their child's daily life rhythm.

MATERIALS AND METHODS

We used public open data of the 2001and 2010cohorts of the Longitudinal Survey of Newborns in the 21st Century, which is a population-based birth cohort study that has been conducted annually since 2001 by the Ministry of Health, Labour and Welfare of Japan. The annual surveys investigate parental socioeconomic characteristics, child-rearing conditions, and awareness about childrearing. The sample chosen from the surveys was selected based on birth registration records of vital statistics. Questionnaires were sent and collected by mail.

In this study, we extracted cross-tabulated data from the first survey of the 2001 and 2010 cohorts, which target the parents of 6-month-old infants [10]. From the survey questions, we selected items asking which child-rearing behaviors parents were aware of. There are six options and multiple answers are permitted: 1) talk often to their baby; 2) hold their baby often; 3) allow their baby to listen to music often; 4) take their baby outside often; 5) maintain a daily rhythm for their baby; and 6) other. We used the answer for "maintain infant's daily rhythm" as an outcome variable in analysis.

Independent variables were the mother's age, number of siblings, family structure, mother's work status, father's involvement in childrearing and housework, and parents' annual total income. Regarding involvement of the fathers in childrearing and housework, the survey question asked, "How often does the father do the following activities of childrearing or housework?" Child-rearing activities were: 1) feeding; 2) diaper changing; 3) bathing; 4) putting the baby to sleep; 5) playing with the baby; and 6) taking the baby outside. Housework activities included: 1) cooking; 2) clearing the table after meals; 3) cleaning the house; 4) doing laundry; 5) taking out the trash; and 6) shopping for daily needs. For all topics, parents were to select one option from the following: always (3 points), sometimes (2 points), rarely (1 point), or not at all (0 points). Finally, each score was summed up and the total was categorized as either active involvement (18–12 points), intermediate involvement (11–6 points), or inactive involvement (5–0 points).

The odds ratio (OR) and 95% confidence intervals (CI) were calculated from cross-tabulated data using a logistic regression model to assess the association between parental awareness about maintaining a daily life rhythm for their infant and childrearing and the family's living conditions. IBM SPSS Statistics 22 version was used for all analyses.

RESULTS

Outlined results of the 2001 and 2010 surveys are summarized in Table1. The target of investigation for the 2001 cohort was 53,575 surveys and 43,767for the 2010 cohort. Response rates were 87.7% (47,010) in 2001 and 88.1% (38,554) in 2010. The average age of mothers and fathers, respectively, was 29.4 and 31.6 (2001) and 30.9 and 32.8 (2010). The percentages of mothers in their 20s was 45.9% (2001) and 34.2% (2010), 51.2% (2001) and 60.0% (2010) for mothers in their 30s, and 1.9% (2001) and 4.5% (2010) for mothers in their 40s or older. Nonworking mothers represented the majority in both years (73.5% in 2001 and 63.7% in 2010). There was not much difference in the distribution of parent's total annual income between 2001 and 2010. In 2001, 53.2% and 63.0% (2010) of parents had awareness about keeping a daily life rhythm for their baby. Regarding the fathers' involvement in childrearing, 40.1% (2001) and 41.8% (2010) were actively involved; fathers' involvement in housework was 9.8% (2001) and 17.0% (2010).

Table 2 shows ORs and 95% CIs for parental awareness about maintaining a daily rhythm for their infants, using a logistic regression model. In both 2001 and 2010, working mothers under childcare leave were more attentive to their baby's daily rhythm as compared with nonworking mothers (OR 1.22, 95% CI 1.15–1.30, $p < 0.001$; OR 1.16, 95% CI 1.10–1.22, $p < 0.001$, in respective years). In families with older sibling(s), parents were less likely to maintain a daily rhythm for the infant (OR 0.80, 95% CI 0.77–0.83, $p < 0.001$; OR 0.49, 95% CI 0.47–0.51, $p < 0.001$, in respective years).

The involvement of fathers in childrearing and housework was not significantly associated with maintaining infants' daily rhythm in both survey years. Higher annual family income (over 6 million yen) was associated with greater parental awareness about infants' daily rhythm (OR 1.43, 1.58; 95% CI 1.29–1.58, 1.38–1.80; $p<0.001$, in respective years).

DISCUSSION

First, the results of this study suggest that total annual income is associated with parental awareness about maintaining a daily life rhythm for their baby. It has been reported that the level of family income influences child health and child behavior [11]. Our results suggest an association between family income and parental awareness of child-rearing activities that may lead to outcomes of child health and child behavior.

Second, in this study, working mothers were more likely than nonworking mothers to be aware of the importance of maintaining their baby's daily rhythm. Empirically, it is considered that working mothers try to keep their babies on a regular schedule. In addition, when working mothers are under childcare leave, it is possible that they use their time to take care of their baby instead of doing other work. This study did not find a distinction between working mothers with full time/regular employment and those with part time/non regular employment. However, a previous study showed that working mothers with full time/regular employment were more likely to report job pressures and inflexible work schedules and to experience more strain related to work and family, whereas those with part time/non regular employment were more likely to face financial difficulties [12]. It has also been reported that mothers employed part time perceived less work–family conflict than mothers employed fulltime [13]. Further analysis with more details about maternal working conditions, which were not included in this study, is needed.

Interestingly, against our hypothesis, the current study showed that in families in which the infant had older sibling(s), parents were less likely to maintain a daily rhythm for the infant.

Table 1: Outlined results of the Longitudinal Survey of Newborns in the 21st Century, in 2001 and 2010.

	2001 cohort (n=47010)	2010 cohort (n=38554)
Response rate	87.7% (47010/53575)	88.1%(38554/43767)
Respondent		
Mother	41,198 (87.6%)	n.a.
Father	3597 (7.7%)	n.a.
Both	1912 (4.1%)	n.a.
Others/No Data	303 (0.6%)	n.a.
Average age of parents		
Mother	29.4	30.9
Father	31.6	32.8
Age group of mother (years)		
19 or less	402 (0.9%)	217(0.6%)
20s	21,586(45.9%)	13,202(34.2%)
30s	24,059(51.2%)	23,375(60.6%)
40s or over	914(1.9%)	1725(4.5%)
No Data	49(0.1%)	35(0.09%)
Sex of baby		
Boy	24,451(52.0%)	19,844(51.5%)
Girl	22,559(48.0%)	18,710(48.5%)
Number of siblings		
Only the baby	23,054 (49.0%)	18,132(47.0%)
Two	17,150 (36.5%)	14,486(37.6%)
Three or more	6806(0.14%)	5936(15.4%)
Family structure		
Infant living with parents	17,970(38.2%)	14,895(38.6%)
With parents and sibling(s)	18,060(38.4%)	16,438(42.6%)
With parents and grandparents/others	9873(21.0%)	6266(16.3%)
With one parent and sibling(s)	396(0.8%)	340(0.9%)
With one parent and grandparents/others	676(1.4%)	584(1.5%)
No data	35(0.07%)	31(0.08%)
Mother's employment status		
Not working	34,592(73.5%)	24,548(63.7%)
Under childcare leave	4724(10.0%)	8827(22.9%)
Working	7119(15.1%)	4804(12.5%)
No data	575(1.2%)	375(1.0%)
Total annual income of parents		
Under 2 million yen (approximately USD 20,000)	1657(3.5%)	981(2.5%)
2–6 million yen (approximately USD 20,000–60.000)	25,093(53.4%)	19,770(51.3%)
Over 6 million yen (approximately USD 60,000)	16,384(34.9%)	14,300(37.1%)
Missing	3876(8.2%)	3503(9.1%)
Father's involvement in childrearing		
Active involvement (Score 18–12)	18,860 (40.1%)	16,115(41.8%)
Intermediate involvement (Score 11–6)	22,090(47.0%)	18,095(47.0%)
Inactive involvement (Score5–0)	3308(7.0%)	2452(6.3%)
Missing	2752(5.9%)	1892(5.0%)
Father's involvement in housework		
Active involvement (Score 18–12)	4594(9.8%)	6565(17.0%)
Intermediate involvement (Score 11–6)	21,670(46.1%)	18,984(49.2%)
Inactive involvement (Score5–0)	18,558(39.5%)	11,411(29.6%)
Missing	2188(4.7%)	1594(4.1%)
Child-rearing activities (Multiple answers)		
Talking to baby	42,132(89.6%)	35,082(83.3%)
Holding baby	30,126(64.1%)	28,286(73.4%)
Letting baby listen to music	8840 (18.8%)	7631(19.8%)
Taking baby outside	23,483(47.8%)	20,443(53.0%)
Keep baby on a daily rhythm	25,256 (53.2%)	24,319(63.0%)
Other	6887 (14.7%)	5009(13.0%)

Abbreviation: n.a. = Not Available

Table 2: OR and 95% CI for parental awareness of infant's daily life rhythm, using logistic regression model.

	Baby born in 2001		Baby born in 2010	
	OR (95% CI)	***p*-value**	**OR (95% CI)**	***p*-value**
Mother's age group (years)				
Under 20	Reference		Reference	
20s	1.34 (1.10–1.63)	0.004	1.68 (1.29–2.20)	< 0.001
30s	1.30 (1.07–1.58)	0.01	1.63 (1.25–2.13)	< 0.001
40s	1.20 (0.95–1.52)	0.131	1.41 (1.06–1.87)	0.018
Family structure				
Infant living with parents	Reference		Reference	
With parents and sibling	0.78 (0.75–0.81)	< 0.001	0.78 (0.75–0.82)	< 0.001
With parents, grandparents, sibling(s)	0.90 (0.86–0.95)	< 0.001	0.84 (0.79–0.90)	< 0.001
With one parent, sibling(s)	0.73 (0.60–0.89)	0.002	0.90 (0.72–1.12)	0.335
With one parent, grandparents, sibling(s)	0.80 (0.68–0.93)	0.004	0.72 (0.61–0.86)	< 0.001
Mother's work condition				
Not working	Reference		Reference	
Under childcare leave	1.22 (1.15-1.30)	< 0.001	1.16 (1.10–1.22)	< 0.001
Working	1.01 (0.96–1.06)	0.68	0.91 (0.85–0.97)	0.003
Siblings				
No siblings (First baby)	Reference		Reference	
Having older siblings (Second baby or after)	0.80 (0.77-0.83)	< 0.001	0.49 (0.47-0.51)	< 0.001
Father's involvement in baby care				
High score	Reference		Reference	
Middle score	1.00 (0.96–1.04)	0.854	1.03 (0.99–1.08)	0.138
Low score	1.02 (0.95–1.10)	0.635	1.05 (0.96–1.14)	0.326
Father's involvement in house work				
High score	Reference		Reference	
Middle score	0.98 (0.92–1.05)	0.547	0.96 (0.91–1.02)	0.172
Low score	0.965 (0.91–1.03)	0.287	0.89 (0.83–0.94)	< 0.001
Total annual income of parents				
Under 2 million yen (approximately USD 20,000)	Reference		Reference	
2–6 million yen (approximately USD 20,000–60,000)	1.25 (1.13–1.38)	< 0.001	1.25 (1.10–1.42)	0.001
Over 6 million yen (approximately USD 60,000)	1.43 (1.29–1.58)	< 0.001	1.58 (1.39–1.80)	< 0.001
Recognition of receiving support from close person				
No	Reference		Reference	
Yes	0.93 (0.86–1.01)	0.087	0.92 (0.84–1.02)	0.113

Abbreviations: CI = Confidence Interval; OR = Odds Ratio

This result might reflect the parents' try to establish a daily rhythm for the siblings rather than for the infant.

In addition, the involvement of fathers in child rearing and housework was not associated with parental awareness about infant daily life rhythm in this study. Previous studies using the Longitudinal Survey of Newborns in the 21st Century (2001–2002) have indicated that infants who experienced a high degree of paternal childcare involvement at 6 months were less likely to suffer from all unintentional injuries at 18 months than those who received a low degree of paternal childcare involvement [14]. However, the findings of our study, which analyzed cross-sectional data of infants at 6 months of age, suggest that the degree of attention paid to the infant's daily life might rely on the parents' lifestyle before having a baby.

This study had some limitations. First, we used public data; therefore, advanced analyses were not conducted. Second, as mentioned above, differences between full-time and part-time working mothers were not considered because working conditions (time spent at work per day or per week) were not included in the analyses. Further study and analysis is required to examine the factors influencing the maintenance of infants' daily life rhythm.

CONCLUSIONS

In this study, we found common factors with respect to parental awareness about maintaining a healthy daily rhythm for their infant. In both survey years, higher total annual parental income and maternal employment status corresponded with more attention paid to infant daily rhythm. The involvement of fathers was not confirmed to be related to this awareness.

ACKNOWLEDGMENT

This study was funded by Health and Labour Sciences Research Grants (H25-004 Research on global health issues, 2014–2015).

REFERENCES

1. Moore M, Meltzer LJ, Mindell JA. Bedtime problems and night wakings in children. Prim Care. 2008; 35: 569-581.
2. Morgenthaler TI, Owens J, Alessi C, Boehlecke B, Brown TM, Coleman J Jr, et al. Practice parameters for behavioral treatment of bedtime problems and night wakings in infants and young children. Sleep. 2006; 29: 1277-1281.
3. Tikotzky L, Sadeh A. Maternal sleep-related cognitions and infant sleep: a longitudinal study from pregnancy through the 1st year. Child Dev. 2009; 80: 860-874.
4. Sheridan A, Murray L, Cooper PJ, Evangeli M, Byram V, Halligan SL. A longitudinal study of child sleep in high and low risk families: Relationship to early maternal settling strategies and child psychological functioning. Sleep Med. 2013; 14: 266–273.
5. Gordon RA, Kaestner R, Korenman S. The effects of maternal employment on child injuries and infectious disease. Demography. 2007; 44: 307-333.
6. Gottfried AE, Gottfried AW, Bathurst K. Maternal employment, family environment and children's development: infancy through the school year. Gottfried AE, Gottfried AW, editors. In: Maternal employment and children's development: Longitudinal research. New York: Plenum Press; 1988. 11-58.
7. Owen MT, Cox MJ. Maternal employment and the transition to parenthood. Gottfried AE, Gottfried AW, editors. In: Maternal employment and children's development: Longitudinal research. New York: Plenum Press; 1988. 85-119.
8. Belsky J. Parental and nonparental child care and children's socioemotional development: a decade in review. J Marriage Fam. 1990; 52: 885-903.
9. Ministry of Health, Labour and Welfare. The fact of working women, 2010-2011. Ministry of Health, Labour and Welfare. Tokyo.
10. e-stat website.
11. Bradley RH, Corwyn RF. Socioeconomic status and child development. Annu Rev Psychol. 2002; 53: 371-399.
12. Seto M, Morimoto K, Maruyama S. Work and family life of childrearing women workers in Japan: comparison of non-regular employees with short working hours, non-regular employees with long working hours, and regular employees. J Occup Health. 2006; 48: 183-191.
13. Buehler C, O'Brien M. Mothers' part-time employment: associations with mother and family well-being. J Fam Psychol. 2011; 25: 895-906.
14. Fujiwara T, Okuyama M, Takahashi K. Paternal involvement in childcare and unintentional injury of young children: a population-based cohort study in Japan. Int J Epidemiol. 2010; 39: 588-597.

Cite this article

Osawa E, Hayashi T, Kawashima TK (2015) Associated Factors for Maintaining Infants' Daily Life Rhythm. Ann Pediatr Child Health 3(4): 1062.