

〈共同研究〉

「途上国における乳幼児期の子どもの発達支援に関する実証研究」

Evaluating the Impact of Early Childhood Education on Child Development in Laos

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Abstract

Early childhood education (ECE) is important to provide the necessary support for children's healthy development during the preschool period. We evaluated whether ECE positively impacted early childhood development (ECD) in Laos. We pooled two rounds of nationally representative cross-sectional household surveys—Lao Social Indicator Surveys 2011–2012 and 2017. The study sample included 9,316 children 3 to 4 years old. Multivariate logistic regression and propensity score-matching (PSM) analysis were performed to estimate the impact of preschool attendance on children's development status. The PSM results showed that preschool attendance positively impacted children's literacy numeracy ($OR = 1.266, p < 0.01$), learning ability ($OR = 1.035, p < 0.01$), physical growth ($OR = 1.011, p < 0.01$), and socio-emotional development ($OR = 1.029, p < 0.05$). We confirmed that home stimulation by caregivers also positively impacted children's literacy numeracy and learning abilities. Since there are large socioeconomic disparities among Laotian children attending preschool, further efforts should be made to promote equitable and inclusive access to ECE in Laos.

1. Introduction

Early childhood is the most significant period for brain development, language skills, and social and educational skills. Proper early childhood development (ECD) builds a basic foundation for human beings and is confirmed to have a positive effect on subsequent academic performance and future labour productivity¹⁻³). Therefore, investing in ECD is justified as a cost-effective measure for a country's development⁴). Nevertheless, it is estimated that around 250 million children under 5 years of age living in low- and middle-income countries cannot fully reach their brain and physical potential due to poverty and undernutrition⁵).

For the sound development of children, it is crucial to provide good experiences of learning and play at home, schools, and communities during early childhood, when the brain is growing rapidly^{5, 6}). Regarding this point, target 4.2 of the Sustainable Development Goals (SDGs), emphasises the

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importance of ECD by stipulating, 'By 2030, ensure that all girls and boys have access to quality early childhood development, care, and pre-primary education so that they are ready for primary education'⁷⁾.

Early childhood education (ECE), including kindergarten and nursery, is an important measure to provide necessary support for the healthy development of children during the preschool period⁸⁾. Although the enrolment rate of ECE is increasing worldwide⁸⁾, only 17% of children aged 3 to 4 years old attended some form of ECE program in the least developed countries during 2010–2018⁹⁾. Furthermore, empirical studies on the effect of ECE on ECD on a large scale in developing countries are still limited, with a few exceptions. For instance, an empirical study in Peru has confirmed that malnourished children who participated in ECE showed higher performance in terms of athletic and cognitive abilities than those who did not¹⁰⁾. However, in many developing countries, the effect of ECE on ECD using nationally representative data remains unclear.

Lao People's Democratic Republic (Laos) is a land-locked country in mainland Southeast Asia and belongs to the least developed countries. In Laos, the proportion of people living below the absolute poverty line (1.90 USD per day) is still high (22.7% in 2012) among Southeast Asian countries¹¹⁾. Although Laos's GDP per capita in 2018 (2,542 USD) exceeded that of Cambodia (1,510 USD) and Myanmar (1,325 USD)¹¹⁾, the prevalence of child undernutrition was the highest in the region. In particular, the prevalence of stunting among children of Laos (44%) was much higher than that of Cambodia (32%) and Myanmar (29%) during 2013–2018¹²⁾. Child undernutrition increases the risks of mortality, mobility, illness, infection, developmental delay, cognitive deficits, and low learning capacities later in life¹³⁾. Due to the high prevalence of poverty and undernutrition, it is estimated that many children in Laos suffer from a poor environment in terms of ECD.

In recent years, the government of Laos has focused on the expansion of ECE nationwide¹⁴⁾, and the number of ECE classes increased from 4,590 in 2011 to 7,650 in 2015¹⁵⁾. According to the Lao Social Indicator Surveys (LSIS), which are nationally representative household surveys, the percentage of children aged 3 to 4 years old who attended ECE increased from 23.0% in 2011 to 32.1% in 2017^{16, 17)}. The purpose of this study is to evaluate the impact of ECE on ECD in Laos by analysing two rounds of LSIS datasets. The findings are expected to help policymakers improve the situation of ECD in Laos by guiding effective ECE policies and programs.

2. Methods

2.1. Study context

Laos is one of the least developed countries, with a GDP of 2,542 USD in 2018¹¹⁾. Laos recognized 49 ethnic groups, although most of the population was 54.6% Lao-Tai, 10.9% Khmu, and 8.0% Hmong; about 26.5% of the population was comprised of other ethnic groups in 2005¹⁸⁾. This ethnic diversity results in an unbalanced opportunity for ECE across the population. Laos has one of the youngest populations in Asia, with a median age of 22.8 years in 2015¹⁹⁾. People under the age of five and 18 constituted 11.6% and 44.2% of the population in 2015¹⁹⁾. However, child development situation in Laos is inferior to that of neighbouring countries. In addition to child undernutrition, the under-five mortality rate in Laos was 47.3% per 1,000 live births in 2018, which was higher than Cambodia's (47.3) and Myanmar's (46.2)¹¹⁾.

2.2. Early childhood education in Laos

ECE in Laos is defined as a 'program which has organised learning components, as opposed to baby-sitting or day-care programs which do not include organised learning'^{16, 17)}. Since ECE is not compulsory in Laos, parents or caretakers generally decide whether to send their child to the ECE. As Article 15 of the Education Law 2008 of Laos states, "Early Childhood Education should ensure that children develop holistically, know the foundation of talking, writing, reading, listening, looking at, and drawing, love their parents, teachers, those surrounding them, country, nature and clearness, have talents, love to learn, and prepare themselves for primary education." A child's attendance in the ECE is expected to improve their readiness for entering primary school. Laos has recently improved the environment for ECE and increased the number of classrooms and teachers under the policy of expanding access to education through pre-primary and community-based school readiness programs¹⁷⁾. Additionally, the Ministry of Education and Sports developed preschool curricula and provided teaching and learning materials to improve the quality of ECE¹⁷⁾.

2.3. Stimulation at home

In addition to evaluating the impact of ECE, we examined whether early stimulation and responsive care for children by caregivers at home had a favourable impact on child development. Home stimulation and responsive care have been confirmed to be effective in the cognitive, physical, social, and emotional development of children during the early period^{5, 6)}. The LSIS collected information on a number of activities considered as early stimulation and responsive care. The LSIS questionnaire asked caregivers to report whether, in the three days preceding the survey, there was any adult who engaged with the child in activities that could promote learning and school readiness: 1) reading books or looking at pictures; 2) telling stories; 3) singing songs; 4) taking the child outside the home, compound, or yard; 5) playing with children; and 6) spending time with children, naming, counting, or drawing things. Following the previous literature, we totaled the number of activities that the adults engaged in, and created a dummy variable of "adequate home stimulation" if the number exceeded four out of the six activities²⁰⁾.

2.4. Early childhood development index

ECD is defined as "an orderly, predictable process along a continuous path, in which a child learns to handle more complicated levels of moving, thinking, speaking, feeling, and relating to others"^{16, 17)}. LSIS applied the ECD Index (ECDI) of the Multiple Indicator Cluster Survey (MICS) developed by UNICEF to assess basic developmental milestones of children aged 3 to 4 years old. The ECDI divides vital domains of a child's overall development into four categories: literacy and numeracy skills, readiness to learn, physical growth, and socio-emotional development²¹⁾. ECDI was calculated using a 10-item module and was used to assess whether a child was developmentally on track in each domain²¹⁾. In the survey, caretakers were asked the following 10 questions to assess each of the four domains.

- (1) Literacy-numeracy: 1) whether a child can identify at least 10 letters of the alphabet, 2) whether they can read at least four simple, popular words, and 3) whether they know the names and recognize the symbols of all numbers from 1 to 10. If at least two of these are true, then the child is considered developmentally on track.
- (2) Learning: 1) If the child follows simple directions on how to do something correctly, and 2) when given something to do, is able to do it independently. If at least one of these are true, then the child is

considered developmentally on track.

- (3) Physical growth: 1) If the child can pick up a small object such as a stick or a rock from the ground with two fingers, 2) the child is not sometimes too sick to play. If at least one of these are true, then the child is considered developmentally on track.
- (4) Social-emotional development: 1) the child gets along well with other children, and 2) the child does not kick, bite or hit other children; 3) and the child does not get distracted easily. If at least two of these are true, then the child is considered developmentally on track.

Based on the ECDI, we used the following outcome variables: whether the child aged 3 to 4 years old is considered developmentally on track in terms of (1) literacy-numeracy skills, (2) learning ability, (3) physical growth, and (4) socio-emotional development. Each variable was coded 1 if the child was on track and 0 otherwise.

2.5. Data

We used two rounds of the latest nationally representative cross-sectional data: the LSIS-I (2011–2012) and the LSIS-II (2017). The LSIS applies the technical frameworks of MICS and the demographic and health survey. The LSIS-I provided baseline data for the 7th National Socio-Economic Development Plan (NSED) and the Millennium Development Goals¹⁶⁾. Following the LSIS-I, the LSIS-II was conducted to monitor the 8th NSED and SDGs. LSIS-I data were collected from 18,843 households from October 2011 to February 2012¹⁶⁾, while 22,287 households were interviewed for the LSIS-II from July 2017 to November 2017¹⁷⁾. Among them, we used the data of 9,316 children aged 3 to 4 years old (4,483 from LSIS-I and 4,883 from LSIS-II) as the study sample.

2.6. Control variables

As control variables, we used child-, parent-, household-, and community-level characteristics. Child-level variables included sex and age (3 or 4 years old). Parent-level variables consisted of their age and educational achievement (none, primary, secondary, and higher). Household-level variables included the ethnicity of the household head (Lao-Tai, Mon-Khmer, Hmong-Mien, and others) and wealth quintiles. The community-level variables include province dummies (Vientiane Capital, Phongsaly, Luangnamtha, Oudomxay, Bokeo, Luangprabang, Huaphanh, Xayabury, Xiengkhuang, Vientiane, Borikhamxay, Khammuane, Savannakhet, Saravane, Sekong, Champasack, Attapeu, and Xaysomboune). In addition, we used a round dummy variable (LSIS-I [2011–2012] and LSIS-II [2017]).

2.7. Statistical analysis

To evaluate the impact of children's attendance in preschool on their development status, we first applied multivariate logistic regressions by assuming that the placement of preschool is exogenous to other factors affecting selection. However, this exogeneity assumption is not realistic because caregivers generally decide whether their child attends preschool. To solve this endogeneity problem, we apply the propensity score matching (PSM) method. The PSM attempts to estimate the effects of a specific policy or treatment in observational studies by reducing the bias arising from confounding factors that might predict outcomes. The PSM matches treated and untreated units based on a set of basic characteristics and attempts to balance both groups. In our study, two groups were created: a treatment group (children who attended preschool) and a comparison group (children who did not attend preschool). Stata version 16 was used for statistical analysis.

3. Results

3.1. Sample characteristics

Table 1 lists the sample characteristics. In addition to the mean values of the total sample population, we report the mean values for children who attended and did not attend preschool. With respect to the

Table 1. Sample characteristics

Variables	Total		Preschool	No preschool	Gap
	Obs.	Mean	Mean	Mean	
Outcome variables					
1. Literacy-numeracy	9,084	0.231	0.540	0.110	0.430***
2. Learning	9,284	0.955	0.986	0.942	0.044***
3. Physical	9,267	0.989	0.998	0.985	0.013***
4. Social-emotional	8,918	0.890	0.902	0.886	0.016***
Main predictor					
Preschool	9,316	0.283			
Home stimulation	9,316	0.518	0.728	0.435	0.293***
Covariates					
Girl	9,316	0.489	0.519	0.478	0.041***
Child age					
3 years	9,316	0.516	0.382	0.569	−0.188***
4 years	9,316	0.484	0.618	0.431	0.188***
Mother's age	9,316	30.0	30.4	29.8	0.6
Educational attainment of mother					
None	9,315	0.299	0.096	0.378	−0.282***
Primary	9,315	0.401	0.316	0.434	−0.118***
Secondary	9,315	0.223	0.370	0.165	0.204***
Higher	9,315	0.078	0.218	0.022	0.196***
Father's age	8,195	33.7	34.1	33.5	0.6*
Educational attainment of father					
None	8,190	0.130	0.039	0.166	−0.127***
Primary	8,190	0.413	0.236	0.482	−0.246***
Secondary	8,190	0.314	0.386	0.285	0.101***
Higher	8,190	0.143	0.339	0.066	0.272***
Ethnicity					
Lao-Tai	9,316	0.488	0.719	0.398	0.321***
Mon-Khmer	9,316	0.199	0.123	0.229	−0.106***
Hmong-Mien	9,316	0.152	0.077	0.181	−0.105***
Other	9,316	0.161	0.081	0.192	−0.111***
Wealth quintile					
Lowest	9,316	0.295	0.098	0.373	−0.275***
Lower middle	9,316	0.217	0.124	0.254	−0.131***
Middle	9,316	0.174	0.145	0.186	−0.041***
Upper middle	9,316	0.159	0.236	0.129	0.107***
Highest	9,316	0.154	0.398	0.058	0.340***
Round					
LSIS-I (2011–2012)	9,316	0.483	0.397	0.517	−0.119***
LSIS-II (2017)	9,316	0.517	0.603	0.483	0.119***

Province dummies are omitted from the table.

main predictor, 28.3% of children attended preschool, and 51.8% of children received adequate home stimulation. Regarding outcome variables, the proportions of children who were on track for literacy numeracy, learning, physical growth, and social-emotional were 23.1%, 95.5%, 98.9%, and 89.0%, respectively. The proportions of those on-track in all four domains were significantly higher ($p < 0.01$) for children who attended preschool than for those who did not. In particular, a large disparity was observed in literacy numeracy between children who went to preschool (54.0%) and those who did not (11.0%).

Regarding the parents' characteristics, educational attainment of both the mother and the father of the children who attended preschool were significantly higher than the parents of children who did not. Turning to the ethnicity of the household head, 71.9% of children with preschool were from the Lao-Tai group; conversely, Mon-Khumer, Hmong-Mien, and other ethnicities were only 12.3%, 7.7%, and 8.1%, respectively. Household wealth level was higher for children who went to preschool than for those who did not.

3.2. Regression analysis

Table 2.1 presents the results of the multivariate logistic regressions on the relationship between preschool enrolment and the four domains of ECD. The magnitude of the effects was assessed by odds ratios (ORs), which can be interpreted as increasing the likelihood of being developmentally on-track (if $OR > 1$) or reducing that likelihood (if $OR < 1$). Regarding the main predictor, whether the child was enrolled in preschool, there was a statistically significant and positive effect on all four ECDI. For instance, the estimated ORs for literacy numeracy ($OR = 4.754$, $p < 0.01$) indicates that if the child attends preschool, the odds of a child being on-track in literacy-numeracy increased by 4.754. Similarly, the estimated ORs for learning ($OR = 2.009$, $p < 0.01$), physical growth ($OR = 3.867$, $p < 0.01$), and socio-emotional development ($OR = 1.188$, $p < 0.1$) showed positive effects of preschool attendance on ECD.

Regarding the estimated results of the covariates, higher educational levels of the mother were positively associated with the literacy-numeracy and socio-emotional development of the child. In contrast, the father's education was not consistently associated with child development. Regarding ethnicity, children from the Lao-Tai group were more likely to be on track in literacy-numeracy and socio-emotional development than those from other ethnicities. Finally, children from wealthier households were more likely to be on track with regard to literacy-numeracy, but not in the other three development domains.

Table 2.2 presents the results of logistic regressions for the effects of home stimulation on the ECDI. It shows that home stimulation by caregivers, statistically significant and positive effects were confirmed for literacy numeracy ($OR = 2.384$, $p < 0.001$), learning ($OR = 1.359$, $p < 0.05$), and socio-emotional ($OR = 1.388$, $p < 0.1$), but not for physical growth.

Table 3 presents the results of the logistic regression analysis to identify factors that are associated with the child's likelihood of attending preschool and receiving adequate stimulation and responsive care at home. The results showed that girls were more likely to attend preschool than boys ($OR = 1.250$, $p < 0.01$), but there was no significant difference between girls and boys with regard to the likelihood of receiving adequate home stimulation. Higher educational levels of both the mother and father, as well as the household's wealth level, were associated with a higher likelihood of preschool attendance and home stimulation. Notably, children from households in the highest wealth quintile were much more likely to attend preschool ($OR = 6.639$, $p < 0.01$) and to receive home stimulation ($OR = 6.639$, $p < 0.01$) compared

Table 2.1. Results of logistic regression analysis for the effects of preschool

	1. Literacy-numeracy	2. Learning	3. Physical	4. Social-emotional
Main predictor				
Preschool	4.754 (0.000)***	2.009 (0.000)***	3.867 (0.001)***	1.188 (0.094)*
Covariates				
Girl	1.161 (0.021)**	1.047 (0.660)	1.467 (0.068)*	1.227 (0.004)***
Child's age				
3 years †				
4 years	1.844 (0.000)***	1.591 (0.000)***	1.324 (0.196)	1.118 (0.119)
Mother's age	0.995 (0.442)	1.000 (0.993)	0.967 (0.100)	1.002 (0.744)
Mother's education				
None †				
Primary	1.500 (0.000)***	1.214 (0.139)	1.550 (0.086)*	1.177 (0.083)*
Secondary	2.296 (0.000)***	1.439 (0.100)*	1.521 (0.342)	1.307 (0.048)**
Higher	2.322 (0.000)***	1.578 (0.248)	1.295 (0.718)	1.356 (0.136)
Father's age	1.016 (0.010)***	1.011 (0.258)	1.023 (0.260)	1.004 (0.510)
Father's education				
None †				
Primary	0.983 (0.898)	1.322 (0.055)*	0.981 (0.951)	1.007 (0.950)
Secondary	1.110 (0.497)	1.253 (0.236)	0.781 (0.519)	1.090 (0.539)
Higher	1.424 (0.040)**	1.340 (0.248)	1.401 (0.541)	1.164 (0.425)
Ethnicity				
Lao-Tai †				
Mon-Khmer	0.753 (0.024)**	0.562 (0.004)***	0.629 (0.185)	1.238 (0.090)*
Hmong-Mien	0.482 (0.000)***	0.612 (0.035)**	0.995 (0.989)	1.155 (0.314)
Other	0.788 (0.060)*	0.647 (0.033)**	0.589 (0.096)*	1.308 (0.053)*
Wealth quintile				
Lowest †				
Lower middle	1.013 (0.908)	0.988 (0.932)	0.729 (0.249)	0.933 (0.537)
Middle	1.286 (0.035)**	1.414 (0.067)*	0.743 (0.345)	0.842 (0.173)
Upper middle	1.542 (0.001)***	1.362 (0.201)	0.858 (0.698)	0.852 (0.282)
Highest	1.848 (0.000)***	1.923 (0.055)*	1.471 (0.552)	0.758 (0.141)
Round				
LSIS-I (2011-2012) †				
LSIS-II (2017)	1.168 (0.041)**	1.387 (0.021)**	1.174 (0.548)	1.223 (0.025)**
Observation	7981	8163	7725	7843

Odds ratios (ORs) are reported, *p<0.1, **p<0.05, ***p<0.01, p-values in brackets, †: Reference
Estimates of province dummies are omitted from the table.

Table 2.2. Results of logistic regression analysis for the effects of home stimulation

	1. Literacy-numeracy	2. Learning	3. Physical	4. Social-emotional
Predictor				
Home stimulation	2.384 (0.000)***	1.359 (0.026)**	1.414 (0.135)	1.308 (0.001)***
Observation	7981	8163	7725	7843

Odds ratios (ORs) are reported, ** $p < 0.05$, *** $p < 0.01$, p-values in brackets
Estimates of covariates are omitted from the table.

to those from the lowest quintile households. Regarding ethnicity, children from the Lao-Tai group were more likely to attend preschool and to receive home stimulation compared to those of other ethnicities.

3.3. Propensity score matching analysis

Table 4 shows the results of the PSM analysis. As a main predictor, children's attendance in preschool had statistically significant and positive effects on all of the ECDI. The estimated ORs were smaller than those obtained by the logistic regressions: literacy-numeracy (OR = 1.266, $p < 0.01$), learning (OR = 1.035, $p < 0.01$), physical growth (OR = 1.011, $p < 0.01$), and socio-emotional development (OR = 1.029, $p < 0.05$). The results support the robust and favourable effects of preschool on ECD in Laos. Turning to home stimulation, we confirmed significant and positive effects of home stimulation on literacy numeracy (OR = 1.109, $p < 0.001$) and learning (OR = 1.020, $p < 0.05$). Nevertheless, home stimulation did not exert significantly positive effects on children's physical growth and socio-emotional development.

4. Discussion

This study investigated the impact of ECE on ECD in Laos. Specifically, we examined whether children who attended preschool had a higher likelihood of being on track in the four different domains of their development status—literacy-numeracy, learning ability, physical growth, and socio-emotional development—compared to those who did not.

First, we confirmed the robust effects of preschool attendance on all four domains of child development by conducting both logistic regression and PSM analysis. This finding suggests that if a child attends preschool, he/she is more likely to develop not only literacy numeracy and learning abilities, which are typically taught at preschool, but also physical and socio-emotional development. These results are consistent with empirical evidence from previous studies conducted in other developing countries^{2, 22}). The positive effects of preschool indicate that an increase in preschool enrolment will lead to the improvement of both cognitive and non-cognitive skills in Laotian children.

Second, we confirmed that home stimulation by caregivers also had a positive impact on children's literacy numeracy and learning abilities. This result is consistent with a previous study that analysed 87,286 children aged 3 to 4 years old from MICS in 38 low- and middle-income countries²³).

Third, we confirmed that there were significant socioeconomic inequalities in terms of educational attainment of the parents, ethnicities, and wealth of the household among Laotian children attending preschool or receiving adequate early home stimulation. The government of Laos should close gaps in children's access to ECE and a healthy home environment.

This study had some limitations. First, we did not examine the quality of the preschools. As several

Table 3. Results of logistic regressions for the selection of preschool and home stimulation

	Preschool	Home stimulation
Girl	1.250 (0.000)***	1.013 (0.784)
Child's age		
3 years †		
4 years	3.133 (0.000)***	1.147 (0.005)***
Mother's age	1.012 (0.106)	1.006 (0.225)
Mother's education		
None †		
Primary	1.477 (0.000)***	1.492 (0.000)***
Secondary	2.442 (0.000)***	2.170 (0.000)***
Higher	5.378 (0.000)***	3.972 (0.000)***
Father's age	1.005 (0.430)	1.003 (0.502)
Father's education		
None †		
Primary	1.226 (0.112)	1.072 (0.379)
Secondary	1.797 (0.000)***	1.193 (0.056)*
Higher	2.721 (0.000)***	1.837 (0.000)***
Ethnicity		
Lao-Tai †		
Mon-Khmer	0.871 (0.182)	0.729 (0.000)***
Hmong-Mien	0.463 (0.000)***	0.532 (0.000)***
Other	0.583 (0.000)***	0.622 (0.000)***
Wealth quintile		
Lowest †		
Lower middle	1.597 (0.000)***	1.102 (0.145)
Middle	2.073 (0.000)***	1.387 (0.000)***
Upper middle	3.231 (0.000)***	1.782 (0.000)***
Highest	6.639 (0.000)***	2.624 (0.000)***
Round		
LSIS-I (2011-2012) †		
LSIS-II (2017)	1.386 (0.000)***	0.398 (0.000)***
Observation	8189	8189

Odds ratios (ORs) are reported, *p<0.1, **p<0.05, ***p<0.01, p-values in brackets.

†: Reference

Estimates of province dummies are omitted from the table.

Table 4. Results of propensity score matching analysis

	1. Literacy-numeracy	2. Learning	3. Physical	4. Social-emotional
Preschool	1.266*** (0.000)	1.035*** (0.000)	1.011*** (0.000)	1.029** (0.014)
Observation	7981	8163	8148	7843
Home stimulation	1.109 (0.000)***	1.020 (0.021)**	1.007 (0.270)	1.010 (0.327)
Observation	7981	8163	8148	7843

Odds ratios (ORs) are reported, **p<0.05, ***p<0.01, p-values in brackets

studies conducted in developing countries confirmed that the quality of preschool was critically important in determining the cognitive development of children, further study will be required to investigate to what extent and how the quality of preschool affects children's cognitive and non-cognitive development. Second, in relation to the first point, we could not identify the concrete mechanism behind the link between preschool attendance and child development. A process analysis that investigates the linkage between the input of education at preschool and child development outcomes will be needed for future studies. Despite these limitations, this study is the first to analyse the effects of ECE on ECD by analysing two rounds of nationally representative cross-sectional data in Laos, and it will thus serve as an important benchmark for further study.

5. Conclusions

This study confirms the importance of ECE for ECD in Laos. Since the enrolment rate of preschool is still low, the further expansion of preschool will be critical for the improvement of ECD in Laos.

List of abbreviations

1. Early childhood education (ECE)
2. Early childhood development (ECD)
3. Early childhood development Index (ECDI)
4. Lao People's Democratic Republic (Laos)
5. Lao Social Indicator Survey (LSIS)
6. Multiple Indicator Cluster Survey (MICS)
7. Ministry of Education and Sports (MoES)
8. National Socio-Economic Development Plan (NSEDPlan)
9. Odds ratios (ORs)
10. Propensity score matching (PSM)
11. Sustainable Development Goals (SDGs)

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