# PSYCHOMETRIC PROPERTIES TESTING OF PARENT MEDIA ADDICTION AND PARENT MEDIA DEPENDENCY TOOLS IN BAHASA MALAYSIA

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**Abstract.** The rapid integration of screen-based media into daily life has altered parent-child interactions, raising concerns about its impact on early childhood development. To measure parent media addiction and dependency, two English-language instruments, namely the 'Parent Problematic Digital Technology Use Scale' and the 'Media and Technology Usage and Attitudes Scale' were translated to Bahasa Malaysia and cross-culturally adapted in this study. A cross-sectional study was conducted in a district of Selangor, Malaysia, among parents and caretakers with normal children 18 and 36 months of age to test the Bahasa Malaysia version of instruments' content validity, internal consistency, and floor ceiling effect involving 100 participants and test-retest reliability involving 60 participants. The Cronbach's Alpha value of 0.734 was reported for 'Parent Problematic Digital Technology Use Scale' and 0.839 for the Media and Technology Usage and Attitudes Scale. The items in the scales correlate adequately in the construct and lack of discriminant validity was reported to be unlikely. Thus, the Bahasa Malaysia scales provide an effective method for measuring parent media addiction and dependency, crucial factors in understanding the impact of smartphone and online use on parent-child interaction. This validated instrument should enable further exploration into the role of digital technology on parent behavior and its influence on early child development, and may guide programs and policies fostering healthier media habits in Malaysian families.

**Keywords:** Bahasa Malaysia, early childhood development, parent media addiction, parent media dependency

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## INTRODUCTION

The rapid growth of screen-based media use has given rise to the phenomenon of technology interference or 'technoference,' the use of technology by parents, which disrupts parent-child interactions (McDaniel and Radesky, 2018a), and is increasingly recognized as an important area of research. Early childhood is particularly vulnerable to technoference, as children in their first few years of life rely heavily on social interactions to learn and imitate behaviors from adults (Reed *et al*, 2017). Parent technology use during interactions with children is linked to heightened parenting stress and behavioral difficulties, highlighting concerns about its potential to disrupt children's normal emotional development (McDaniel and Radesky, 2018b).

Screen-based media have transformed human interactions, drawing away from the traditional face-to-face interaction to communication mediated through various screen-based platforms (Firth *et al*, 2024). Besides communication, screen-based media also serve as a source of entertainment and education, but also of distraction, particularly in families with young children (Wu *et al*, 2014; Council on Communications and Media, 2016). It is reported around two-third of young children spend two to four hours engaging themselves in screen-based media, with odds of excessive screen use greater among children whose parents were uncertain about restriction practices, did not impose screen time limits, used screens during meal times, or did not believe screen exposure affected language development (Bhutani *et al*, 2025).

Several studies have shown an association between increased parent media use and prolonged screen-time viewing among children (Barr-Anderson *et al*, 2011; Jago *et al*, 2012; Myruski *et al*, 2018; Tang *et al*, 2018; Goncalves *et al*, 2019; Xie *et al*, 2023). A mother screen-time viewing during meals is positively associated with increased children's screen-time viewing, while limit-setting and monitoring by mothers significantly reduced children's screen-time access (Tang *et al*, 2018).

Over the past decade, Malaysia has seen near-universal (99.5%) mobile phone ownership, longer daily use, a shift from feature phones to smartphones, and increased spending on mobile devices and broadband access (Bernama 2016, Bernama 2017, Bernama 2025, Malaysian Communications and Multimedia Commission, 2017). This increase in usage is also accompanied by a moderate level of smartphone addiction among Malaysian parents with children 6-12 years of age (Acar and Maisarah, 2025). In addition, studies conducted in the country report that more than three-quarters of children below five years of age do not adhere to screen-time guidelines or recommendations (Arumugam *et al*, 2021; Musa *et al*, 2022; Raj *et al*, 2022).

Apart from the impact of excessive screen-time on children's poor developmental outcomes (Madigan *et al*, 2020; Sundqvist *et al*, 2024), screen-based media usage among parents is also a vital area needed to be explored as the practice greatly impacts temperament, attachment, cognitive development, and language acquisition of their young children (Yang and Kim, 2024; Pyne *et al*, 2025). Although not many studies in the country have explored this area of concern, recently Acar and Maisarah (2025) reported that parent smartphone addiction is positively correlated with child behavioral problems.

Promoting healthy media use behavior of parents and encouraging them to provide a responsive and emotionally supportive care for their young children remain a

challenge and cannot be addressed through a one-size-fits-all approach (Arumugam *et al*, 2021). Thus, an evaluation of instruments for measuring parent media behavior is crucial to assess problems such as parents' digital media addiction and dependency. This study evaluated the psychometric properties of two instruments, namely, the 'Parent Problematic Digital Technology Use Scale' (McDaniel and Radesky, 2018b) and the 'Media and Technology Usage and Attitudes Scale' (Rosen *et al*, 2013). Both the authors have granted permission for the translation and cross-cultural adaptation of the instruments.

The significance of this study lies in addressing an important gap of assessing how parents' digital media habits affect early childhood development in Malaysia. By translating the scales, we provide reliable, culturally adapted tools to measure parental media addiction and dependency. With strong psychometric properties, the instruments enable researchers, clinicians, and policymakers to better understand the influence of screen use on parent-child interactions. Its application can guide evidence-based interventions and policies that promote healthier digital habits and support nurturing and enabling homes for Malaysian families in an increasingly digital world.

## MATERIALS AND METHODS

### Study design and site

The study employed a cross-sectional design to test the psychometric properties of instruments translated from English to Bahasa Malaysia. The study was conducted in Gombak, a district located in the state of Selangor, Malaysia, the most populous state in Peninsular Malaysia, with internet and mobile phone users of 99.3 and 98.5% respectively in 2022, reflecting its position as the state with one of the highest levels of connectivity in the country (DOSM, 2025).

### Participants

Participants were recruited from

parents or caretakers of children attending government health clinics for scheduled vaccination or routine development assessment. A simple random sampling technique was utilized, and data were collected via a questionnaire given by members of the research team. Inclusion criteria were: (i) Malaysian nationality of above 18 years of age, and (ii) parent or caretaker with children 15-21 or 33-42 months of age, and who spent at least 15 hours a week with the child being assessed. Exclusion criteria of parent or caretaker were: (i) those with children with congenital abnormalities, or (ii) those with sensorineural disability or undergoing any form of psychiatric treatment at the time of data collection. Population involved, methods used for assessment of reliability and validity, minimum sample size required and sample size recruited in each stage of psychometric properties testing is presented in Table 1.

**Study instruments**

Parent Problematic Digital Technology Use: The Parent Problematic Digital Technology Use of McDaniel and Radesky (2018b) was adapted. It contained a three-item scale assessing difficulty in resisting smartphone use, preoccupation with calls or messages and perceived overuse adapted from prior work on problematic mobile phone use (Derks and Bakker, 2014). Items were rated on an agreement scale and then averaged, with higher scores indicating greater media addiction.

Media and Technology Usage and Attitudes Scale: The Media and Technology Usage and Attitudes Scale of Rosen *et al* (2013) was adapted. It comprised 15 subscales, in which the three-item media dependence subscale was used to measure parent media dependency, *ie*, anxiety when without a smartphone or internet access. Items, scored by frequency, were summed and averaged, with higher scores indicating greater media dependence.

Table 1

Sample size and assessment method for psychometric testing of scales

| Instruments | Assessment method | Required minimum participant size | Recruited participant size |
|---|---|---|---|
| Parent Problematic Digital Technology Use Scale and Media and Technology Usage and Attitudes Scale | Internal consistency, Floor and ceiling effect | 100[a] | 100 |
| | Test-retest reliability (within 1 to 2 weeks) | 30[b] | 60 |

[a]Yurdugül (2008); [b]Bujang and Baharum (2017)

**Content review**

Expert opinions provided by two public health medical specialists based on their review of previous research studies were taken into consideration in selecting relevant instruments. This included three items from the Parent Problematic Digital Technology Use short version (McDaniel and Radesky, 2018b) to measure parent media addiction and one subscale consisting of three items from the Media and Technology Usage and Attitude Scale (Rosen *et al*, 2013) to measure parent media dependency.

The items selected were those most relevant to the study objectives and effectively captured the scope of interest. The selective adaptation was aimed at minimizing respondents' burden while maintaining conceptual clarity. Fig 1 shows the steps involved to ensure the tools translated from English to Bahasa Malaysia gave consistent and dependable results.

**Content validity**

The content validity was

performed by a panel of four experts consisting of a pediatrician, a clinical psychologist and two public health medical specialists. Measurement aims and the target population were taken into consideration. The instruments were checked for relevance, clarity, and suitability in the Malaysian context, with amendments suggested according to the sociocultural norms of the local setting. For a panel of three to five experts, the content validity index (CVI) acceptable cut-off score is 1.0 (Polit *et al*, 2007).

**Translation**

The study instruments were translated from English into Bahasa Malaysia, with forward translation by the principal investigator and two native-speaking public health medicine specialists, and independent back-translation by a blinded linguist (Fig 1). Discrepancies were resolved, culturally inappropriate terms were avoided, and revisions were iterated until a satisfactory equivalence was achieved. The translated Bahasa Malaysia items are presented in Table 2.

**Pilot test**

Following acceptance of the final version of the Bahasa Malaysia questionnaire, a pilot test was conducted with ten parents to assess feasibility, comprehension, and completion time. The Bahasa Malaysia questionnaire was found to be relevant, easily understood by the parents with at least primary level education and free of socio-cultural concerns (Perneger *et al*, 2015)

**Quality assessment of the study instrument**

Quality criteria for assessment of the questionnaire previously proposed by Terwee *et al* (2007) were used to test the reliability and validity of the instrument. Nunnally and Bernstein (1994) proposed a criterion of 0.70 to 0.90 as a measure of good internal consistency. Value of 0.96 and above is a sign of redundancy (Terwee *et al*, 2007). A corrected item-total correlation (CITC)

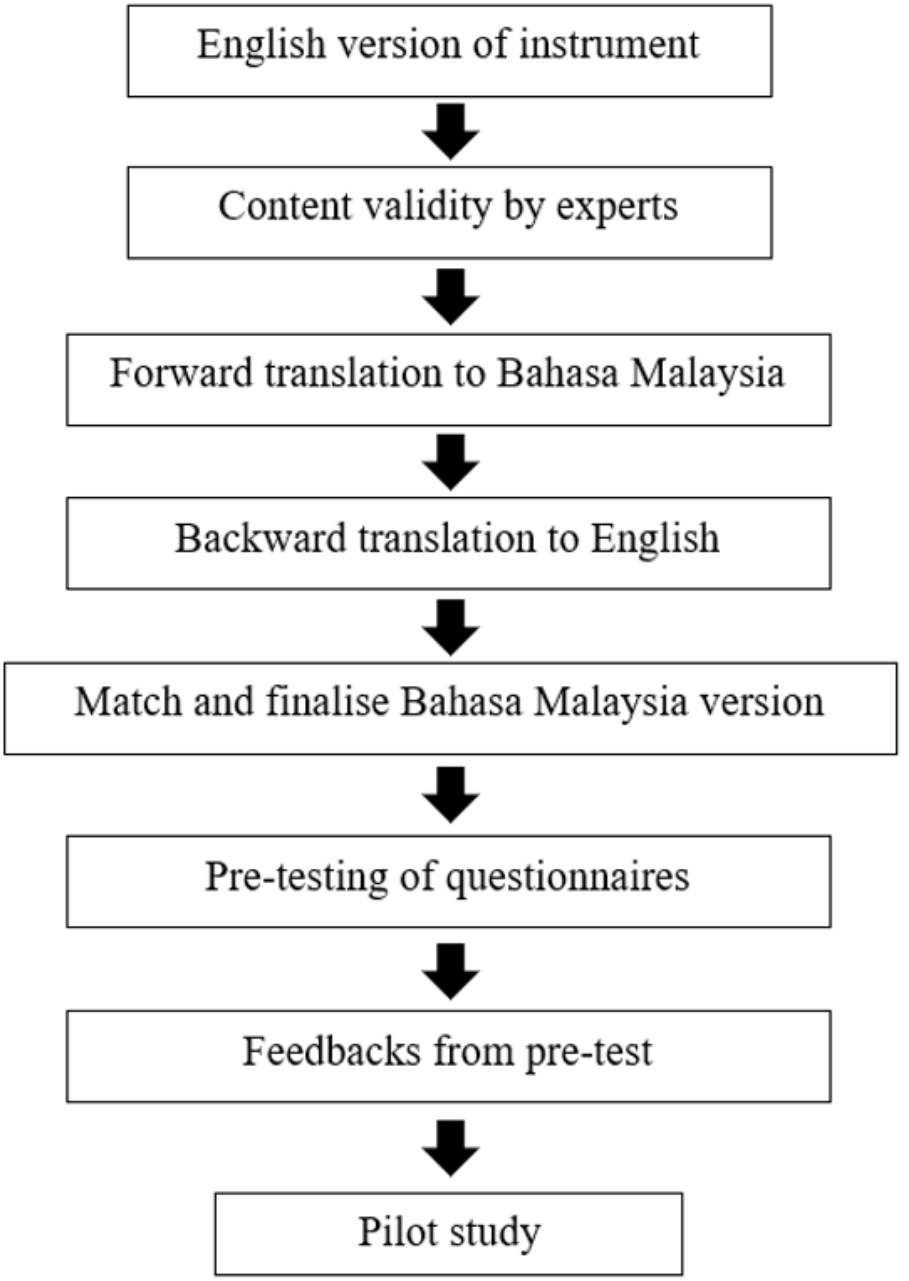


Fig 1 - Flow chart of study implementation

Table 2

Items of the Parent Problematic Digital Technology Use Scale and the Media and Technology Usage and Attitudes Scale in Bahasa Malaysia

| Item no. | English version | Bahasa Malaysia version |
|---|---|---|
| | Parent Problematic Digital Technology Use Scale | |
| 1. | When my mobile phone alerts me to indicate new messages, I cannot resist checking them. | *Apabila telefon bimbit saya memberi notifikasi pesan baru, saya tidak mampu bertahan tanpa memeriksa pesan baru tersebut.* |
| 2. | I often think about calls or messages I might receive on my mobile phone. | *Saya kerap memikirkan tentang paggilan atau pesanan yang mungkin saya terima melalui telefon bimbit saya.* |
| 3. | I feel like I use my mobile phone too much. | *Saya merasakan penggunaan telefon bimbit saya adalah sangat berlebihan.* |
| | Media and Technology Usage and Attitudes Scale | |
| 1. | I get anxious when I don't have my cell phone. | *Saya berasa gelisah jika tidak mempunyai telefon bimbit di sisi.* |
| 2. | I get anxious when I don't have the Internet available to me. | *Saya berasa gelisah jika tidak mempunyai akses internet.* |
| 3. | I am dependent on my technology. | *Saya bergantung kepada alat teknologi media saya.* |

value greater than 0.30 indicates acceptable internal consistency and that the item contributes adequately to the overall construct (Hair *et al*, 2009). For test-retest reliability, which assesses the stability of an instrument over time, Intra Class Coefficient (ICC) Value of 0.70-0.89 is accepted as good reliability and more than 0.90

as excellent (Terwee *et al*, 2007). Floor and ceiling effects were determined, defined as the lowest or highest possible score achieved by ≥15% of the respondents. The test-retest reliability was carried out within 1-2 weeks between the first and second occasions when the participants were presented with the questionnaire.

**Ethical considerations**

The study protocols were approved by the Medical Research and Ethics Committee, the National Institute of Health, Malaysia (approval no. NMRR-18-3444-44236). Prior written informed consent was obtained from each participant, with assurance of confidentiality of the information collected. The questionnaires were anonymized and stored in password-protected files accessible only to the research team.

## RESULTS

**Sociodemographic characteristics of study participants**

Table 3 shows the sociodemographic characteristics of study sample used for testing of internal consistency and floor and ceiling effect. Mean age (± standard deviation (SD) of study sample is 28.04 (±10.14) months. Gender distribution is almost equal. Around two-third of respondents are Malays (61%), followed by Chinese (19%), and Indians (14%). Only a small portion of parents are made up of those without formal schooling or with primary education. Children from low-income group based on Malaysian Household Income Survey classification is made up of 13% respondent. In terms of biological factors, children with prematurity and low birth weight were recorded by less than 10% and lesser children.

**Content validity**

The item-content validity index (I-CVI) for each instrument received an excellent level of 1.0, indicating that all items were rated as acceptable by the four experts on the review panel.

Table 3

Sociodemographic characteristics of subjects (N = 100)

| Variables | Frequency* *n* (%) |
|---|---|
| Gender | |
| Male | 51 (51) |
| Female | 49 (49) |
| Age, mean (±SD) | 28.04 (±10.14) |
| Ethnicity | |
| Malay | 61 (61) |
| Chinese | 19 (19) |
| Indian | 14 (14) |
| Others | 6 (6) |
| Mother's education | |
| No formal schooling | 1 (1) |
| Primary school | 1 (1) |
| Secondary school | 62 (62) |
| Diploma and above | 36 (36) |
| Father's education | |
| No formal schooling | 2 (2) |
| Primary school | 0 (0) |
| Secondary school | 73 (73) |
| Diploma and above | 25 (25) |

Table 3 (cont)

| Variables | Frequency* *n* (%) |
|---|---|
| Monthly household income | |
| <MYR1,000 | 1 (1) |
| MYR1,001-3,000 | 12 (12) |
| MYR3,001-6,000 | 58 (58) |
| MYR6,001-9,000 | 23 (23) |
| >MYR9,000 | 6 (6) |
| Premature birth | |
| Yes (born before the 37th week of pregnancy) | 7 (6) |
| No | 93 (94) |
| Child's birth weight | |
| Low (<2,500 gram) | 10 (10) |
| Normal (≥2,500 gram) | 90 (90) |

*Unless otherwise stated

MYR: Malaysian Ringgit (1 MYR = 0.24 United States Dollar, USD); SD: standard deviation

**Internal consistency of the Bahasa Malaysia versions**

The inter-item correlation and corrected item-total correlation of the Bahasa Malaysia Parent Problematic Digital Technology Use Scale was 0.39-0.66 and ≥0.43, respectively (Cronbach's Alpha, $\alpha$ = 0.73). Whereas, the inter-item correlation and corrected item-total correlation of the Bahasa Malaysia Media and Technology Usage and Attitudes Scale was 0.50-0.63 and ≥0.60, respectively (Cronbach's Alpha, $\alpha$ = 0.84). Findings are presented in Table 4. The results

suggest sufficient relationship between the items in each scale. Cronbach's Alpha value of >0.7 indicate the internal consistency was good. The minimum CITC which was more than 0.3 showed item contributed well to the overall scale.

Table 4

Inter-item correlation between the items in Bahasa Malaysia version of the Parent Problematic Digital Technology Use Scale and the Media and Technology Usage and Attitudes Scale

| Instruments | Item 1 of the instrument | Item 2 of the instrument | Item 3 of the instrument | CITC |
|---|---|---|---|---|
| Parent Problematic Digital Technology Use Scale (Parent Media Addiction) | | | | |
| Item 1 | 1.000 | 0.656 | 0.387 | 0.621 |
| Item 2 | 0.656 | 1.000 | 0.396 | 0.640 |
| Item 3 | 0.387 | 0.396 | 1.000 | 0.430 |
| Media and Technology Usage and Attitudes Scale (Parent Media Dependency) | | | | |
| Item 1 | 1.000 | 0.772 | 0.501 | 0.715 |
| Item 2 | 0.772 | 1.000 | 0.632 | 0.817 |
| Item 3 | 0.501 | 0.632 | 1.000 | 0.600 |

Note: Inter-item correlation matrix shows the correlations between each pair of items (Item 1 to Item 2, Item 1 to Item 3, *etc*), to check if items are too highly correlated (redundant) or too low (unrelated). Hence, the item number appears vertically and horizontally. Whereas, CITC value is the correlation of one item with the sum of the remaining items to check how well each item fits within the construct.

CITC: corrected item-total correlation

**Test and retest reliability**

Test-retest reliability using Intraclass Correlation Coefficient, ICC (two-way mixed model of absolute agreement) showed ICC of 0.96 for the Bahasa Malaysia Parent Problematic Digital Technology Use Scale and 0.98 for Bahasa Malaysia Media and Technology Usage and Attitudes Scale, indicating excellent level of test-retest reliability. Findings are shown in Table 5.

**Floor or ceiling effect**

The lowest and highest possible score ranged 1% - 8% for the scales, (Table 6), hence floor or ceiling effect was positively rated as the values are below 15%.

## DISCUSSION

The objective of the study was to test the psychometric properties of the Bahasa Malaysia Parent Media Behavior Scale, which was adapted from the Parent Problematic Digital Technology Use Scale (McDaniel and Radesky, 2018b) to measure parent media addiction and the Media and Technology Usage and Attitudes Scale (Rosen *et al*, 2013) to measure parent media dependency.

This study followed a rigorous process aligned with previous guidelines and recommendations (Sullivan, 2011; Sharmini, 2016; Tsang *et al*, 2017). Back-translation and cross-cultural adaptation methods were employed to ensure the accuracy and quality of the final Bahasa Malaysia version. All original (English) items were retained with minimal changes, with phrases and words chosen carefully to best reflect Malaysian sociocultural norms. For example, terms such as "resist" and "think about," which describe media addiction, and the terms "anxious" and "dependent" portraying media dependency, were translated to accurately align with typical practices in Malaysia. Such modifications were consistent with findings from previous validation studies, where cultural adaptation is necessary to maintain conceptual equivalence without altering the test items (Sharmini, 2016; Tsang *et al*, 2017).

Table 5

Test-retest reliability by item and scale

| Variable | ICC | 95% CI | Level of reliability |
|---|---|---|---|
| By item | | | |
| Parent media addiction (Q1) | 0.916 | 0.864 - 0.949 | Excellent |
| Parent media addiction (Q2) | 0.955 | 0.926 - 0.973 | Excellent |
| Parent media addiction (Q3) | 0.957 | 0.930 - 0.974 | Excellent |
| Parent media dependency (Q1) | 0.910 | 0.854 - 0.945 | Excellent |
| Parent media dependency (Q2) | 0.986 | 0.977 - 0.992 | Excellent |
| Parent media dependency (Q3) | 0.965 | 0.942 - 0.979 | Excellent |
| By scale | | | |
| Parent Media Addiction Scale | 0.961 | 0.936 - 0.977 | Excellent |
| Parent Media Dependency Scale | 0.976 | 0.960 - 0.986 | Excellent |

Note: Intraclass coefficient (ICC) value of more than 0.90 is considered excellent (Terwee *et al*, 2007)

CI: confidence interval

Table 6

Floor or Ceiling Effect of the Scales

| Scale | Lowest possible score achieved (%) | Highest possible score achieved (%) | Presence of floor or ceiling effect |
|---|---|---|---|
| Parent Media Addiction Scale | 7.0 | 1.0 | None |
| Parent Media Dependency Scale | 8.0 | 1.0 | None |

In the current study, internal consistency with Cronbach's alpha of 0.73 for Bahasa Malaysia Parent Problematic Digital Technology Use Scale was good, similar to that reported for the original instrument, with Cronbach's alpha of 0.74 and 0.78 for mother and father respectively (McDaniel and Radesky, 2018b). Test-retest (ICC of 0.96) of showed excellent reliability (Nunnally and Bernstein, 1994); however, the test-retest reliability was not reported for the original instrument.

For the Media and Technology Usage and Attitudes Scale in Bahasa Malaysia, internal consistency with Cronbach's Alpha value is 0.84 (>0.7); indicating it to be good (Hair *et al*, 2009). Finding in this study is comparable to the original instrument which has reported items in its subscales with Cronbach's alpha ranging between 0.80 to 0.87 (Rosen *et al*, 2013). Test-retest reliability with ICC value of 0.98 indicates good reliability (Nunnally and Bernstein, 1994).

Efforts to measure screen-based media usage have been ongoing ever since the technology became part of our daily lives. From measurement of media addiction (van den Eijnden *et al*, 2016) to assessment of media dependency and technology usage (Rosen *et al*, 2013), instruments to quantify addiction of internet and digital media use have been gaining popularity and have been adapted to conform with other cultures and languages (Kesici and Tunç, 2018; Samaha *et al*, 2018). The validated Bahasa Malaysia scales, which included elements of parental media addiction and media dependency, has created a new tool for the emerging research of parenting and family health studies in the country. The scales used together provides a valid and reliable instrument to explore parent media behavior rapidly and inexpensively, thereby allowing insight into the problematic media usage among parents and caretakers of infants. The findings provided preliminary evidence

that the scales may be appropriate for the local Malaysian population. In its current form, the scales may be useful as a screening instrument to generate early evidence on parent media behavior, which could guide future policy and program development.

However, the study had several limitations. (i) the Bahasa Malaysia scales to measure parent media behavior contained only three items adapted from the Parent Problematic Digital Technology Use and three items from a subscale of the Media and Technology Usage and Attitude Scales out of total 15 items (Rosen *et al*, 2013). These items were chosen to represent the core behavioral dimension most relevant to technoference and parent's self-regulation of media use, which aligns with the study's primary objective to assess parental problematic media use in the form of addiction and dependency rather than broader patterns of media involvement. These limitations underscored the preliminary and exploratory nature of the current study and the need for more comprehensive scales. And (ii), the size of the test population was limited. Future studies should examine parents' beliefs and perceptions of screen-based media usage at home, and the extent to which screen-based media interferes with parent-child interaction; and should include validation of a larger, diverse population, which should not exclude parents and caretakers with children at risk of developmental issues or with documented social-emotional difficulties.

In conclusion, this study successfully provides a reliable and culturally appropriate tools for assessing parental media use and its influence on parent-child interaction and on young children's development. The tool can be applied in research and public health settings to inform community and national programs and policies aimed at reducing technoference and promoting healthier media practices in families with young children.

## CONFLICT OF INTEREST DISCLOSURE

The authors declare no conflict of interest.

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