



# Parental Smartphone Addiction and Child Behavioral Problems: The Mediating Role of Parenting Quality

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### ABSTRACT

**Objective:** This study aimed to examine the direct and indirect effects of parental smartphone addiction on child behavioral problems, with parenting quality as a mediating variable.

**Methods and Materials:** A descriptive correlational design was employed with a sample of 410 parents from Malaysia, determined according to the Morgan and Krejcie sample size table. Participants were recruited through schools and community centers and completed standardized measures assessing smartphone addiction, parenting quality, and child behavioral problems. Data were analyzed using SPSS-27 for descriptive statistics and Pearson correlations, and AMOS-21 for structural equation modeling (SEM). Model fit indices, including  $\chi^2/df$ , GFI, AGFI, CFI, TLI, and RMSEA, were used to assess model adequacy.

**Findings:** Descriptive statistics revealed moderate levels of parental smartphone addiction ( $M = 32.47$ ,  $SD = 6.81$ ), relatively high parenting quality ( $M = 74.26$ ,  $SD = 9.54$ ), and mild to moderate child behavioral problems ( $M = 18.63$ ,  $SD = 5.72$ ). Correlation analyses showed that parental smartphone addiction was positively correlated with child behavioral problems ( $r = .36$ ,  $p < .001$ ) and negatively correlated with parenting quality ( $r = -.41$ ,  $p < .001$ ). Parenting quality was negatively correlated with child behavioral problems ( $r = -.44$ ,  $p < .001$ ). SEM confirmed partial mediation: parental smartphone addiction negatively predicted parenting quality ( $\beta = -.39$ ,  $p < .001$ ), which in turn negatively predicted child behavioral problems ( $\beta = -.41$ ,  $p < .001$ ). The direct path from parental smartphone addiction to child behavioral problems remained significant ( $\beta = .25$ ,  $p = .001$ ), while the indirect effect through parenting quality was also significant ( $\beta = .16$ ,  $p < .001$ ).

**Conclusion:** The study highlights that parental smartphone addiction increases child behavioral problems both directly and indirectly through reduced parenting quality. Interventions should target reducing parental smartphone addiction and enhancing parenting practices to safeguard children's behavioral health.

**Keywords:** Parental smartphone addiction; Parenting quality; Child behavioral problems.

## 1. Introduction

Rapid diffusion of smartphones has reshaped everyday family routines, introducing unprecedented opportunities for connection as well as novel challenges for healthy child development. A growing body of work portrays problematic or addictive patterns of smartphone use as a multi-determinant phenomenon with cognitive, behavioral, and contextual antecedents, which can spill over into parent–child dynamics and children’s socioemotional adjustment (Ertemel & Ari, 2020; Extremera et al., 2019; Goldstein & Goldstein, 2024). While technology can enrich learning and access to resources, concerns persist about technoference—the intrusion of device use into interpersonal exchanges—and its potential to erode the quality of parenting behaviors that scaffold children’s self-regulation and behavior (Amiraliev, 2020; Merkaš et al., 2024). Conceptually, problematic smartphone use draws from addiction frameworks that emphasize salience, mood modification, tolerance, withdrawal, conflict, and relapse, intersecting with broader internet-related dysregulation (Goldstein & Goldstein, 2024). Among adolescents, emotion regulation difficulties and cognitive biases have been tied to higher risk of problematic use (Extremera et al., 2019), and marketing and engagement architectures of platforms can reinforce compulsive checking and social comparison (Ertemel & Ari, 2020; Karataş et al., 2024). Although this evidence largely centers on youths, analogous patterns in adults—especially parents—may carry distinctive consequences, because their device habits shape the emotional climate of the home, routines of monitoring and responsiveness, and the modeling of attentional control that children observe and internalize (Loleska & Pop-Jordanova, 2021; Merkaš et al., 2024).

Empirical studies increasingly implicate family processes in the etiology and maintenance of smartphone-related problems. Harsh or psychologically controlling parenting has been associated with adolescents’ problematic use, whereas supportive practices appear protective (Flamant et al., 2022; Kim, 2022; Yun et al., 2022). In Korean samples, parental smartphone addiction predicts children’s problematic use, with moderation by child age and gender, underscoring developmental sensitivity and family transmission processes (Son et al., 2021). Cross-sectional and longitudinal work further indicates that parenting attitudes, adolescents’ aggression, and parent–child relationship quality are intertwined with problematic technology habits (Doo & Kim, 2022; Son et al., 2022).

Beyond East Asian contexts, public health commentaries argue that youth smartphone addiction constitutes an emerging global concern, with implications for policy and family-based prevention (Loleska & Pop-Jordanova, 2021).

Within the family microsystem, parenting quality—encompassing warmth, structure, consistent monitoring, and low psychological control—has been repeatedly linked to youth adjustment. Studies show that psychologically controlling practices elevate maladjustment while adolescents’ coping resources can buffer daily risks (Flamant et al., 2022). Relatedly, parental psychological control has been associated with greater smartphone and internet addiction behaviors, partially through socioemotional traits such as shyness (Zhang et al., 2022). Research in Indonesian and Southeast Asian settings identifies parental structure and psychological control as robust predictors of adolescent problematic smartphone use, highlighting how rule clarity and autonomy support may function as protective factors (Lathiifah et al., 2023; Proborini & Septania, 2021). Clinical evidence from India emphasizes the interplay of parenting style, parental personality, and child temperament in pathways to anxiety—factors that also intersect with parenting quality and could indirectly influence technology-related behaviors and child outcomes (Sahithya & Raman, 2021).

Concurrently, communication patterns within families appear pivotal. A recent study reports that problematic smartphone use co-occurs with strained family communication, suggesting bidirectional reinforcement where device absorption reduces high-quality conversations and, reciprocally, poor communication fosters compensatory online engagement (Merkaš et al., 2024). Work on “phubbing” (phone snubbing) shows that discrepancies between adolescents’ and parents’ perceptions of parental phubbing relate to adolescent dependence, with the parent–child relationship mediating these links; such findings imply that relationship quality is a central conduit through which device behavior translates into youth outcomes (Chen, 2023; Chen et al., 2023a). Among Chinese rural adolescents, smartphone dependency has been tied to mental health through cognitive failures and the parent–child relationship, again underlining relational mechanisms (Chen et al., 2023b). Broader ecological correlates of adolescent smartphone use reinforce the salience of family processes. Harsh parenting has been associated with higher adolescent addiction symptoms, operating through depression and social pain, which suggests that emotionally aversive climates propel youths toward online coping and social

surrogacy (Wang et al., 2024). Positive parenting functions in the opposite direction; higher self-esteem fostered by positive practices is associated with lower cyberbullying perpetration, partly through reducing the pull of smartphone addiction (Kim et al., 2024). Meta-analytic work on nomophobia points to multifactorial determinants, including emotional regulation and social connectedness, which are themselves nurtured or hindered by day-to-day parenting behaviors (Rahmah et al., 2024). During the pandemic, elevated social media use and parental neglect were linked to heightened adolescent smartphone addiction risk, again situating parenting quality as a modifiable lever (Karataş et al., 2024).

Patterns of use matter as well. In South Korea, profiles of heavy or dysregulated smartphone use co-occur with physical, psychological, and cyber-behavioral risks, mapping onto higher externalizing and internalizing symptoms—forms of child behavioral problems that carry long-term costs if unaddressed (Oh & Park, 2022). Preteen longitudinal findings identify both protective and risk factors across personal and environmental domains, with parental behaviors and family characteristics prominently represented (Son et al., 2022; Yun et al., 2022). Complementary evidence from Nigeria and Indonesia underscores that low awareness of behavior problems associated with smartphones and gaps in parental guidance coexist with risky behaviors and lower physical activity, pointing to opportunities for psychoeducation and family-focused interventions (Omede, 2023; Silvanasari et al., 2018; Yusuf et al., 2023). Community-based initiatives targeting parents' knowledge and practices demonstrate feasibility for prevention, including programs that explicitly address smartphone addiction within families (Marini et al., 2023).

Crucially, the scholarly lens has widened from child and adolescent device use to parents' own patterns. Parental support can deter problematic smartphone use in youths via higher self-esteem and lower fear of missing out (Kim, 2022), yet parents themselves are embedded in the same attention-economy ecosystems that foster compulsive engagement (Ertemel & Ari, 2020). When parents exhibit addictive smartphone behaviors, they may model dysregulated attention, respond less contingently to children's bids, and reduce scaffolding of self-control—mechanisms that plausibly deteriorate parenting quality (e.g., lower warmth, inconsistent structure) and, in turn, elevate children's behavioral problems. Evidence on adolescents' coping as a moderator of controlling parenting

implies that children's resources can buffer some risks, but higher quality parenting likely remains the principal protective factor in early and middle childhood (Flamant et al., 2022). Studies during and after pandemic disruptions further suggest that household routines and parental availability are fragile under increased digital load, with downstream implications for child behavior (Karataş et al., 2024; Merkaš et al., 2024).

Internationally, the phenomenon is visible across cultural contexts—from rural China to Southeast Asia and Eastern Europe—indicating that associations between family functioning and smartphone-related risks are not confined to a single setting (Chen et al., 2023b; Lathiifah et al., 2023; Loleska & Pop-Jordanova, 2021). Religious and cultural perspectives echo the need for balance and mindful technology integration in family life (Mico, 2022). Observational and panel designs are beginning to clarify temporal ordering, though more work is needed to delineate parent-driven versus child-driven effects, reciprocal escalation loops, and developmental windows of heightened susceptibility (Son et al., 2022; Yun et al., 2022). Early evidence from Indonesian villages and other community samples highlights the social nature of smartphone use and its implications for face-to-face interaction—a reminder that device practices are embedded in local norms and social capital (Siokal et al., 2025).

At the level of child outcomes, behavioral problems—spanning externalizing (e.g., aggression, rule-breaking) and internalizing (e.g., anxiety, withdrawal)—are shaped by moment-to-moment parental attunement, consistency, and emotional availability. When parental smartphone addiction competes for attention, it may undermine these caregiving tasks. Studies link device overuse with neglectful or inconsistent parenting and with adolescent maladjustment, and correlate problematic use with health-risk behaviors including disordered eating and sedentary patterns that often accompany broader regulatory difficulties (Kabbaro et al., 2023; Oh & Park, 2022; Yusuf et al., 2023). Attachment-focused research likewise indicates that insecure bonds and weaker emotion regulation are associated with greater smartphone dependency, implying that high-quality parenting could be a protective mediator that attenuates risk transmission to children (Proborini & Septania, 2021; Sahithya & Raman, 2021). In adolescent samples, discrepancies in perceived phubbing between parents and youths are tied to dependence, suggesting that what matters is not only behavior but also how it is experienced relationally—a theme that generalizes to younger children's



sensitivity to parental unavailability (Chen, 2023; Chen et al., 2023a). Synthesizing these strands, prior research offers three converging insights that motivate the present work. First, problematic smartphone use is multiply determined and consequential across the family system, with parents' own patterns exerting distinct influences beyond children's usage (Extremiera et al., 2019; Goldstein & Goldstein, 2024; Son et al., 2021). Second, parenting quality consistently emerges as both a correlate and a mediator in technology-adjustment links, aligning with broader models that locate self-regulation, warmth, and structure at the heart of child behavioral development (Flamant et al., 2022; Kim, 2022; Lathiifah et al., 2023; Zhang et al., 2022). Third, cross-cultural evidence indicates both generalizable mechanisms and context-specific nuances, underscoring the need for studies that test theoretically specified mediation models across diverse settings and family ecologies (Mico, 2022; Oh & Park, 2022; Siokal et al., 2025; Yun et al., 2022).

Accordingly, the present study investigates whether parenting quality mediates the association between parental smartphone addiction and child behavioral problems.

## 2. Methods

### 2.1. Study Design and Participants

This study employed a descriptive correlational design to examine the relationships between parental smartphone addiction, parenting quality, and child behavioral problems. The sample consisted of 410 parents from Malaysia, selected based on the Morgan and Krejcie (1970) sample size determination table to ensure adequate statistical power. Participants were recruited through schools and community centers, representing diverse socioeconomic and cultural backgrounds. Inclusion criteria required participants to be parents of children between 6 and 12 years old, while those with diagnosed psychiatric disorders or incomplete questionnaires were excluded from the final sample.

### 2.2. Measures

Child behavioral problems can be assessed using the Strengths and Difficulties Questionnaire (SDQ), developed by Goodman (1997). This widely used tool consists of 25 items divided into five subscales: emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems, and prosocial behavior. Each item is rated on a 3-point Likert scale ranging from 0 (not true) to 2 (certainly true). Subscale scores are summed to provide both

domain-specific scores and an overall difficulties score, with higher scores indicating greater behavioral problems. The SDQ has been validated in diverse populations and age groups, and numerous studies have confirmed its strong psychometric properties, including good internal consistency, test-retest reliability, and construct validity.

Parental smartphone addiction can be measured using the Smartphone Addiction Scale – Short Version (SAS-SV), created by Kwon et al. (2013). The SAS-SV contains 10 items designed to capture core dimensions of problematic smartphone use such as daily-life disturbance, withdrawal, tolerance, and positive anticipation. Items are rated on a 6-point Likert scale, ranging from 1 (strongly disagree) to 6 (strongly agree), with higher total scores reflecting higher levels of smartphone addiction. The tool has been applied in both adolescent and adult samples, demonstrating good reliability and validity across cultures. Its internal consistency (Cronbach's alpha typically above 0.85) and criterion validity against related constructs such as internet addiction have been consistently supported in previous research.

Parenting quality can be measured by the Parenting Stress Index – Short Form (PSI-SF) developed by Abidin (1995), which is commonly used to assess the quality of the parent-child relationship and overall parenting experience. The PSI-SF includes 36 items across three subscales: parental distress, parent-child dysfunctional interaction, and difficult child. Each item is scored on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating greater stress and lower perceived parenting quality. The PSI-SF has been validated extensively, showing strong internal consistency (Cronbach's alpha values above 0.90), as well as construct and predictive validity in relation to child and parent outcomes. Its robust psychometric support makes it a reliable tool for evaluating parenting quality in empirical studies.

### 2.3. Data Analysis

Data analysis was conducted using SPSS version 27 and AMOS version 21. First, descriptive statistics including mean, standard deviation, frequency, and percentage were computed to summarize demographic and study variables. Pearson correlation analysis was then performed to determine the bivariate relationships between parental smartphone addiction, parenting quality, and child behavioral problems. Following this, a structural equation

modeling (SEM) approach was used to test the hypothesized mediation model, assessing both direct and indirect effects.

### 3. Findings and Results

The demographic profile of the participants indicated that among the 410 parents, 247 (60.24%) were mothers and 163 (39.76%) were fathers. Regarding age, 108 participants (26.34%) were between 25–30 years, 142 (34.63%) were

between 31–35 years, 97 (23.66%) were between 36–40 years, and 63 (15.37%) were above 40 years old. In terms of education, 164 parents (40.00%) held a bachelor's degree, 122 (29.76%) had completed a diploma, 81 (19.76%) reported a master's degree, and 43 (10.49%) had a secondary school education or lower. Household income levels showed that 152 participants (37.07%) earned below RM 4,000 monthly, 167 (40.73%) earned between RM 4,001–7,000, and 91 (22.20%) reported more than RM 7,000 per month.

**Table 1**

*Descriptive Statistics of Study Variables*

Variable	M	SD	N
Parental Smartphone Addiction	32.47	6.81	410
Parenting Quality	74.26	9.54	410
Child Behavioral Problems	18.63	5.72	410

The descriptive statistics indicated that the mean score for parental smartphone addiction was 32.47 (SD = 6.81), for parenting quality was 74.26 (SD = 9.54), and for child behavioral problems was 18.63 (SD = 5.72), suggesting moderate levels of smartphone addiction, relatively high parenting quality, and mild to moderate behavioral difficulties in children.

Prior to conducting correlation and SEM analyses, statistical assumptions were examined and confirmed. Normality was assessed using skewness and kurtosis values, which were within the acceptable range of -1 to +1 (e.g., skewness for child behavioral problems = -0.42, kurtosis =

0.67; skewness for smartphone addiction = 0.38, kurtosis = -0.54). Linearity was confirmed through scatterplot inspection, showing consistent linear patterns across variables. Multicollinearity diagnostics indicated tolerance values above 0.78 and variance inflation factor (VIF) values below 2.10, demonstrating no serious multicollinearity concerns. Homoscedasticity was examined using Levene's test, which was nonsignificant ( $p = .281$ ), confirming equal variances. Together, these results indicate that the data met the required assumptions for Pearson correlation and SEM analyses.

**Table 2**

*Correlation Matrix of Study Variables*

Variable	1	2	3
1. Parental Smartphone Addiction	—		
2. Parenting Quality	$r = -.41, p < .001$	—	
3. Child Behavioral Problems	$r = .36, p < .001$	$r = -.44, p < .001$	—

The results revealed that parental smartphone addiction was positively correlated with child behavioral problems ( $r = .36, p < .001$ ) and negatively correlated with parenting quality ( $r = -.41, p < .001$ ). Parenting quality was also

negatively correlated with child behavioral problems ( $r = -.44, p < .001$ ), supporting the mediational assumption of the study.

**Table 3**

*Fit Indices of the Structural Model*

Fit Index	Value	Recommended Threshold
$\chi^2$	124.37	—
df	58	—
$\chi^2/df$	2.14	< 3.00
GFI	.94	≥ .90

AGFI	.91	≥ .90
CFI	.96	≥ .95
TLI	.95	≥ .95
RMSEA	.052	≤ .08

The model fit indices indicated a good overall model fit:  $\chi^2(58) = 124.37$ ,  $p < .001$ ,  $\chi^2/df = 2.14$ , GFI = .94, AGFI = .91, CFI = .96, TLI = .95, and RMSEA = .052. These results

meet or exceed conventional cutoffs, suggesting that the proposed model adequately represented the observed data.

**Table 4**

*Direct, Indirect, and Total Effects in the Structural Model*

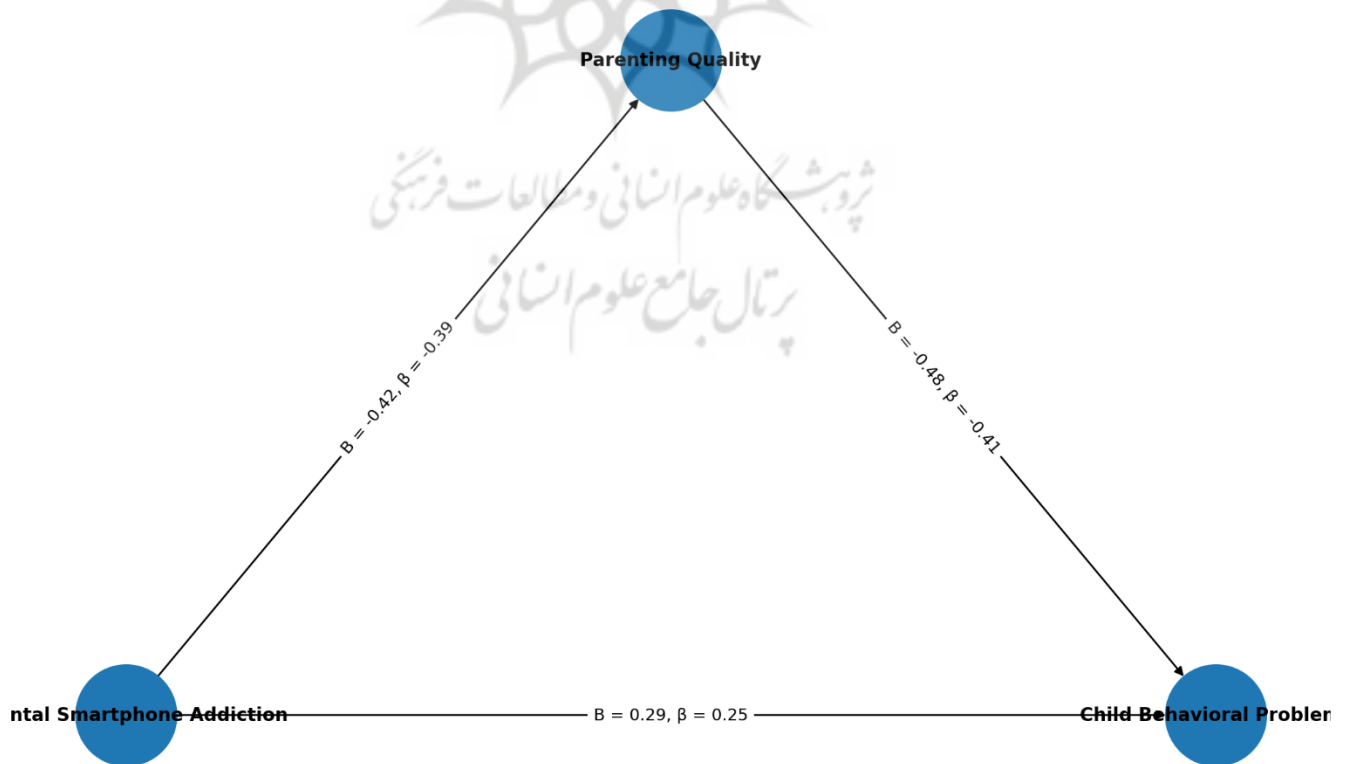
Path	b	S.E.	$\beta$	p
Smartphone Addiction → Parenting Quality	−0.42	0.07	−.39	<.001
Parenting Quality → Child Behavioral Problems	−0.48	0.09	−.41	<.001
Smartphone Addiction → Child Behavioral Problems (direct)	0.29	0.08	.25	.001
Smartphone Addiction → Child Behavioral Problems (indirect via Parenting Quality)	0.20	0.05	.16	<.001
Smartphone Addiction → Child Behavioral Problems (total)	0.49	0.07	.41	<.001

The SEM analysis demonstrated that parental smartphone addiction had a significant negative effect on parenting quality ( $\beta = -.39$ ,  $p < .001$ ). Parenting quality, in turn, was negatively associated with child behavioral problems ( $\beta = -.41$ ,  $p < .001$ ). The direct effect of smartphone addiction on child behavioral problems was significant ( $\beta = .25$ ,  $p = .001$ ),

and the indirect effect through parenting quality was also significant ( $\beta = .16$ ,  $p < .001$ ), indicating partial mediation. The total effect ( $\beta = .41$ ,  $p < .001$ ) highlighted the substantive role of parental smartphone addiction in predicting child behavioral problems.

**Figure 1**

*Model with Beta Coefficients*



#### 4. Discussion and Conclusion

The findings of this study demonstrate that parental smartphone addiction exerts both a direct and indirect effect on child behavioral problems, with parenting quality operating as a significant mediator in this association. Specifically, parental smartphone addiction was negatively associated with parenting quality, which in turn was negatively associated with children's behavioral difficulties. Additionally, even after accounting for this mediation pathway, a direct relationship remained between parental smartphone addiction and child behavioral problems, suggesting partial mediation. These results align with the growing literature emphasizing the pervasive influence of digital device usage within family systems and highlight the critical role of parenting practices in shaping children's socioemotional and behavioral outcomes (Doo & Kim, 2022; Merkaš et al., 2024; Zhang et al., 2022).

The direct effect of parental smartphone addiction on child behavioral problems supports prior research indicating that parents' over-engagement with digital devices can undermine the caregiving environment. In line with evidence that parental neglect or inattentiveness is associated with youth maladjustment (Karataş et al., 2024), the present study shows that excessive smartphone use compromises parental responsiveness and consistency, leading to elevated child behavioral difficulties. This resonates with previous findings linking parental phubbing to adolescent smartphone dependence through disruptions in parent-child relationships (Chen, 2023; Chen et al., 2023a). Although those studies primarily examined adolescents, the present findings extend this dynamic to younger children, emphasizing that parental inattention due to smartphone addiction can foster feelings of neglect, frustration, and externalizing or internalizing symptoms in children.

At the same time, the mediation effect of parenting quality underscores the importance of family relational processes in transmitting the effects of technology use to child development. When parents are absorbed by their smartphones, they may provide inconsistent discipline, reduced emotional warmth, or diminished monitoring, which erodes parenting quality and fosters behavioral problems in children. This finding echoes research showing that parental psychological control and low structure predict adolescent problematic smartphone use (Lathiifah et al., 2023; Proborini & Septania, 2021), and it dovetails with the argument that parenting quality is a central conduit through which parental behaviors, including smartphone addiction,

affect children's adjustment (Flamant et al., 2022; Kim, 2022). In particular, studies in China and Korea emphasize that discrepancies in parental availability, either through phubbing or harsh parenting, fuel problematic smartphone use and maladjustment among youth (Son et al., 2021; Wang et al., 2024). The present results provide additional evidence that the mechanism operates not only through children's device habits but also directly through parenting behaviors.

The significant direct effect of parental smartphone addiction on child behavioral problems suggests that factors beyond parenting quality also play a role. This may include modeling processes, where children imitate the dysregulated use of smartphones observed in their parents, thereby internalizing inattentive or compulsive behavioral patterns (Son et al., 2022; Yun et al., 2022). Furthermore, parental smartphone addiction may contribute to increased family conflict, disrupted daily routines, or lower-quality communication, all of which can increase child stress and behavioral difficulties (Kabbaro et al., 2023; Merkaš et al., 2024). In Nigerian and Indonesian contexts, for example, insufficient parental awareness of smartphone-related behavioral problems has been associated with adolescents' risky behaviors and reduced physical activity (Omede, 2023; Silvanasari et al., 2018; Yusuf et al., 2023). These findings align with the present results, suggesting that when parents themselves struggle with smartphone overuse, their children are doubly vulnerable—both from diminished parenting quality and from the broader negative environment shaped by compulsive device use.

From a theoretical perspective, these results are consistent with ecological and family systems models, which propose that parental behaviors and relational patterns mediate the effects of broader contextual influences on children's adjustment (Sahithya & Raman, 2021). The presence of partial mediation indicates that smartphone addiction does not solely affect children via parenting quality, but also through other proximal pathways such as parental stress, distraction, or emotional unavailability. Prior studies emphasize that emotionally controlling or neglectful parenting exacerbates maladjustment, yet adolescents' coping strategies and contextual supports can buffer some risks (Flamant et al., 2022). By extension, children's individual resilience may moderate the observed relationships, a possibility warranting further exploration.

Cross-cultural evidence provides additional support for these findings. In South Korea, patterns of smartphone use have been linked with physical, psychological, and cyber-behavioral problems in adolescents, reflecting the broad



scope of technology's impact on youth adjustment (Oh & Park, 2022). Longitudinal analyses in Korea further confirm that family factors, including parental smartphone behaviors, predict preteens' problematic smartphone use and associated risks over time (Son et al., 2022; Yun et al., 2022). In rural China, cognitive failures and parent-child relationships have mediated the link between smartphone dependency and adolescent mental health (Chen et al., 2023b). Together, these findings parallel the mediation observed in the present study, reinforcing the universality of family relational mechanisms in linking parental technology use with child outcomes.

Moreover, our findings converge with studies reporting that positive parenting functions as a protective factor. For instance, higher parental support has been shown to reduce problematic smartphone use via increased self-esteem and decreased fear of missing out (Kim, 2022), while positive parenting reduces adolescents' likelihood of cyberbullying perpetration, partly through mitigating smartphone addiction (Kim et al., 2024). The current results similarly highlight that stronger parenting quality can buffer children from the risks associated with parental smartphone addiction. Conversely, harsh parenting has been linked to greater adolescent addiction symptoms through depression and social pain (Wang et al., 2024), and neglectful practices during the pandemic have exacerbated adolescent smartphone addiction (Karataş et al., 2024). The negative association between parental smartphone addiction and parenting quality observed in the present study reflects these patterns, illustrating how device absorption may mimic neglectful or harsh parenting dynamics.

Our findings also align with meta-analytic evidence pointing to nomophobia and related smartphone use disorders as multifactorial problems involving cognitive, emotional, and relational risk factors (Rahmah et al., 2024). In particular, these reviews stress that preventive and intervention efforts should incorporate parental involvement, as family contexts are central to the development and management of problematic smartphone use. The present study contributes to this literature by empirically showing that parental smartphone addiction affects child behavior through diminished parenting quality, thereby supporting arguments that interventions must target parents as well as children.

At the same time, cultural and religious contexts may influence how families perceive and manage smartphone use. In Indonesia, scholars emphasize that technology must be framed within cultural and moral norms to prevent youth

disengagement from family interaction (Mico, 2022). In Borongloe Village, community-level analyses revealed that smartphone usage reduces adolescent social interaction (Siokal et al., 2025), echoing our findings that excessive parental smartphone use undermines family dynamics. Across contexts, the convergence of evidence suggests that the mechanisms observed here—disrupted parenting quality and consequent child behavioral problems—are globally relevant, though the intensity and expression may vary with cultural expectations and norms.

Overall, this study underscores the dual pathways by which parental smartphone addiction influences child behavioral problems: directly, by modeling dysregulated device use and reducing parental availability, and indirectly, by eroding parenting quality. The evidence complements previous work on adolescents while extending it to younger children, thereby contributing to a more comprehensive understanding of how family digital habits shape child outcomes. The results underscore the urgent need to address parental smartphone addiction within family-based interventions to safeguard children's behavioral health (Loleska & Pop-Jordanova, 2021; Marini et al., 2023).

## 5. Suggestions and Limitations

Several limitations must be acknowledged when interpreting these findings. First, the study employed a cross-sectional design, which limits the ability to infer causality between parental smartphone addiction, parenting quality, and child behavioral problems. Longitudinal research is needed to confirm temporal sequences and to rule out bidirectional effects, such as the possibility that child behavioral problems contribute to increased parental smartphone use as a form of stress coping. Second, the study relied on self-report questionnaires, which may be subject to response bias and shared method variance. Incorporating multi-informant assessments (e.g., child, teacher, and observational measures) could provide a more nuanced understanding. Third, the sample was drawn exclusively from Malaysia, which limits generalizability. Cultural differences in parenting norms and smartphone usage patterns may moderate the observed relationships. Additionally, the measures captured general behavioral problems but did not differentiate between internalizing and externalizing symptoms, which may be differentially affected by parental smartphone use. Finally, while the model accounted for parenting quality, other relevant family



dynamics, such as marital conflict, parental stress, and sibling relationships, were not assessed.

Future research should employ longitudinal and experimental designs to establish causal pathways between parental smartphone addiction, parenting quality, and child behavioral outcomes. Cross-cultural comparative studies would be particularly valuable to explore how cultural expectations and norms about technology use shape the magnitude and mechanisms of these associations. It would also be important to differentiate between types of child behavioral problems, examining whether externalizing behaviors such as aggression are more strongly linked to parental smartphone addiction than internalizing problems such as anxiety. In addition, future work should investigate potential moderators, including children's temperament, resilience, and coping skills, which may buffer or exacerbate the effects of parental smartphone use. Incorporating neurocognitive measures could shed light on how parental smartphone addiction affects attentional control and emotion regulation processes in children. Finally, intervention studies are needed to test whether reducing parental smartphone addiction and enhancing parenting quality can effectively lower children's behavioral difficulties.

From a practical standpoint, these findings highlight the importance of addressing parental smartphone use in family-based interventions aimed at improving child behavioral health. Psychoeducation programs for parents should emphasize the impact of their smartphone habits on parenting quality and children's adjustment, encouraging mindful use and digital boundaries within the home. Schools and community organizations can partner with families to create awareness campaigns about the risks of excessive smartphone use and provide strategies for enhancing parent-child interaction quality. Policymakers should also consider integrating parental digital wellness into broader public health initiatives, recognizing that reducing smartphone addiction is not only an individual concern but a family and societal priority. Clinicians working with families should assess parental technology use as part of child behavioral assessments and provide guidance on balancing connectivity with present and responsive caregiving.

### Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript.

### Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

### Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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### Declaration of Interest

The authors report no conflict of interest.

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### Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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