THE IMPLEMENTATION OF EARLY CHILDHOOD EDUCATION IN THE TIME OF COVID-19 PANDEMIC: A SYSTEMATIC REVIEW

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Abstract

Purpose of the study: The study examined the implementation of early childhood education during the pandemic of COVID-19.

Methodology: A systematic review identified the implementation in early childhood education settings. Electronic databases such as PubMed, MEDLINE, Web of Science, Scopus and manual search on Google Scholar were explored with specific keywords from the inception of the pandemic COVID-19 to November 30, 2020.

Main Findings: Early childhood education has been influenced due to school closure. Most of the children experience online learning, to reduce the spread of the outbreak, especially when face-to-face learning cannot be conducted. Parents and teachers have significant roles in supporting the children to improve their cognitive and social development. However, the implementation of home learning causes some difficulties in relation to the self-regulation of very young children, the readiness to utilize digital technology and learning materials, parent's beliefs and attitudes on online learning compared with traditional learning, and requirements of demanding time and knowledge to accompany the children. Therefore, it is important to have good communication between parents and teachers to support early childhood online learning during the outbreak.

Applications of this study: This article will provide evidence from some countries about the matter of early childhood education during the COVID-19 pandemic. The study will be useful for improving the quality of early childhood education.

Novelty/Originality of this study: Due to the COVID-19 pandemic, the early childhood education has changed from the traditional system to online education system to reduce the spread of the diseases. This article will show the various implementations of learning system during the outbreak and the lesson learned.

Keywords: COVID-19, Early Childhood, Education, Online learning, Pandemic.

INTRODUCTION

Since March 2020, the World Health Organization (WHO) has declared the pandemic of the novel coronavirus, known as COVID-19 as a global pandemic (World Health Organization, 2020). It is recommended to work from home, the school from home and physical distancing to slow down the spread of coronavirus. The school-age population have been impacted by the school closure, including those in early childhood. The daily interactions and activities among early childhood have changed during the pandemic due to school closure, confinement and cancellation of social gatherings (Garbe et al., 2020; OMEP Executive Committee, 2020).

Playing and social interactions with others are the important aspect of children's development and early learning (OMEP Executive Committee, 2020). Daily physical activities among children have changed (Boland & Mortlock, 2020). Spending time for games, sports, study, and play with friends in the parks, school, playgrounds, and gardens become limited due to physical distancing and public places closure (Lau & Lee, 2020). During the pandemic, the safety and health of the children are important as a concern for parents (Garbe et al., 2020).

Early childhood is an important milestone in children's life when children's learning and developmental process are created for their future (Anderson et al., 2003). Earlier literature show that early childhood education is a worthy investment due to its impact on children's development outcome, cognitive-academic outcomes in their school-age, healthier lifestyles, economic performances in the future as productive employees and citizens, and reducing social costs (Heckman, 2011, 2012; Paananen et al., 2015). However, due to school closure, many education systems move from traditional face-to-face learning to online learning to ensure the class meeting continue during the outbreak (Organisation for Economic Co-operation and Development (OECD), 2020). Online learning is a platform of learning that many schools adopted during the pandemic.

The practices of online learning are challenging for families with early childhood children. The study examined the implementation of early childhood education during the pandemic of COVID-19.

LITERATURE REVIEW

Due to the coronavirus (COVID-19) pandemic, almost all of the education system moved to online learning. An educational method that provides access to the internet is called as online learning (Kim, 2020). Online learning can make the learning system more flexible, timetable and available and also reduce the educational barriers because of

geographical location (Dong et al., 2020; Kim, 2020). To achieve the target, online learning needs different learning teaching and strategies from those used in traditional learning. For some lessons that need practice such as practicum courses, video observation is one method that suggested as an alternative for student teaching (Kim, 2020).

Approaching digital technology for young children is challenging especially when parents play significant roles as teachers, facilitators and coaches that need parenting and educational skills during the online learning (Abuhammad, 2020a; Garbe et al., 2020). Digital technology is related with to issues of interaction exploring, including social interactions, among very young children. Even though online learning is used for early childhood education, teachers should facilitate and enhance children for learning, thinking and communicating online.

Digital technology can help young children to grasp the complexity of their social environments, adapt to new social experience and empower children to learn the leadership (Danby et al., 2018). Digital tools such as touch screen tablets are believed can promote early children to develop their literacy skills (Neumann, 2014). There is a possibility of parents who are discomfort and unwillingness to use online learning for their early childhood. Parents have significant roles in providing access and the use of digital devices at home for their children, which may turn effects for children's learning (Neumann, 2014). Previous research reveals that very young children's access to digital tools has a positive relationship with children's skills in writing skills and letter-sound (Neumann, 2014).

In the remote areas, slum areas or rural areas where the internet connection is limited and many low-income families lived, online learning becomes difficult to achieve. The inequality to access technology still occurred in Indonesia which makes some students vulnerable because they facing the barriers of education (Azzahra, 2020). Digital technology such as smartphones, tablets, laptops, and the internet connection is needed as support equipment in online learning.

There are some advantages of implementing online learning such as quick and efficient delivery of courses through geographical and time constraints, flexible, convenient, increased accessibility and interest for non-traditional students, increased participation rates, and cost-effective (Heirdsfield et al., 2007; Kim, 2020). However, there are some drawbacks of online learning for young children such as depend on the technological abilities of students and teachers, need parent/adult guidance, need more interactive methods to make young children focused in online learning (Kim, 2020). A study in Jordan reveals there are four barriers of distance learning during the pandemic: 1) Personal barriers which included lack of training and support, lack of technical expertise, inadequate communication and lack of qualifications; 2) Technical barriers which included insufficient investment and maintenance and poor connectivity; 3) Logistical barriers which included difficulties when using distance learning, lack of student preparedness, dissatisfaction with distance learning modality and the inability of distance learning to meet student's needs; and 4) Financial barriers which included inability to buy technology and inability to pay for internet services (Abuhammad, 2020b). Moreover, there are some barriers of inclusion and participation of digital for childhood education: 1) psychological access (such as discomfort to use computers or other digital devices); 2) material access (such as do not have access to online devices); 3) skills access (such as limited skills to utilize digital technologies); and 4) usage access (such as the possibility to use digital devices in various ways) (Danby et al., 2018).

METHODOLOGY

This study was a systematic review study, in which literature in the English language was evaluated using an electronic search strategy of the different database in PubMed, MEDLINE, Web of Science, Scopus, and manual search on Google Scholar. Searching in databases was used by exploring of a web-based engine and hand searching using keywords of "early childhood", "children", "education", "online learning", "pandemic", "home learning", "home-schooling", "kindergarten", "outbreak", and "COVID-19". The keywords were chosen for evaluation in the PubMed database in accordance with the Medical Subject Headings (MeSH) system. In a hierarchy called a tree, MeSH concepts are grouped, with more specific concepts arranged under wider forms (Ecker & Skelly, 2010). The use of MeSH terms expands the search strategy and optimizes it (Ecker & Skelly, 2010).

Articles were included in this study if fulfilled the following inclusion criteria: (1) reported as publication or reports and written in English, (2) the previous study is qualitative or quantitative research or a literature review, (3) focused on the process, factors and outcome related with early childhood education or very young children, (4) the study related to the situation of COVID-19 pandemic, (5) published between December 2019 and November 2020. Studies were excluded pre-print articles, opinion and commentary,

About 68 paper abstracts were selected and reviewed in term of the inclusion and exclusion criteria in the beginning evaluation of the article titles. Based on the criteria, there were 15 articles were appropriate to be further reviewed. In the next phase, Author prepared the full paper of each article's title. The author tried to find the full-text article through various databased. However, if the full text could not be found, the Author tried to send a request of the full article to the correspondence author's email directly. Only studies which fulfilled the inclusion and exclusion criteria and found the full text would be extracted and included in the study. The articles were classified based on scientific content.

FINDINGS AND DISCUSSION

Table 1: The implementation of early childhood educational during the COVID-19 Pandemic

Authors	Country	Focus	Methods	Participants	Results
(Abuhammad, 2020b)	Jordan	Barriers to distance learning during the pandemic	Facebook search engine	248 posts and threats	Four barriers of distance learning during the outbreak were personal barriers, technical barriers, logistical barriers and financial barriers.
(Dong et al., 2020)	China	Parent's belief and attitude of young children's online learning	Cross-sectional study	3,275 parents	Generally, parents had negative beliefs on the value system and the benefits of online learning for very young children.
(Kim, 2020)	the USA	Online learning of practicum course	Descriptive study	-	There are three phases of practicum coursing using online learning for early young children: planning/preparation, implementation and reflection.
(Lau & Lee, 2020)	Hong Kong	Distance learning and screen media usage among young children based on parents' perspective	Cross-sectional through online survey (Qualtrics)	6,702 parents of the students in kindergarten and primary school	Based on the parents' perspective, many children experience difficulties to complete the assignments of distance learning. The online learning for young children should be more interactive with a clear learning concept. The use of digital tools increases during the class suspension.
(Giménez-Dasí et al., 2020)	Spain	The effects of isolation on psychological effects among young children	Cross-sectional through online survey	167 families	Among young children, the psychological changes were not observed. Young children are protected by their families during the confinement. However, families experience difficulties related to emotional regulation, eating and sleeping habits and toilet training.
(Shumba et al., 2020)	Kenya	Nurturing care among early childhood during pandemic	Review	Articles	Early childhood learning and development is one of the interventions that need to be addressed during the pandemic. Caregiver need to equip by practical support to guide a quality early learning at home.
(Tarrant & Nagasawa, 2020)	the USA	The impact of the COVID-19 pandemic on early childhood educational system	Cross sectional survey	3,355 respondents of program leader, child care provider, teachers, support staff	There are challenges of remote instruction for remote instruction such as engaging young children, development of curriculum and the access to digital technology tools

					for families and their children. It is important to develop a learning curriculum specifically for online learning.
(Macartney et al., 2020)	Australia	Transmission among children in schools and early childhood education setting during the pandemic	recorded, monitored and interviewed the cases of laboratory confirmed COVID-19	15 schools and 10 early childhood education and care	The SARS-CoV-2 transmission in the school setting was low and manageable during the first wave of the pandemic in the context of effective epidemic response. Educational settings may open with providing some measures od disease control such as contact tracing, extensive testing, and quarantine/isolation.
(Fleer, 2020)	Australia	Play spaces in early childhood education to support girls motives in science, technology, engineering and mathematics (STEM)	Educational experiment	13 children (girls) aged 4-5 years	The intervention of Conceptual PlayWorld, which focus on role-playing, among very young girls was transformed as a new way of playing which children can have interaction and social relations that girls realized a competence and a motive. STEM education can help the girls from preschool to understand the current situation of COVID-19 pandemic.
(Ahmad & Zabadi, 2020)	Palestine	Transformation education process from traditional to online system using Google's G Suite in Private Kindergarten school	Case study	10 classrooms (200 students and 10 teachers)	Online learning can be implemented after the pandemic ended with strengthening the system and the skills of the teachers, administration and parents. Some issues need to be reduced to improve the quality of online learning such as the grading system, plagiarism and cheating.
(Pawilen, 2020)	the Philippines	Supplementary curriculum themes for Kindergarten students to help students understand about COVID-19 pandemic	Analysis of existing reports, curriculum, documents, and literature review	-	The supplementary curriculum is needed to help young children understand about the current situation of the Pandemic. The curriculum highlighted the unique cultural values and family-oriented.
(Bao et al., 2020)	the USA	Reading ability among kindergarten students during the school closures.	Early Childhood Longitudinal Study	18,170 students of Kindergarten (public and private school)	The reading ability of kindergarten students decreases during the school closures compared with formal education in summer. Reading books to

					young children at home is recommended to anticipate the reading loss and strengthen family bounds.
(Garbe et al., 2020)	the USA	Parents' experience with their children during remote learning	Online survey with open ended ques(Hu & Lu, 2020)	122 parents	Parents experience some difficulties during remote learning such as balancing responsibilities, non-positive learner motivation, accessibility (such as learner special needs, parents' limited knowledge, lack of technology hardware and internet connection) and learning outcomes (such as curriculum, academic progress and socio-emotional development).
(Hu & Lu, 2020)	the USA	Pedagogical design and operationalization in virtual school programs	Comparative study	2 school programs	Virtual school programs have some challenges and opportunities. There are some activities such as student-teacher and parents-teachers one-on-one communications are needed to meet student's needs. Moreover, offline sharing and feedback will be beneficial for virtual educational programs in Prekindergarten and Kindergarten schools.
(Foti, 2020)	Greece	Distance learning in Greek Kindergarten Schools during the Pandemic	Online survey	101 teachers	Asynchronous distance learning through internet and integrated system is conducted to maintain communication between teachers, families and students.

Early Childhood education

In the digital era, early childhood is familiar with touchscreen technologies with an internet connection (Kim, 2020). Early childhood education focuses on learning by playing, interacting and exploring by using various languages, their body interaction and movement for communication (OMEP Executive Committee, 2020). Early childhood education involves multifunctional activities can build young children's emotional and affective relationship. Therefore, gesture, physical contact, body language, facial expression, dynamic movement, outdoor playground, or hugs are needed for the children learning system.

During the pandemic, there are some changes in daily activities such as less physically active time, sleep later at night or irregular sleep schedule, spend more time for sedentary and screen time which increased risk of exposure by unsafe and inappropriate substances, favourable diets disturbance and increase risk of obesity (Giménez-Dasí et al., 2020; Guan et al., 2020; Lau & Lee, 2020; Wang et al., 2020). Physical activities went down by 59%, time watching television increased by 66%, time playing video games increased by 35% and screen time increased by 81% during April 2020 when the pandemic occurred (Guan et al., 2020).

Home confinement has caused potential physical and mental health problems such as weight gain, stress, frustration, boredom, lack in-person contact (Wang et al., 2020). Guidelines of the learning system for early childhood should be clear and easy to understand in achieving the educational requirements and promoting a healthy lifestyle, so it is not overburdening the pupils (Wang et al., 2020). However, isolation or confinement may also increase the risk of domestic violence (Yoshikawa et al., 2020).

Challenges of online learning

School closures significantly reduce the transmission of the virus. Most of the children experience online learning, to reduce the spread of the outbreak, especially when face-to-face learning cannot be conducted. Online learning is an important learning system during the pandemic. By online learning, the educational contents and materials can be delivered. Moreover, young children can meet and interact with their teachers and friends. Stimulating activities among young children can be developed through online learning.

The implementation of home learning has challenged families with young age children. Some potential challenges are occurred during home learning in relation with self-regulation of very young children, remaining focused and concentrated during online learning, the readiness to utilize of digital technology and learning materials, parent's positive beliefs and attitude on online learning compared with traditional learning, motivation to be active and interactive during online learning, accessibility to digital technology tools, quality of the preschool program, development of distance learning curriculum, and requirements of demanding time and knowledge to accompany the children (Dias et al., 2020; Dong et al., 2020; Organisation for Economic Co-operation and Development (OECD), 2020; Tarrant & Nagasawa, 2020). Young children may not have technological abilities like adults such as typing some words, sharing files or uploading the assignments, but they can utilize the simple technology such as mute the microphone, turn on the camera or leave form the meeting.

There are three phases which need to be enhanced in the process of home learning: planning, implementation and reflection (Kim, 2020). In the planning session, teachers should prepare the syllabus, materials, online learning tools and virtual instruments to support the process of online teaching. During the implementations, teachers should have good communication with the parents by sending emails to inform the preparedness needed for the learning process and ensure the timetable of each class. Then, teachers should create an interactive and creative class to encourage physical and cognitive development for early childhood. In the reflection session, teachers ask their student to share the insight and reflections of the lesson and experience during online learning (Kim, 2020).

Online learning for very young children has led to some difficulties such as the lack of focus and interest of early childhood, the interruption from other family members during the virtual meeting, and limited resources and materials for online learning (Lau & Lee, 2020). As preschool students, it is difficult for young children to keep concentrated during online learning. Children's behaviours such as jumping on the chair, rolling on the floor or bringing their pets or toys to online class are unavoidable during the virtual class (Pramling Samuelsson et al., 2020). Moreover, parents experience difficulties for handling some problem related to changes in children behaviour since the beginning of the pandemic (Yoshikawa et al., 2020). Therefore, the teacher's and parent's cooperation are needed to create the class more conducive.

A study in China reveals that parents of young children appear to oppose the online learning due to the limitations of online learning, the insufficient self-regulation of young children, and parent's lack of time and technical expertise to facilitate online learning (Dong et al., 2020). Furthermore, there are some parent's negative belief of online learning such as less effective when online learning compared with traditional learning, probability lead to vision problems such as myopia among early childhood because increasing of screen time, and limited physical activities especially for children who addicted with gadgets during stay at home (Dong et al., 2020; Lau & Lee, 2020). A study in Sweden shows that parents see preschool as a secure place including how the workers minimize the potential risks from a highly contagious virus in school (Pramling Samuelsson et al., 2020).

In Indonesia's online learning, unequal access to the internet connection, the inequality in teacher qualifications and education quality and also the limited ICT skills are becoming a barrier especially during the COVID-19 Pandemic (Azzahra, 2020). Teachers need to equip with the knowledge to use and deliver the lessons by using ICT because it is not easy to deliver lessons for early childhood with online learning.

Toxic stress among very young children may change the brain structure and function which can influence children's learning (including cognitive development, linguistic ability, social and emotional skills), health and behaviour (Shonkoff et al., 2012). Moreover, children who experience stress such as trauma, suffer adversity and lose stable attachment and bonding have detrimental effects on children's health, wellbeing and lifelong learning (Shonkoff et al., 2012).

Teachers' and Families' support

Besides the students, the teachers also need capacity building to use Information and Communication Technology (ICT) effectively in their teaching then practice it in facilitating their students to enhance the learning process. Capability to handle online learning by developing teacher's presentation skills, skills to make children stay focused and interacting are needed by teachers to accomplish the online learning goals.

Open communication needs to be developed between children, their parents and teachers to help the young children are they have any physical and psychological problems during online learning and home confinement (Wang et al., 2020). Good and intense communication between parents and teachers are needed to achieve online learning goals. Parental emotional support and teachers enthusiasm towards online learning are associated with learning attitudes such as pupil's

self-efficacy, ambitious learning goals, enjoyment of reading and motivation to master tasks (Organisation for Economic Co-operation and Development (OECD), 2020). Parents and teachers have significant roles in supporting the children to improve their cognitive, social and emotional development.

As can be known, the outbreak has changed the way of living including social life such as isolation, psychological distress, substantial economic distress, depression, restricted travel and also domestic violence (Campbell, 2020; Patrick et al., 2020). The changes, difficulties, and hardship caused by the outbreak have made some parents be resistant to the process of digital and online learning for early childhood. Nowadays, parents should focus not only on their daily routine but also in assisting their children during online learning. Parental guidance plays an important role in early childhood online learning (Lau & Lee, 2020). As adults, parents should help young children to prepare the material, guide them to be in touch with technology, translate the lessons from their teachers, support their children to do worksheet or homework and also to submit the assignments through student's email.

During the pandemic, parents not only need a good parenting skill but also need a good capability of education to accompany and support their children in online learning (Abuhammad, 2020b; Lau & Lee, 2020; Wang et al., 2020). Parents need to monitor their child's performance and guide their children to build self-discipline during stay at home. During the isolation, parents and children have more time to meet and do some activities together, such as doing domestic works together, so the family bonds and children's self-skills can be strengthened.

Parents and teachers should encourage healthy movement behaviours among children (Guan et al., 2020). This is important because 1) home confinement may be related with increased risk of vitamin D deficiency, mental health problems, and myopia, 2) physical activities may reduce the risk of respiratory infections among children, 3) healthy movement behaviours can be used as coping strategy for life-changing among children, 4) the impact of healthy movement behaviours are more pronounced, and 5) longer health impacts and economic consequences (Guan et al., 2020).

However, parents who are still working from the office during pandemics, such as those who work in the hospital, clinics, pharmacy, etc., cannot accompany their children on online learning. In this condition, parents can utilize media-based learning platforms and recorded online learning to guide their children doing the worksheets, so children are not at risk to be disadvantaged in their academic goals. Later, when the pandemic begins to fall and schools begin to reopen, social distancing in school should be practiced to minimize the spread of the virus (Viner et al., 2020).

During the online learning, it is essential to provide learning materials especially for those families who do not have many learning equipment at home. Moreover, families need to strengthen their skills in cognitive development, creativity, and critical thinking to help young children during online learning. School readiness program should be established during online learning. The school needs to develop specific curriculum adaptation for learning program during and post the pandemic (Tarrant & Nagasawa, 2020).

CONCLUSION

Pandemic COVID-19 has a potential impact of early childhood educational system worldwide. It may influence children's cognitive and social development. Teachers, parents, governments and all societies must be in collaboration to do mitigating actions to reduce negative impacts on the future generations. Therefore, it is important to have good communication between parents and teachers to support early childhood online learning during the outbreak.

LIMITATIONS OF THE STUDY

There are some limitations of the current review. First, the review focuses only on the online learning system during the pandemic. Second, the reviewed articles are mostly from developed countries. Future research is necessary to examine how online learning for very young children has created changes in academic performances.

RECOMMENDATION

It is recommended to prepare the learning materials much more details to support early childhood education. It will help parents to be well prepared and more focused on supporting their young children during home learning. The promotion of the benefits of online learning should be improved, so parents will have more positive belief and attitudes, then can fully support their young age children in online learning. Holistic and humanistic learning system for early childhood should be implemented to fulfil the rights of education among children. Moreover, the curricula guidelines should be clear and well developed to maximize the ability to utilize the online learning system.

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COMPETING INTERESTS

None declared.

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