

Relationship Among the Knowledge, Attitudes, and Practice of Executive Functions of Teachers in Childcare Centers in Thailand

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Abstract

The quality of Executive Functions (EF) practicing of teachers supports children to learn and improve EF. EF development in children is a new topic in Thai education that has to be investigated. This study aims to investigate the relationship among knowledge, attitudes, and practicing of teachers' executive functions (EF) in childcare centers. These relationships were examined in a Thai context (n = 100). A questionnaire survey was performed to canvas teachers' knowledge, attitudes, and EF skills practicing. The data were analyzed using Spearman's Rho correlation. The results demonstrated that the teachers understood the concept of EF, possessed positive attitudes toward promoting EF development, and regularly practiced activities for EF development in children (75.72%, 79.98%, and 77.21%, respectively). The results revealed that having sufficient knowledge and a positive attitude toward the EF have a positive relationship with practicing activities related to EF development. This study suggested that further knowledge should be provided in simple strategies that encourage a positive attitude towards exercising EF in children and allow teachers to plan EF activities in childcare centers on a daily basis.

Keywords: Executive functions (EF), Childcare center, Teachers, Thailand

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Introduction

Executive functions (EF) refer to a set of cognitive abilities that humans utilize to learn, work, and manage everyday life activities to achieve goals. The control and regulation of these mental skills are essential for a human's development and proper functioning in society. At the same time, trouble with the EF can lead to learning, emotional, and behavioral complications (Diamond, 2013). EF development is especially important in early childhood to aid a child's learning as well as social and emotional development. In Thailand, EF is a relatively new area of study that has begun to attract attention in the last five years. The importance of EFs in the brain's functioning is becoming more well understood, and it is becoming clear that improving EF skills in children can help their brains become more competent.

Executive functions in early childhood

In modern society, it is becoming increasingly crucial for children to communicate, collaborate with others, apply critical thinking/problem-solving skills, as well as to display creativity. Therefore, children in the early childhood stage should be prepared to make them ready to learn, analyze, plan, and then apply these skills to solve problems. This set of skills are termed executive functions (EFs). These EFs are related to the process of how the brain works and effectively monitors and controls the children's actions. The frontal lobes within the brain are responsible for the higher-order cognitive functions for processing and regulating behaviors. EF that results from the working processes of the prefrontal cortex and the dorsolateral prefrontal cortex performs information processing, planning, organizing, critical thinking, and problem solving. The anterior cingulate cortex works on emotional perception. In particular, it suppresses inappropriate responses and decisions, while the orbitofrontal cortex of the brain controls impulses and regulates socially appropriate behaviors (Alvarez & Emory, 2006). The development of a child's brain is closely related to the development of their EFs. The brain processes comprise cognitive processes and behavioral competencies, including the working memory, self-directed behavior, planning, organization; behavioral regulation and control toward a changing

environment; and appropriate decision-making based on positive and negative outcomes (Chan et al, 2008). Most significantly, when children had opportunities to develop their EF skills, they will be far better prepared to grow up as adults who can establish goals, control emotions, stay focused — i.e., not being easily distracted — and adjust their mindset to specific situations. Conversely, children who lack EF skills may tend to act aggressively, display attention deficits, be unprepared to socialize, and more likely to become involved with narcotics (Blair & Razza, 2007; Bull et al., 2008).

Therefore, the promotion of EF activities should be encouraged in early childhood, particularly in the formulation of learning experiences and the creation of activities at home and in childcare centers. A variety of activities that can be performed to practice EFs, including a half-hour activity to promote the working memory, interference control, and cognitive flexibility processes (Röthlisberger et al., 2012). Additionally, the use of certain apps on a computer, tablet, or mobile device, aerobics exercise, martial arts, practicing awareness, and role-play activities are recommended to promote EF. These are some common examples of activities that can help children aged 4-12 years old with their integrated development to assist in consistent EF development. (Diamond & Lee, 2011).

A systematic review of 26 research that reported on the EF development in children in a number of countries, found that children's EF varied according to gender, geography, and the country's economic status. Bilingual children are better advanced in their ability to conduct resilience activities (shift/cognitive flexibility) and inhibition than monolingual children. In East Asian countries, girls did better than boys. However, in Tanzania, Iran, Sweden, Spain, and China, boys performed better than girls on EFs. Furthermore, older children in severely underprivileged communities showed lower scores of EF development than younger ones (Schirmbeck et al., 2020). That means the underprivileged children lack the resources and support they need to study as they grow up. Similarly in Thailand, child language development, parenting style, and parental stress were all linked to the development of children's EF (Seamkhumhom et al., 2019). Discrepancies in children's EF development across countries were discovered to be dependent on the children themselves as well as their families, communities, and environmental factors. EF of children can be improved by providing them the opportunity to learn from qualified caregivers in a learning-appropriate environment. The childcare center is one of the key environmental

factors influencing children's EF development (Choi et al., 2016; Graziano et al., 2016). Childcare center is the environment where children learn by interacting with teachers, friends, and self-learning with support from teachers. The EF practicing of teachers should be examined for improvement. Therefore, teacher's EF practices should be evaluated for improvement. However, a few research have investigated the teacher's practice in childcare centers in Thailand.

Childcare centers and children's EFs

When children reach a suitable developmental age, they develop EF skills with parental support, primarily through interacting with people, exploring new situations, playing, and performing housework (Vernon-Feagans et al., 2016). Childcare centers have an important role in determining appropriate activities for improving children's growth and development. According to a study conducted in Cambodia, Mongolia, and Vanuatu, found that children who attended childcare centers had higher EF scores than children who did not attend (Sun et al., 2018). Children's EF can be improved through the quality of teacher-child interactions as well as emotional support and classroom practice (Choi et al., 2016). In addition, as reported by teachers, a more deficient quality child-teacher relationship was predictive of a lower readiness score and higher academic impairment in children (Graziano et al., 2016). As a result, the teacher's involvement is critical for children's academic accomplishment, and teachers should understand how to organize appropriate activities to assist children's growth and promote their EFs. Teachers should also be familiar with each child's behavior and be able to assess children's competencies through observation or the use of specific tools.

Teachers' practice is now required in academic planning, such as in the Thai-based setting in this study, in order for them to be proficient at generating appropriate learning processes as well as the ability to be innovative regarding the stated criteria (Sukawetchaworakit et al., 2020). Prior research concerning childcare centers in Thailand revealed that the setting details of the learning experience could be divided into two categories: research developing teacher knowledge (mainly concerned with planning, practicing, observing, and reflecting) and research into the children's results (e.g., as assessed individually by considering the child's capability to solve problems creatively)

(Kraiwan & Lehmongkol, 2017). Despite the fact that there are few studies on the integration of the EF in learning in Thailand, one previous study found that 51 students from three kindergarten schools who participated in the EF training program (*Discipline 101* program) developed three positive socio-emotional types of attitudes as well as the EF (Themkumkwun et al., 2017); nevertheless, there have been breakthroughs in EF training for teachers in recent years – primarily by professionals (Hanmethee et al, 2018). Furthermore, the first EF survey among young children in Thailand was recently conducted utilizing the tool described by Chutabhakdikul et al. (2017) covering five key EF skills: 1) working memory – the ability to recognize data for immediate use, 2) inhibitory control – the ability to display pausing behaviors at the time considered, 3) shift/cognitive flexibility – the ability to perform resilience activities, 4) emotional control – the ability to cope with a variety of emotions, and 5) planning and organizing – the ability to target, prioritize, process, and assess situations and activities. The research group of 2,965 children aged 2 to 6 years old found that 30% of the children, or around one in every three children, had delays in EF development ($T < 45$ scores). Moreover, 30% of children with EF dysfunctions ($T \text{ score} > 55$) had behavioral issues. Thai preschool children's EFs are so low that they may damage their readiness to learn and lead to undesired habits in the future.

Knowledge, activities, practice (KAP)

The processes of implementing EF knowledge have effectively flourished in relation to Bloom's theory (Bloom, 1965), which describes how knowledge and attitudes can be connected to pragmatism. Bloom et al.'s theory (1956) of the formation of desirable behaviors covers three aspects: 1. Knowledge, in which the brain processes have a relationship with the cognition of the facts under consideration. 2. Attitudes, which cover the process of mentality, emotion, and value, as well as beliefs; and 3) practice, which relates to the use of physical expression of talents with sufficient knowledge and a positive attitude, ultimately good practice can be achieved over time. Last but not least, the multi-step of decision-making represents physical expression and requires sound knowledge and attitude to complete the final process. The level of teacher knowledge contributes to the teacher's attitude, which in turn influences the teacher's practice toward the empowerment process. Expert teachers in EF can help preschool children improve their EFs. The

outcomes of a teacher training program showed it helped them improve children's EFs in terms of their working memories, inhibition, and combined EFs (Walk et al., 2018), such as socio-emotional attitudes and EF (Themkumkwun et al., 2017).

The purposes of the present study were to study the definitions and the relationship between knowledge, attitude, and practice of the executive functions (EF) in teachers in childcare centers. The findings should aid teachers in their efforts to help Thai children learn by engaging in high-quality activities, improving their EF abilities, and arranging activities in early childhood educational institutions.

Method

Representative samples

In this study, we employed purposeful sampling using the G*Power tool, a representative sample size of 110 teachers was calculated. Based on the researchers' experience in the teacher's knowledge and practice survey compliance with early childhood education standards in 2018, only 50 percent of Thai teachers responded to the questionnaire. As a result, a total of 220 questionnaires were distributed to childcare teachers. Teachers who had participated in the two-day training program to promote EF in early childhood children in the past two years in six regions of Thailand were asked to participate in this study. Knowledge of EF, lesson plans for EF promotion, re-arranging children's activities in childcare centers, and tools for EF assessment in children were all included in the training. A total of 100 teachers responded to the questionnaire. The return rate was 45.45%, which means that 90.90% of the expected sample (110) was returned. The demographic details of the participants are shown in Table 1.

The 100 teachers were all females, with an average age of 41.08 years old (range, 23–59); their marital status was married (63%) vs single (30%); average experience as a childcare teacher was 12.81 years; and the highest education level was bachelor's degree (67%); with an average number of teachers was 6.99 per center; and average number of children was 61.99 in each childcare center (range 15–202).

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Table 1. *Characteristics of the teachers and daycare centers (n = 100 people)*

Data	Frequency	Percentage
Sex & Age		
- Female	100	100.0
Age ($\bar{x}$ = 41.08, S.D.= 9.65, range 23–59)		
- 21–30 years	15	15.0
- 31–40 years	30	30.0
- 41–50 years	33	33.0
- 51–60 years	19	19.0
- Undefined	3	3.0
Marital status		
- Single	30	30.0
- Married	63	63.0
- Widowed	6	6.0
- Undefined	1	1.0
Working experience ($\bar{x}$ = 12.81, S.D. = 8.11, range 2–30)		
- 1–5 years	21	21.0
- 6–10 years	22	22.0
- 11–20 years	30	30.0
- more than 20 years	23	23.0
- Undefined	4	4.0
Highest educational level		
- Senior High School	2	2.0
- Diploma/Vocational Certificate/High Vocational	6	6.0
Certificate		
- Bachelor Degree	67	67.0
- Master Degree	25	25.0
- Undefined	4	4.0
Number of teachers in the centers ($\bar{x}$ = 6.99, S.D. = 12.01, range 1–55)		
- 1–3 people	39	39.0
- 4–6 people	36	36.0
- More than 6 people	18	18.0
- Undefined	7	7.0
Number of children in the centers ($\bar{x}$ = 61.99, SD = 52.21, range 15–202)		
- 1–50 people	58	58.0
- 51–100 people	23	23.0
- 101–150 people	5	5.0
- Undefined 150 people	10	10.0
- Undefined	4	4.0

Instruments

The information was gathered using a self-reported questionnaire. The questionnaire was developed using the findings from the literature review (Chutabhakdikul et al., 2017; Diamond, 2013), and it consisted of four sections as follow:

Section: 1 Personal Information. This section covered questions regarding the age, educational level, position, and experience of the teachers in the childcare centers, as well as the number of children and teachers in the childcare centers, including any seminars or training.

Section 2: EF Knowledge Promotion of the Teachers. This section was developed from the literature review covering the comprehensive definitions of the EF (7 items), the means of performing EF development or the activities practicing the EF (22 items), EF assessment (4 items), for a total of 33 items. The respondents' choices were the *True-False* types – *True* (+1 point), *False* (-1 point), *Uncertain/Unknown* (null). Total potential scores ranged from 0 to 33 points, representing the knowledge criteria of the teachers as follows: Low/Moderate/High is a scale that can be interpreted as follows: Scoring 60% or less is considered low; Scoring 60%–79% is considered moderate; Scoring higher than 80% is considered high (Bloom, 1971).

Section 3: Attitudes of the Teachers Toward EF Promotion. This section was developed based on the literature review analysis of the EF's benefits and attitudes regarding its use (20 items). The respondents' choices were in accordance with a four-level rating scale: Strongly disagree, Undecided/ Disagree, Strongly agree, and Agree. Total potential scores ranged from 20 to 80 points, representing the teachers' attitudes: Scoring 60% or less is considered bad attitude; scoring 60%-79% is considered moderate attitude; scoring higher than 80% is considered good attitude.

Section 4: Practicing EF Promotion by the Teachers. This section was also developed from the literature review, specifically from that section that covered the administration (8 items) of EF practices, including Working memory (7 items), Inhibitory control (6 items), Shift/ cognitive flexibility (5 items), Emotional control (5 items), and Planning and organizing (5 items); management of non-desirable EFs (2 items); assessment (7 items); and communication with parents (2 items), resulting in 47 items in total. The respondents'

choices were based on a four-level rating scale according to the frequency with which the activities were carried out in practice, starting from following the actions in correspondence with the specified statements – daily, occasionally, or even null actions. Total scores ranged from 47 to 188 points, interpreted as follows: Scoring less than 60% is considered low; Scoring 60%–79% is considered moderate; Scoring higher than 80% is considered high.

Quality verification of the tools: 1. *Content validity*: Five specialists in the subject assessed for the content validity: two nursing instructors, one education instructor, a head, and a teacher from a qualified childcare center. They examined the content accuracy, the correspondence with the objectives, and the language appropriateness. The researcher considered all of the suggestions from these specialists for improvement. 2. *Reliability*: Before analyzing the internal consistency of the questionnaires using Cronbach's alpha coefficient and the KR20 method for examining the three sets of questionnaire questions (0.69, 0.82, 0.95), appropriate research tools were employed to experiment with competent teachers for a total of 30 people.

Data collection processes

Data collection started after obtaining ethical approval from the Institutional Review Board. Teachers in the childcare centers who had attended the two-day EF training program in the previous two years were given copies of questionnaires. Informed consent was obtained before starting the data collection process. The teachers were invited to complete the questionnaires voluntarily and then returned them to the researchers. The researchers maintained the privacy and information security of the participants by using personal codes. All information will be destroyed within five years after the research is published.

Data analysis

Personal data analysis: The teachers' knowledge level, attitudes, and practices for EF promotion were analyzed by descriptive statistics. The frequency and percentage were employed to analyze the categorical data, whereas the average value and the standard deviation were employed with continuous data. Spearman's Rho correlation was used due to the assumption of normality.

Results

The findings revealed that teachers had moderate EF knowledge, with 75.72% correctness, with the highest value of 90.14% for *EF meaning*, and the lowest score of 65.55% for knowledge regarding EF promotion for children. The average score for the *attitudes in the early childhood EF promotion* was *equally moderate* at 78.98%. Specifically, on the most strongly agreed item, the teachers agreed that the daily practice of EF promotion in children was the item they most firmly agreed with 100%. In comparison, the issue that they most strongly disagreed (43%) was that the current curriculum was suitable and additional EF exercises were unnecessary. Regarding the EF practice, the

Table 2. *Distribution of EF knowledge, attitudes, and practicing for promoting the EF skills in early childhood by teachers (n = 100).*

Knowledge dimensions	Percentage of correctness	Level
Knowledge about the promotion of EF skills by teachers	75.72	Moderate
Meaning of the EF	90.14	High
EF promotion for children	65.55	Moderate
EF assessment	68.00	Moderate
Attitude dimensions	Percentage of conformity	Level
Attitudes toward EF promotion in the early childhood by teachers	78.98	Moderate
Practice dimensions	Percentage of regular practice	Level
Practicing EF promotion in the early childhood by teachers	77.21	Moderate
Management	74.09	Moderate
Promotion of the EF for working memory	80.00	High
Promotion of the EF for inhibitory control	84.33	High
Promotion of the EF for shift/cognitive flexibility	74.60	Moderate
Promotion of the EF for emotional control	84.50	High
Promotion of the EF for planning and organizing	86.70	High
Management of the non-desirable EF's behaviors	59.85	Low
Assessment	71.54	Moderate
Communication with parents	64.14	Moderate

teachers most frequently got the children to practice EF skills by reciting their *demands* and *feelings*. At the same time, non-desirable EF management, communication with parents, and assessment were practiced regularly, with ratings of 59.85%, 71.54, and 64.14%, respectively. Regarding the referral of children with EF behavioral problem data to the relevant people, such as nurses or psychologists, the average score was approximately 54% for the other tasks, which many teachers had no experience. (Table 2)

The results illustrated that the EF knowledge as well as the attitudes of the teachers had a relationship with the practicing EF promotion ($r = 0.336$, $p < 0.05$; $r = 0.339$, $p < 0.05$, respectively) in the early childhood (Table 3).

Table 3. *Illustration of analyzing the relationship among EF knowledge, attitudes, and practicing EF skills in relation to the promotion of the EF in early childhood by teachers (n = 100).*

	1.	2.	3.
<i>Attitudes toward the EF</i>	1		
<i>Promotion toward the EF</i>	0.399*	1	
<i>Knowledge about the EF</i>	0.192	0.336*	1

* $p < 0.05$. r = Spearman's Rho correlation

Discussion

According to the findings, the most progression development was the role of teachers, with an average knowledge score of 75.72 points (*moderate level*) (Table 2). This is possible since this study group had already completed training on the *Project of Key Knowledge Development and the Movement of EF for Health in Children and Youth* two years ago in Thailand. The percentage of teachers who understood the meaning of the EF was 90.14% (*good level*). When performing a point-by-point analysis, it was discovered that the most effective factor in the learning, according to *Bloom's Theory of Learning* (Bloom et al., 1956), was the recitation of the definitions and theories. In contrast, the least effective factor was the means of developing/activities leading to the development, with a score of 65.55% (*moderate level*). These findings point to the need for teachers to be given concrete examples of how to employ EF to implement in their classrooms. The EMIL

training program developed by Walk et al. (2018), focused on children's cognitive and socio-emotional development, as well as the development of EFs and their significance in social and academic skills. Teachers had to learn how to improve EFs in a preschool setting in a variety of ways. Teachers reflected on EF issues and discussed ideas on modifying EF activities and enhancing EFs in their preschoolers' daily lives. According to the findings, teachers who completed the EMIL training program scored significantly higher on three out of seven EF measures (inhibitory control, visual-spatial working memory, and combined EFs) than a control group. It was suggested that more information on EF should be presented in a way that makes EF understandable. Moreover, there are ways of utilizing the knowledge for providing a more advanced level depending on the analysis and knowledge synthesis for extending development after the training to apply this to actual situations, which is a form of knowledge that requires more than two years of time and experience. (Tochon & Munby, 1993).

The findings also revealed the relationship between Thai preschool teachers' EF knowledge promotion and their practice of EF promotion in childcare centers, with teachers who understand EF development for children can select the appropriate EF skills for their students. A survey of teachers' knowledge, values, and practice in New Zealand revealed that teachers who were aware of the importance of EF for learning attempted to support EF development in children (De la Haye-Stokes, 2017). While a qualitative study in Thailand revealed that 22 teachers' EF competency was based on three dimensions; 1) knowledge, 2) skills, such as planning, creating learning materials, assessing, and contributing to the EF knowledge of colleagues, and 3) certain key attributes, such as the mental and physical qualities of the teachers (Intaraprasert et al., 2020). It can be demonstrated that daycare teachers with proper EF knowledge may be able to organize EF activities.

The teachers' attitudes regarding EF showed that 78.98% (Table 2) had a moderate level of attitude regarding EF promotion. It was also shown that every teacher (100%) agreed that children who received consistent support for their EF development quickly adapted to others, which positively impacted the learning process and the children's learning outcomes. According to Leatherman and Niemeyer (2005), teachers' overall attitudes were usually influenced by their individual previous classroom experiences. When the early childhood teachers had more experience, they were better able to integrate such practice

into the classroom, including encouraging children to engage, resulting in a significant increase in the children's positive attitudes in a class. The research displayed the average teaching experience among the study cohort of 12.81 years, reflecting the teachers' positive attitudes toward their careers, resulting in their readiness to apply the related thoughts to promote early childhood learning quality in the classroom. As a result, when new knowledge, such as that related to EF, is introduced, teachers should be implanted with positive attitudes as well as appropriate activities that may affect their practices. The results of this study supported those of an Israeli study, in which teachers claimed that EFs influenced students' performance in reading and arithmetic, as well as the pedagogical practices (Rapoport et al., 2016).

Despite the fact that the representative research participants had already completed EF training, some of the teachers still had negative attitudes toward the EF promotion. They had strong beliefs in their previous curricula (Thailand's core curriculum for early childhood). Furthermore, they were concerned about their readiness for the implementation, or sometimes they thought the transition to the EF curricula was too complicated. This could be because EF key knowledge being a relatively new breakthrough in Thailand over the last five years, causing teachers to be unsure about its implementation. A few countries have applied the EF key knowledge to actual curricula, such as Sweden, which developed "*the Social and Emotional Material Learning (SMELA)* and *the Digital Individual Learning (DIL)*" for examination and used these as comparative criteria with the former curricula. However, no definite findings have been reached concerning which curriculum is the most beneficial. There is some ambiguity among the teachers, resulting in a *moderate* level in the attitude towards EF (Gerholm et al., 2018; Gerholm et al., 2019).

When looking at the details regarding practicing EF promotion, it was discovered that teachers had an average score of 77.21 points (*moderate level*). The activities that were commonly employed were: the practices for the children to be capable of expressing their desires, being responsible for putting away their items (or toys) after usage, which covered the aspects of working memory and were a part of daily life. However, the teachers only achieved a moderate level of success in promoting shift/cognitive flexibility. It might be challenging to arrange activities involving the children's thinking process in this area. As a result, more specific activities are thus required. Symbol mapping and rule switching, for

example, both require cognitive flexibility, which involves both independence and interaction (Legare et al., 2018). However, in Thailand, 15 early childhood children for 1 teacher receive childcare development support, making planning activities difficult. It was also found that around 71.54% of teachers performed EF assessment, and 54% did not refer children with EF problems to related professionals, such as nurses or psychologists. This problem could be caused by teachers who have not been trained to assess EF. In Thailand, such assessment is mainly carried out by healthcare personnel. At least 83 measures, such as head-toes-knees-shoulders tasks, Minnesota Executive Function scale, or Child Behavior Rating Scale, are used to assess EF in preschool-age children. Some of the assessments are designed to capture teachers' perspectives of children's interactions with adults and other children in a classroom (Ackerman & Friedman-Krauss, 2017). This last section is critical, because when teachers can assess their EF, they can design appropriate activities to promote EF.

In conclusion, the findings demonstrated that the teachers' knowledge and attitudes toward EF had a positive relationship with the practice of EF activities, which aligned with Bloom's Theory of Learning (Bloom et al., 1956). However, early childhood teachers in Thailand are unfamiliar with EF. As a result, when there is sufficient EF promotion, learning can be more successful, leading to better understanding of the EF (Cognitive Domain) and the development of more positive attitudes and values promoting the EF (Affective Domain). Finally, the teachers will be able to integrate their EF knowledge into new activities allowing them to practice their EF skills and promote their proficiency (Psychomotor Domain). In addition, special education for teachers was observed to improve EF scores in specific subscales. According to these findings, the cognitive domain forms a foundation for the psychomotor domain (Rapoport et al., 2016). The study results support Bloom's theory, indicating that changing practice could be easier to be accomplished when the teacher's knowledges and beliefs are addressed and improved.

Conclusions and Recommendations

Improving the teachers' EF KAP should enhance EF development in children, as this

study found a clear correlation. Therefore, it is essential to assess the teachers' knowledge of EF regularly. There should be a seminar/training about EF with a focus on developing key knowledge in the up-to-date trends on how to form promising and positive attitudes for institutional administrators, teachers, and caregivers as well as for other groups of people involved in the supervision of early childhood children. Promoting EF should be another substantial policy for initiating and promoting the learning experience in early childhood. There must be some solid examples of actual activities that teachers may obtain, including clear-cut processes for improving tools for assessing the EF so that the teachers can utilize and use those tools to assess children prior to the screening process and identification of sporadic problems. Following this, the child's non-desirable behaviors will be referred to nurses and psychologists for further assistance and consultation, as well as to accompany the child's supervision in early life.

As a policy recommendation, the government and/or the relevant institutions should provide adequate fiscal budget support for EF development in early childhood. Such development is necessary for each child to attain higher levels of education, as well as to encourage and to create qualitative equality in childcare centers so that they can be more comprehensively act in providing coverage and accessibility for each Thai household, regardless of the variation in their economic and social circumstances. The sample cohort was confined to teachers who participated in the EF training program, which is a limitation of this study. This sample of preschool teachers may not be representative of all preschool teachers in Thailand.

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