

ORIGINAL ARTICLE

INFLUENCES OF MATERNAL KNOWLEDGE AND SOCIO-ECONOMIC FACTORS ON DEVELOPMENT OF CHILDREN AGED 1-3 YEARS IN NHA TRANG CITY, VIETNAM

Truong Hoang Viet¹, Sutham Nanthamongkolchai², Chokchai Munsawaengsub² and Supachai Pitikultang²

¹ Doctor of Public Health Program, Faculty of Public Health and Faculty of Graduate Studies, Mahidol University, Bangkok, Thailand

² Department of Family Health, Faculty of Public Health, Mahidol University, Bangkok, Thailand

Corresponding author: Sutham Nanthamongkolchai

Email: sutham.nan@mahidol.ac.th

ABSTRACT

Although early childhood development (ECD) is emphasized in regulation and law, Vietnam still refers the term ECD to early childhood education and the role of parents in promoting child development is not frequently mentioned. This study aims to examine the influences of mother's knowledge of child development and socio-economic factors on child development. We conducted this cross-sectional study in Nha Trang city, Vietnam and collected data from 296 child-mother dyads using multistage sampling. Child development is measured by Ages and Stages Questionnaire, Third Edition (ASQ-3) and completed by mothers. The results show that there were 34.1% of children reported with suspected delayed development. Inappropriate level of maternal knowledge of child development, practice to promote child development, and positive parenting practice took up 80.4%, 75.3%, and 76.0%. Results from the multiple logistic regression reveal that maternal knowledge of child development and several socio-economic factors including children's age, and children living with both parents were significantly associated with child development. The study recommends that mothers should improve their knowledge of child development to ensure their children's healthy development.

Keywords: child development, maternal knowledge, Ages and Stages Questionnaire (ASQ-3), Nha Trang, Vietnam

INTRODUCTION

Although early childhood development received global attention since its inclusion in the UN Sustainable Development Goals, 250 million children (43%) younger than 5 years in low-income and middle-income countries are at risk of not achieving their developmental potential¹. Analyses using UNICEF's caregiver reported Early Childhood Development Index found that 36.8% of 3-year-old and 4-year-old children in 35 low- and middle-income countries (LMICs) do not attain basic cognitive and socio-emotional skills, such as following directions and inhibiting aggression².

Maternal knowledge and caregiving practice have been found to be related to child development across studies. Benasich and Brooks-Gunn³ reported that mothers having higher knowledge of child development tended to have children with higher cognitive skills and fewer behavioral problems. Several caregiving factors influencing child development have been found by study of Walker et al.⁴, including cognitive stimulation, caregiver sensitivity and responsiveness to the child, and caregiver effect (emotional warmth or rejection of child). Study by Cprek et al.⁵ showed a strong correlation between positive parenting practices and child's risk of developmental, social, and behavioral delays.

The other socio-economic factors have been found to be related to child development through various studies. Study by Sinno et al.⁶ found that child development was related to gender, place of residence, and maternal education. The study emphasized maternal education as an important predictor of child development⁶. Another study by Contreras and Gonzalez⁷ suggested the relationships between demographic, mother's cognitive ability and health related factors and child's psychomotor development. Study by Jampaklay et al.⁸ indicates the important of mother's presence in the home toward child development.

The situation of child development in Vietnam is documented in several reports. According to analysis from Duc⁹ using data from Vietnam Multiple Indicator Clusters Survey, 17.2% of children did not reach their full developmental potential within the first five years. Results from a report of Vietnam General Statistics Office and UNICEF¹⁰ indicated that there were only 29.4% of children who were on track for literacy-numeracy domain. Though child development issue is recognized and has been addressed widely in many parts of the world, the term 'child development' is rather little-known in Vietnam¹¹. Vietnam refers the term ECD as a synonym with early childhood education, often in the form of kindergartens, pre-school and day care while Vietnamese parents are typically not aware of the

importance of their roles as well as their responsibility in stimulating their children's development¹². Though the ECD services are delivered through the form of early childhood education, there are still 77% of under-three children and 13% of children aged 3-5 years not being enrolled in the formal early childhood education¹³.

Khanh Hoa province whose capital is Nha Trang city started addressing child development issue following the national project for comprehensive child development^{14, 15}. Previous studies and programs in Khanh Hoa province focused mostly on child nutrition and feeding practice¹⁶. This study aims to explore child development, maternal knowledge and the influences of mother's knowledge and socio-economic factors on child development in Nha Trang city, Vietnam. The results of this study are expected to contribute to the body of knowledge about development among children aged 1-3 years and to be a reference for developing a guideline for further program promoting child development in Vietnam and especially Nha Trang city.

METHODS

This is a cross-sectional study conducted in Nha Trang city, Khanh Hoa province, Vietnam. This study aimed to examine the influences of mother's knowledge and socio-economic factors on child development. The data was collected using self-administered questionnaires during October 11st, 2019 to January 10th, 2020. There were 296 children aged 1-3 years and their mothers residing in Nha Trang city selected from 12 kindergartens and 5 local health centers using multistage cluster sampling technique. Firstly, nine wards (Vietnam's third-tier administrative units) were randomly selected, then certain health centers and kindergartens located in these wards were contacted and selected based on availability. The data was collected during the vaccination days at the health centers and all eligible mothers and children were asked to participate in the study. While all eligible mothers of children who were enrolled in the selected kindergarten were also asked to take part in the survey. Though most of the data was collected from these nine wards, several mothers and children were residential in different areas, because not all children residential in these wards were vaccinated in health centers or enrolled in kindergarten located in these wards. It is noted that the study sample included only children free from disability in order to eliminate any potential effect of disabilities on child development.

Child development was measured using the Ages and Stages Questionnaire, Third Edition (ASQ-3). The instrument, which was designed and developed by J. Squires and D. Bricker for children aged 2 to 66 months, was completed by the

mothers within 12-18 minutes¹⁷. The screening instrument consisted of 30 items in five domains: gross motor, fine motor, communication, problem solving and personal-social. It had test-retest reliability of 92.0%, sensitivity of 87.4% and specificity of 95.7%¹⁷. The children's developmental status was determined based on the cutoff scores whether their development was on track or suspected delayed. Knowledge of child development was measured by a questionnaire developed by the researchers including 17 items based on Piaget's theory of cognitive development, Erikson's stages of psychosocial development, and a guide by American Academy of Pediatrics titled "Caring for your baby and young child - Birth to age 5"¹⁸⁻²⁰. The questions covered the knowledge of the characteristics, factors, and stimulating activities of three developmental domains: physical, cognitive, and social-emotional development. The result of the responses was classified into two level: "appropriate", and "inappropriate". The Kuder-Richardson (KR-20) coefficient was 0.70 for reliability test. Practice to promote child development was assessed by items taken from the questionnaire constructed and applied by Jampaklay et al.²¹ The questionnaire examined the frequency of mothers practicing promoting child development activities. This questionnaire had 20 items and three level of frequency of applying the practices ("always", "sometimes", and "never"). The resulted scores were based on the frequency of the practices and categorized into two level: "appropriate", and "inappropriate". The Cronbach's alpha coefficient for reliability test was 0.71. Positive parenting was measured by a self-developed questionnaire based on the concept of Positive parenting by Eanes²². The concept included five components of positive parenting which were attachment, respect, proactive parenting, empathetic leadership, and positive discipline. The questionnaire consisted of 17 items asking how often the mothers apply positive parenting practices. The frequency of applying these practices was categorized into three categories, which were "always", "sometimes", and "never". The method of scoring and categorizing was similar with practice to promote child development as having two categories: "appropriate", and "inappropriate". The Cronbach's alpha coefficient was reported as 0.88. The socio-economic factors included in multivariate analysis consisted of child characteristics (sex, age, breastfed within first hour, infectious disease, and living with both parents), mother's characteristics (age, marital status, educational attainment, and occupation), and household's characteristics (family size).

This study was approved by the Ethical Review Committee for Human Research, Faculty of Public Health, Mahidol University (COA. No. MUPH 2019-024).

Table 1 Frequency and percentage distribution of characteristics of mothers, children, and households (n=296)

Variable	Frequency	Percentage
Maternal characteristics		
<i>Knowledge of child development</i>		
Appropriate	58	19.6
Inappropriate	238	80.4
<i>Practice to promote child development</i>		
Appropriate	73	24.7
Inappropriate	223	75.3
<i>Positive parenting practice</i>		
Appropriate	71	24.0
Inappropriate	225	76.0
Not remember	2	0.7
<i>Educational attainment</i>		
Diploma or higher	182	61.5
Below diploma	102	35.5
No response	9	3.0
<i>Occupation</i>		
Formal employed	160	54.0
Informal employed	132	44.6
No response	4	1.4
Child characteristics		
<i>Child's sex</i>		
Female	156	52.7
Male	140	47.3
<i>Child's age (in months)</i>		
12-23	147	49.7
24-36	149	50.3
<i>Breastfed within first hour</i>		
Yes	210	70.9
No	84	28.4
Not remember	2	0.7
<i>Diarrhea</i>		
No	219	74.0
Yes	64	21.6
No response	13	4.4
<i>Infectious disease</i>		
No	253	85.5
Yes	32	10.8
No response	11	3.7
<i>Living with both parents</i>		
Yes	272	91.9
No	13	4.4
No response	11	3.7
Household's characteristics		
<i>Family size</i>		
≤ 3 members	102	34.5
> 3 members	179	60.5
No response	15	5.1

Statistical analysis

The data analysis consisted of two parts: descriptive and multivariate analysis. Descriptive analysis reported the frequency and percentage distribution of the variables while multiple logistic regression was applied to examine the potential influence of independent variables on development of children aged 1-3 years. The final model of multiple logistic regression analysis was reported with odd ratios, standard errors, confidence intervals, and p-values. The significant level for the analysis was set at p-value<0.05.

RESULTS

General characteristics

Regarding maternal characteristics, majority of mothers (80.4%) had inappropriate level of knowledge of child development. The same pattern had been found among two practice variables; it shows that 75.3% and 76.0% of mothers had inappropriate level of practice to promote child development and positive parenting practice, respectively. Majority of the mothers (61.5%) attained diploma or higher

degrees. More than half (54.0%) of mothers were formally employed while 44.6% were informally employed. Considering child characteristics, 47.3% of children were boys. Number of children aged 12-23 months (49.7%) was approximately equal to number of those aged 24-36 (50.3%). More than two-thirds (70.9%) of children were breastfed within the first hour. Children having diarrhea and infectious disease in the last 6 months took up 21.6% and 10.8% respectively. Most children (91.9%) lived with both parents. For household's characteristics, families with more than three members were most common with 60.5%. (Table 1)

Child development

It is suggested that 34.1% of children were suspected delayed in at least one domain of development. The findings also suggest that the developmental domain with highest prevalence of child suspected developmental delay was fine motor (22.3%) while this prevalence was lowest in communication domain (5.1%). The proportions of child suspected delay for the other developmental domains were 13.2%, 10.8%, and 6.8% for problem-solving, personal-social, and gross motor, respectively. (Table 2)

Table 2 Frequency and percentage distribution of child suspected developmental delay (n=296)

Variable	Frequency	Percentage
Suspected developmental delay		
No	195	65.9
Yes	101	34.1
Suspected developmental delay in gross motor domain		
No	276	93.2
Yes	20	6.8
Suspected developmental delay in fine motor domain		
No	230	77.7
Yes	66	22.3
Suspected developmental delay in problem-solving domain		
No	257	86.8
Yes	39	13.2
Suspected developmental delay in personal-social domain		
No	264	89.2
Yes	32	10.8

Factors influencing child development

There are 12 variables and 250 samples (84.5% of total samples) included in the final model with R-squared value equal to 0.129. The combination of missing responses in several variables caused fewer samples used in the multiple logistic regression analysis. This suggests that these variables explain 12.9% of the variation of child suspected development delay. Considering each individual variable in the model, after adjusted by other variables, children whose mothers had inappropriate level of knowledge of child development were 2.28 times more likely to have suspected developmental delay than those whose mothers had appropriate level of knowledge (p<0.05). Practice to promote child development and positive parenting practice were not significant predictors for child suspected delay. For other maternal characteristics, though

maternal educational attainment exerted some influence on child development, none of these variables was found significantly associated with child suspected developmental delay. Taking child characteristics into account, children whose ages were 24-36 months had significantly smaller odds of having suspected delay than those whose ages were 12-23 months (p<0.05). Children who did not live with both parents were 4.33 times more likely to have suspected delay than those who did live with both parents (p<0.05). Other child characteristics, such as child's sex, breastfed within first hour, diarrhea and infectious disease, were found not significantly related to child suspected developmental delay. Regarding to household's characteristic, family size was found not significantly associated with child suspected developmental delay. (Table 3)

Table 3 Odds ratio of variables predicting child development

Variable (n=250)	Odds ratio	Standard error	Confidence interval (CI)	p-value
Maternal characteristics				
<i>Knowledge of child development</i> (ref: appropriate)				
Inappropriate	2.28	0.41	1.02-5.07	0.044
<i>Practice to promote child development</i> (ref: appropriate)				
Inappropriate	1.45	0.36	0.71-2.97	0.303
<i>Positive parenting practice</i> (ref: appropriate)				
Inappropriate	0.75	0.35	0.38-1.49	0.417
<i>Mother's educational attainment</i> (ref: diploma or higher)				
Below diploma	1.87	0.32	0.99-3.55	0.053
<i>Mother's occupation</i> (ref: formal employed)				
Informal employed	0.67	0.32	0.36-1.26	0.211
Child characteristics				
<i>Child's sex</i> (ref: female)				
Male	1.26	0.29	0.71-2.23	0.432
<i>Child's age (in months)</i> (ref: 12-23)				
24-36	0.55	0.30	0.30-0.98	0.044
<i>Breastfed within first hour</i> (ref: yes)				
No	1.68	0.32	0.90-3.15	0.105
<i>Diarrhea</i> (ref: no)				
Yes	1.58	0.37	0.76-3.29	0.218
<i>Infectious disease</i> (ref: no)				
Yes	0.46	0.51	0.17-1.26	0.130
<i>Living with both parents</i> (ref: yes)				
No	4.33	0.70	1.10-17.08	0.036
Household characteristic				
<i>Family size</i> (ref: ≤ 3 members)				
> 3 members	1.06	0.30	0.58-1.91	0.858
Constant	0.19	0.59		0.005

DISCUSSION

The findings of this study fulfil two major objectives, which reveal the suspected developmental delay prevalence, and its related factors among children 1-3 years old in Nha Trang city. Firstly, it indicates that 34.1% of the children having suspected developmental delay. Secondly, mother's knowledge of child development, child's age and living with both parents are factors associated with suspected developmental delay in children aged 1-3 years in multivariate model. These factors are appeared to have similar patterns with those reported in other regions. Additionally, mother's practice to promote child development and educational attainment are also worth considering since these variables were found related to child suspected developmental delay in bivariate analysis.

Duc⁹ reported in a study analysing large nationally representative survey that 17.2% of Vietnamese children did not reach their full developmental potential within the first 5 years. The equivalent prevalence is reported higher in this study probably due to the sample was collected from younger age group. If the similar pattern, that older children were less likely to have suspected

developmental delay, is assumed among children aged 3-5 then it can explain why the prevalence of child suspected development is higher in younger age group. Also, the different methods (screening tools) of categorizing children with and without suspected developmental delay between this and previous studies may contribute to the different prevalence.

Mother's knowledge of child development is often found to be related to child developmental outcomes²³. It was reported that mothers having higher knowledge of child development are more likely to have children with better developmental outcomes, such as cognitive ability and behavioral development³. However, the evidence for how parental knowledge impact child development is still inadequate. Parental knowledge of child development may indirectly influence child development through parenting skills²³. It may be understood as parents having better knowledge tend to perform better caregiving practices, then these proper practices may improve the developmental outcomes in children³. The findings in this study suggest the similar pattern with previous studies that mothers having better knowledge of child development are less likely to have children with suspected developmental delay.

The relationship between child's age and child development are inconsistent across previous studies^{6-8, 24}. Some studies^{8, 24} indicate the higher risk of being suspected developmental delay in older children while several others^{6, 7} suggest the opposite. The findings in this study show that children whose age is from 24 to 36 months have lesser risk of being suspected developmental delay than those aged from 12 to 24 months. This is somewhat consistent with the results of studies from Sinno et al.⁶ and Contreras et al.⁷ which also show higher developmental performance among older age groups. In the context of this study, the higher developmental performance among older children might be explained that older children are more likely to be enrolled in kindergartens¹³, thus, there are often more opportunities for these children to learn and play hence develop better skills.

The family environment is one of the major sources of stimulating and enhancing child development. Father's role, as a main part of the family environment, is undeniably important in child rearing. Even though fathers are not often considered as the main caretakers of the children, especially in Vietnam and many countries sharing the same culture, fathers indirectly influence child development in many ways through their effects on other people and social circumstances.

CONCLUSION

Findings from this study contribute to the extension of the existing body of knowledge by examining the potential relationships between maternal knowledge of child development and socio-economic characteristics and child development. By exploring these relationships, child's age, children living with both parents, and maternal knowledge of child development were found to be influencer of child development. These findings emphasize the important role of parents in promoting child development and indicate that several broad recommendations may be worth mentioned and deserve further studies. Firstly, there should be informative routine programs or interventions introducing parents, especially mothers, about knowledge of child development. The mothers whose husband are away may receive more benefits from these programs since the offered knowledge and skills may help them cope with extra difficulties during caregiving tasks by their own. Secondly, the role of Vietnamese parents in proactive monitoring and promoting child development should be emphasized in further studies and programs related to child development. And lastly, due to lack of assessment in disadvantage population, furthers studies focusing on child development are expected to be conducted in rural area and address vulnerable population.

For example, fathers contribute to the emotional health and development of the children through economic support. Another important, indirect influence comes from father's source of emotional and instrumental support to the other people, mostly mothers, who directly involve in taking care of the children. These supports can ease the mother's workload and stress while on the other hand enhance mother-child relationship hence positively influence child development²⁵. This study agrees with the study from Contreras et al.⁷ that children living with both parents were at lower risk of being developmental delay. In contrast, study from Jampaklay et al.⁸ suggests that children were not at higher risk of having delayed development as long as they live with their mothers, regardless their fathers' presence.

Several limitations of this study are taking into consideration. Firstly, due to limited resource and time and difficulty on reaching young children in suburban areas, most participants were residential in urban areas. Therefore, it is impossible to generalize the results of this study to the situation nation-wide. Secondly, there were feedbacks from the participants that the questionnaires were too long. This might cause the participants losing motivation to answer the questions accurately.

Conflict of interest

The authors declare no potential conflict of interest.

REFERENCES

1. Britto PR, Lye SJ, Proulx K, et al. Nurturing care: promoting early childhood development. *Lancet*. 2017;**389**(10064):91-102.
2. McCoy DC, Peet ED, Ezzati M, et al. Early childhood developmental status in low-and middle-income countries: national, regional, and global prevalence estimates using predictive modeling. *PLoS Med*. 2016;**13**(6):e1002034.
3. Benasich AA, Brooks-Gunn J. Maternal Attitudes and Knowledge of Child-Rearing: Associations with Family and Child Outcomes. *Child Dev*. 1996;**67**(3):1186-205.
4. Walker SP, Wachs TD, Gardner JM, et al. Child development: risk factors for adverse outcomes in developing countries. *Lancet*. 2007;**369**(9556):145-57.
5. Cprek SE, Williams CM, Asaolu I, et al. Three positive parenting practices and their correlation with risk of childhood developmental, social, or behavioral

- delays: An analysis of the National Survey of Children's Health. *Matern Child Health J.* 2015;19(11):2403-11.
6. Sinno D, Tamim H, Faytrouni F, et al. Factors affecting child development assessed by the Ages and Stages Questionnaire (ASQ) in an Arabic speaking population. *Early Hum Dev.* 2018;120:61-6.
 7. Contreras D, González S. Determinants of early child development in Chile: Health, cognitive and demographic factors. *Int J Educ Dev.* 2015;40:217-30.
 8. Jampaklay A, Richter K, Tangchonlatip K, et al. The impact of parental absence on early childhood development in the context of Thailand. *Asian Pac Migr J.* 2018;27(2):209-30.
 9. Duc N. Developmental risk factors in Vietnamese preschool-age children: Cross-sectional survey. *Pediatr Int.* 2016;58(1):14-21.
 10. Vietnam General Statistics Office, The United Nations Children's Emergency Fund. Viet Nam Multiple Indicator Cluster Survey 2014, Final Report. Hanoi, Vietnam: 2015.
 11. Vietnam Ministry of Labour - Invalids and Social Affairs. Investing in children is most effective for the long-term development of all nations 2017 [cited 2018]. Available from: <http://www.molisa.gov.vn/vi/Pages/chitiettin.aspx?IDNews=26418>.
 12. The United Nations Children's Emergency Fund. Regional experience on integrated approach to early childhood- six case studies in East Asia. Bangkok: The United Nations Children's Fund, East Asia and Pacific Regional Office, 2004.
 13. The United Nations Children's Emergency Fund. Consultative Workshop for National Programme on Comprehensive Child Development 2017 [cited 2018]. Available from: https://www.unicef.org/vietnam/vi/media_a_27034.html.
 14. Khanh Hoa Portal. For the comprehensive child development 2018 [cited 2020 September]. Available from: <https://www.khanhhoa.gov.vn/vi/van-ban-chinh-sach-936/vi-su-phat-trien-toan-dien-tre-em-4840>.
 15. Ministry of Labour, War Invalids and Social Affairs. The Project aims for comprehensive child development 2018 [cited 2020 September]. Available from: <http://www.molisa.gov.vn/Pages/tintuc/chitiet.aspx?tintucID=218201>.
 16. Vietnam National Institute of Nutrition, Alive & Thrive, The United Nations Children's Emergency Fund. Information of Nutritional Monitoring in 2014 - Khanh Hoa [cited 2021]. Available from: <http://viendinhduong.vn/viewpdf.aspx?n=/TT%20Dinh%20duong%202014-Chuan/Bac%20mien%20trung/V03p2014-511-Kh%C3%A1nh%20H%C3%B2a.pdf>.
 17. Singh A, Yeh CJ, Blanchard SB. Ages and Stages Questionnaire: a global screening scale. *Bol Med Hosp Infant Mex.* 2017;74(1):5-12.
 18. Nixon D, Aldwinckle M. Exploring: Child Development from Three to Six Years. 2nd ed. Katoomba, N.S.W.: Social Science Press; 2003.
 19. Herr J. Working with Young Children. 7th ed. US: Goodheart-Willcox Publisher; 2012.
 20. American Academy of Pediatrics. Caring for Your Baby and Young Child. 6th ed: Bantam Books; 2014.
 21. UNICEF Thailand. The Impact of Internal Migration on Early Childhood Well-Being and Development. 2016.
 22. Eanes R. Positive parenting: an essential guide. U.S.: Tarcher and Perigee; 2016.
 23. Sanders MR, Morawska A. Can Changing Parental Knowledge, Dysfunctional Expectations and Attributions, and Emotion Regulation Improve Outcomes for Children? Encyclopedia on Early Childhood Development. 3rd ed. University of Queensland, Australia 2014.
 24. Glascoe FP. Screening for developmental and behavioral problems. *Ment Retard Dev Disabil Res Rev.* 2005;11(3):173-9.
 25. Lamb ME. The Role of the Father in Child Development. 5th ed: Wiley; 2010.