

# Parent's perception of digital device use among their preschool children and its associated factors in Kota Setar, Kedah

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## ABSTRACT

**Introduction:** Digital devices are an integral part of children's lives, and its use is associated with both risks and benefits. The aim of this study was to determine parent's perception of digital device use among their preschool children.

**Materials And Methods:** A cross-sectional study was conducted among parents of 145 children in the year 2020. Participants were selected using multistage randomisation technique from 10 of the 75 registered government kindergartens in Kota Setar District, Kedah. Data were collected using a self-administered questionnaire. Analysis was done using descriptive statistics and the association between parent's demographic characteristics and the overall perception of digital media use by their preschool children was tested using Chi-square test.

**Results:** A total of 150 questionnaires were distributed, and 145 were returned (96.7% response rate) out of which 139 were complete. We found that parent's overall perception of their preschool children using digital devices was mixed, where about one-third of them perceived that digital device use was a risk, one-third perceived it as beneficial while one-third were unsure. The common perception of risk was that digital devices impaired children's physical (71.9-90.6%) and intellectual domains (71.9-86.3%) especially causing damage to eyesight (90.6%), causing addiction (86.3%) and exposed to radiation (81.3%). The perceived benefits of using digital device were mainly in the social domain, promoting technology awareness (64.8%), easily accessible and portable (63.3%) and entertaining (64.0%). They also perceived that digital devices promoted creative and interactive learning (62.6%). Parent's overall perception of digital media use was associated with their employment status ( $p=0.028$ ).

**Conclusion:** Parent's overall perception regarding digital device use among their preschool children was mixed. They perceived that digital devices commonly cause risk to the physical and intellectual aspects of their children while there are some benefits to the social aspects. There is an association between parent's overall perception and employment status.

## KEYWORDS:

Child, digital device, parents, perception, preschool

## INTRODUCTION

Digital devices have a major impact on our day-to-day activities. It has now extended into the children's world mainly in education, social relationship and communication aspects, through devices such as smartphones, laptops and tablets.<sup>1</sup> The impact of using these devices on children has both, benefits as well as potential risks. A systemic review showed that the interconnection between children and digital technology has dual effects with some positive implications in educational aspects and some negative implications such as delayed development in social and language skills.<sup>2</sup>

In the academic perspective, digital devices contribute to a positive attitude towards children's learning by increasing alphabet recognition, boost reading skills and mathematical knowledge. Cognitively, it enhances visual intelligence skills and helps to develop their psychomotor skills. On the hind side, digital devices negatively affect preschool children in physical, psychological and social aspects of development as they tend to become less physically active and are at risk of musculoskeletal problems and obesity. Psychologically, there is a risk of developing addictive disorders, depression, aggression or violent behaviour, which stems from the inability to discriminate fantasy from reality. In the social context, digital device usage showed a high incidence of decreased family time, communication between family members, increased social isolation and impeded the development of their interpersonal skills.<sup>3</sup>

In Malaysia, about 95.9% of preschool children use digital devices, which mostly (95%) belong to their parents and start early in life with a mean age of exposure at 3.9 years (SD1.25).<sup>4</sup> Hence, parents have an important role in mediating digital device use and are responsible for the appropriate use of these devices among their preschool children. However, many of them are unsure regarding the effects of these devices and technology use by their young children and have numerous concerns regarding this issue.<sup>5</sup> Hence the aim of this study is to assess parent's perception of digital device use among their young children for better understanding of their perspectives on this matter.

## MATERIALS AND METHODS

This is a cross-sectional study done in Kota Setar district, Kedah, in February 2020. Data were collected using

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multistage randomisation technique. Epicalculator was used to calculate the sample size for this study using the expected frequency of 50% with an acceptable margin of error 5%. An additional 20% was included for the possibility of incomplete or unreturned questionnaires giving the final sample size of 145. To achieve this sample size, 10 government kindergartens were selected randomly from the 75 which were registered in the district, using the fish bowl technique. After obtaining permission for the study from the principals of each kindergarten, 15 students (all between ages 4 and 6 years) were selected randomly by computer from each school using the student's registry. The selected students were then given an envelope containing the information sheet regarding the study, consent form and the questionnaire to be filled by their parents. They were instructed to return these forms to their respective class teacher within a week. The researcher then collected these forms from the class teachers. Parents who could not understand the national language, Bahasa Melayu or refused to participate, were excluded.

Digital devices were defined as all smartphones, touch screen tablets (e.g., ipad), laptops or desktop computers with an exception to television to avoid duplication of information as TV programs can be viewed through digital devices. A self-administered questionnaire was used to assess parent's perception of digital device use among their children. This questionnaire was developed in the English language from the literature search.<sup>6,7</sup> It was then translated (forwards and backwards) to the local language (Bahasa Melayu) by two linguists. Parent's perception of risk and benefits of their preschool children using digital devices was assessed using 12 statements in four domains (physical, intellectual, emotional and social). Each of these statements was followed by a 5-point Likert scale response option (strongly agree, agree, neutral, disagree, strongly disagree) from which the parents were instructed to select one. Content validation for the questionnaire was done by two family medicine specialists and piloted among 30 parents from another kindergarten for face validity. Selections of options 'agree' and 'strongly agree' were analysed together as an agreement to the statement, and selections of 'disagree' and 'strongly disagree' were analysed together as a disagreement to the statement while the option 'neutral' was analysed separately. The overall perception of parents with regards to digital media use among their preschool child was assessed by a single question 'Do you think that your preschool child's digital device use causes more benefit than harm?' This question was followed by three answer options of 'yes', 'no' or 'unsure'. The internal consistency for perceived risks and benefits questionnaire was 0.974 and 0.713, respectively. Data were analysed using IBM SPSS version 26. Parent's perceived risk and benefits of digital device use by their preschool children was described using descriptive statistics while Chi-square test was used to determine the association between parent's demographic characteristics and the overall perception of digital media use by their preschool children. This study was approved by University Kebangsaan Malaysia (UKM) research ethics committee (FF-2019-381) and Kota Setar district Department of Education.

## RESULTS

A total of 150 questionnaires were sent out to parents of preschool children, and 145 responses were received (96.7% response rate). Out of this, 139 responses were complete and were subjected to analysis. For the perception of risk, most parents perceived that digital device use among their preschool children would cause risk to their physical (71.9-90.6%) and intellectual domains (71.9-86.3%). A large majority of them (90.6%, n=126) perceived that digital device causes damage to eyesight, results in device addiction (86.3%, n=120) and exposes their children to radiation (81.3%, n=113). They also commonly perceive that digital devices affect their child's emotion and social domains, making them impatient and socially isolated (Table I).

As for the benefits of digital device use, more than half of them (n=87, 62.6%) indicated that it promotes creative and interactive learning. They also perceive that digital device was favourable in the social domain promoting technology awareness (n=90, 64.8%), is entertaining (n=89, 64.0%), and is easily accessible and portable (n=88, 63.3%) (Table II).

However, the overall parent's perception regarding digital device use among their preschool children was mixed, where about one-third of them (30.2%, n=42) perceived more benefit, one-third (34.5%, n=48) perceived more harm, while the remaining one-third (35.3%, n=49) were unsure of its effects. Parent's overall perception of digital device use was associated with employment status (p=0.028). Table III shows an association between the overall perception and parent's demographic characteristics.

## DISCUSSION

Digital devices are fast gaining popularity among young children, and it is important to assess parent's perception on its use. Studies have found that exposure to digital technology among preschool children can cause both adverse effects and benefits. The risks of prolonged exposure affect behavioural aspects such as conduct disorders, sleep disorders, attention deficit, higher prevalence of obesity and depression. They also tend to experience physical problems such as headaches, neck, shoulder pain and poor posture.<sup>8,9</sup> On the other hand, some benefits have been observed in the cognitive, psychosocial and social aspects of development. Since parents are the main mediators of device use among young children, assessing their perception sheds light on their views on this matter.

Our study found that the overall perception of parents regarding their preschool children using digital devices was mixed with one-third of them perceived as more benefit, while one-third perceived as more risk and one-third were unsure. Among parents who perceived that digital device use was a risk, they were mainly concerned about the negative impact on the physical (71.9-90.6%) and intellectual (71.9-86.3%) aspects of their children. They were particularly concerned about possible eye damage, addiction and radiation effects related to digital device use. However, only a small percentage of parents perceived risk of using digital devices to the social and emotional aspects of their children. Parents in Singapore and Italy also had similar concerns

**Table I: Parent's perceived risk of digital device use among preschool children**

| Perception of risks in domains           | Agree<br>n (%) | Neutral<br>n (%) | Disagree<br>n (%) |
|--|----------------|------------------|-------------------|
| Physical                                 |                |                  |                   |
| Damages eyesight                         | 126 (90.6)     | 12 (8.6)         | 1 (0.8)           |
| Exposed to radiation                     | 113 (81.3)     | 21(15.1)         | 5 (3.6)           |
| Inactive lifestyle                       | 100 (71.9)     | 25 (18.0)        | 14 (10.1)         |
| Intellectual                             |                |                  |                   |
| Causes device addiction                  | 120 (86.3)     | 15 (10.8)        | 4 (2.9)           |
| Has undesirable contents                 | 103 (74.0)     | 25 (18.0)        | 11 (8.0)          |
| Causes over-dependence                   | 100 (71.9)     | 31 (22.3)        | 8 (5.8)           |
| Emotional                                |                |                  |                   |
| Causes poor social-emotional development | 81 (58.3)      | 38(27.3)         | 20 (14.4)         |
| Causes impatience                        | 85 (61.2)      | 31 (22.3)        | 23 (16.5)         |
| Encourages tantrums                      | 79 (56.8)      | 37 (26.7)        | 23(16.5)          |
| Social                                   |                |                  |                   |
| Causes social isolation                  | 85 (61.2)      | 26 (18.7)        | 28 (20.1)         |
| Causes poor social skills                | 78 (56.1)      | 31 (22.3)        | 30 (21.6)         |
| Causes poor communication skills         | 74 (53.3)      | 32 (23.0)        | 33 (23.7)         |

**Table II: Parent's perceived benefits of digital device use among preschool children**

| Perception of benefits                                   | Agree<br>n (%) | Neutral<br>n (%) | Disagree<br>n (%) |
|--|----------------|------------------|-------------------|
| Physical   |                |                  |                   |
| Improves movements and coordination of hands and fingers | 59 (42.5)      | 54 (38.8)        | 26 (18.7)         |
| Improves sensation of vision, hearing and touch          | 43 (30.9)      | 64 (46.0)        | 32 (23.1)         |
| Improves reflexes  | 49 (35.3)      | 62 (44.6)        | 28 (20.1)         |
| Intellectual   |                |                  |                   |
| Improves academic achievement                            | 55 (39.6)      | 75 (53.9)        | 9 (6.5)           |
| Promotes creative and interactive learning               | 87 (62.6)      | 46 (33.1)        | 6 (4.3)           |
| Enhances learning process                                | 81 (58.3)      | 54 (38.8)        | 4 (2.9)           |
| Emotional  |                |                  |                   |
| Appreciates music  | 70 (50.4)      | 58 (41.7)        | 11 (7.9)          |
| Encourages independence                                  | 43 (30.9)      | 61 (43.9)        | 35 (25.2)         |
| Reduces tantrums   | 28 (20.1)      | 72 (51.8)        | 39 (28.1)         |
| Social   |                |                  |                   |
| Promotes technology awareness                            | 90 (64.8)      | 43 (30.9)        | 6 (4.3)           |
| Easily accessible and portable                           | 88 (63.3)      | 46 (33.1)        | 5 (3.6)           |
| Entertaining   | 89 (64.0)      | 41 (29.5)        | 9 (6.5)           |

**Table III: Association between overall perception of digital device use and parent's demographic characteristics**

|  |                      | Benefit n (%)     | Harm n (%)          | Unsure n (%)       |  |
|--|----------------------|-------------------|---------------------|--------------------|--|
| Overall perception of digital device use |                      | 42 (30.2)         | 48 (34.5)           | 49 (35.3)          |  |
| <b>Parent's characteristics</b>          | <b>Benefit n (%)</b> | <b>Harm n (%)</b> | <b>Unsure n (%)</b> | <b>p-value</b>     |  |
| Ethnicity                                |                      |                   |                     |                    |  |
| Malay                                    | 35 (30.2)            | 43 (37.1)         | 38 (32.7)           | 0.280 <sup>a</sup> |  |
| Others                                   | 7 (30.4)             | 5 (21.8)          | 11 (47.8)           |                    |  |
| Relationship                             |                      |                   |                     |                    |  |
| Father                                   | 17 (39.5)            | 14 (32.6)         | 12 (27.9)           | 0.502 <sup>b</sup> |  |
| Mother                                   | 24 (26.1)            | 32 (34.8)         | 36 (39.1)           |                    |  |
| Others                                   | 1 (25.0)             | 2 (50.0)          | 1 (25.0)            |                    |  |
| Occupation status                        |                      |                   |                     |                    |  |
| Employed                                 | 27 (31.8)            | 35 (41.2)         | 23 (27.0)           | 0.028 <sup>a</sup> |  |
| Unemployed                               | 15 (27.8)            | 13 (24.1)         | 26 (48.1)           |                    |  |
| Total income                             |                      |                   |                     |                    |  |
| < RM 2500 (Low)                          | 18 (32.7)            | 19 (34.6)         | 18 (32.7)           | 0.190 <sup>a</sup> |  |
| RM 2500-5000 (Middle)                    | 16 (28.6)            | 15 (26.8)         | 25 (44.6)           |                    |  |
| > RM 5000 (High)                         | 8 (28.6)             | 14 (50.0)         | 6 (21.4)            |                    |  |
| Education level of parent                |                      |                   |                     |                    |  |
| School                                   | 16 (32.0)            | 14 (28.0)         | 20 (40.0)           | 0.424 <sup>a</sup> |  |
| Tertiary education                       | 26 (29.5)            | 34 (38.7)         | 29 (31.8)           |                    |  |

<sup>a</sup>Pearson's chi-square test. <sup>b</sup>Fisher's exact test.

where they were mainly concerned regarding the risk of digital device towards their children's physical and intellectual development especially visual deterioration, eye irritation, addiction, sleep disorders and their overall health.<sup>7,10</sup> This suggests that parents were either more concern about physical and academic aspects rather than social and emotional aspects of their child or they were unaware that digital device use could affect the emotional and social development of young children. This finding is in contrast to parents in the United States of America (USA) where only a small percentage (11%) of them believed that the use of digital device can cause long-term physical, emotional and intellectual damage.<sup>6</sup> Parents in different parts of the world have different perception towards the impact of digital devices on their children, probably due to differences in the socio-cultural aspects of each country.

Parents in our study perceived that digital device use by their preschool children was beneficial, especially in the social (63.3-64.8 %) and intellectual domains (39.6-62.6%). They perceived that digital device promoted technology awareness, was entertaining, easily accessible, portable and promoted creative and interactive learning. An earlier study showed positive psychosocial and cognitive outcomes when digital media was used for less than 30 minutes a day among children between ages 3–5 years.<sup>11</sup> Playing games is important for children's learning process, and the use of smartphones and other digital devices provides an excellent gaming environment for the digitally minded child. Technology-assisted play is different from the traditional play where it can stimulate imagination and guide children to follow certain rules. Children who are familiar with the technology are able to make changes to the game which influences the outcome of their play and eventually creates a link to real life.<sup>1</sup> Parents in Singapore also perceived the benefits of digital device on their children's intellectual development especially in improving academic performance, promoting creativity and interactive learning.<sup>7</sup> This may be because there are a large number of applications (apps) for touchscreen devices which are marketed as 'educational' products to promote sales. However, more than half of these apps are of low-quality design hence, parents need to be aware of this and match it with their children's learning needs and goals.<sup>12</sup>

Although parents were mostly able to identify their specific perceptions of risk and benefits of their child using digital device, their overall perception of risks and benefits was mixed. This is not surprising as recent information also suggests there are both advantages and disadvantages of using digital device among young children. According to American Academy of Paediatrics (AAP), there are evidence-based benefits, such as promoting early learning, increased social contact, exposure to information and enhancing knowledge. On the other hand, there are risks such as impact on sleep, attention, learning, obesity, depression and exposure to unsafe content.<sup>13</sup> The American Academy of Child and Adolescent Psychiatry (AACAP) announced new guidelines which now state that parents need to be involve, know the content of appropriate games and apps as not all of these apps promote learning and encourage them to monitor their children's time in the virtual world.<sup>14</sup>

Our study found an association between parent's overall perception of preschool children using digital devices with employment status ( $p=0.028$ ). We postulate the possibility that parents who are employed are more familiar with digital device use and hence are aware of the pro and cons of young children using these devices. However, an earlier study showed that parent's own skills using digital devices and technology did not influence their perception regarding concerns in mediating their preschool children in using these devices, suggesting that perception is affected by interplay between multiple factors.<sup>15</sup> An earlier study in USA found that parents with higher education were against their children spending excessive time on digital devices as they perceived that there are other better methods for child play.<sup>6</sup> In contrast, our study did not show any association between parent's education level with their overall perception ( $p=0.424$ ). Education may not be the only factor influencing perception as multiple internal (e.g., personality, expectation, experiences, attitude, emotion, behaviour, motivation, culture) and external factors (e.g., changes in the intensity or magnitude of stimuli and repeated exposure) influence people's perception. Malaysian parent's personality, culture and experiences may differ from those of American parents, attributing to the difference in perception towards young children's digital device use, irrespective of parent's education level.

Digital devices are here to stay and will remain an integral part of everyone's daily lives, including young children. It will be a major challenge to prevent children from using these devices as more and more of their peers join the digital race. Parents have the responsibility to show good role modelling and guide these young children towards a healthy experience with digital devices. Physicians also can contribute by assisting and motivating parents in providing evidence-based recommendations such as co-viewing, monitoring content and limiting exposure time, which are all beneficial actions in mediating digital device use among children.<sup>16</sup>

One of the limitations of this study is that data were collected from kindergartens in one state; hence, the results may not be applicable to the entire population. We could not exclude, recall and socially desirable bias which may have caused under or over-reporting of information. Another difficulty which the researchers faced was that the age for preschool children in Malaysia is between 4 and 6 years while in other countries, the age group for preschool had a wide variation; hence, comparing our findings with other studies was challenging.

## CONCLUSION

Parent's overall perception regarding the risks and benefits of digital device use among their preschool children was mixed where one-third of them perceived it as beneficial, one-third perceived it as harmful and another one-third were unsure. Most parents' perception of risks for using digital device was regarding the effect on physical and intellectual aspects of their children such as damage to eyesight, device addiction and radiation exposure. However, they also perceived some benefits of digital device use on the social and intellectual



aspects of their child. They perceive that digital devices raised technology awareness, are easily accessible, portable, entertaining and promoted creative and interactive learning. Parent's overall perception of digital media use was associated with their employment status. Their mixed perception and main concerns regarding the use of digital device by their preschool children highlights the importance of parental mediation in terms of control and supervision related its use.

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