FACTORS AFFECTING DEVELOPMENT OF CHILDREN AGED 3-5 YEARS IN MUANGPHRAI PRIMARY CARE UNIT, SELAPHUM DISTRICT, ROI-ET PROVINCE, THAILAND

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ABSTRACT: This cross sectional research was intended to study about the situation of child development and to investigate the factors affecting development of children aged 3-5 years in Muangphrai Primary Care Unit Selaphum District Roi-et Province from the 210 participants in 2 sub-districts, Municipal of Muangphrai Sub-district and Local Administration of Bungklua Sub-district. Collecting data in December 2009, the questionnaire was developed by the researcher and based on the standard and goals of maternal and child health care, using the assessment of child development Anamai '49 that developed by the Department of Health to assess the child development. The independent variables in this research were the variables of socio demographic, the variables of birth, nutrition, medical history, and the variables of developmental environment of the children. The dependent variable was child development (2 levels, normal and delayed). 58.1% (122/210) of children had normal development, and 41.9 percent (88/210) had delayed development. The data were analyzed by multiple logistic regression analysis. Independent variables associated with delayed development were age (P = 0.043), child order (P<0.001), received the quality of antenatal care (P = 0.011), delivery process (P = 0.033), breastfeeding (p = 0.022), supplementary nourishment (P = 0.047), exposure to diseases affecting child development (P = 0.004), opportunities encouraging child development (P = 0.013), sanitary drinking water (P = 0.001), and hygiene learning and health behavior (P = 0.001). Based on study results, the main recommendations include: (1) Families and communities should provide the service of antenatal care cover all pregnant women by the standard of the quality of antenatal care process. (2) Plan to encourage all breastfeeding mothers to provide their children the breastfeeding at least the first six months and to support supplementary nourishment to their children appropriately by age. (3) The communities should provide the sanitary drinking water for their children or their people by improve the water supplies to be sanitary to drink. And (4) To promote on personal hygiene for children and their families and for all communities.

KEYWORDS: child development, developmental risk factors, Anamai'49

INTRODUCTION: The age of early childhood is the most important age of human life. Most of the growth progress and the human developments occur during this period. It is a period of the quality foundation of life and the good mind of people. Children during this age should be encouraged to have good development of physical, emotion, mind and intelligence. During this period the brain is most capable of learning. However, the social and economic change in Thailand as the present time affecting severely on Thai family life styles, the social and economic changes also affect on the development of children aged 0-5 year severely. The Ministry of Public Health reported that the percentage of children with normal development decreased from 71.1% in 1998 to only 67.7% in 2006[1]. And the important finding was the children aged 3-5 years were in delayed development higher than the children aged 0-2 years. And, one of the goals of Healthy Thailand Project, Ministry of Public Health is the children aged 0-5 years in normal development would increase to be more than 80%. This research was intended to study

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that what was the situation of child development in the research area and what were the risk factors that affecting child development of children aged 3-5 years, conceptual framework was based on the related literatures, The Assessment and Encouragement of Early Child Development Handbook[2]. and the Maternal and Child Care Handbook,[3] the independent variables were classified by 3 groups,

1) Socio-demographic; e.g. sex, age, birth order number, residence area, parents' age, parents' education level, main child care giver, sized of family, type of family, and family income.

2) Birth, nutrition and medical history; e.g. received the quality of antenatal care, delivery process, term of pregnancy, body birth weight, child breastfed, supplementary nourishment, iodized-salt consuming, diseases interfering development.

3) Developmental environment; e.g. appropriate books for children received, appropriate toys for children received, family activities encouraging child development received, received family opportunities encouraging child development, child rearing patterns, sanitary drinking water, health behavior and hygiene learning in the family, crises in family, and family knowledge in child development.

The dependent variable is child development that assessed by the Assessment of Child Development Anamai'49 [4]. The tool was developed by the Department of Health, based on the assessment of child development DENVER II [5]. Results of the assessment are either normal development or delayed development.

Delayed development in the children indicates that there are caused by many risk factors such as children lack opportunities encouraging childe development, health system in maternal and child care does not satisfying, and the individual factors of the children. The first two factors can encourage by families and communities, and the workers who response to this event directly are the public health officers.

METHODS: This was a cross-sectional research study, study of 210 children aged 3-5 years in Muangphrai Primary Care Unit, Selaphum District, Roi-et Province. Systematic sampling was applied to select the participants from all children aged 3-5 years, their parents or their care givers were interviewed by using the questionnaire, The questionnaire was developed by the researcher according to the suggestion of child development in the maternal and child health care hand book, child development was assessed by using the assessment of Anamai'49. Data were collected in December 2009. The collected data were analyzed by using program SPSS. The statistics frequency, percentage and crosstabs were used to describe participant characteristics. Associations between independent and dependent variables were analyzed by multiple logistic regression. There were 3 sets of independent variables, relating to (1) socio demographic characteristics (6 covariates and 2 factors), (2) birth, nutrition, and medical history (6 covariates), (3) developmental environment (9 covariates). Preliminary logistic models were run for each set, and covariates and factors for which $p \leq 0.15$ were entered in a semifinal logistic regression model. Covariates and factors for which $p \leq 0.15$ in the semifinal model were entered in a final logistic regression model. This included 12 covariates and 2 factors (total 16 independent variables). The study protocol was approved by The Ethical Review Committee for Research Involving Human Research Subjects, Chulalongkorn University.

RESULTS: The number of male children was 59% and female was 41%. The first children of the parents were 52.4%. The children were reared by their grand parents or relatives by 59.5%, most of the child care givers were succeed on the education level of primary school or lower (80.0%). The majority of the children's families were the medium-sized families (45.7%), extended families (85.2%), and the families with low income (37.1%). Discussed by the quality of maternal and child health care, the children of mother who received the quality of antenatal care were 85.7%, received the normal delivery were 81.0%, kept full term of pregnancy were 91.9%, and the children whom body birth weight more than 2,500 gram were 91.9%, received child breastfed at least the first 6 months of aged were 49.5%, received enough appropriate supplementary nourishment were 36.2%, received iodine consuming were 55.7%, and 91.9% of the children are unexposed to the diseases which interrupt on child development process. The children received appropriate child books encouraging on child development were 49.5%, received appropriate child toys were 62.4%, the children who received giving appropriate family's activities were 54.8%, received appropriate opportunities from their families to encourage child development were 60.5%, and most of the families, 77.1%, often reared their children by using inappropriate child rearing patterns. Most of the children (85.2%) received the appropriate sanitary drinking water. 67.6% received the health education to develop their health behavior from their families. 16.2% of children lived in the families with crises.

The results of child development assessment by using the Anamai'49 to assess, the research reports that the children in Muangphrai Primary Care Unit, 210 children, were in normal development 122 children, the frequency was 58.1%. And 88 children were in delayed development, the frequency was 41.9% (Table 1).

Table 1: Child development

Characteristics	Frequency	Percentage
Child development		
- Normal development	122	58.1
- Delayed development	88	41.9

The variables analyzed by Multiple logistic regression were;

1) Dependence variable is the results of child development of children aged 3-5 years. The value of child development is classified to be 2 types, 0 = Normal Development and 1 = Delayed Development.

2) Independent variables, the researcher specified the variables to be 3 groups;

Group 1: Socio demographic The related variables are; Sex, Age (3-level factor), Age of the father, Child order number, Child's resident area, Main child care giver (3-level factor), Adults with whom the child lived, and Family income.

Group 2: Birth, nutrition and medical history; Quality of antenatal care, Delivery process, Child breastfed received, Supplementary nourishment received, Iodized-salt consuming and Exposed to the diseases affecting child development (such as thalassemia, anemia, and epilepsy).

Group 3: Developmental environment; Appropriate books for children received, Appropriate toys for children received, Family activities encouraging child development, Opportunities encouraging child development received, Child rearing patterns, Drinking water sanitation, Hygiene behavior, Child deserted and Family knowledge on child development. The followings are the variables analyzed by 3 steps to address the research question. The final logistic model is summarized in Table 2.

Table 2: Final logistic regression model for variables in the Equation (model X^2 (16df) = 142.76, p<0.001)

	B	Odds ratio (exp(B))*	95% confidence interval	P-value
Sex (female vs. male)	-0.79	0.45	0.19 to 1.09	0.077
Age (categorical, X^2 (2 df) =6.29, p=0.043) (factor)				0.043
3 yrs vs. 5 yrs.	0.17	1.18	0.36 to 3.86	0.784
4 yrs vs. 5 yrs.	1.25	3.49	1.15 to 10.61	0.027
Birth order (other vs. first)	2.07	7.89	2.87 to 21.66	<0.001
Residence area (Rural vs. municipal)	0.78	2.19	0.87 to 5.47	0.095
Main care giver (categorical, X^2 (2df) = 4.31, p=0.116) (factor)				0.116
Mother only vs. other	-1.10	0.33	0.09 to 1.25	0.104
Mother and father vs. other	0.35	1.42	0.45 to 4.51	0.550
Content of antenatal care (low quality vs. adequate quality)	1.73	5.67	1.48 to 21.67	0.011
Delivery process (other processes vs. normal delivery)	-1.31	0.27	0.81 to 0.90	0.033
Child breastfed (less than 6 months vs. at least 6 months)	1.19	3.28	1.19 to 9.06	0.022
Supplementary nourishment (inappropriate vs. appropriate)	1.00	2.72	1.01 to 7.30	0.047
Diseases that affect development (exposed vs. unexposed)	3.01	20.32	2.64 to 156.45	0.004
Received appropriate books for children (not enough vs. enough)	0.94	2.55	1.01 to 6.40	0.047
Received appropriate opportunities (not enough vs. enough)	1.22	3.40	1.29 to 8.98	0.013
Received sanitary drinking water (poor vs. good)	1.93	6.91	1.83 to 26.12	0.004
Health behavior and hygiene learning (poor vs. good)	1.63	5.10	1.96 to 13.28	0.001
Constant	-18.72	<0.001		<0.001

* Odds ratio for delayed development.

Eleven variables were associated significantly with delayed development. These were Age (P=0.043), Child's birth order (P<0.001), Content of antenatal care (P=0.011), Delivery process (P=0.033), Child breastfed (P=0.022), Supplementary nourishment (P=0.047), Unexposed to the diseases (P=0.004), Received appropriate books for children (P=0.047), Received appropriate opportunities (P=0.013), Received sanitation drinking water (P = 0.004), and Health behavior and hygiene (P = 0.001).

DISCUSSION: There is much available research on child development, but there are some factors that the researcher interested to study increased, the research results are discussed by the references and relates literatures as the followings; The children who was born by normal delivery are suspected to be delayed development higher than the children who was born by the other processes, according to the medical reports that delayed development caused by Asphyxia in delivery process. This research reports that, the quality of antenatal is a factor affecting on child development. Kathryn Kost[6] studied about the effects of the pregnancy planning status affected on birth outcomes and infant care, found that, the proportion of infants born with a health disadvantage was significant if the pregnancy was intended lower than if it was mistimed. The current research is consistent with the report of Duanghathai Janchau[7], which studied factors influencing the development of

children aged 0-5 years in the North of Thailand and found that receiving antenatal of substandard quality, their children might be in delayed development more than with adequate quality. The effects of breastfeeding at least the first 6 months is a factor that affects child development. This information corresponds to the research report of P.J. Quinn[8], which studied the effect of breastfeeding on child development and found that there is a strong positive relationship. Also, the research of Kathryn Kost found that the pregnancy planning status was correlated with the duration of breastfeeding. The children with congenital diseases such as anemia, thalassemia, tend to be delayed development more than the children with unexposed to these diseases. The current research is consistent with the report of Susan P. Walker[9] which study about the effects of the appropriate supplementary nourishment for children affect on child development by the children who have received supplementary food properly were more likely to have normal development than children with inappropriate nutrition. This research opposes to the report of Sutham Nuntamongkolchai[10] that the children who live in the families with or without their parents are few different level of delayed development. The children who received appropriate books for children and appropriate opportunities are suspected to be delayed development lower than the other, this report supports to the guideline by UNICEF in the report of Thailand Multiple Indicator Cluster Surveys[11], children should receive these factors appropriately. The development of the children aged 3-5 years in Muangphrai Primary Care Unit also affected by the drinking water and child's personal hygiene, the statistics reports that the children who have received the sanitation drinking water properly and who opened to the good personal hygiene properly are likely to be in normal development more than the children who have not received the factors at a statistically significant level. The problems of the drinking water sanitation or personal hygiene issues such as the clean food for health, the hand washed for hygiene are the causes of infectious diseases in children. Of course, these diseases are obstructing on child development, so this report confirms that the child personal hygiene and the drinking water sanitation suppliers in their families are the fundamental factors affecting child development.

CONCLUSION: Explanation by the statistics, the variables that suspected to be the risk factors affecting child development were;

1) Socio demographic: age, and child order.

2) Birth, nutrition and medical history; quality antenatal care received, delivery process, child breastfeeding, supplementary nourishment, exposed to diseases interfering child development

3) Developmental environment; appropriate books for children received, appropriate opportunities encouraging child development received, sanitary drinking water and hygiene learning and health behavior

Based on study results, the main recommendations include: (1) Families and communities should provide the service of antenatal care cover all pregnant women by the standard of the quality of antenatal care process. (2) Plan to encourage all breastfeeding mothers to provide their children the breastfeeding at least the first six months and to support supplementary nourishment to their children appropriately by age. (3) The communities should provide the sanitary drinking water for their children or their people by improve the water supplies to be sanitary to drink. And (4) to promote on personal hygiene for children and their families and for all communities.

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REFERRENCES:

1. Public Health, Ministry. Bureau of Policy and Strategy. 2008. Thailand Health Profile 2005-2007. Printing Press, The War Veterans Organization of Thailand.

2. Public Health, Ministry. Department of Health. 2004. The Assessment and Encouragement of Early Child Development Handbook. Bureau of Health Encouragement, Department of Health, Ministry of Public Health. 2008.

3. Public Health, Ministry. 2007.Maternal and Child Care Handbook. Ministry of Public health.

4. Public Health, Ministry. Hospital of Health Encouragement. 2007 The Assessment of Child Development Anamai'49 Handbook. Hospital of Health Encouragement, The Fourth Regional Heath Promotion Center, Department of Health.

5. Frankenburg W.K., Dobbs, J.B., Archer P. Shapiro H. and Bresnick B. The Denver Developmental Screening Test, The Journal of Pediatrics 89 (January 1992):91-97.

6. Kost K., Landry D.J. and Darroch J.E. 1998. The effects of pregnancy planning status on birth outcomes and infant care. Family Planning Perspectives,30:223-231. [electronic journal cited September/ October 1998]; Available from: http://www. guttmacher. org/pubs/journals/3022398.pdf.

7. Duanghathai Junchua. 2004. Influencing Factor on Early Child Development. The 9th Regional Health Promotion Center, Department of Health,

8. Quinn P.J., O'Callaghan M., Williams G. M., Najman J.M., Andersen M.J. and Bor W. The effect of breastfeeding on child development at 5 years: A cohort study. Journal of Paediatrics and Child Health, 37:465–470.

9. Walker S.P., Wachs T.D., Gardner J.M., Lozoff B., Wasserman G.A., Pollitt E., *et al.* 2007. Child Development in Developing Countries 2 Child development: Risk Factors for Adverse Outcomes in Developing Countries. The Lancet, 369: 145-13. [electronic journal cited 13 January 2007]; Available from: http://www.ecdgroup.com/docs/lib_00351 4724.pdf.

10. Sutham Nuntamongkolchai, Sirikul Isaranurug and Chokchai Munswaengsup. 2006. Parental migration and health status of children aged 1-12 years. Journal of Public Health and Development, Volume 3 Year 3.(2006): 57-64.

11. Information and Communication Technology, Ministry. National Statistical Office, 2008. Monitoring the Situation of Children and Women. Thailand Multiple Indicator Cluster Survey, National Statistical Office.