

The Digital Media Impact on the Well-Being of Children: A Systematic Literature Review

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Abstract

People may focus on the adverse effect of digital media use among children. It may lead to a lower level of the child's well-being and kinds of negative psychological implications. In the other hand, the use of digital media also generates some positive impacts on a child's well-being. Some contextual factors should be discovered in mediating this gap. A systematic literature review was conducted and generated 532 papers. Studies were involved if they used any kinds of digital media among the children. The study methodology was aligned by the PRISMA guidelines for systematic literature review. Screening for those articles remained 21 articles which met the inclusion criteria. This review provides both negative and positive effects of digital media use among the children and its implication for their well-being. The review draws some contextual factors in inflicting the adverse effect of digital media use, and it might some key-points to overcome the negative effects of digital media use on a child's well-being. Discussion: Some intervention had been conducted to overcome the negative effects of digital media use targeted to the children and parents. This review brings insight for future study to arrange the comprehensive intervention for children, parents, teachers, as well as a peer.

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INTRODUCTION

The recent popularity of the digital media and wide arrays of its applications has brought a number of significant changes economically, politically, socially, and culturally. New technologies, digital platforms, intrusive and/or engaging software, and media-related behaviors are rapidly changing and exceed our understanding of their impact on wellbeing. Further, digital devices such as computers, tablets, and mobile phones, as well as the many digitally mediated activities that children today engage in via these devices, such as using the internet, going on social networking sites, chatting online or playing video games. Television is considered separately. We highlight the form of digital media such as YouTube, and also include kind of social media; Facebook, Twitter, Instagram, and so on.

One group that also impacted by the widespread of this technology is children. Data showed the penetration of digital media in children life. Based on the latest surveys, 91.7% of children now use digital media, approximately 5.2 hour per day which increases with student age (Badri et al., 2017; Comscore, 2017). The use of digital media on children on these discussions across many media platforms, for instance, youtube (71%) and interactive digital devices such as online games (75%) and touch screen devices (66%) (Comscore, 2017).

It is undeniable that the spread of information through digital media psychologically has an effect on children well-being. Numerous studies have been identifying deleterious impacts of digital media uses on mental health. It's linked with increased depression, anxiety, anti-social personality disorder, compulsive behavior, poorer academic achievement, low self-esteem, increased levels of psychological distress and suicidal ideation (Chou and Edge, 2012; Kross et al., 2013; Rosen, Cheever and Carrier, 2012; Sampasa-Kanyinga and Lewis, 2015; Smahel et al., 2015; Stiglic and Viner, 2019; Tartari, 2015). Also, physical health symptoms included eye problems, headaches, tiredness, obesity, inadequate sleep quality, musculoskeletal problems (Mustafaoglu et al., 2018; Robinson et al., 2017; Smahel, Wright, Cernikova, 2015). Using a large sample of children from 35 public primary schools, Khaheian et al. (2018) found that time spent on digital media use has the highest impact on child Body Mass Index (BMI) that contributed to child obesity, physical health problem and quality of life. Cyberbullying during childhood, online sexual harassments, increase the risk of aggressive

behavior, violence desensitization is also found as impact of digital media use and become a major risk factor for mental health problems and often carried right through to adulthood (Akram and Kumar, 2017; Rios, 2016; Scott et al., 2016; Tartari, 2015). Mental health problems that occurred in childhood if not well-addressed will also impact later development (Ediati, 2015) and increasing emotional and behavioral problems (Kaloeti, 2016).

Even though several scientists shows a negative impact on using digital media on children, others have argued that digital media affords many opportunities for giving positive outcome such as social, emotional, and intellectual development and that harms are overstated (UNICEF, 2017; Granic et al., 2014). Many potential positive influences found such as developing and maintaining interpersonal relationships, a real-time portal for accessing information and news (Wood, Bukowski and Lis, 2016). Social development includes improve access to diversity, increase inclusion, and reduce social isolation with positive interactions both from their daily social circles and from like-minded individuals from various groups (Dyer, 2018; UNICEF, 2017). It is also generally found that children's well-being and emotional development are stimulated by digital technology from building positive relationships with friends and watching some entertainment (UNICEF, 2017; Siddiqui and Singh, 2016). Digital media bring families together – through television, movies, playing video games and engaging in creative activities together like created music, photos or videos together (Livingstone, Jennifer, and Ólafsson, 2018). Still, children could reduce negative emotion to express their thoughts on social media (Siddiqui and Singh, 2016).

Undiyaundeye (2014) conclude that learning letters of alphabets through computer games could develop literacy skill for children. Moreover, watching fiction and documentary content on media social could give intellectual benefits like developing problem-solving and critical thinking (Undiyaundeye, 2014). In addition, social media has a positive impact to market children skills, enhanced creativity, develop artistic abilities and inner potential seek (Anderson and Subrahmanyam, 2017; Akram and Kumar, 2017; Chollin, 2015). In education process, social media gives an alternative way to the students to effectively reach each other to class ventures or for help on homework assignments and teachers may post social media about class activities, schools events, and homework assignments which will be very useful to them (Siddiqui and Singh, 2016).

Further, a report conducted by Swist et al. (2015) cooperates with the Commissioner for Children and Young People Western Australia recommended 8 domains of positive social media's impact on children and young people as follows; (1) promote positive norm about health and well-being and enhances health initiatives, (2) foster identity formation, community-building, and creativity, (3) support the self-directed learning and aspirations of marginalized young people and informal knowledge networks and social support for young people generally, (4) provide significant opportunity to new leisure, play and recreation spaces for children and young people that enhance creativity and well-being, (5) Positively influence the consumption patterns by facilitating supportive network and attitude to financial literacy, (6) Create new spaces for civic and political engagement by opening up opportunities for diverse forms of participation, self-expression, as well as creatively addressing social issues, (7) Amplifying risk to physical and emotional safety but can also promote proactive approaches to issues of risk and safety that empower them to develop and support their resilience and well-being, (8) support family and intergenerational relationships that utilize different forms of expertise, including knowledge and skills of children, young people, peers, family, and other adult, to promote safety, well-being, and resilience. However, our understanding of the relationship between the use of digital media and the psychological well-being of children remains unclear.

METHODS

Objective

The objective of this study is to identify digital media effect on children's well-being, current research gaps and inform future research on digital media use and psychological well-being of children is imperative. The review was prospectively registered with PROSPERO registry systematic reviews (reference number **CRD42015025908**). We engaged in a systematic literature review using the Standard Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines to review to reporting of the review of the findings (Moher et al., 2009).

Search strategy

In April 2018 a keyword search spanning the period between 2003 and 2018 was executed in major electronic databases (PubMed, ERIC, Scopus, TandFonline, ScienceDirect, and

PsycArticles) to capture published research related to digital media and children wellbeing. In addition, the manual hand-searching to cover the variability in coverage, indexing, and depth information that may not be unlisted in electronic databases (Arksey & O'Malley, 2005). Furthermore, syntaxes were chosen in order to capture articles related to study purpose and were systemized with the conjunction AND and OR by using the Boolean method. This study was using string code combination as follows (children digital media AND (wellbeing OR well-being), (digital technology* OR "digital age" AND child*), AND (well-being OR wellbeing))

Selection criteria

Articles that will be selected are: 1) those written in English; 2) published in peer-reviewed journals; 3) in which empirical findings were reported (using quantitative correlational design - has correlational coefficient (r) and standardized mean differences (SMD) or odds ratio (OR) 95% confidence interval, for experimental design studies, particularly, the comparator can be active or inactive control group); 4) examined children from 0-13 years; 5) no cultural restriction to be used on the finding targeted articles; 6) addressing the influences of digital media on children's wellbeing; 7) published between 2003-2018.

Data extraction and data synthesis

To maintain articles validity, the capturing articles, then, will be reviewed based on title, abstract and full paper before undergoing assessment the risk of bias by using Critical Appraisal Skill Programmed (CASP). Analyzing articles will use the charting technique (Ritchie and Spencer, 1994), the data extraction method that includes analyzing the studies by charting and sorting different key issues and themes. Authors will independently review for deciding the eligible studies. Any disagreement will be resolved through discussion and consensus before eligibility studies collected and reviewed.

RESULTS

Study selection

Titles and abstracts were reviewed and potentially eligible articles identified after removal of duplicates. The search identified 214 articles; the removal of duplicates left 174. Papers' titles, abstracts, and keywords were screened by authors, which resulted in the exclusion of 112 articles which were not clearly pertinent: they did not match the research questions and criteria.

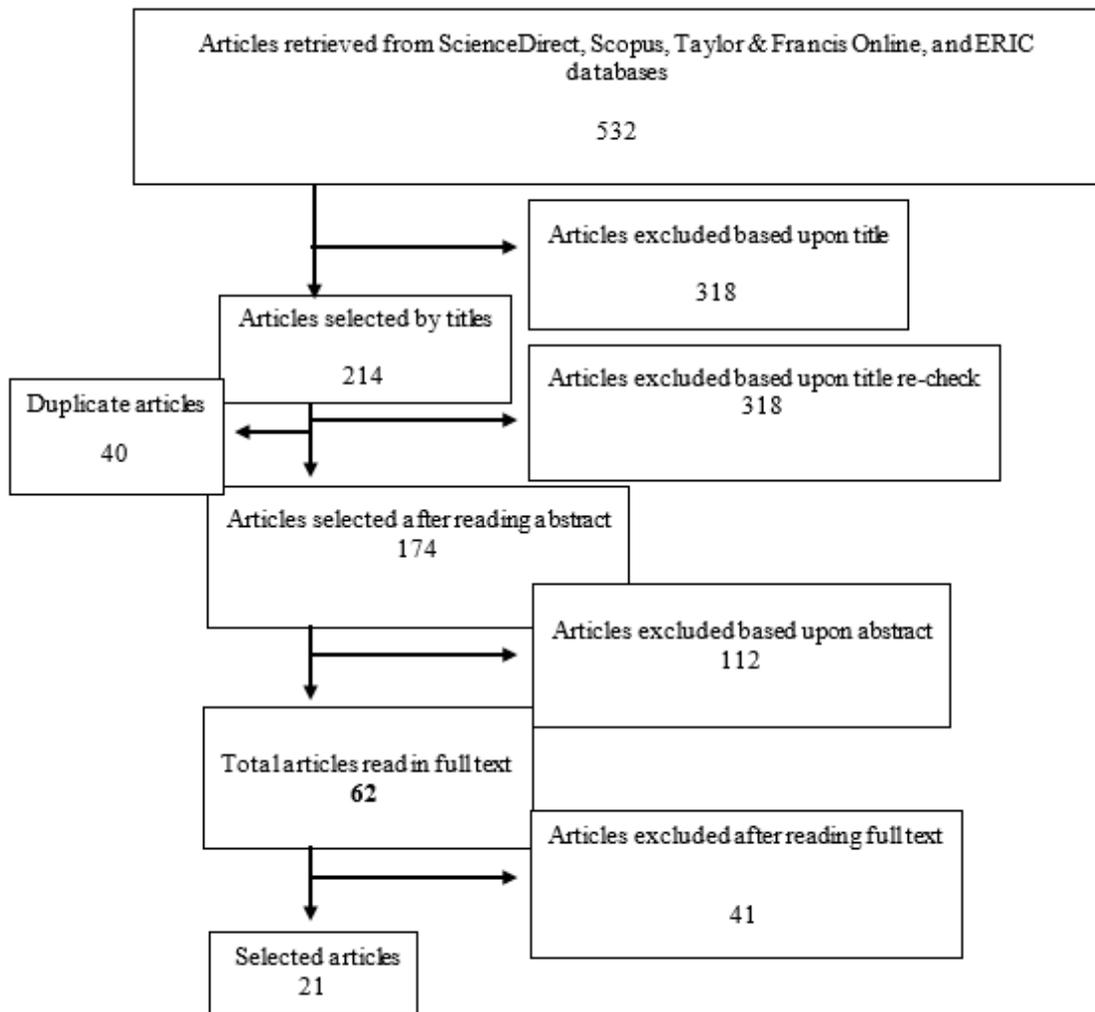


Fig. 1. PRISMA flowchart diagram

After a review of full text to determine final eligibility, 21 papers result for final assessment. A flow chart of the procedure of literature search and selection is shown in figure 1.

Tabel 2. Inclusion and exclusion criteria

Inclusion Criteria	Exclusion Criteria
Published in targeted OPACs or reputable English journal (for hand searching)	Published in grey literature
English wrote	Written in a non-English language
Using quantitative correlational design	Published for the last 15 years (2003 to date)
Has correlation coefficient (r), (SMD) 95% confidence interval	Has focus on digital media technology
	The mean age of the participants was 12 years old or below
	Scrutinize positive effect of digital or social media on children well-being
	Examine uniqueness as a result of social or digital media effect for children well-being

No cultural restriction -

Characteristics of studies reviewed

Twenty-one studies published between 2003 and 2018 were included in this review. Four articles published in 2017, three articles in 2013, 2015, 2016, an article in 2003, 2006, 2011, 2014, and two articles in 2009 and 2012. Most of the selected studies took place in the western country with nine from the USA and one from Brazil and Canada. Two studies conducted in Europe which one in Italy and another one in Austria and the UK. In other hands, four studies from Asia, i.e. one from South Korea, China, Singapore, and Indonesia, and the last from Libya. Mean ages of each study were clearly stated in 10 studies, while 11 provided the unclear information about age (i.e. preschool, elementary school, graders level). One study specifically involved girls, while another study uses both girls and boys with the sample sizes ranged from $n=66$ to $n=1,000,000$ with a mean age of the children 8.34 ± 3.01 years old. Furthermore, the boys indicate more exposure to video games, and girls meanwhile express their interest in internet device focusing on social media. Children in younger age are more exposed to the digital media, whereas the older children performed their ability to select certain devices they like and try to regulate themselves not to use the media in an excessive amount of time, even though kinds of negative emotions and lower level of well-being still exist in a lot of children.

Device use and correlates to well being

Eight studies involved video games, both online and offline. At the natural setting, the video games bring a negative impact to the children, i.e. aggression, lower empathy, anxiety, addiction. Conversely, the video games in which used to be manipulation in experimental setting present positive outcomes, i.e. competitive behavior, innovativeness, anxiety reduction. Four studies examined the impact of television (TV). Effect of TV exposure mainly causes aggressive behavior, while that negative effect does not exist through parental co-viewing and the ability of children to recognize both violent and non-violent content on TV. Three studies explored the role of the internet in inflicting the depressive symptoms and feel lonely. These conditions occur due to the excessive use of the internet, while other evidence found the internet use as a determinant in children's self-esteem and well-being when they are competent in seeking school and life-related information through this media. Two articles discovered the correlates of phones use

on social stress and mental state talk, while the social well-being also indicates the positive correlation. Two studies discussed the unspecified digital media focused on interpersonal interaction (e.g. social media) and its implication to the presence of negative emotions and lower level of well-being. Furthermore, the media in which not provide the non-interpersonal interaction correlates to the positive mental health.

Internal factors

Some internal properties contextually affect the well-being of children on digital media uses. According to all studies involved in this review, there are at least three internal inflicted-factors of children in responding the digital media uses, i.e. self-control and regulation, cognitive and socio-emotional development, and body perception/image (exclusive in girls). Self-control and regulation play a critical role in moderating the media habituation as well as the impact due to the habituation. Children with a lower level of self-control and regulation indicate the inability to control their habit in media use and the habituation results in a number of negative behavior, e.g. media victimization and aggressive behavior. Cognitive and socio-emotional factors comprise several included-factors in which associated with digital media use and its implication. Cognitive factors include working memory and intelligence in which the higher level of these factors indicate the children to absorb, filter, and replicate the content of media in real life. Furthermore, empathy is a key factor in socio-emotional development among the children to build anti-bullying and victimization attitudes as well as prevents aggressive behavior. Moreover, body perception/image exclusively occurs in children in moderating their body satisfaction due to watching online magazine which exposed them to the image of a model in there. This occurrence also conducts the body-shaming among girls in digital media. Children with a greater gap of body image and ideal image of the body according to the online magazine are found with the lower level of well-being.

External factors

Parent and teacher play a critical role in shaping the proper use of digital media for children, therefore the children well-being is possible to arise. Two articles found out the impact of parental involvement on children's well-being in using digital media, while only an article discusses the role of teacher. The form of presence of parents on digital media use among children may arise in co-viewing TV, discussing the con-

tent of media, or using the same media in which their children use. Teacher and parent's awareness is crucial in controlling their children's digital media behavior. An article proved that psychoeducation for teacher and parent may intervene in the children's digital media misbehavior. Moreover, parental or family attachment tends to predict aggressive behavior in which digital media use is a trigger of that behavior. A study revealed that insecure attachment and parental aggressiveness to children bring children into aggressive behavior and digital media provides the idea of the way to children be aggressive.

Peer is also the broad part of external factors which determines the effects of media uses among the children. Peer is so significant for children where a set of psychological attributes of children, e.g. perception, attitudes, and behavior are strongly affected perceived control behavior and subjective norms peers, thus their involvement with delinquent peer tends to generate delinquent behavior. Moreover, the broader aspect of the association between media use and well-being is culture. Culture differentiates the information-seeking behavior and the way of children in responding to digital media. The studies involved in this review provide information that children with a higher educated community show a higher level of esteem and well-being compared with a community of low education level. Moreover, culture also distinguishes the accessibility of children to afford digital media. Children from rural community tend to take for granted all the content of digital media and replicate it in their real life, whereas the parents in an urban context are literate enough in educating their children to be appropriate in digital media use.

DISCUSSION

This systematic review identified 21 articles reported correlates of digital media uses on well-being among the children. The literature revealed that children are naturally literate to use digital media and this phenomenon generates both advantage and disadvantage. Many evidence found kinds of harmful effect through digital media use, while the effects are nevertheless generated by many contextual factors. In contrary, some evidence provided the efficacy of digital media uses to be beneficial for the sake of the child's mental health and well-being. Thereto, we conclude that the perilous of digital media use is an overstatement. A number of factors play a critical role in shaping the negative consequences of digital media uses. The excessive length of spending

the time to run digital media is the first concern. Przybylski and Weinstein (2017) found the time of children spend using digital media has differed impact regarding the variety of digitally-mediated activities. For example, using smartphones had negative impacts when using exceeded 2 hours per day, watching movies on computers had a negative impact when used exceeded 4 hours per day. But, when children do not use all the digital media was associated with lower psychological wellbeing. On the video games, at least 15 hours per week in 24 months or more is impactful to desensitization of violence, which is indicated by lower empathy and high aggression (Funk et al., 2003). The aggression is inflicted in form of verbal, physical, and relational in which the children are able to be anonymous and feel free to be aggressive in digital media (Daly and Perez, 2009; DePaolis and Williford, 2015; McInroy and Mishna, 2017). The same result is also found in everyday uses of digital media. In addition, 3-4 hours per day of internet use results in the high probability of addiction and the presence of aggressive behavior in children's real life (Seo et al., 2011). In other words, the duration of digital media uses should be less than doing real activities.

Furthermore, the content of media is a critical point to be discussed. The adverse effect of digital media in which the children are involved in aggressive behavior is exactly affected by the violent content of media (Rosenkoetter, Rosenkoetter, and Acock, 2009). In general, digital media is divided into the social (e.g. Instagram, facebook, twitter) and non-social (music, video, reading) interaction-based media (Pea et al., 2012). Pea et al. (2012) revealed that the social interaction-based media results in a stronger negative effect on the mental health and well-being among children, conversely, the non-social interaction-based media is not significant. Moreover, the use of digital media which concerns to body image generates negative effects on girls' mental health and well-being (Dohnt and Tiggemann, 2006). Regarding the online games, Przybylski (2014) found playing video games is equal to traditional forms of play, providing opportunities for identity growths as well as cognitive and social parts. But, associated with the benefits, the content of video games and the time spent need consideration. We assume that controlling the content and duration of digital media consumption among children is inevitable to prevent the counterproductive effects of digital media. In order to control digital media behavior, some characteristics of children should be considered. The nature of children tends to have a great curiosity about everything

in which digital media, unfortunately, provides this without the awareness of parents and teacher (Priewasser, Roessler, and Perner, 2013). The children will take for granted of all both positive and negative content of media if they are unable to properly recognize and interpret the content of digital media. This condition is getting worse if some kinds of bad psychological state of existing. Dohnt and Tiggemann (2006) found that the consumption of digital media focusing on body image is significantly affected the girls' perception of their body and it consequents to their body dissatisfaction, anxiety, and psychological distress if they have no their perceived ideal body. Moreover, one of the significant emerged factors in aggressive behavior of children is their vulnerability to violence. Unlike the bad body perception which commonly occurs in girls, the boys are identified to have more arousal to be violent (Daly and Perez, 2009). Both boys and girls are significantly influenced by their peer, and delinquent peer means the high possibility of delinquent behavior (Cole et al., 2016). This condition conducts the differences in cyberbullying between boys and girls. Some literature revealed that self-control and self-regulation are required to make children resist this adverse condition and obtain their well-being (Agina and Tennyson, 2012; Cliff et al., 2017). The very first thing that should be concerned by parents and teacher is children's ability to recognize and interpret the content of media. If the children indicate to have no ability to recognize and interpret the content, parents and teacher should give them a direction to consume the proper contents according to their category of age. In other hands, if the children show their ability to recognize and interpret the content, parents and teacher are obligated to confirm and re-comprehend them about what have they known and understood (Ostrov, Gentile, and Mullins, 2013). Furthermore, Krossbakken, et al., (2018) proposed a parental guide for prevention of problematic video gaming in children, which the intervention encompasses the parental comprehension to video games problem in children, sleep duration, time restriction, substitute the time in gaming to the physical activity, parental comprehension and efficacy in screening the content, time, and activity, and restrictive, active as well as co-playing mediation. The other studies also found that the parental guide is significant to overcome internet addiction and excessive view of television (Warren, 2001; Winkler et al., 2013). Thus, the role of parents and teacher is important to shape the children character to appropriately use digital media. Parents should be aware that

they contribute to the inappropriate use of digital media among their children. The other main problem is an insecure attachment between parent and child as well as the passiveness of parents to control what their children watch and do through digital media as well as illiterate to identify which content is good or not for their children (Merritt et al., 2016). McDade-Montez et al., (2014) examined the parental co-viewing TV affects the positive outcomes for their children, i.e. self-esteem, and emotional quality of life as well as the child's well-being. As in parental co-viewing, the presence of parents in all kinds of digital media is a necessity. Parents may lead the children to recognize both positive and negative content of digital media, and comprehend them as well as build their attitude toward that content (Ho, Chen, and Ng, 2017). Even though the children have already an inappropriate interpretation for the media due to their peer influence, the parent should change their attitude toward media which is wrong (DePaolis and Williford, 2015). Parents also have to take care and do a cognitive reframing to their children in which exposed to the adverse effects of digital media, e.g. psychological distress, anxiety, and depression due to the cyberbullying, body image exposure, and addiction (Schoneveld et al., 2016). Furthermore, collaboration among parents, teachers, and other parents are needed to prevent the negative effects of media use on their children. Some interventions had proven their significance in overcoming the negative effects of media use among children. Digital media literacy to parents and teacher is a critical determinant in mediating the adverse effects of digital media. Parents and another family member should make a proper home technology environment. For 3-5 years children, parents should introduce the technology in educational context and children are forbidden to use their own phones or tablets. Children in elementary school are permitted to use their digital media through their parents' control, i.e. knowing their social media password, time restricting, and disallow the children to use the gadget in the private room Terras and Ramsay, 2016. In addition, for children in 12-18-year-old, parents should make intensive communication with their children, redefining boundaries and strengthening the parent-child relationship. Moreover, 18 years children or more should be comprehended about morality and empathy. Parents could encourage them to take the perspective of their parents. Let them cognitively consider that they are facing a new period of life and the future independently as well as to be a parent too (Daloje and Woods, 2018). Parents and teachers

also ought to boost the children innovativeness through media to change the media misbehavior, e.g. include the media innovativeness into the school curriculum (Ladeira et al., 2016).

In a larger perspective, culture may have a critical role in making a difference among the well-being of children. The cultural difference indicates the difference of cognitive process and moral state which differentiate information-seeking behavior and respond of children toward media (Pinto et al., 2016; Liu et al., 2013). Children from the region with a high educated community show a greater level of well-being and self-esteem than low educated community (McDade-Montez et al., 2015). This condition is conducted by the accessibility of digital media for children. Especially in Indonesia, the great gap between the uptown children and rural children generates a significant difference in digital media literacy (Kristianto, 2017). The context of rural community kindly offered a psychosocial education to the parents, teachers, as well as the children to appropriately use the digital media, before the great wave of media penetrates to the community.

Limitations

While comprises from many diverse sources, the synthesizing method used in this review was the narrative method rather than meta-analysis, thus we cannot control the bias of each study. The variety of the studies involved in this review have different methodological rigor. Moreover, selected articles were English-language paper, published from 2003, which may have limited the findings.

Future Direction

The study provides an efficacy of digital media use to be positively impactful for the child's well-being. Some contextual factors always exist and should be controlled- this is the proper way of digital media use of children. Some interventions have to be conducted in order to alleviate the adverse effect of digital media use. This review generates insight for future study to arrange a comprehensive intervention, not only to the children but also to the parents, teachers, as well as their peers to prevent those negative effects. Furthermore, this review also provides some ideation for parents and teachers to be comprehended in digital media and its effects and may lead the parents and teachers to be more collaboratively control the children's use of media and its behavioral implications in home and school.

Also, to understand the accumulative ef-

fects of digital media uses from a young age, the use of longitudinal and cohort studies is necessary.

CONCLUSION

Digital media use among the children is unable to be avoided due to the globalization in nowadays era. The use of digital media is indeed helpful for children to be connected in the wider world as well as the educational purpose for them to be more creative and imaginative. In the other hand, most of the literature highlights the adverse effect of digital media use of children. Consequently, people may overestimate the involvement of digital media use in their child's development. This review found that the negative effect of digital media use exactly exists, but it arises due to some contextual factors, i.e. the content of media, duration of use, parental control, peer influence, and school-related condition (including teacher competencies). Thus, forbidding children to access digital media is such not a solution, and conversely, improving parents' and teachers' competencies in controlling the child's behavior in media use is more solute. Family functioning and social relation at schools are suggested more important to have robust media effects on children wellbeing (Parkes et al, 2013; Ferguson, 2017). In addition, the proper way of children to use digital media leads them to generate their well-being due to its advantage in many aspects of children daily live, e.g. communication, improving children's innovativeness and creativity in their academic tasks as well as daily tasks. The utilization of digital media as multi-faceted activity needs to be considered in conjunction with another part of children's lives in arrange to decide the impact with their psychological wellbeing.

Declaration of conflicting interests

The authors declare that there is no conflict of interest with respect to the research, authorship, and/or publication of this article.

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