**TITLE PAGE**

**Title: Effect of child rearing by grandparents on the cognitive development**

**among Thai children at one year of age**

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**of age**

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**ABSTRACT**

**Background:** Thai society changed to modernization, parents of the child immigrate to work in the industrialized or urban areas; transferred child rearing to others include a grandparents ,In the year 2004 children being reared by grandparents, 24.2 %The review literature found that child reared by the grandparent had chance of being delay development than those reared by the parent; particular the development of cognitive . However there are few studies to explore which the important dimensions of child rearing associated with child cognitive development

**Objective**: To study effect on dimensions of child rearing by grandparents on the cognitive development among Thai children at one year of age

**Methods:** This study is part of the prospective cohort study of Thailand(PCTC) conducted in 2005 involving yielding approximately 4,225 infants and their parents or caregivers. Data were collected via interviews or extracted from existing records. Demographic characteristics were described using mean and standard deviation for continuous variable and frequency and percentage for categorical variable. Each dimensions was quantified by percentage, estimated by the mean of items and the 95% confidence (CI) were also calculated for each of these items. Multiple logistic regression was used for cognitive development data analysis; base on Capute scale

**Results**: The rate per 100 children for delay of cognitive development: Responsiveness were; warmth xx.x (95%CI: xx.x –xx.x), cohesion xx.x (95%CI: xx.x –xx.x), clear communication & person-centered discourse 95%CI: xx.x –xx.x) and attachment xx.x (95%CI: xx.x –xx.x) Demandingness were; monitoring(95%CI: xx.x –xx.x), confrontation (95%CI: xx.x –xx.x) and consistent & contingent (95%CI: xx.x –xx.x) and associated factors were significantly, *p* < 0.005 included children: , A boy (OR = xx.x; 95%CI: xx.x-xx.x), low birth weight (OR = xx.x; 95%CI: xx.x-xx.x), preterm(OR = xx.x; 95%CI: xx.x-xx.x), breast feeding less than 6 months (OR = xx.x; 95%CI:xx.x-xx.x), ever hospital admission (OR = xx.x; 95%CI: xx.x-xx.x), more than 3 sibpling (OR = xx.x; 95%CI: xx.x-xx.x) and younger grandparents (OR = xx.x; 95%CI: xx.x-xx.x), low education (OR = xx.x; 95%CI: xx.x-xx.x), sufficient income, agriculture (OR = xx.x; 95%CI: xx.x-xx.x),

**Conclusions**: Child rearing by grandparents were at substantial risk…….. for delay of cognitive development. To alleviate the problem, high attention should be promote and support them about………………….

**Key words**: prospective cohort study, child rearing, children, development, grandparents.

**INTRODUCTION**

Children are an important human resource(1,2); window period of their growth and development was 1-2 years of age from appropriated child rearing which there are father and mother were key persons.(3–7) But w hen the Thai society changed to modernization, family structure changes; parents of the child immigrate to work in the industrialized or urban areas; transferred child rearing to others include a grandparents and several left their children with grandparents alone (8,9) In the year 2004 children being reared by grandparents, 24.2 %(10) The review literature found that most of grandparents emphasized focus on promoting the physical. But in the learning process, particular, the development of cognitive, they could not support the children well, so these effected to child reared by the grandparent had chance of being delay development than those reared by the parent (8,11–15)and in children most studies of styles(16–21) and factors related to child rearing(11,18,22–25) but in dimensions of child rearing; responsiveness and Demandingness (26–28) on the cognitive development this is the most important children development milestone there are few studies. So researcher interested to explore what the important item of dimensions associated cognitive development

**MATERIALS AND METHODS**

***Study design***

This study is part of the prospective cohort study of Thailand(PCTC) conducted in 2005 involving yielding approximately 4,225 infants and their parents or caregivers. Data were collected via interviews or extracted from existing records. This paper included 563 infants who reared by grandparents and were born between October 15, 2000 and September 14, 2002. Cognitive development was measured 1-2 weeks after the home visit. That is, it was measured the same day the children visited the hospital at 1 year of age as mentioned in Aim1. This is because Capute scale required to be administered by pediatricians. All pediatricians at each study hospital had experience using the tool-they had ever used the test for their previous study.

***Study outcome***

***Statistical analysis***

Demographic characteristics were described using mean and standard deviation for continuous variable and frequency and percentage for categorical variable. All analysis were done using Stata version 12 (StataCorp,College Station,TX). All statistiiccal tests considered a probability of 0.05 as statistical significant level. Each dimensions was quantified by percentage, estimated by the mean of items and the 95% confidence (CI) were also calculated for each of these items. Multiple logistic regression was used for cognitive development data analysis; base on Capute scale(29–32)

**RESULTS**

The sample of this research are part of PTCT cohort members; that all of members there are 4,225 infants . These children were born to all women who had gestational age between 28th and 38th weeks and willing to participate in the study. Exclusion criteria were pregnant woman who were abortion and could not communicate. There were 4,221 live birth, 32 deaths after within 1 year and 11 withdrawers. And inclusion criteria in of this research were selected infants who reared by primary caregiver which was grandparents there were 563 infants

(Fig. 1).

**Total number of infants**

**(N = 4,225)**

Abortion and could not communicate, 4

Sample were

4,221

Deaths after within 1 year, 32 and withdrawers,11 and loss case, 62

Sample were

4,116

included infants who reared by grandparents

Sample were

563

**Fig. 1.** The inclusion flow chart

**Demographic Characteristics**

Of the 563 Infants, almost all of them,xx.x%, were girl, with a mean BW of xx.x±x.Xx grams (ranged: xx-xx), GA (xx.x) weeks(ranged: xx-xx), BF (xx.x) months (ranged: xx-xx), HA (xx.x) times (ranged: xx-xx), sibling (xx.x) (ranged: xx-xx) and almost of grandparents xx.xx%, were grandma, with a mean age xx.xx years(ranged: xx-xx), education level xx.xx level (ranged: xx-xx), Insufficiency of income(xx.x%) and agriculture of occupation (Table 1).,

**Table 1.** Demographic characteristics presented as percentage unless specified otherwise

| **Characteristics** | **Total**  **(4,225)n=563** | **Percentage** |
| --- | --- | --- |
| **Children** |  |  |
| Gender |  |  |
| Boy | x.x | x.x |
| Girl | xx.x | xx.x |
| Birth weight |  |  |
| Low (< 2,500) | 66 | 11.7 |
| Normal | 497 | 88.3 |
| Gestational age |  |  |
| Preterm (< 37) | 148 | 26.3 |
| Term | 414 | 73.7 |
| Breast feeding (months) |  |  |
| <6 | 543 | 96.5 |
| 6+ | 20 | 3.5 |
| Hospital admission |  |  |
| Yes | 68 | 12.2 |
| No | 472 | 83.8 |
| (n=540) |  |  |
| Number of sibling |  |  |
| 1 | 435 | 77.3 |
| 2+ | 128 | 22.7 |
| **Grandparents** |  |  |
| Grandpa | 33 | 5.86 |
| Grandma | 530 | 94.14 |
| Age |  |  |
| <60 | x.x | x.x |
| 60+ | x.x | x.x |
| Education |  |  |
| Primary school | 93 | 47.0 |
| ≤Secondary school | 105 | 53.0 |
| (n=198) |  |  |
| Sufficiency of income |  |  |
| Sufficient | 247 | 52.1 |
| Insufficient | 227 | 47.9 |
| Occupation |  |  |
| Non agriculture | x.x | x.x |
| Agriculture | x.x | x.x |

**Dimensions of child rearing**

The rates of delayed cognitive development were different between two groups in each type of dimensions of child rearing (Chi-square test = x.x, p-value <0.xxx) (Table 2).

The difference is significant in [name of dimension] dimension, and not significant in [name of dimension] dimension.

**Table 2.** Chi-square tests for the rates of delayed cognitive development between two groups in each type of dimensions of child rearing

From review literature matching with CRF form

( D02)

| **Dimensions**  **of child rearing** | **Total**  **(n=xx,xxx)** | **Cognitive development** | | χ2 | **P-value** |
| --- | --- | --- | --- | --- | --- |
| **Responsiveness** |  | **Delay**  **(n=xx,xxx)** | **Normal (n=xx,xx)** |  |  |
| (d28f)(Warmth) |  |  |  |  |  |
| Yes | 36( 6.39) | 9 (25.0) | 27 (75.0) |  |  |
| No | 523 (92.90) | 81(15.5) | 441 (84.5) |  |  |
| (n= 559) |  |  |  |  |  |
| xxxx (Cohesion) |  |  |  |  |  |
| Yes | xx.x  (xx.x-xx.x) | xx.x  (xx.x-xx.x) | xx.x  (xx.x-xx.x) |  |  |
| No | xx.x  (xx.x-xx.x) | xx.x  (xx.x-xx.x) | xx.x  (xx.x-xx.x) |  |  |
| xxxx(Clear communication ) |  |  |  |  |  |
| Yes | x.x  (x.x-x.x) | x.x  (x.x-x.x) | x.x  (x.x-x.x) |  |  |
| No | x.x  (x.x-x.x) | x.x  (x.x-x.x) | x.x  (x.x-x.x) |  |  |
| (d28b)( (Attachment) |  |  |  |  |  |
| Yes | 295 (52.40) | 38 (12.93) | 256 (87.07) |  |  |
| No | 264 (46.89) | 52 (19.70) | 212 (80.30) |  |  |
| (n=559) |  |  |  |  |  |
| **Demandingness** |  |  |  |  |  |
| xxxx (Monitoring) |  |  |  |  |  |
| Yes | xx.x  (xx.x-xx.x) | xx.x  (xx.x-xx.x) | xx.x  (xx.x-xx.x) |  |  |
| No | xx.x  (xx.x-xx.x) | xx.x  (xx.x-xx.x) | xx.x  (xx.x-xx.x) |  |  |
| xxxx (Confrontation) |  |  |  |  |  |
| Yes | x.x  (x.x -x.x) | x.x  (x.x-x.x) | x.x  (x.x-x.x) |  |  |
| No | x.x  (x.x -x.x) | x.x  (x.x-x.x) | x.x  (x.x-x.x) |  |  |
| xxxx (Consistent,Contingent) |  |  |  |  |  |
| Yes | x.x  (x.x- x.x) | x.x  (x.x-x.x) | x.x  (x.x-x.x) |  |  |
| No | x.x  (x.x- x.x) | x.x  (x.x-x.x) | x.xx  (x.xx-x.x) |  |  |

***Factors associated with* Cognitive development*of all* Dimensions of child rearing**

The strongest factor that associated to delayed cognitive developmentof all types was [name of dimension]. That is, children who [in YES group] were x.xx times the risk of delayed cognitive development compared to who did not (OR = x.xx; 95%CI: x.xx –x.xx; *p* <0.xxx) (Table 3). The second strongest factor was [name of dimension](OR = x.xx; 95%CI: x.xx –x.xx; *p* < 0.xxx). Others factors that were highly significant factors, *p*<0.001, associated with the delayed cognitive development included [name of dimension], and [name of dimension]

**Table. 3.**Odds ratios (ORs) of delayed cognitive development and their 95% confidence intervals for each factor of dimensions of child rearing adjusted for all other factors presented in the table using logistic regression

| **Factors** | **Number** | **% Delay** | **Crude OR** | **Adjusted OR** | **95%CI** | **P-value** |
| --- | --- | --- | --- | --- | --- | --- |
| **Dimensions of child rearing** |  |  |  |  |  |  |
| (Warmth) |  |  |  |  |  |  |
| Yes | xxx | xx.x | 1 | 1 |  | 0.xxx |
| No | xxx | xx.x | x.xx | x.xx | x.xx – x.xx |  |
| (Cohesion) |  |  |  |  |  |  |
| Yes | xxx | xx.x | 1 | 1 |  | 0.xxx |
| No | xxx | xx.x | x.xx | x.xx | x.xx – x.xx |  |
| (Clear communication ) |  |  |  |  |  |  |
| Yes | xxx | xx.x | 1 | 1 |  | 0.xxx |
| No | xxx | xx.x | x.xx | x.xx | x.xx – x.xx |  |
| (Attachment) |  |  |  |  |  |  |
| Yes | xxx | xx.x | 1 | 1 |  | 0.xxx |
| No | xxx | xx.x | x.xx | x.xx | x.xx – x.xx |  |
| **Demandingness** |  |  |  |  |  |  |
| (Monitoring) |  |  |  |  |  |  |
| Yes | xxx | xx.x | 1 | 1 |  | 0.xxx |
| No | xxx | xx.x | x.xx | x.xx | x.xx – x.xx |  |
| (Confrontation) |  |  |  |  |  |  |
| Yes | xxx | xx.x | 1 | 1 |  | 0.xxx |
| No | xxx | xx.x | x.xx | x.xx | x.xx – x.xx |  |
| Consistent,Contingent |  |  |  |  |  |  |
| Yes | xxx | xx.x | 1 | 1 |  |  |
| No | xxx | xx.x | x.xx | x.xx | x.xx – x.xx |  |

***Factors associated with* Cognitive development*of all* Dimensions of child rearing**

The strongest factor that associated to delayed cognitive developmentof all types was [name of dimension]. That is, children who [in YES group] were x.xx times the risk of delayed cognitive development compared to who did not (OR = x.xx; 95%CI: x.xx –x.xx; *p* <0.xxx)

(Fig. 2).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Factors** |  | **Odds ratio** | **95%CI** | **p-value** |
| ??? |  | x.xx | x.xx – x.xx | 0.xxx |
| ??? |  | x.xx | x.xx – x.xx | 0.xxx |
| ??? | | x.xx | x.xx – x.xx | 0.xxx |
| ??? |  | x.xx  5  4  α  1  0.50  2  0 | x.xx – x.xx | 0.xxx |
|  | 3 |  |  |  |

**Fig. 2.** Factors affecting delay cognitive development of all dimensions of childrearing presented as odds ratio adjusted for, warmth, cohesion, clear communication & person-centered discourse, attachment ,monitoring, confrontation, and consistent & contingent, using multiple logistic regression

***Factors associated with non-physical workplace violence***

MSD was predominantly the strongest factor associated with non-physical WPV, i.e., it was two folds the risk of WPV of all types compared to who did not (OR = x.xx; 95%CI: x.xx –x.xx; *p* < 0.xxx) (Fig. 3).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Factors** |  | **Odds ratio** | **95% CI** | **p-value** |
|  |  |  |  |  |
| ??? |  | x.xx | x.xx – x.xx | 0.xxx |
| ??? |  | x.xx | x.xx – x.xx | 0.xxx |
| ??? | | x.xx | x.xx – x.xx | 0.xxx |
| ??? |  | x.xx | x.xx – x.xx | 0.xxx |
| ???    .50  0 |  | x.xx | x.xx – x.xx | 0.xxx |
|  | 2  1 |  |  |  |
|  |  |  |  |  |

**Fig. 3.** Factors effecting non-physical workplace violence with or without job absence, presented as odds ratio adjusted for gender, marital status, job type, current working status, having second job, experiencing neurological illnesses, types of working institution, and working area, using multiple logistic regression

**DISCUSSIONS**

***Explaining the findings***

<copy narrative parts of the Results followed by explaining each important findings in turn , 5-10 references needed here in this section where about half of them are the same as the one cited in the Introduction section of the manuscript>

***Strength of the study***

<to be written>

***Limitation of the study***

* *Can selection bias distort the findings?*
* *Can information bias distort the findings?*
* *Can confounding bias distort the findings?*

***Conclusions***

(copy from the Conclusion section of the abstract then add some)

***Recommendations***

<to be written>

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