Information and Communication Technologies Use of Parenting in Early Childhood in the Pandemic Era: Benefits, Risks, and Implications

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Abstract

The COVID-19 pandemic outbreak poses serious challenges to traditional parenting practices. ICT-assisted parenting, in which parents seek information, make connections, and participate in intervention programmes, is receiving increased attention. Global studies indicate that online parenting is beneficial for children's cognitive, emotional, and behavioural development, as well as for parent-child interactions. Despite this, there remains a research gap in portraying ICT use among parents of children aged 3 to 6 during and after the pandemic epidemic. Four databases were searched to identify six original research publications published between 2020 and 2022 (ProQuest Centra, Elsevier Science Direct Journals, PsycINFO and ERIC). The three major forms of ICT use in parenting were identified: information-centric, communication-centric, and intervention-centric. All three types of activities are beneficial to parental activities, particularly in terms of reducing parental stress and increasing parental confidence during the lockdown. Given that post-pandemic parental ICT use research is still in its infancy, future research should concentrate on parenting intervention groups, including rigorous quantitative study designs with controlled groups. Guidelines and strategies should be issued to facilitate and ensure the quality of information dissemination. Furthermore, a home-school partnership that incorporates online parenting into the communication agenda is desirable.

Keywords: Parenting, ICT, COVID-19, Online Parenting, Social Media, Parenting Intervention, Parenting Resources

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1. Introduction

Limited access to parenting support during the COVID-19 pandemic has become a crucial issue. (Sherr et al., 2022; Tomlinson et al., 2022). The lockdown, school closures, travel restrictions, and limited access to medical services had a substantial impact on parents, especially in families with special needs (Wisen-Vincent & Bokoch, 2022). According to the United Nations Educational, Scientific, and Cultural Organization (2020), 1.38 billion children were denied access to school or childcare because of the COVID-19 virus. Parents and caregivers were compelled to work fewer hours or from home with children (Tomlinson et al., 2022). Social isolation, infection anxiety, economic stress, fatigue, and caregiver burden led to a significant increase in parental stress, depression, and other mental health problems (Perks & Cluver, 2020). Prolonged exposure to traumatic stress increases the risk of strained parent-child relationships and child abuse in families (Wu & Xu, 2020). This is an urgent crisis that necessitates the development of effective alternatives by the government, policymakers, and educators when traditional methods of providing parenting support are obfuscated.

Parents, being children's first teachers, have a profound impact on children's development (Baker, Sanders, & Morawska, 2017). Literature supports the positive relationship between active parental involvement and academic achievement in children, whereas insufficient parenting has been linked to aggressiveness in adolescence and juvenile delinquency (Madge & O'Connor, 2004). Positive parenting practices have both short-term and long-term benefits for children's behavioural and emotional development, such as boosting self-esteem, reducing depression, and alleviating trauma (Cheun & Pomerantz, 2012; Morgan et al., 2017). Multiple parenting programmes (e.g., Positive Parenting Program [PPP] or as Triple-P Program) are shown to improve parent-child relationships, reduce caregiver stress and abuse during discipline, and improve child and caregiver mental health in a variety of demographic and socioeconomic settings (Breitenstein et al., 2014; Franke et al., 2020; Wisen-Vincent & Bokoch, 2022).

ICT (Information and Communication Technology) is deeply interwoven in people's daily life. ICT refers to Internet-capable electronic devices such as laptops, tablets, and smartphones, as well as their software and applications (Na & Chia, 2008). China has 989 million Internet users in 2020, with a population penetration rate of 70.4% (China Internet Network Information Center, 2021). Parents increasingly rely on ICT for parental support and solutions. Walker and Rudi (2014) discovered that more than 25% of mothers in the United States searched for parenting information daily. Bakers et al. (2017) surveyed 459 Australian parents of children ages 2 to 12 and found that the majority of parents utilise parenting websites (65%) and social media (45%) for parenting information. Online relationships with other parents are valued by parents as a important venue to develop community, exchange social support, share information, and gain a better understanding of the parenting experience (Hall & Irvine, 2009; Madge & O'Connell, 2004). Similarly, in China, young parents with children between the ages of infants and preschoolers are increasingly turning to social media for guidance to navigate this life-altering transition (Gao, Jiang & Yang, 2021). According to the "China Parenting Report under COVID-19" published by China's professional parenting platform, the daily activity of parenting online communities increased by 22% year over year during COVID-19, while the number of online consultation services increased by 50.58 % (Yuer, 2020).

According to previous research and reviews, there are three distinct types of ICT activities: information-centric, communication-centric, and intervention-centric (Nieuwboer, Fukkink & Hermanns, 2013; Walker & Rudi, 2014; Breitenstein et al., 2014) (See in Figure 1). When seeking parenting information, parents frequently visit websites (Nieuwboer et al., 2013). Social media platforms are popular when seeking social support (Daneback & Plantin, 2008). Emails and video/audio meetings are reported to predominate at online interventions. (Nieuwboer et al., 2013). Notably, these channels may overlap; for instance, parents can access information on Facebook pages, and some parental websites offer interactive discussion forums (Haslam & Baker, 2017). It has been reported that parents engage in multiple ICT activities simultaneously (Nieuwboer et al, 2013; Baker et al, 2017; Daneback & Plantin, 2008). For example, parents seeking information about children's illness will use search engines to skim the information. To validate their findings, parents post on message boards or read comments below relevant posts. Depending on their Internet proficiency and level of preparedness, some parents join parenting groups. In the subsequent phase, if interventions are required, they can be obtained via email consultations or therapy sessions conducted online.
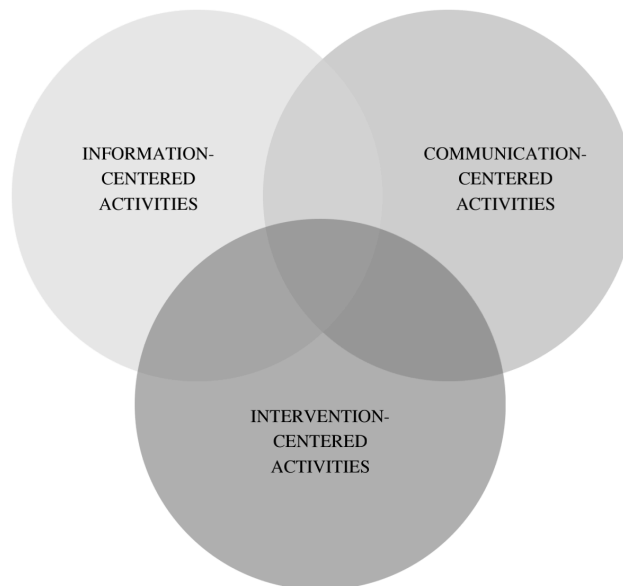

Figure 1 Diagram of ICT Activity Types for Parenting

The impact of the COVID-19 pandemic is pervasive and long-lasting, significantly altering the landscape of parenting. The transition of parenting from traditional print or in-person to ICT-based methods is anticipated (Gao et al., 2021). Recent research has shown that online parenting holds promise for increasing access to information and is an effective way to teach parents behaviour management skills (Spencer et al., 2020). Despite this, there is a dearth of critical reviews of research on the use of ICT by parents of children during the COVID-19 pandemic. Few studies categorised ICT activities serving the general population into clear-defined subgroups. The purpose of this paper is to examine the recent findings of ICT use in early childhood parenting during the COVID-19 pandemic. We examine the benefits, risks, and implications of current practices in an effort to provide critical insights into the future application and evolution of online parenting.

2. Method

2.1 Literature Research

The study employed four inclusion criteria to acquire relevant publications (See in Table 1). First, we located research on online parenting by searching four databases (ProQuest Centra, Elsevier Science Direct Journals, PsycINFO and ERIC). We identified four root concepts as keywords that should appear in publications simultaneously: internet, parenting, early years, and COVID-19. According to the extensive terms identified, further research was also undertaken (See in Table 2). The outbreak of COVID-19 was declared as Public Health Emergency of International Concern by the World Health Organization on January 30, 2020, and a pandemic on March 11, 2020. Therefore, studies published between January 2020 and September 2022, when this article was written, were included. Finally, we limited our research to English-written and original research articles published in peer-reviewed journals. Literature Review is excluded due to the precision and depth of the data.

Table 1 Inclusion Criteria

Inclusion Criteria	Description
I1	Articles from ProQuest Centra, Elsevier Science Direct Journals, PsycINFO and ERIC
I2	Articles containing all KW1-4 including their extensive terms
I3	Articles published between January 2020 and September 2022
I4	Original research articles published at peer-reviewed journals and written in English.

Table 2 Search Terms for Inclusion Criteria

Code	Root Terms	Extensive Terms
KW1	Online	*ICT; Internet; Social Media; App; Websites*
KW2	Parenting	*Parental; Parents; Parental/Parenting Support; Parenting Programs/Interventions; Parental/Parenting Resources*
KW3	Early Years	*Children; Early Childhood; Preschool(ers)*
KW4	COVID-19	*Pandemic; Coronavirus*

2.2 Literature Selection

Using the inclusion criteria, the initial literature search identified 3608 studies (See in Figure 2). Inclusion criteria were then applied to refine the selection, and duplicates were deleted. 284 articles passed the second filter and proceeded on to title and abstract evaluation manually. Irrelevant items, such as parental stress, newborn health concerns, and pregnancy, were eliminated, leaving 34 articles. By manually examining the full texts of 34 articles, their eligibility was determined. Finally, four articles that fulfil all inclusion requirements and are pertinent to the topics were chosen. During the full-text review, two additional relevant papers were added. In total, six articles were selected as the final reviewable articles.
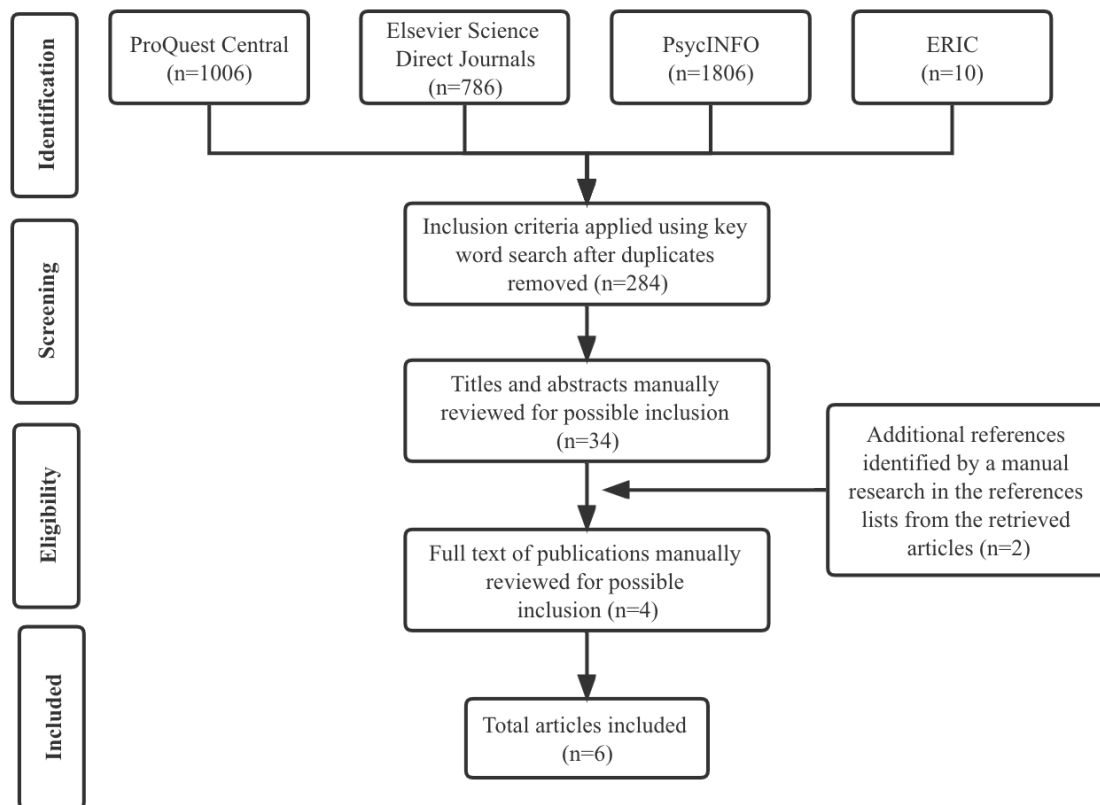
Figure 2 Diagram of Literature Selection Process

2.3 Literature Analysis

Included articles were reviewed and organised according to the three broad themes: information-centric, communication-centric, and intervention-centric activities. A spreadsheet was constructed to collate data on the research topic and key findings (See in Table 3). We arranged studies in rows and established columns for the study's basic information, themes, research aims or questions, research design, and key findings. Using the spreadsheet, we were able to visually examine researchers' interest in particular topics during the COVID-19. Then, we grouped papers with comparable themes together in order to compare them across various perspectives. Throughout this process, we identified specific research interests that emerged within each theme. In a subsequent section, the benefits, risks, and implications are discussed in detail. We also examined the limitations of these studies, which calls for future research.

Table 3 Descriptive Information of the Included Studies

Author/Year	Article Titles	Themes	Research Aims/Research Questions	Research Design	Main Findings
Lasecke et al., 2022	Disseminating online parenting resources in the community during the COVID-19 pandemic: Lessons learned	Information-tric	How does the use of dissemination strategies in an online parenting programme affect parental participation?	Quantitative Correlational; Data of clicking and attendance	Findings suggest a positive association between the number of dissemination strategies and parental involvement. a) The most dissemination strategies received schools had the highest number of attendees and the greatest ratio of attendees by strategies. b) The use of dissemination strategies is positive associated with the number of clicks for the online Everyday Parenting course.
Sherr et al., 2022	Tipping the balance – an evaluation of COVID-19 parenting resources developed and adapted for child protection during global emergency responses	Information-centric	What are parents' perspectives on whether parenting resources at scale are feasible and beneficial to parents in various settings under COVID-19 constraints?	Qualitative; Surveys and interviews	Findings show that rapid provision of parenting resources at scale is feasible under COVID-19 constraints and beneficial for parents across different settings. a) Parents reported that the online resources were perceived as a welcomed additional source of support. Many parents felt the tips were particularly helpful by providing ideas on control, pausing, thinking, and introducing routines. b) The timeliness of the resources was perceived as a significant factor, as they were released early in the pandemic which allowed parents in need to have quick access to support and facilitators. c) The online format of the resources increased the reach as it was available anywhere to anyone with access to the internet.
Zhao & Ju, 2022	How do Internet moms raise children? The reshaping of Chinese urban women's parenting psychology by COVID-19 online practices	Communication-centric	How is the changing impact of Internet-based parenting practises on the daily lives of Chinese urban mothers during the COVID-19 pandemic?	Mixed-methods; Observations and interviews	Findings suggest that, during the COVID-19 global pandemic, Chinese urban women shifted their parenting practices to the Internet. a) Online parenting communities make urban mothers' psychological shift from traditional experience to scientific parenting. b) This online parenting practice during the pandemic allowed them to accept their role as "Internet moms" with a positive mindset. They are observed to be more proactive in learning and sharing parenting knowledge, as well as expressing themselves through the Internet.
Tomlinson et al., 2022	Lessons for a COVID-19 era: Barriers and facilitators to court ordered online parenting programs for divorcing and separating parents	Intervention-centric	What are the barriers to and facilitators of parent participation in court-ordered online parenting programs during family law cases?	Qualitative; Interviews	Findings suggest that many parents viewed online parent programs positively (e.g., convenient), they also reported barriers to participation (e.g., technology problems). a) All parties (100%) who participated in a program viewed the program positively, felt the program was helpful, and reported that they enjoyed the quizzes and videos. b) Other than access to technology, some parents noted the programs were inconvenient because they

3.   Discussion

3.1 Information-centric Activities

3.1.1   Benefits, Risks, and Implications

In response to the demand for easily accessible and practical parenting advice during the lockdown, governments and other organisations, such as the WHO, UNICEF, and World Childhood Foundation, have made reading materials, broadcasts, and videos available online (Lasecke et al., 2022; Sherr et al., 2022). According to the findings identified, it is feasible to conduct rapid distribution parenting materials on a broad scale within COVID-19 restrictions and beneficial for parents from a variety of backgrounds (Sherr et al., 2022). Parents were appreciative of the resources' timeliness, low cost, and convenience of use (i.e., parents can download resources for numerous uses at no cost). As the process of widespread distribution of online resources during the epidemic, researchers became interested in the dissemination strategies. The dissemination strategies refer to how information is delivered effectively and efficiently to parents and educators (Bernhardt & Felter, 2004). Due to the enormous amount of information available online, an increasing number of respondents revealed the difficulties of locating relevant resources, organising multiple resources, decoding and utilising specific online resources (Lasecke et al., 2022). Parental involvement with online resources could be greatly altered by the application of proper dissemination strategies (Bernhardt & Felter, 2004; Plantin & Daneback, 2009). Immigrant parents valued resources offered in various languages (such as English, Chinese, and Spanish). Providing a variety of distribution forms (emails, newsletters, and live presentations, for example) and employing a pictorial visual design were also favourably associated with view counts (Lasecke et al., 2022). Schools' and parents' opinions should be considered to improve the efficacy of disseminating information.

Notably, Sherr (2022) reported parental interests in integrating interactive components into online resource platforms. Parents who were interviewed remarked that there was rarely a section on websites where they could provide feedback on the advice presented, as well as commenting on results regarding specific cases or age groups. According to researchers, introducing interactive elements could be especially beneficial for parents who feel alienated and/or are unable to access their normal sources of support (Plantin & Daneback, 2009). Thus, the possibility of integrating information-centric and communication-centric activities should be addressed. More parents would benefit if they could tailor their experiences to their specific parenting needs. Additional research is required to investigate the relationship between dissemination strategies and parental involvement with online parenting resources. It is considered that identifying the appropriate ways for distributing online resources would contribute to the effective application of online resources, hence benefiting children's development.

3.1.2   Limitations

The research design of current studies, particularly the data collection, could be refined. In Lasecke at al.'s research (2022), early enrolment data is missing, and participants are not followed, making it difficult to track the dropout rate and the number of parents who engage throughout the programme. Consequently, the reported participation data were imprecise. In addition, due to the quantitative design of the study, no input from parents was obtained; the direct participation of parents could provide a more in-depth understanding of the success of resource dissemination. Sherr et al.'s research (2022), on the other hand, included extensive

and systematic interviews with parents. Whereas, the sample size was rather small, with only 1–2 interviews from each eight nations. Due to the underrepresentation, perspectives on online parenting tools may be skewed.

3.2 Communication-centric Activities

3.2.1   Benefits, Risks, and Implications

Parents can share their experiences in online groups to confirm their ideas, anticipate child-rearing challenges, and get reassurance that their children's behaviour is regarded as normal (Duggan et al., 2015). Parents also receive timely feedback and assistance, particularly in instant messaging parental groups (Walker & Rudi, 2014). Some parents may encounter challenges that are unusual in their social circles, such as Autism (Lee & Sullivan-Bolyai 2011). They find it easier to seek advice from others online who have overcome similar obstacles, and those parents may be in a better position to provide consistent support (Haslam & Baker, 2017). Anonymity is another benefit of online parental support. Parents are more comfortable seeking support online in anonymous or hidden parenting forums, according to interviews with families who have experienced difficult life events such as the death of one of their siblings (Gao et al., 2021).

Parental stress and depression have been shown to be reduced significantly when parents use online communication and connectivity to provide emotional and social support (Haslam et al. 2006). Parents feel supported simply by reading the experiences of others even if they do not post or interact (Haslam & Baker, 2017). Knowing other parents experienced similar frustration about leaving their kids to day care is observed to release young working mothers' level of stress (Haslam et al. 2006). These findings are confirmed by Zhao and Zhu (2022) at their qualitative study of impact of Internet-based parenting practices on Chinese urban women during the COVID-19 pandemic. Moreover, the internet community might contribute more fundamental and long-term influence at reshaping women's view of being a mother. Researchers suggest that virtual parental communities, creating a new platform for information empowerment and mutual support, promote the parental confidence and a more independent image of self (Gao et al., 2021; Zhao & Ju, 2022).

Nonetheless, social media platforms such as Facebook have limited quality control measures. As reported by many researchers, the majority of information available at parenting communities were maintained by individuals or self-help groups (Eysenbach et al., 2002; Walker, Dworkin & Connell, 2011; Zhao & Zhu, 2022). These information and support provided have possibly fewer resources to enable them to uphold the quality of the information (Duggan et al., 2015). Furthermore, many parenting groups and parenting influencers on social media, as indicated by Zhao and Zhu (2022), earn profits by integrating sections for selling parental goods or ads, raising suspicions about their motivation. Legislative conduct guidelines and monitor should be published to ensure the transparency and integrity of information released on these platforms. Moreover, online parenting communities, as noted by Wartella et al. (2013), could reversely provoke parental stress through peer pressure created by members in community. For example, some parents reported that they worried more about their children's competency in learning via comparison with other parents at their Facebook parenting groups.

Therefore, the paper contends that that government and professional institutes should provide appropriate guidance. To begin, the government can exert influence on both suppliers and

receivers through enacting regulations and legislation to control platforms, as well as publishing guidelines or official websites to facilitate parental use (Eysenbach et al., 2002). Preschools and nurseries can also actively increase home-school partnerships, such as by conducting lectures on how to find reliable information and support online. Teachers should also be aware of the prevalence of ICT use among parents, actively approaching parents and providing support if necessary. Finally, parents are encouraged to self-educate themselves before employing ICT in parenting. This can be done by asking questions like "Is there someone profiting from this information?" or "Does it come from a trustworthy organization or source?" (Duggan et al., 2015). Furthermore, it is seen to be prudent to weigh responses by utilizing numerous ICT activities across multiple platforms. If the information can be verified by other parents on social media and validated by numerous independent platforms, the validity of the information improves (Walker et al., 2011).

3.2.2   Limitations

Only one study is identified related to communication-centric ICT use at this paper. It is evident that more research is required to investigate more about how the engagement with virtual parenting groups influence the parenting outcomes. As indicated by Zhao and Zhu (2022), future research should pay attention to collecting empirical data from the perspective of other members of the family, as well as comparing urban mothers with other family members. Aside from this, there is little research including the direct observation of parenting activities even prior to the pandemic. The dominant research tools employed to collect data are survey or interviews of parents, which make the whole picture missing the voice of children as well as a more objective account of what is exactly happened in practice. More qualitative research could be conducted to provide rich account of how parents communicate, especially how information is transmitting and its influence in real life.

3.3 Intervention-centric Activities

3.3.1   Benefits, Risks, and Implications

During COVID-19, two studies related to intervention-centric parenting activities utilising ICT were identified. Participation in online parenting interventions may result in improvements in three distinct areas (Tuntipuchitanon, 2022; Wisen-Vincent & Bokoch, 2022). First, online intervention programs, such as Triple-p/PPP, are associated with better social, emotional, and behavioural outcomes for children. Second, online parenting interventions can make a statistically significant positive impact on parenting knowledge and strategies. Moreover, parents' confidence in themselves also significantly rises after the programs. Finally, the improvement of relationship between parents and children was observed, especially the occurrence of positive interactions increased, and negative interactions significantly decreased compared with prior of the intervention.

Notwithstanding, taking a close look at these interventions, what in common is that the involvement level was relatively low, and the attrition rate was relatively high compared with traditional on-site interventions. Based on the identified studies, this paper contends that it might be due to the loop of learning-application-feedback was not yet rigorously formed at online programs (Na & Chia, 2008). For example, both interventions are mainly delivered in passive video-watching. These videos are pre-recorded, and fewer specific instructions were given based on individual cases. More importantly, rarely any feedback was given to parents during nor after their application of acquired strategies. Parents were not encouraged to ask

questions or involved in discussion enough to involve deep insights, thus parents were less motivated compared with on-site participation (Wisen-Vincent & Bokoch, 2022). Therefore, there are two directions of implications emerging from the existing research. First, the delivery of the content should be more interactive. Live lessons are preferred with real instructors present, where parents and children can present together and receive individualized support. Secondly, feedback should be sought, and questions should be answered in time during and after the interventions to ensure the sustainable support to parents.

3.3.2   Limitations

Due to the on-going lockdown and restrictions of the pandemic, both studies had relatively short period time of intervention (Tuntipuchitanon, 2022; Wisen-Vincent & Bokoch, 2022). In addition, their sampling strategies are less elaborated with relatively homogenous or small size of participants. Notwithstanding, what is most noteworthy is that these studies lack direct comparison with on-site intervention groups. Previously, the online parenting interventions were reported less effective compared with on-site groups due to the high rate of attrition (Melville, Casey & Kavanagh, 2010). However, the situation has changed critically after the pandemic because parents have limited choice but to attend online. It is also indicated by researchers that parents' belief towards online intervention has also changed towards a positive direction (Tuntipuchitanon et al., 2022). In addition, other than PPP, program such as PlayStrong Neuro-Filial Parenting Program has also demonstrated high competency in improving child behaviours, parent–child relationship quality, and parenting strategy use (Wisen-Vincent & Bokoch, 2022). The comparison between different programs might be beneficial in improving the overall design of online intervention programs.

4.   Conclusions

This narrative review provided a critical analysis of six original studies conducted between 2020 and 2022 on the benefits, risks, and implications of parental ICT use during the COVID-19 pandemic. There are three distinct types of parental ICT activities identified: information-centric, communication-centric, and intervention-centric activities. Although relatively fewer research on this important topic have been discovered, this article aims to present cutting-edge and critical insights regarding ICT use in early childhood parenting, particularly in the post-pandemic era.

This analysis demonstrates that the use of ICT during the pandemic is practical and advantageous for parents with young children in all three types of activities. Online resources provide rapid and low-cost access to essential and practical parenting information. Connecting with online parenting communities was also reported to reduce the stress level of parents and build parental confidence. During the lockdown, virtual communities, such as social media platforms, provide timely parental support by exchanging parenting information and strategies. Due to the stringent control of in-person communication during the pandemic, researchers found that an increasing number of parents prefer online parenting and are adjusting their parental roles to the virtual world. Thirdly, online parenting interventions were perceived to have expanded their influence during the pandemic and were anticipated to help a greater number of children who have difficulty accessing on-site interventions. In addition to well-known PPP programmes, more interventions, such as the PlayStrong Neuro-Filial Parenting Program, have been adapted for online delivery and reported to improve parenting results.

Researchers highlight requests for the addition of interactive components and the expansion of the dissemination of online resources for information-centric activities. In order to safeguard parents from erroneous and biased information, it is anticipated that regulations and policies would be issued regarding the authenticity and transparency of material given on online parenting networks. Online and traditional parenting communities can collaborate to provide more comprehensive support, with educators and schools providing information or training sessions on utilising online resources critically. Also significant is the fact that online parenting treatments are still in their infancy. Compared to on-site programmes, the dropout rate is relatively high, and the degree of participation is comparatively low. Researchers hypothesised that this is because the design of current interventions does not actively involve parents in the learning process. In addition, less feedback and tailored instructions were provided compared to interventions conducted on-site. Future online interventions should therefore include incorporating interactive portions where parents can discuss concerns with practitioners and receive personalised feedback following the practise of interventions.

Although the review was committed to including all important original research in this field, it is not a systematic review in concept and execution. Given the rapid development of ICT use in parenting in the post-pandemic era, systematic reviews of this topic are preferred. Moreover, literature review with focused type of activity, such as online intervention, is believed to add in-depth insights to the field's practice. Overall, more research could be conducted to study the use of ICT in parenting in early childhood settings in response to COVID-19. This review intends to inspire confidence in continuing to invest in research in this sector by critically examining both advantages and dangers and, as a result, producing future implications.

References

Baker, S, & Sanders, M.R., (2017). Predictors of Program Use and Child and Parent Outcomes of a Brief Online Parenting Intervention. *Child Psychiatry Hum Dev 48*, 807–817. https://doi.org/10.1007/s10578-016-0706-8

Baker, S., Sanders, M.R., & Morawska, A. (2017). Who uses online parenting support? A cross-sectional survey exploring Australian parents' internet use for parenting. *Journal of Child and Family Studies, 26*(3), 916-927.

Bernhardt, J. M., & Felter, E. M. (2004). Online pediatric information seeking among mothers of young children: results from a qualitative study using focus groups. *Journal of medical Internet research, 6*(1), e7.

Breitenstein, S. M., Gross, D., & Christophersen, R. (2014). Digital delivery methods of parenting training interventions: a systematic review. *Worldviews on Evidence-Based Nursing, 11*(3), 168-176.

Cheung, C. S. S., & Pomerantz, E. M. (2012). Why does parents' involvement enhance children's achievement? The role of parent-oriented motivation. *Journal of Educational Psychology*, *104*(3), 820.

China Internet Network Information Center. (2021). The 47th Statistical Report on China's Internet Development. Retrieved from https://www.cnnic.com.cn/IDR/ReportDownloads/202104/P020210420557302172744.pdf

Daneback, K., & Plantin, L. (2008). Research on Parenthood and the Internet: Themes and Trends. Cyberpsychology: *Journal of Psychosocial Research on Cyberspace, 2*(2), article 2. Retrieved from http://cyberpsychology.eu/view.php?cisloclanku=2008110701&article=2

Eysenbach, G., Powell, J., Kuss, O., & Sa. (2002) ER: Empirical studies assessing the quality of health information for consumers on the world wide web: a systematic review. *JAMA, 20,*2691-700.

Franke, N., Keown, L. J., & Sanders, M. R. (2020). An RCT of an online parenting program for parents of preschool-aged children with ADHD symptoms. *Journal of attention disorders, 24*(12), 1716-1726.

Gao, Y., Jang, J., & Yang, D. (2021). Understanding the Usage of Online Media for Parenting from Infancy to Preschool At Scale. *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*, 1–12. https://doi.org/10.1145/3411764.3445203

Hall, W., & Irvine, V. (2009). E-communication among mothers of infants and toddlers in a community-based cohort: a content analysis. *Journal of advanced nursing, 65*(1), 175–183. https://doi.org/10.1111/j.1365-2648.2008.04856.x

Haslam, D. M., Pakenham, K. I., & Smith, A. (2006). Social support and postpartum depressive symptomatology: The mediating role of maternal self-efficacy. *Infant Mental Health Journal, 27*(3), 276–291. doi:10.1002/imhj.20092

Haslam, D. M., Tee, A., & Baker, S. (2017). The use of social media as a mechanism of social support in parents. *Journal of Child and Family Studies, 26*(7), 2026-2037.

Lasecke, M., Baeza-Hernandez, K., Dosovitsky, G., DeBellis, A., Bettencourt, B., Park, A. L., & Bunge, E. L. (2022). Disseminating online parenting resources in the community during the COVID-19 pandemic: Lessons learned. *Journal of Community Psychology, 50*(5), 2443–2457. https://doi.org/10.1002/jcop.22788

Lee, M. M., & Sullivan-Bolyai, S. (2011). Parent mentor perspectives on providing social support to empower parents. T*he Diabetes Educator, 37*(1), 35–43. doi:10.1177/0145721710392248

Madge, C., & O'Connor, H. (2006) Parenting Gone Wired: Empowerment of New Mothers on the Internet? *Social & Cultural Geography, 2,* 199-220.

Melville, K. M., Casey, L. M., & Kavanagh, D. J. (2010). Drop-out from Internet-based Treatment for Psychological Disorders. *British Journal of Clinical Psychology, 49*(4), 455-471.

Morgan, A. J., Rapee, R. M., Salim, A., Goharpey, N., Tamir, E., McLellan, L. F., & Bayer, J. K. (2017). Internet-delivered Parenting Program for Prevention and Early Intervention of Anxiety Problems in Young Children: Randomized Controlled trial. *Journal of the American Academy of Child & Adolescent Psychiatry, 56*(5), 417-425.

Na, J. C., & Chia, S. W. (2008). Impact of online resources on informal learners: Parents' perception of their parenting skills. *Computers & Education, 51*(1), 173-186.

Nieuwboer, Christa, C., Fukkink, Ruben, G., & Hermanns, Jo, M.A. (2013). Peer and Professional Parenting Support on the Internet: A Systematic Review. *Children and Youth Services Review, 35*(11), 1823-1829. Retrieved from https://doi.org/10.1016/j.childyouth.2013.08.008

Perks, B., & Cluver, L. D. (2020). The parenting 'vaccine'. *Nature Human Behaviour, 4*(10), 985–985. doi: 10.1038/s41562-020-0932-8

Plantin, L., & Daneback, K. (2009). Parenthood, Information and Support on the Internet. A Literature Review of Research on Parents and Professionals Online. *BMC family practice, 10(*1), 1-12.

Sherr, L., Mebrahtu, H., Mwaba, K., Nurova, N., Chetty, A. N., Swartz, A., Cluver, L., Steventon Roberts, K. J., & Lachman, J. M. (2022). 'Tipping the balance' – an evaluation of COVID-19 parenting resources developed and adapted for child protection during global emergency responses. *Health Psychology and Behavioral Medicine, 10*(1), 676–694. https://doi.org/10.1080/21642850.2022.2104285

Tomlinson, C. S., Rudd, B. N., Applegate, A. G., Diaz, A., & Holtzworth-Munroe, A. (2022). Lessons for a COVID -19 era: Barriers and facilitators to court ordered online parenting programs for divorcing and separating parents. *Family Court Review*, *60*(2), 303–321. https://doi.org/10.1111/fcre.12643

Tuntipuchitanon, S., Kangwanthiti, I., Jirakran, K., Trairatvorakul, P., & Chonchaiya, W. (2022). Online positive parenting programme for promoting parenting competencies and skills: Randomised controlled trial. *Scientific Reports*, *12*(1), 6420. https://doi.org/10.1038/s41598-022-10193-0

UNESCO: COVID-19 Educational Disruption and Response, 2020, Available at: https://www.unesco.org/en/articles/covid-19-educational-disruption-and-response

Walker, S. K., & Rudi, J. H. (2014). Parenting Across the Social Ecology Facilitated by Information and Communications Technology: Implications for Research and Educational Design. *Journal of Human Sciences and Extension, 2*(2). Retrieved from https://www.jhseonline.com/article/view/671

Walker, S. K., Dworkin, J., & Connell, J. H. (2011). Variation in Parent Use of Information and Communications Technology: Does Quantity Matter? *Family and Consumer Sciences Research Journal, 40*(2). doi:10.1111 j.1552-3934.2011.02098.x

Wartella, E., Rideout, V., Lauriella, A., & Connell, S. (2013). Parenting in the age of digital technology: A national survey. *Northwestern University, Center on Media and Human Development.* Retrieved from http://web5.soc.northwestern.edu/cmhd/wpcontent/uploads/2013/05/Parenting-Report _FINAL.pdf

Wisen-Vincent, G., & Bokoch, R. (2022). Effectiveness of the PlayStrong Neuro-Filial Parenting Program: A program evaluation of an online pilot during COVID-19. *International Journal of Play Therapy*. https://doi.org/10.1037/pla0000186

Wu, Q., & Xu, Y. (2020). Parenting stress and risk of child maltreatment during the COVID-19 pandemic: A family stress theory-informed perspective. *Developmental Child Welfare, 2*(3), 180–196. doi: 10.1177/2516103220967937

Yuer (2020). *APA Report on Parenting in China under COVID-19[Announcement].* Beijing: Yuer Web.

Zhao, R., & Ju, G. (2022). How do Internet moms raise children? The reshaping of Chinese urban women's parenting psychology by COVID-19 online practices. *Frontiers in Psychology*, *13*, 933582. https://doi.org/10.3389/fpsyg.2022.933582

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