การรับรู้และการปฏิบัติของครูผู้ดูแลเด็กในศูนย์พัฒนาเด็กเล็กเพื่อป้องกันโรคโควิด-19
Perceptions and Practices among Childc0are Teachers in Young Children Development Centers for the COVID-19 Prevention

นิพนธ์ต้นฉบับ

Original Article

อนุสรา มั่นศิลป์[1]* และ ไพลิน นุกูลกิจ[2]

[1] คณะพยาบาลศาสตร์ มหาวิทยาลัยรัตนบัณฑิต อ.สามโคก จ.ปทุมธานี 12160
[2] ณะพยาบาลศาสตร์ มหาวิทยาลัยราชพฤกษ์ อ.บางกรวย จ.นนทบุรี 11130

* Corresponding author: anutsara.man@gmail.com

วารสารไทยเภสัชศาสตร์และวิทยาการสุขภาพ 2568;20(2):187-192.

Anutsara Mansin[1]* and Pailin Nukulkij[2]

[1] Faculty of Nursing Rattana Bundit University. Samkok, Prathum Thani. 12160, Thailand
[2] Faculty of Nursing Rajapruk University. Bang Kruai, Nonthaburi 11130, Thailand

* Corresponding author: anutsara.man@gmail.com

Thai Pharmaceutical and Health Science Journal 2025;20(2):187-192.

บทคัดย่อ

วัตถุประสงค์: เพื่อ 1) ศึกษาการรับรู้และการปฏิบัติเพื่อป้องกันโควิด 19 ของครูผู้ดูแลเด็กในศูนย์พัฒนาเด็กเล็ก และ 2) ทดสอบความสัมพันธ์ระหว่างการรับรู้กับการปฏิบัติ **วิธีการศึกษา:** การวิจัยเชิงความสัมพันธ์มีครูผู้ดูแลเด็ก 212 คนเป็นตัวอย่าง โดยสุ่มจากศูนย์พัฒนาเด็กเล็ก 118 แห่งใน จ.ปทุมธานี ในช่วงกันยายน 2565 – มิถุนายน 2566 โดยตอบแบบสอบถามการรับรู้และการปฏิบัติเพื่อป้องกันโรคโควิด-19 แสดงระดับการรรับรู้และการปฏิบัติ และทดสอบความสัมพันธ์ระหว่างการรับรู้และการปฏิบัติด้วยค่าสถิติสหสัมพันธ์ของเพียร์สัน **ผลการศึกษา:** คะแนนเฉลี่ยการรับรู้ความรุนแรงและความเสี่ยงต่อการเกิดโรคที่ระดับมาก การรับรู้ประโยชน์และอุปสรรคต่อการป้องกันโรคระดับปานกลาง คะแนนเฉลี่ยการปฏิบัติเพื่อป้องกันโรคระดับปานกลาง พบความสัมพันธ์ที่มีนัยสำคัญทางสถิติ คือ การรับรู้ความรุนแรงของโรคสัมพันธ์กับการดูแลเด็กและสุขอนามัยส่วนบุคคลของครู (r = 0.218 และ 0.184 ตามลำดับ, P-value < 0.01 ทั้งคู่) การรับรู้โอกาสเสี่ยงสัมพันธ์กับการดูแลเด็ก การจัดอาหาร การสื่อสารกับผู้ปกครอง สุขอนามัยส่วนบุคคลและสิ่งแวดล้อมของครู (r = 0.183, 0.331, 0.185, 0.265 และ 0.245 ตามลำดับ (P-value < 0.05 ทั้งหมด) **สรุป:** ควรส่งเสริมการปฏิบัติเพื่อป้องกันโควิด 19 ของครูผู้ดูแลเด็กในศูนย์พัฒนาเด็กเล็กซึ่งอาจทำได้โดยเพิ่มการรับรู้ด้านประโยชน์และอุปสรรคต่อการป้องกันโรค

คำสำคัญ: การรับรู้และการปฏิบัติ; ครูผู้ดูแลเด็ก; ศูนย์พัฒนาเด็กเล็ก; โควิด 19

Editorial note
Manuscript received in original form: December 21, 2024;
Revision notified: March 2, 2025;
Revision completed: June 6, 2025;
Accepted in final form: June 6, 2025;
Published online: June 30, 2025.

Abstract

Objective: To determine the levels of perceptions and practices of childcare teachers in preventing COVID-19 in young children development centers and the correlations between the perceptions and practices. **Methods:** This correlational study recruited 212 child-care teachers as participants from 118 young children development centers in Pathumthani province, Thailand, to complete the questionnaires of the teacher perception and preventive practices in the COVID-19 prevention. Pearson's correlation coefficient was computed to determine correlations between the perception and practice. **Results:** The average perception scores on the severity and risks of contracting the disease were at a high level, awareness of the benefits and barriers in preventing the disease was at a moderate level and the average disease-prevention score was at a moderate level. Correlations with significance were perceptions of the severity of the disease and the care being provided to the children and the personal hygiene of the teachers (r = 0.218 and 0.184, respectively, P-value < 0.01 for both), risk awareness and the care being provided to the children, food preparation, communication with parents and the personal hygiene and environment of the teachers with a statistically significant relationship of 0.05. (r = 0.183, 0.331, 0.185, 0.265 and 0.245, respectively, P-value < 0.05 for all). **Conclusion:** The practice to prevent COVID-19 among childcare teachers in young children development centers could promoted in part through enhancing the perceptions of the benefits and barriers in disease prevention.

Keywords: perceptions and practices, childcare teachers, young children development centers, COVID-19

Journal website:
http://ejournals.swu.ac.th/index.php/pharm/index

Introduction

The COVID-19 is capable of undergoing many mutations that are capable of infecting people with both violent non-violent cases of the disease. Symptoms of the COVID-19 usually include fever, dry cough, fatigue and loss of the senses of smell and taste. When the disease spreads, it destroys the lungs with symptoms of pneumonia and difficulty in breathing leading to respiratory failure. Symptoms spread violently, reaching a critical stage in other systems of the body, including blood clots clogging up the blood vessels in the important organs of the body; an impaired immune response of the body; aging; obesity; chronic diabetes; high blood pressure; and heart, kidney or lung disease. It contributes to compounding the severity of the COVID-19 in those infected with the disease, and may easily and rapidly lead to a loss of life. This research investigates the perceptions and practices of preschool teachers in Thailand regarding COVID-19 prevention. Between December 2019 and September 2021, globally, 1,695,256 preschool-aged children (under five years old) were reported to have contracted COVID-19, representing 1.8% of global cases. A total of 1,721 child deaths were reported, constituting 0.1% of global COVID-19 mortality[1]. In Thailand, during the third wave of the pandemic (April 2021 – February 2022), 107,059 preschool children were

cumulatively infected, with 29 deaths. Most fatalities involved children with pre-existing health conditions, and transmission was largely attributed to household contacts. At that time, no COVID-19 vaccine was available for this age group[2].

Young children are a highly vulnerable population entirely reliant on caregivers, parents, or child-care teachers. The COVID-19 pandemic significantly impeded decades of progress across multiple sectors, including poverty reduction, health, educational access, nutrition, child protection, and mental well-being. The pandemic's widespread and profound impact exacerbated existing poverty and inequalities, resulting in unprecedented violations of children's rights[3]. A recent report from UNICEF Thailand[4] highlighted the substantial negative consequences for children, particularly concerning health deterioration, nutritional deficiencies, increased poverty, heightened safety risks, and significant learning loss. Severe outbreaks necessitated the closure of preschools, leading to widespread educational disruption and developmental delays for children who heavily depend on these facilities for care and early childhood development. A 2019 survey of preschool enrollment in Thailand indicated that 86.3% of the 5,863 surveyed Thai children aged 36-59 months were enrolled in preschool[5]. A recent report from UNICEF Thailand highlighted the substantial negative consequences for children, particularly concerning health deterioration, nutritional deficiencies, increased poverty, heightened safety risks, and significant learning loss[6].

The concern of the investigators was on their study of perceptions and practices for the purpose of preventing the COVID-19 disease from infecting the teachers caring for the children in the child-care development centers. Perceptions include perceptions toward risk of contracting the disease, perceptions toward the severity of the disease, perceptions of the benefits of disease prevention and treatment, and perceptions of wastefulness or of various barriers. The investigators also studied the relationship between perception and practice for the purpose of preventing the spread of the COVID-19 pandemic. Utilizing the Health Belief Models a theoretical framework[7]. The Health Belief Model posits that beliefs about disease severity, personal susceptibility, and potential health consequences influence health behaviors. Accordingly, this research will assess teachers' understanding of disease severity, their perceived risk of infection, their awareness of potential health risks associated with infection, their adoption of preventative behaviors, their recognition of barriers to prevention, and their understanding of the benefits of remaining healthy. Prior research on children's respiratory health risks associated with industrial air pollution demonstrated the effectiveness of risk management strategies informed by perceived risk[8]. This study extends this understanding to the context of COVID-19, exploring teachers' awareness of health and safety risks to young children and their role in preventing disease transmission. The study's focus on effective COVID-19 prevention within the context of high-quality, comprehensive childcare aligns with the importance of establishing a strong foundation for the healthy development of young children into adulthood. The integration of health and safety education into daily routines within preschool settings is essential, beginning in early childhood. A key objective is to promote the well-being of young children – encompassing physical, mental, and emotional health – ensuring their healthy development and protection from COVID-19 infection.

Specifically, this study aimed to determine the level of perception of COVID-19 and the practice to prevent COVID-19 among childcare teachers in young children development centers. We also aimed to examine correlations between individual aspects of perception and individual aspects of practice. Accordingly, it was hypothesized that individual aspects of perception of COVID-19 were correlated with individual aspects of the practice to prevent COVID-19.

Methods

The present research took the form of a descriptive research. The population that was used in this study consisted of a total of 430 teachers providing care for young children[9] in 118 child-care centers of local government organizations in seven districts of the Province of Pathum Thani. Sample group sizes were calculated by the method of Yamane (1973)[10], with a defined certainty level of 95% and a sample-group error level of 0.05. Substitution in the formula of Yamane, $n = N/ 1 + Ne^2$ yields the result $n = 430/ 1 + 430(0.05)^2$, from which the sample group size was found to be 207 participants. As a protection against sample-group losses, the group size was increased by an additional 10%. The group size was thus increased by an additional 21

persons. Accordingly, the size of the sample group under study became 207 + 21 = 228 cases. Selection criteria for the sample group consisted of teachers caring for young children in the child development centers of local government organizations in the districts of the Province of Pathum Thani. Both male and female teachers were selected without regard to age, and all those who were selected entered into the study voluntarily.

The sampling method employed was a selection of young children development centers with a minimum of three child care teachers. The calculated sample size was 228 individuals. Based on the inclusion criteria, the sample comprised child care teachers from approximately 40 centers out of a total of 118 centers within local administrative organizations across seven districts in Pathum Thani Province.

Research Instrument

The questionnaire was subdivided into three sections, as follows:

Section 1: A general information questionnaire requesting the personal information of teachers caring for young children in the child development centers was prepared. The requested information included sex, age, educational level, marital status, income and the length of time in practice. Also included was the question of any history of chronic illnesses, history of COVID-19 infections and treatments, history or relationships with COVID-19 patients and 14-day quarantine, history of COVID-19 infections and treatment of family members and vaccination history in the form of a check list. Fill in the blanks for all 12 items.

Section 2: A 30-item multiple-choice questionnaire on perceptions toward the COVID-19 was prepared, in which a checkmark ✓ was entered into the box corresponding to perceptions in each of these areas: eight items pertaining to disease risk perceptions, seven items pertaining to disease severity perceptions, seven items pertaining to perceptions of disease prevention benefits and eight items pertaining to perceptions of disease prevention barriers. Scoring criteria was based on the Likert five-level rating-scale model, namely, fully agree, agree, neither agree nor disagree, disagree and fully disagree, with a score of 5 for 'fully agree,' a score of 4 for 'agree', a score of 3 for 'neither agree nor disagree,' a score of 2 for 'disagree' and a score of 1 for 'fully disagree.' Results were interpreted as consisting of five levels. Specifically, an average value within 4.51-5.00 indicated a maximum level of perception; an average value within 3.51-4.50 indicated a high level of perception; an average value within 2.51-3.50 indicated a moderate level of perception; an average value within 1.51-2.50 indicated a low level of perception; and an average value within 1.00-1.50 indicated a minimal level of perception. The reliability of the questionnaire was 0.86.

Definition of Perceptual Variables:

Perceived Susceptibility: This refers to an individual's subjective belief regarding their risk of contracting a disease, which subsequently motivates them to engage in preventive behaviors. Perceived Severity: This encompasses an individual's perception of the potential consequences and seriousness of a disease, including the possibility of complications or harm to bodily functions. This perception drives the development of protective behaviors through the reinforcement of beliefs aimed at avoiding such adverse outcomes. Perceived Benefits: This denotes an individual's recognition of the positive health outcomes that can be achieved through the adoption of preventive measures. Perceived Barriers: This signifies an individual's belief in the existence of obstacles or impediments that may hinder their ability to engage in preventive behaviors. Individuals will consequently seek to mitigate or circumvent these perceived barriers.

Section 3: A 36-item questionnaire on COVID-19 disease prevention practices was prepared for teachers caring for young children, with practice levels defined as a score of 3 for practicing regularly, a score of 2 for practicing often and a score of 1 for practicing infrequently. Data was analyzed on a three-level rating scale, in which an average value within 2.51-3.00 meant mostly practicing; an average value within 1.51-2.50 meant moderately practicing and an average value within 1.00-1.50 meant minimally practicing. The reliability of the questionnaire was 0.88.

Quality testing of the research instruments

The tools of research were tested for quality by finding their content validity, which was established by presenting the questionnaire used for data compilation to three connoisseurs, who tested it for its content validity. It was then modified and corrected according to the

recommendations of the connoisseurs and assigned an IOC index of 1.00. It was then tried out on 30 teachers who were caring for young children in the young children development centers in provincial districts situated in the vicinity of the Province of Pathum Thani. A reliability analysis of the questionnaire was subsequently performed by applying Cronbach's alpha coefficient.

Protecting the Rights of the Sample Group

The present research passed certification by the Human Research Ethics Committee on Medicine and Public Health of the Province of Pathum Thani, Certification number PPHO-REC 2565/16, with date of certification September 1, 2022. The investigators complied with international standards of human research ethics, including the process of soliciting participants for this research, explaining the research in detail and requesting their consent to participate in the sample group for this research.

Data collection procedure

1. The investigators coordinated their work and prepared documents requesting approval to proceed with their research with agencies related to the child-care centers. At the same time, they also explained their objectives and requested cooperation in compiling their data.

2. The investigators mailed their questionnaires, approval documents and explanatory documents seeking signed consent for participation in the research to teachers who were caring for young children. They were being invited into the sample group where the objectives and process of the research would be explained to them and to ask their cooperation in consenting to participate in the program of research.

3. The investigators attached an empty envelope together with a duty stamp and their address so that the sample group could then mail the questionnaires back to the investigators.

4. The investigators collected all of the data on the questionnaires that had been mailed back to them from the sample group. They checked each of the questionnaires for completeness, and then recorded and performed a statistical analysis of the data accordingly.

Data analysis

Demographic characteristics of the participants and study variables were summarized using mean with standard deviation and frequency with percentage. Relationships of the study variables were tested using Pearson's product moment correlation coefficient analysis. Statistical significance was set at a type I error of 5% (or P-value < 0.05). All statistical analyses were performed using the software program SPSS version 20.

Results

The personal data from the sample group of 212 teachers who were caring for young children in the child development centers were analyzed. It was found from the analysis of this data that the majority were within 36-45 years of age, at 39.2% while 86.8% were of the female sex. In addition, results also showed that 86.8% were married; 51.4% (a clear majority) had been educated to the bachelor's-degree level; 61.3% had overall average yearly incomes of >92,000 Baht; 38.7% of the teachers caring for young children had been working in the child development centers for overall periods of <5 years; 30.7% had never undergone any training on the COVID-19 pandemic; 75.5% of the sample group had contracted the COVID-19 virus; and 46.2% were able to recover on their own at home (Table 1).

Table 1 Demographic characteristics of the participants (N = 212).

Characteristics	N (%)
Age (years)	
<25	8 (3.8)
25-35	48 (22.6)
36-45	83 (39.2)
46-55	56 (26.4)
>55 and higher	17 (8.0)
Sex	
Male	28 (13.2)
Female	184 (86.8)
Marital status	
Single	81 (38.2)
Married	109 (51.4)
Widowed/divorced/separated	22 (10.4)
Education	
Vocational certificate - high vocational certificate	48 (22.6)
Associates degree	11 (5.2)
Bachelor's degree	130 (61.3)
Master's degree	23 (10.8)
Doctor's degree	0 (0.0)
Annual income (Baht)	
<23,000	67 (31.6)
23,001-46,000	37 (17.5)
46,001-69,000	13 (6.1)
69,001-92,000	13 (6.1)
>92,000	82 (38.7)
Time working (years)	
<5	65 (30.7)
5-10	61 (28.8)

11-15	53 (25.0)
16-20	26 (12.3)
>20	7 (3.3)
COVID-19 training	
Some previous training	52 (25.5)
No previous training	160 (75.5)
Previous contract with the COVID-19	
Never at any time	70 (33.0)
Previously, with home recovery by oneself	98 (46.2)
Previously, stayed at a hospitel	36 (16.9)
Previously, with hospital stay	8 (3.8)

Perceptions toward the risk and severity of disease in the sample group of child-care teachers in the young child development centers were averaged and then analyzed. It was found from the results of the analysis that the majority had average scores at a high or very highest level. The average perception scores were quite high in the area of disease risk perceptions and perceptions of the benefits and barriers to disease prevention (Table 2).

Table 2 Perceptions toward risk/severity of disease and toward benefits and barriers to disease prevention (N = 212).

Perceptions domains (score range)	mean	SD
Perceptions toward risk of disease (8-40)	29.71	3.64
Perceptions toward disease severity (7-35)	25.03	3.06
Perceptions toward benefits of disease prevention (7-35)	23.75	3.33
Perceptions toward barriers to disease prevention (8-40)	25.74	4.23

The performance scores on COVID-19 prevention of the teachers who were caring for young children in the child development centers were averaged. From the results of averaging the scores, it was found that in the area of caring for young children, the teachers were capable of managing the children's toy activities, preparing food for the children, communicating with the children's parents or guardians and maintaining their own personal hygiene and surrounding environment only moderately (Table 3).

Table 3 Practices of the childcare teachers in the child development centers toward disease prevention n (N = 212).

Practice area (score range)	mean	S.D.
Caring for young children (4-12)	8.13	1.21
Managing the children's toy activities (4-12)	7.42	1.32
Preparing food for the children (3-9)	5.36	.86
Communicating with the children's parents/guardians (6-18)	12.22	2.03
Personal hygiene and environment of the child-care teachers (13-39)	29.79	3.48
Environmental hygiene of the child-care teachers (6-18)	12.57	1.84

The average score of perception and practice found from testing was at a statistically significant level of 0.01. It was found from this result that perceptions of disease severity were positively related to the child-care and personal hygienic practices of the child-care workers (r = 0.218** and 0.184**). Disease risk perceptions were positively related to child-care practice, food preparation for children, communication with the children's parents/guardians and personal hygiene and environment of the child-care teachers (r = 0.183**, 0.331**, 0.185**, 0.265** and 0.245**, respectively) . Perceptions of the benefit of disease prevention were positively related to the personal hygienic practices of the child-care teachers (r = 0.191**). Testing at a statistically significant level of 0.05 revealed that disease severity and perceptions toward disease prevention were positively related to communication behaviors toward parents/guardians (r = 0.145* and 0.159*) (Table 4).

Table 4 Relationships between the perceptions and practices of the participants (N = 212).[§]

Perception aspects	Practice aspects					
	Childcare	Managing children's toy activities	Food preparation for children	Communication with parents /guardians	Personal hygiene of the child-care teachers	Environmental hygiene of the child-care teachers
Perceptions toward disease severity	0.218**	0.105	0.084	0.145*	0.184**	0.097
Perceptions toward risk of disease	0.183**	0.135*	0.331**	0.185**	0.265**	0.245**
Perceptions toward the benefits of disease prevention	0.105	0.103	0.016	0.159*	0.191**	0.127
Perceptions of barriers to disease prevention	0.120	0.057	0.028	0.070	0.117	0.119

* P-value < 0.05; ** P-value < 0.01.

§ Pearson's product moment correlation coefficient.

Discussions and Conclusion

This study revealed a relatively high average perception of COVID-19 severity and risk among participants. This finding is attributable to the novel nature of the pandemic and the rapid global dissemination of information facilitated by modern digital communication technologies. The widespread availability of information through online social media likely contributed significantly to heightened awareness. This aligns with research indicating a significant positive correlation between perceived risk, communication patterns, self-protective behaviors, and public perception of governmental responses to COVID-19[11]. Consistent with these findings, an analysis of COVID-19 preventive behaviors in a sample of adults (aged 20-59) residing in Chom Thong district, Bangkok, showed a high prevalence of such behaviors (88.45%, mean = 12.8, SD = 2.9).

However, five factors were significantly associated ($p < 0.05$) with these behaviors: gender, marital status, knowledge of COVID-19, access to healthcare resources and services, and communication of prevention policies (facilitating factors). Contributing factors included information received from television or online media, family, friends, and healthcare professionals.[12] Conversely, perceived benefits and barriers to prevention were rated as moderate. This suggests that a significant portion of the sample may lack access to comprehensive information, for example, regarding the efficacy of different COVID-19 vaccines in preventing infection, severe illness, and death. Uncertainty about vaccine effectiveness, along with stress, anxiety, and fear of infection, and the economic impact of the pandemic, may also have played a role.

The implementation of COVID-19 prevention measures by childcare providers in early childhood development centers was found to be moderate across all areas. This included childcare practices, food preparation, the organization of learning activities for individual children or small groups (maximum 5 children per group), toy sanitation, and personal hygiene of the caregivers. While high awareness and concern regarding COVID-19 infection, coupled with frequent prior implementation of preventive measures, contributed to some adherence to protective behaviors, full compliance was not achieved. Challenges were particularly evident in maintaining separate activity spaces and toys for different small groups due to limited space and insufficient resources. Environmental hygiene practices among caregivers were also moderate. Avoiding high-risk areas or crowded locations and limiting the use of crowded public transportation or air-conditioned vehicles proved difficult for many caregivers due to residential location and reliance on public transport. These occupational constraints distinguish the preventive behaviors of childcare providers from those observed in a broader sample of adults in Chom Thong district, Bangkok, where a high level of COVID-19 preventive behaviors (88.45%) was reported.[13]

This study examined the relationship between childcare providers' perceptions and practices regarding COVID-19 prevention in early childhood development centers. Perceived disease severity correlated with practices related to childcare and caregivers' personal hygiene. Perceived risk of infection correlated with practices related to childcare, food preparation, communication with parents, and caregivers' personal and environmental hygiene. Perceived benefits of prevention correlated with caregivers' personal hygiene practices. These findings suggest that perceptions of severity and risk influenced the adoption of preventive measures across multiple domains. While high levels of awareness were observed, practical implementation was often constrained by various factors. The correlation between perceived benefits and personal hygiene practices, as well as communication with parents, indicates that recognizing the benefits of prevention led to stricter adherence to personal hygiene and the provision of additional information to parents to protect themselves and their children at home. These findings are consistent with other research demonstrating a moderate positive correlation ($r = 0.522$, $p < 0.001$) between health literacy and COVID-19 preventive behaviors.[14]

Conclusion

Consideration should be given to individual conduct and comprehensive management of the relevant facilities and surroundings in all aspects in order to forestall situations from arising where the disease could break out with much greater effectiveness.

Recommendations

Comprehensive Support for Child-care teachers: Child-care teachers require comprehensive support to effectively control the spread of COVID-19. This support should extend beyond awareness initiatives and encompass other relevant areas.

Recommendations for Future Research

1. Investigate Effective Strategies for Enhancing Caregiver Awareness: Future research should explore and identify effective strategies for promoting awareness across the four identified domains among child-care teachers. This investigation should focus on developing preparedness protocols that enable caregivers to implement appropriate and accurate practices during any disease outbreak.

2. Examine Barriers to Caregiver Awareness and Implementation: Further research is needed to investigate the challenges and obstacles that impede caregivers' awareness across the four domains and their ability to implement appropriate practices during infectious disease outbreaks.

Limitations of the Research

1.Temporal Context of Data Collection: The data collection for this study did not occur during the peak of the COVID-19 pandemic. Rather, it was conducted during a period when the severity of the pandemic had subsided.

2.Variability in Physical Environments: The physical environments of the respective early childhood development centers exhibited heterogeneity. Factors such as the location of the centers, their size, the architectural design of buildings, and the spatial dimensions of indoor areas varied across the sites. Furthermore, differences in institutional policies and regulations among the centers were observed. These variations in physical environment and policy frameworks may have contributed to disparities in teachers' perceptions and practices.

Strengths

This research holds significant implications for young children, as it addresses the crucial role of childcare providers in fostering both developmental growth and robust health. In addition to promoting quality developmental milestones, caregivers are responsible for ensuring the physical and mental well-being of children, safeguarding them from infectious disease risks, and strictly adhering to public health policies and disease control measures.

Weaknesses

The data collection occurred during a period when the severity of the COVID-19 pandemic had subsided. Furthermore, the physical environments of the early childhood development centers, which are geographically dispersed throughout Pathum Thani Province, exhibited significant variability

Acknowledgements

The authors appreciate all child-care teachers for contributing to data collection and Faculty of Nursing, Pathum Thani University and Faculty of Nursing, Rattana Bundit University for facilitating this research.

Funding disclosure

We would like to express our personal thanks to the University of Pathum Thani for having funded this research in all of its various aspects

References

1. World Health Organization. COVID-19 in children and adolescents: Scientific brief. [Internet]. World Health Organization. 2021 Sep 29 [cited 2023 Dec 17]. Available from: https://www.who.int/publications/i/item/WHO-2019-nCoV-Sci_Brief-Children_and_adolescents-2021.1
2. Phiansriwatchara E. Department of Health disclosed "COVID-19 infection in children over 100,000 cases, caused by COVID-19 infection among family". Thairath Online. 2022 [cited 2023 Dec 17]. Available from: https://www.thairath.co.th/news/local/2323395 (in Thai)
3. THAIPUBLICA. Preventing a lost decade: Urgent action to reverse the devastating impact of COVID-19 on children and young people. [Internet]. ThaiPublica > Hot issue > Covid 19 > reverse, THAIPUBLICA. 2021 Dec [cited 2023 Dec 20]. Available from: https://thaipublica.org/2021/12/unicef-report-impact-of-covid-19-on-children-and-young-people/ (in Thai)
4. Zhussupova D. [Internet]. Five impacts of COVID-19 on children in Thailand, Their well-being may be affected in the long-term unless critical action is taken now. UNICEF in partnership with WHO and IOM in Thai. UNICEF for every child Thailand. 2022 July [cited 2023 Dec 20]. Available from: https://www.unicef.org/thailand/stories/five-impacts-covid-19- children-thailand
5. National Statistical Office Thailand & Unite Nations Children's Fund. [Internet]. Chapter 7 learn in multiple indicator cluster survey 2019, survey finding report. National Statistical Office; NSO & Unite Nations Children's Fund; UNICEF, MICS. Aug 2022 [cited 2023 Dec 20]. p. 158. Available from: https://www.unicef.org/thailand/media/5146/file/Multiple%20Indicator%20Cluster%20Survey%202019.pdf (in Thai)
6. Office of the Education Council (ONEC), Ministry of Education. National standard for early childhood care, development and education Thailand. Bangkok: Pleckyaurn Co. Ltd., Printing. (p.2). 2019.
7. Becker MH. The health belief model and sick role behavior. In Becker MH, Maiman LA, editors. The Health Belief Model and Personal Health Behavior. New Jersey: Chales B. Slack; 1975.
8. Bergstra AD, Brunekreef B, Burdorf A. The mediating role of risk perception in the association between industry-related air pollution and health. PLoS One. 2018 May 3;13(5):e0196783. doi: 10.1371/journal.pone.0196783.
9. Academic collaboration project between Local Administrative Organization and Suan Dusit University. Child development centers. 2021 September 29. Retrieved from: http://www.dusitcenter.org/schools/?region=central&pc=13&prov=ปทุมธานี#spd (in Thai).
10. Yamane T. Statistics: an introductory analysis. 3rd ed. New York: Harper and Row Publications. 1973.
11. Buasanit V, Boon-itt S. Risk perception, communication and protective behaviors during the covid- 19. Master of Business Administration, Faculty of Commerce and Accountancy, Thammasat University, academic year 2020 copyright of Thammasat university. Retrieved from: DigitalFile%231_591296.pdf (in Thai).

12. Ruankham P, Kongsin S, Jiamton S, Sattayasomboon Y, Uthis P. Factors associated with preventive behaviors against COVID-19 SAR-COV-2 among the adult population: a case study of Chom Thong District, Bangkok Metropolitan. Journal of Health Science 2022;31(Suppl 2): S247-59. (in Thai)
13. Ruankham P, Kongsin S, Jiamton S, Sattayasomboon Y, Uthis P. Factors associated with preventive behaviors against COVID-19 SAR-COV-2 among the adult population: a case study of Chom Thong District, Bangkok Metropolitan. JHS 2022;31(Suppl 2):S247-59. Retrieved from: https://phad.ph.mahidol.ac.th/research/2565/13.65%20Piyanan%20Article.pdf (in Thai).
14. Kotpan K and Junnua N. Associated between health literacy and coronavirus disease 2019 prevention behavior among people in Mukdahan province. Research and innovation for SDGs in the next normal, College of Medicine and Public Health, Ubon Ratchathani University. 2022. Retrieved from: https://www.ubu.ac.th/web/files_up/00008f2022090115080291.pdf (in Thai).