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The Influence of the COVID-19 Pandemic on Early Educators' Perspectives on Digital Play

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Abstract:
This research aimed to explore the perspectives of early educators regarding the impacts of digital play on preschool children's physical, cognitive, and socio-emotional development and the potential impacts of the COVID-19 pandemic on their perspectives. Besides, the present study investigated the challenges perceived by early educators when implementing digital play. By adopting a qualitative phenomenological research design, 24 interview questions were developed based on the current study's research aims. Semi-structured interviews were conducted with five early educators recruited via purposive sampling in Selangor and Kuala Lumpur. The collected data were analyzed using thematic analysis. The findings indicated that the COVID-19 pandemic had a minor to non-existent influence on the perspectives of early educators towards digital play. Challenges faced due to the implementation of digital play include overstimulation, technological instability, and limited availability of technological devices. In virtual lessons, early educators faced the limitation of virtual instruction while the children faced difficulty in getting adult support. Therefore, parents and early educators should carefully monitor the content of digital play exposed to children. The government may improve children's education through strategic financial aid for kindergartens and low-income families. Moreover, policymakers and employers may set flexible policies which increase parents' availability to support their children's education. As a novel study that investigated the potential influence of the COVID-19 pandemic on early educators' perspectives towards digital play, this research has provided fundamental implications for government, early educators, parents, and society in the mid-pandemic and post-pandemic society to adjust their practices in promoting preschool children's healthy development.

Keywords: child development, digital play, early educator, COVID-19 pandemic, preschool children.

新冠肺炎大流行对早期教育者对数字游戏的看法的影响

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摘要：
本研究旨在探讨早期教育工作者对数字游戏对学龄前儿童的身体、认知和社会情感发展的影响以及 新冠肺炎 大流行对其观点的潜在影响的观点。此外，本研究调查了早期教育者在实施数字游戏时所面临的挑战。通过采用定性的现象学研究设计， 根据当前研究的研究目标开发了 24 个访谈问题。对在雪兰莪和吉隆坡通过有目的抽样招募的五名早期教育工作者进行了半结构化访谈。使用主题分析对收集的数据进行分析。研究结果表明，新冠肺炎大流行对早期教育工作者对数字游戏的看法产生了轻微甚至不存在的影响。由于实施数字游戏而面临的挑战包括过度刺激、技术不稳定和技术设备的有限可用性。在虚拟课程中，早期教育者面临虚拟教学的限制，而孩子们则难以获得成人的支持。因此，家长和早期教育工作者应仔细监控儿童接触的数字游戏内容。政府可以通过对幼儿园和低收入家庭的战略性财政援助来改善儿童的教育。此外，政策制定者和雇主可以制定灵活的政策，增加父母支持子女教育的机会。作为一项调查 新冠肺炎大流行对早期教育工作者对数字游戏的看法的潜在影响的新研究，这项研究为大流行中期和大流行后社会的政府、早期教育工作者、家长和社会提供了根本意义调整促进学龄前儿童健康发展的做法。

关键词：儿童发展、数字游戏、早期教育者、新冠肺炎流行病、学龄前儿童.

1. Introduction

Digital play is a new concept introduced in early childhood education due to the emergence of the digital age. With the evolution of technologies, the new cultural context has created new opportunities for children's play (Kankaanranta et al., 2017). Digital play may refer to children's interactions with digital technologies, including mobile devices, internet-enabled toys, robotics, open-ended software, digital media content, etc. (Marsh et al., 2016). Today's young children are active users of technology, with preschoolers able to access online content on their own through video-sharing platforms (Marsh et al., 2017). The appropriateness of digital play for preschool children has been the subject of heated debate for years. Digital play proponents asserted that digital play, such as mobile applications, can help young children learn literacy and numeracy skills earlier in their development (Disney et al., 2019; Marklund & Dunkels, 2016). In addition, some parents believe that digital play improves children's self-regulation, concentration, and motivation for learning (Erdogan et al., 2019, Ka Vian & Zhooriyati, 2021). On the other hand, other parents had expressed concerns about the health consequences of digital play, such as physical inactivity and vision problems. Furthermore, parents were concerned about the inappropriateness of some digital play's content and feared that their children would become addicted to digital play as a result of this (Erdogan et al., 2019).

Due to the controversy associated with digital play, recent cross-cultural research has revealed that digital play was the least preferred form of play by parents and early educators for young children (Erdogan et al., 2019; Slutsky et al., 2019). For example, parents from Western and Asian countries prefer their young children to engage in traditional play, e.g., physical play, constructive play, pretend play, and games with rules, compared to digital play (Erdogan et al., 2019). Similarly, early educators from Europe, the Middle East, and North America reported digital play as the least used type of play in kindergartens compared to non-digital play (Slutsky et al., 2019). Most early childhood educators who discouraged digital play emphasized the importance of socio-emotional development in early childhood, fostered through children's exploration of the natural environment and interactions with objects, adults, and peers, among other things. Besides, adequate movement behaviors play an important role in children's healthy physical development (Carson et al., 2017). Thus, most parents and early educators still prefer non-digital play, which provides a hands-on learning experience for young children (Erdogan et al., 2019; Slutsky et al., 2019).

However, since 2020, the Coronavirus Disease 2019 (COVID-19) pandemic has led to a surge in the use of digital technologies due to the social distancing norms, prohibition of physical gatherings, and restriction of outdoor activities (Pandey & Pal, 2020). In turn, this significantly impacted children's play behaviors worldwide, as physical activity was reduced while sedentary behavior and screen time were increased (Moore et al., 2020). While the Movement Control Order (MCO) was in effect in Malaysia during the period in which COVID-19 was expected to spread, educational institutions, including early childhood institutions, were closed as a preventive measure against the virus (Ministry of Health Malaysia, 2021). As a result, early educators resorted to conducting virtual classes for preschool children to ensure that the children's learning continued during the closure of kindergartens. As play-based learning in kindergartens moved online, preschool children became increasingly engrossed in digital play (Disney et al., 2019). Early educators primarily used YouTube and self-created videos to impart new knowledge, tell stories, demonstrate arts and crafts, and provide singing and dancing instruction to preschool children. They also supplemented their virtual classes with online interactive games from educational software and websites (e.g., Seesaw, education.com, zapzapmath.com, twinkl.com, and others) to enhance their learning. Through digital play, preschool children can synchronize their learning using drawings, photos,

videos, and other media and receive audio feedback from their early educators. As a result of the COVID-19 pandemic, there has been a significant increase in the use of digital play in virtual preschool classes.

Early educators' exposure to and familiarity with the digital play has increased. The inevitable trend of digital play has also stimulated early educators' creativity in designing innovative digital play activities to engage preschool children in virtual classes. It was suggested that with the increased familiarity and creativity, the early educators might change their perspectives on the impact of digital play on early childhood development. Besides, the inevitable trend of digital play in kindergartens has given rise to a series of new challenges to early educators, preschool children, and their families, e.g., the lack of adult support and technological resources (Dong et al., 2020).

Early educators and preschool children faced additional difficulties in remote learning. For example, the availability of resources has accentuated the learning gap experienced by children from less affluent backgrounds. Furthermore, early educators lack professional training in developing open-ended activities that encourage engagement through digital technology (Dias et al., 2020).

Even though pre-pandemic research revealed that early educators avoided engaging in digital play on the whole (Slutsky et al., 2019), to date, no research has looked into the potential impact of the COVID-19 pandemic on the perspectives of early educators toward digital play. Following up on previous research, this study aims to investigate the perspectives of early educators on the impact of digital play on child development and to determine whether the COVID-19 epidemic has impacted early educators' perceptions of digital play. In addition, the current research seeks to identify the challenges that early educators perceive in implementing digital play in their classrooms.

This study could increase the mid-pandemic and post-pandemic society's awareness of how the COVID-19 pandemic might influence our child-rearing practices and development by integrating technology learning. Thus, it may provide profound implications for the government, early educators, parents, and society to improve their practices to promote the contemporary learning of preschool children.

2. Literature Review

2.1. Impact of Digital Play on Children's Physical Development

Exergaming, i.e., playing with active video games that require physical activity (Staiano et al., 2018), has been increasingly used in school-based settings to promote the physically active lifestyle of children (Gao et al., 2019). Despite being a screen-based activity, exergaming has shown a positive effect in promoting preschool children's moderate-to-vigorous physical activity at school and has demonstrated the potential to enhance motor skill competence of preschool children (Gao et al., 2019). Besides, home-based exergaming of children with overweight and obesity was found to improve the children's cardiometabolic health and physical activity level (Staiano et al., 2018).

On the other hand, many parents had voiced their concern about the reduced amount of physical activity of young children as they were mainly engaged in digital play and online learning. At the same time, they were quarantined at home during the COVID-19 pandemic (Dong et al., 2020). Besides, due to the increased usage of digital devices during the COVID-19 pandemic, the increased screen time has led to the risen prevalence of digital eye strain in children (Jayadev et al., 2020; Mohan et al., 2021).

2.2. Impact of Digital Play on Children's Cognitive Development

According to Morrison (2015), digital technology may be used as a scaffolding tool for early literacy development. Using developmentally appropriate digital equipment and software applications, early educators may support preschool children's exploration and learn through educational play activities. For example, in carefully planned literacy immersion activities, preschool children observe the early educators' modeling of reading and writing, participate in shared reading and writing, and then engage in independent reading and writing. In addition, literacy immersion play activities may be enhanced through digital technologies like iPads which support individualization of learning pace (Morrison, 2015). Besides, early educators may support preschool children to create simple electronic books about themselves or based on a field trip in which they can add their own pictures, voices, and text using child-friendly software. During the electronic book-creating process, children may learn many print concepts, such as reading text from left to right and from top to bottom, separating words with space, and learning about the meanings of words (Morrison, 2015).

According to Highfield (2016), open-ended techno-toys such as a drawing app enable children to engage in a child-controlled activity that harnesses creativity. Kervin (2016) suggested that applications like PuppetPals may enhance children's storytelling experience by supporting creative and imaginative play and promoting their language abilities. Moreover, Cahill and Bigheart (2016) argued that educational television programs like Sesame Street and Dora the Explorer might enhance children's literacy development, particularly vocabulary, by pairing the target words with actions, images, and contextual definitions.

In contrast, close-ended techno-toys which only accept a limited range of responses, for example, drill-and-practice educational software, might be counterproductive for preschool children's learning due to restricted ways of interaction (Highfield, 2016). Similarly, Palaiologou's (2016) research had shown that early educators were concerned that digital devices did

not allow children to initiate activities, thus impeding their creativity and imagination. Sosa (2016) found that parent-child play with techno-toys was associated with lower quantity and quality of language input compared to parent-child play with traditional toys, thus suggesting a deleterious effect of digital play on children's early language development.

2.3. Impact of Digital Play on Children's Socio-Emotional Development

For socio-emotional development, Wu et al. (2017) found a higher risk of conduct problems and emotional difficulties in preschool children with more than 2 hours of screen time per day compared to preschool children with less screen time. Due to the prevalence of media violence, preschool children are easily exposed to violent scenes which portray unpunished aggressive acts in television programs (Srivastava et al., 2018). Children exposed to media violence via television programs or playing video and computer games are more likely to engage in aggressive cognition and behavior (Gentile et al., 2017; Zhang et al., 2021). The effect of media violence may be explained by Bandura's (1971, as cited in Toh & Lim, 2021) social learning theory, as children might learn aggressive behaviors by observing and imitating the unpunished aggressive acts portrayed by the characters in digital play content.

As emphasized in Vygotsky's (1987) social constructivist theory, social collaboration is important for the healthy development of preschool children. Children naturally seek interaction and involvement with their parents, siblings, peers, and teachers. According to Morrison (2015), many digital games today support young children's social interaction and collaboration. Popular digital technologies such as smartphones, iPads, Youtube, Zoom, WhatsApp, Facebook, Instagram, and interactive whiteboard may be used as learning tools that provide abundant opportunities for peer collaboration in today's preschool classrooms. Through social interaction with same-age peers, older peers, and early educators, children may gain new skills via observation which beneficially impact their development and learning. Therefore, early educators may integrate collaborative digital play in their instructional process to motivate preschool children to be active and involved learners. Through careful planning and appropriate support by early educators, preschool children can engage in cooperative and exploratory learning by working together in small groups. The cooperative learning environment allows children to develop social skills and build confidence when collaborating with others, sharing information, and teaching each other (Morrison, 2015).

However, when digital play was implemented in online learning, early educators often faced difficulties creating play activities that enable preschool children to participate in effective social interactions with peers and early educators. Without a shared space for play among peers, the preschool children were deprived of chances to learn to collaborate in groups and to resolve conflicts between peers. The diminished opportunities to practice important social skills, such as lining up properly and asking for permission to go to the washroom appropriately, were potentially detrimental to the social development of preschool children (Dong et al., 2020).

2.4. Challenges of Implementing Digital Play in Early Childhood Education

While the implementation of digital play is increasingly prevalent in kindergartens during the COVID-19 outbreak, there are significant challenges faced by early educators, preschool children, and families of the children. First, many early educators were concerned that the lack of movement-based activities and hands-on exploration in virtual classes would cause a deleterious effect on the socio-emotional development of preschool children (Erdogan et al., 2019; Slutsky et al., 2019). When preschool children learn remotely from home, they lack the opportunities to acquire important social skills, e.g., to line up properly and ask permission to go to the washroom appropriately. Without a shared space for play among peers, the preschool children were deprived of chances to learn to collaborate in groups and to resolve conflicts between peers. As children were not attending kindergarten physically, they also missed the opportunities for early school experience and adjustment, especially to establish supportive social ties in the school environment, which is essential for school readiness (O'Farrelly et al., 2020).

Besides, without the physical classroom setting and the company of peers, young children may easily feel isolated due to the lack of learning atmosphere in virtual classes, thus undermining their motivation to learn (Dong et al., 2020). Instructional strategies commonly used to engage young children in a physical classroom, e.g., collaborative play, are hardly applicable in a virtual classroom. While children who receive adequate support from their caregivers may adapt well to learning in digital classrooms, many without parental support struggle to learn from digital play materials, exacerbating the existing inequalities among children. Many parents lack the time (Zhooriyati & Despois, 2022) and professional knowledge to support their children's use of digital play to learn (Dong et al., 2020). Additionally, many children from less privileged families lack access to resources necessary for online learning, such as a stable internet connection and digital devices.

Furthermore, creating digital play materials is a skill-demanding job. For example, to create a video of storytelling, art and crafts demonstration, or singing and dancing guidance, an early educator must prepare the necessary devices and equip themselves with videography and video editing techniques. This might add an extra burden on early educators who were not

familiar with the use of technology. In addition, early educators were not fully prepared to implement digital play in virtual classes as they had not received adequate specialized training on how to effectively promote preschool children's learning and development via online communication tools (Kim, 2020).

Moreover, the overstimulation hypothesis suggests that many of the vivid visual effects shown on screen-based devices, such as rapid sequencing of motion and frequent changing of scenes, are overstimulating for the developing sensory organs of young children (Christakis, 2011). Thus, frequent and prolonged exposure to screen-based digital content might cause preschool children to be easily distracted, have shortened attention spans, and be more likely to engage in disruptive behaviors due to overwhelming feelings.

3. Methods

3.1. Method and Design

A qualitative phenomenological research design was used to describe and understand a particular group of participants lived experiences surrounding a phenomenon (Creswell & Creswell, 2018). By adopting this research design, an in-depth understanding of the perspectives of early educators regarding the impacts and challenges of implementing digital play was obtained.

3.2. Sample and Location

Five early educators recruited using a purposive sampling technique participated in the online interviews. The early educators recruited using a purposive sampling technique were aged between 23 and 29. The participants were chosen based on the following inclusion criteria: (1) Malaysian early educator currently employed at a registered kindergarten; (2) age between 21 and 50 years; (3) possess an educational qualification in early childhood education or a related field; (4) has at least one year of work experience as an early educator; and (5) possesses adequate knowledge and experience in implementing digital play. The educational qualification of participants in this study ranged from diplomas to master's degrees in education and psychology. Their working experience in early childhood education ranged from 2 to 10 years.

Details of participants are shown in Table 1.

Table 1. Participants' details

Participant	Age	Educational Qualification	Working experience
P1	23	BA (Hons) Early Childhood Education	5 years
P2	28	Master of Child Psychology	10 years
P3	27	Diploma in Early Childhood Education	4 years
P4	29	MA Special Education	3 years
P5	26	BA (Hons) Psychology	2 years

3.3. Research Procedure

Several kindergartens in Selangor and Kuala Lumpur were identified through a Google search to recruit participants for the study. Contacts with early educators were established through the principals of kindergartens, who communicated with them via email and phone calls to the researcher. Prior to commencing each interview, participants were contacted and emailed a participation information letter and informed consent. Participants were also asked to sign the consent form as proof of agreement to the interview and the data collection.

The semi-structured interviews took place through a video conferencing software called Zoom Meeting. Approval from the participant to record the session was obtained before the interview. Once the participant had given consent, he or she was instructed to sign the online informed consent form digitally. Each interview was conducted in English and lasted approximately one hour and fifteen minutes. The interview was followed by a debriefing session with the participants.

3.4. Data Collection

The qualitative interview questions used in this study were adapted from a quantitative questionnaire with high reliability, which was used in the original study. A total of 24 interview questions were developed based on the Parent Play Preference Questionnaire used in Erdogan and colleagues (2019) quantitative study of parents' beliefs and practices regarding their children's play, and a qualitative study of early educators' preferences regarding children's play (Slutsky et al., 2019). The interview questions regarding the perceived challenges faced by early educators were prepared in accordance with the current study's research aims. Interrogative words (e.g., "what", "when", "where", "which", "who", and "how") would precede the interview questions. Additionally, there was a restriction on replacing words within sentences. Thus, the reconstructed interview questions will retain the intended meaning of the original items, as they will have been converted directly from closed to open-ended questions while retaining the initial explanation of the questions.

A field expert was appointed to conduct validation and reliability tests on the interview questions regarding their language, wording, and relevance. The interviewer investigated the topic of interest with the participants to ensure data saturation until there was nothing left to add. For example, questions were used at the end of the interview, such as 'Is there anything else you would like to add?' or 'Do I need to know anything other than what I have asked you?' This was done to ensure that *saturation* was achieved and that there was nothing else to add to the topic of interest. Whereas for credibility, the researchers used the triangulation of sources. The participants were interviewed at different points in time and compared with the participants with different perspectives.

3.5. Data Analysis

The collected data were analyzed using thematic analysis for identifying, analyzing, and reporting recurring patterns within the data collecting, which were categorized as distinct themes under which the relevant portions of information belong (Terry et al., 2017). For themes to be extracted from the data, detailed information was required; the purpose of the extracted themes was to answer the research questions posed in this study successfully.

The list of themes generated from the current study is shown in Table 2.

Table 2. Themes

Topic	Domain/Setting	Theme
Digital play impact	Physical development	Encouragement of active behavior
		Increase in sedentary behavior
	Cognitive development	Enhancement of language learning
		Restriction of language style
		Enhanced exposure to scientific knowledge
		Reduced hands-on learning experiences
		Diminished creativity
	Socio-emotional development	Deteriorated emotional self-regulation
		Increased aggressiveness
		Deteriorated social skills and character building
Challenges	Physical and virtual lessons	Overstimulation in preschool children
		Technological instability
		Limited availability of technological devices
	Virtual lessons	Limitations of virtual instruction
		Difficulty in getting adult support

4. Results

4.1. Perspectives of Early Educators on the Impact of Digital Play on Preschool Children's Physical Development

Participants reported that digital play could inspire more active behavior in preschool children. For example, children were actively involved in exercise through educational films such as child-friendly workout lessons and movement tunes. On the other hand, some believe that digital play has increased sedentary behavior in youngsters, particularly when passively watching videos.

"Regarding physical education, there are a lot of active learning. There are a lot of exercises that we do, and even when we do number songs and counting together, they are actively involved in it" (P4, 29)

"They all just sit down there and do nothing. Basically, all the kids, whenever there is screen time, they are motionless. Even when it is a dance video, it takes more side encouragement to get them to move, rather than to ask them to follow the movement of the teacher without any video" (P2, 28).

4.2. Perspectives of Early Educators on the Impact of Digital Play on Preschool Children's Cognitive Development

As a result of the children's exposure to song videos and interactive games, the participants believed that digital play had aided their language learning in general and their phonics acquisition in particular. Apart from that, digital gaming has increased their exposure to scientific knowledge, such as fundamental geography and biology concepts, among others.

"Language definitely helps. I find that with digital play, phonics and phonetics pick up much faster" (P2, 28).

"There are things like National Geographic or Discovery Channel. All of these are very scientific-based. There are also multiple web pages specifically designed for preschoolers to understand the human body, the structure of the world, and the globe. Why is it a sphere, not flat, kind of situation" (P3, 27).

On the other hand, early educators believed that significant exposure to animation programs had resulted in preschool children's language styles being more similar to the speech styles depicted in animated programs. Following that, passive learning through digital play restricted the children's opportunities for hands-on learning. It had been found that digital play had failed to give multimodal experiences of active exploration, which are essential for preschool children's learning. Preschool children's creativity is lessened due to frequent exposure to digital play since they tend to become mimics and lack originality in their ideas.

"If they like to watch Peppa Pig because they are copying from the movie, so it is like, their speech is like limited to a certain style of what is shown on Peppa Pig. Even though their vocabulary is broadened, but then their dialogue, their script in their mind is set to one" (P3, 27).

"I believe in hands-on learning, especially when it comes to math and science and things. But with the pandemic and the increased use of digital play, I feel like I am teaching, and they are just absorbing. Whereas, with less digital play with more physical interaction, they would have more hands-on experiences, more multisensory experiences, which I feel will help them retain knowledge better" (P4, 29).

"I find that too much digital play actually restricted the creative crafting of a child. So, for example, creating a peacock out of your palm drawing, things like this that they see on the internet, they can do it. They will remember. But the thing is, it is not a creation. You know, it is not a creative thing" (P2, 28).

4.3. Perspectives of Early Educators on the Impact of Digital Play on Preschool Children's Socio-Emotional Development

Early educators believed that digital play had

negatively impacted preschool children's emotional self-regulation, demonstrated by their raised negative feelings. Furthermore, due to their tendency to emulate the aggressive speech and actions demonstrated by the characters in television shows, the digital play has also been shown to increase children's aggressiveness. As a result of their limited socialization and character development opportunities, youngsters who spend too much time playing on digital devices suffer from poor social skills and character formation.

"Children who have too much digital play will have lower self-regulation. Some of them do not even know how to manage their own emotions. Their negative emotions are elevated much more as compared to their positive emotions" (P2, 28).

"I observed this 4-year-old child in my class. He likes to watch Tom and Jerry show. You know Tom and Jerry show, Tom likes to bully Jerry, Jerry likes to bully Tom, right? He likes to copy that behavior" (P1, 23).

"I feel like social skills are learned through natural interaction, and every use of digital play reduces the amount of natural interaction, which in turn reduces the possibilities of them developing and progressing in these areas" (P4, 29).

4.4. Influence of the COVID-19 Pandemic on Early Educators' Perspectives towards Digital Play

The findings indicate that the COVID-19 pandemic had only a minor to non-existent impact on the viewpoints of early educators regarding digital play, except for a few cases. Therefore, early childhood educators have maintained their belief that digital play should be utilized sparingly and judiciously to reduce the detrimental effects on preschool children's development.

"So, my opinion still stands that digital play is not something I would consider to incorporate as the main thing in preschool teaching, but with the careful use of digital play, we can minimize its negative impacts on our very young learners" (P4, 29).

4.5. Challenges Perceived by Early Educators When Implementing Digital Play

Early educators were concerned that the introduction of digital play might cause overstimulation in preschool children, making them easily distracted and having a short attention span. In addition, many children, particularly those enrolled in virtual school, have difficulties obtaining adult support because of their parents' hectic work schedules or lack of expertise in using digital technology.

"All of these make them very hard to process, and it shortens their attention span. They do not comprehend what I am saying at this point. So, a lot of distractions, a lot of attention span issues as well" (P2, 28).

"So, I think the time to delegate for their child and for their work is a kind of challenge for them. And they are obviously managing the household. Some of them, their parents are nowhere to be found, until they are like 'I need my scissors! I can't find my scissors!' They will be really stressed; they will be crying and so on" (P5, 26).

Early educators believed that the difficulty of providing personal assistance to children in a virtual setting hindered the effectiveness of their teaching efforts in virtual schooling environments.

"Sometimes it is very difficult for you just to stay online and not be able to help your children do certain things physically. Before they can just come up to you physically" (P5, 26).

There were instances where courses were disrupted due to technological instability, such as an unstable internet connection or a digital device malfunctioning. Apart from that, many kindergartens and families only have a limited number of technical equipment that can be used to assist learning through digital play.

"Our internet connection sometimes is not stable, and sometimes the Smartboard does not work and like it is a lot of technicality challenges. Sometimes cause a lot of time wasted, and you know children are just waiting, so it is not really helpful" (P4, 29).

"Maybe some families only have one right. So maybe using the mum's phone to have the online classes but at the same time the mum is work from home, and then have to do work from their phone" (P1, 23).

5. Discussion

5.1. Perspectives of Early Educators on the Impact of Digital Play on Preschool Children's Physical Development

Early educators believe that the appropriate use of digital play can increase the active behavior of preschool children, which is beneficial for their physical development in particular. For instance, action songs and workout tutorial videos may be used in different subjects. As a result of imitating the characters' actions in the song videos, preschoolers demonstrated more active behavior throughout the lesson. This has the potential to improve motor skill competence and promote moderate-to-vigorous physical activity in preschool children in educational settings, which in turn can promote a physically active lifestyle in children. Better cardiometabolic health in childhood may be realized in the long run.

Another group of educators was concerned that digital play increased sedentary behavior in preschool children, particularly when the children sat down and passively watched videos on their computers. As a result, the children's participation in physical activity has decreased. The two opposing viewpoints expressed by early educators led to the conclusion that whether digital play has a positive or negative impact on the physical development of preschool children depends on the type of digital play used and how the early educator implements and incorporates it into the lesson. For example, videos to guide a song and dance session could be beneficial, whereas a prolonged period of passive viewing videos could be detrimental to

children's physical development.

5.2. Perspectives of Early Educators on the Impact of Digital Play on Preschool Children's Cognitive Development

For cognitive development, digital play effectively enhances preschool children's language learning, particularly phonics. When phonics concepts were taught through digital play, e.g., phonics songs, children were more engaged when singing and dancing together along with the vivid characters and visuals presented in the videos. In addition, children acquired phonics concepts in an engaging, fun way via the easily remembered lyrics and dance movements. Children's acquisition of phonics was also enhanced through interactive online games.

However, the digital play has the potential to constrain children's ability to express themselves verbally. For example, children who have had extensive exposure to animated television programs are more likely to mimic the speech patterns of the animated characters. This is incongruent with Cahill and Bigheart (2016), which argued that children's exposure to educational television programs might lead to advantages in literacy. Based on the contradiction, it was suggested that the impact of television programs on the language development of preschool children is influenced by the interaction between multiple factors, e.g., style of language used, nature of the interaction between television characters, themes of television programs, etc.

Moreover, digital play resources based on scientific knowledge, such as National Geographic Kids, have increased preschool children's exposure to scientific knowledge. Some early educators, on the other hand, did not favor using digital play in the scientific learning of preschool children, according to the findings. Instead, the early educators contended that preschool children should actively construct their world knowledge by exploring and interacting with the natural environment rather than passively taking in information.

Furthermore, preschool children's creativity and imagination are diminished due to excessive exposure to digital play. The children's artistic expression frequently exhibits characteristics of imitation or resemblance to digital play content, which is problematic. While some digital play products are commercialized as open-ended and may stimulate creativity, children's creations within the virtual platform are restricted by the limited options with designed functions. At the same time, the natural environment allows children to construct original creations from unlimited alternatives of elements with endless possibilities of functions. Thus, the natural environment is contended to be more effective in stimulating the creativity of preschool children compared to digital play. This finding contradicts Highfield (2016) and Kervin (2016), who suggested that open-ended techno-toys may stimulate children's imagination and creativity. Based on the contradiction, it was suggested that the effectiveness of stimulating preschool children's creativity depends on the features of techno-toys and on the suitability of a techno-toy for the child's developmental level and ability, the way of interaction with the toy, the duration of play, the availability and quality of scaffolding, and the opportunities to integrate with natural explorations.

5.3. Perspectives of Early Educators on the Impact of Digital Play on Preschool Children's Socio-Emotional Development

For socio-emotional development, excessive exposure to digital play might deteriorate the emotional self-regulation of preschool children. Preschool children with constant exposure to digital play, especially screen-based devices, are likely to display more elevated negative emotions and have difficulties managing them.

Besides, excessive exposure to digital play is likely to increase the aggressiveness of preschool children. Children are likely to imitate the aggressive words or violent actions shown by characters in television programs. Besides, with constant exposure to video games with violent scenes, children are more likely to develop hostile thoughts.

Furthermore, with overexposure to digital play, preschool children also showed deteriorated social skills and character building. The early educators advocated that the social skills of young children are best learned in a natural environment, where children can practice negotiation, cooperation, leadership, conflict skills, etc. As classes are conducted virtually during the lockdown, children can hardly practice social skills through digital play in a virtual setting. With the lack of natural interaction, children also lack opportunities for character building. In contrast, some argued that children might learn moral values effectively by using digital play in conjunction with role-plays or puppet shoes. The early educators held more positive views toward implementing digital play in physical settings. For example, child-friendly robots and coding games benefit social skills practice as children may work as a team to achieve a common goal. With appropriate scaffolding, digital games may support social interaction and collaboration in preschool children. Children may acquire social skills by observing and interacting with more competent peers.

The present findings indicated that the COVID-19 pandemic had resulted in minor to non-existent influence on the perspectives of early educators towards digital play. Despite the drastic increase in the use of digital play during the COVID-19 pandemic, the early educators generally stand firm with their perspective that digital play should only be used minimally to minimize its negative impacts on preschool children. While the use of digital play is inevitable during the pandemic, the early educators stated that adults should

be selective in the type and content of digital play exposed to preschool children.

5.4. Challenges Perceived by Early Educators When Implementing Digital Play

As a result of the inclusion of digital play in preschool children's learning, early educators, preschool children, and their families have faced some difficulties. Digital play caused overstimulation in preschool children, which led to attentional and behavioral problems. The vivid visual and sound effects of digital play are often overstimulating for preschool children. With simultaneous high-intensity sensory excitement, preschool children face difficulty processing the information and get overwhelmed easily. Overstimulation may cause preschool children to feel tired, angry, upset, throw tantrums, and refuse to follow simple instructions. Besides, overstimulation causes preschool children to be easily distracted and reduces their attention span. The impact of overstimulation intensified after excessive screen time, which is common when digital play is implemented in virtual classes. With overstimulation, children may behave uncontrollably and aggressively.

Besides, when digital play is implemented via virtual lessons, the early educators feel their instructional effectiveness diminished due to the constraints of the virtual setting. Circle time and cooperative play are not implementable without a shared physical space. Early educators can hardly establish an emotional connection with preschool children without eye contact and physical contact. They also find it difficult to provide personal guidance to the children.

Early educators also faced their implementation of digital play interrupted by technological instability, e.g., instability of internet connection and malfunction of digital devices. To minimize the interruption by technological instability, early educators may keep a backup lesson plan and perform routine maintenance of digital devices.

Furthermore, many kindergartens and families of preschool children struggled with the limited availability of technological devices, especially when financial difficulties were common during the COVID-19 pandemic. Many families struggled with the need to share technological devices among family members. Some preschool children from low-income families who could not afford a digital device had been left out of the virtual school.

Moreover, many preschool children face difficulties in getting adult support for their learning via digital play, particularly during virtual lessons. In addition, many parents struggle to support their children due to their packed working schedules. Others faced additional barriers such as digital illiteracy or unfamiliarity with the educational software.

5.5. Theoretical and Practical Implications

For theoretical implications, the encouragement of active behavior and the increase of aggressiveness in preschool children via digital play is in line with Bandura's (1971, as cited in Toh & Lim, 2021) social learning theory, which states that new behaviors can be acquired by observing and imitating others. Besides, the early educators' opinion that cooperative play using robots and coding games may be beneficial for preschool children's social skills learning is in line with Vygotsky's (1987) social constructivist theory stating that young children actively construct their knowledge from their experiences and interactions with others and the environment. Furthermore, the impact of overstimulation by screen-based devices on attentional and behavioral problems of preschool children is consistent with the overstimulation hypothesis (Christakis, 2011). The overstimulation hypothesis postulated that fast-paced cartoon shows with surreal pacing, rapid sequencing of motion, and frequent changing of scenes might lead to deficits in children's executive function.

For practical implications, parents and early educators should carefully monitor the content of digital play exposed to children. Caregivers and early educators should also limit the time for digital play in preschool children. For example, the implementation of digital play should not be more than 30 minutes for each lesson. Furthermore, overstimulation in preschool children due to digital play had profound implications for producers of digital play products for young children. Overexposure to digital play may defeat the purpose of learning, result in addiction to electronic devices, and cause a burden on young children's developing sensory organs. Therefore, producers of digital play should make informed decisions concerning features of children's television programs and educational videos, e.g., the pace of shows and the frequency of scene changing, to avoid placing a burden on young children's developing sensory organs and functions. Besides, the government should look into the needs of society and provide strategic financial aid for kindergartens and low-income families to support children's education.

Moreover, policymakers and employers may support parents by setting legal and organizational policies which allow parents to have more flexible schedules and thus may be more available to support their children's education. Government and employers may also provide more subsidies, flexible benefits plans, and flexible leave and transfer policies to allow parents to spend more time with their children. Besides, early education programs may provide workshops to guide parents in manipulating digital devices and software.

6. Conclusion

6.1. Main Findings of the Present Study

In conclusion, for physical development, early educators perceive that digital play may encourage active behavior in preschool children while also increasing the children's sedentary behavior. For

cognitive development, digital play may enhance preschool children's language learning and their scientific knowledge exposure. On the other hand, digital play may restrict children's language style, reduce their hands-on learning experiences, and diminish their creativity. For socio-emotional development, digital play may deteriorate preschool children's emotional self-regulation, increase their aggressiveness, and deteriorate their social skills and character building. The COVID-19 pandemic has resulted in minor to non-existent influence on the perspectives of early educators towards digital play. Despite the drastic increase in the use of digital play, early educators generally stand firm with their perspective that digital play should only be used minimally to minimize its negative impacts on preschool children.

Regarding the challenges of digital play, early educators perceive that digital play causes attentional and behavioral problems in preschool children due to overstimulation. Besides, technological instability and the limited availability of technological devices interfere with implementing digital play. In virtual classes, early educators perceive the limitation of virtual instruction and children's difficulty in obtaining adult support.

6.2. Comparison with Other Studies

Compared to similar research conducted before the COVID-19 pandemic (Erdogan et al., 2019; Slutsky et al., 2019), the current finding revealed a similar attitude of the early educators towards digital play. Even after the extensive implementation of digital play during the COVID-19 pandemic, the early educators stand firm with their perspective that digital play should be used minimally to minimize its negative impacts on preschool children. This result resonated with Slutsky et al.'s (2019) finding that early educators from Europe, the Middle East, and North America had reported digital play as the least used type of play in kindergartens compared to non-digital play. Similarly, Erdogan et al. (2019) had shown that Western and Asian parents preferred their children to engage with traditional play compared to digital play.

From current findings, the enhancement of language learning and increased sedentary behavior due to digital play paralleled the educational benefits and health concerns discussed in Erdogan et al. (2019). Besides, the early educators held a similar view to Slutsky et al. (2019) regarding the importance of hands-on learning experiences and social interactions in early childhood. Furthermore, the current study yielded novel findings, such as the restriction of language style due to digital play.

6.3. Implication and Explanation of Findings

Regarding theoretical implications, Bandura's (1971, as cited in Toh & Lim, 2021) social learning theory may explain the encouragement of active behavior and the increase of aggressiveness in preschool children via digital play. The improvement of preschool children's social skills through cooperative digital play is consistent with Vygotsky's (1987) social constructivist theory. Besides, attentional and behavioral problems due to overstimulation in preschool children are explainable by the overstimulation hypothesis (Christakis, 2011). For practical implications, parents and early educators should monitor the content and duration of digital play exposed to children. Producers of digital play should reduce the effect of overstimulation in preschool children by making informed decisions concerning features of children's television programs and educational videos. Besides, the government should improve children's education by providing strategic financial aid for kindergartens and low-income families. Moreover, policymakers and employers may set flexible policies that increase parents' availability to support their children.

6.4. Strengths and Limitations

By adopting the qualitative semi-structured interview method, the comprehensiveness of data obtained in the current study is accompanied by the flexibility to capture related experiences of early educators, which contained additional values. Besides, the present research innovatively attended to the potential influence of the COVID-19 pandemic on the perspectives of early educators, which is a novel component compared to similar research.

The current research had some methodological limitations. First, the small sample size of the present study might limit the generalizability and validity of the current findings. Second, the sample of the current study only included female early educators. Third, due to the constraints during the COVID-19 pandemic, the present study adopted online video interviews as the only data collection method without incorporating direct observations of preschool children's play. Lastly, the current research did not include the perspectives of preschool children's parents.

6.5. Conclusion, Recommendation, and the Line of Future Research

As a novel study to investigate the potential influence of the COVID-19 pandemic on early educators' perspectives towards digital play, the current study has provided fundamental implications for government, early educators, parents, and society in the mid-pandemic and post-pandemic society to adjust their practices to promote the healthy development of preschool children.

To expand on the present research, it is recommended to adopt a cross-cultural approach to obtain perspectives of early educators from countries of various cultures. Besides, future studies may look into the perspectives of early educators on the impact of the implementation of digital play on other languages, such

as the Mandarin language, Malay language, Tamil language, etc., and other aspects of language skills such as reading and writing. Furthermore, future research may investigate the impact of digital play on other specific areas of cognitive development, e.g., executive function, memory, problem-solving, etc. Moreover, a longitudinal study was recommended to examine whether children's exposure to digital play with scientific-based content is associated with enhanced interest and performance in scientific subjects during elementary and secondary school.

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Authors' Contributions

Y. E. T. designed the research, conducted the interviews and data analysis, and produced the manuscript. Z. S. M. provided consultations throughout the research and edited the manuscript.

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