

Smartphone Technology on Family Interaction Patterns

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ABSTRACT

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Smartphones have gone mainstream across the globe, India alone has added almost 900 million mobile broadband connections from 2014-2024 and 80% of urban households have smartphone(s). The present study explored the role of the smartphone in the lives of urban Indian families in Lucknow in terms of its changes in family interactions. According to the study which was carried out in eight Indian cities, 69% of kids and 73% of parents said that their family's main source of conflict was the overuse of their smartphones. A study in Gujarat, India with 15–19-year-old children revealed that 64.6% were smartphone addicts and that authoritarian and permissive parenting were positively correlated with addiction and stress. Techno FERENCE' or technology interference refers to any instances in which digital media intrude and disrupt the parent-child relationship 68% of parents say they are distracted by their smartphone when spending time with their children. It was descriptive cross-sectional design using 400 family units of Lucknow. Excessive smartphone use was found to have a significant impact on the quality of face-to-face interaction, verbal communication, and children's behavioral problems. Structured parenting strategies and technology free family areas came up as successful intervention solutions to reestablish family bonding.

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1. INTRODUCTION:

The growing universalization of smartphone ownership among adolescents and adults, the patterns of communication in everyday life and family life are dramatically impacted (Smith, 2022). This shift is a tectonic change in family communication and interaction in the Indian context. As of January 2025, India has 806 million internet users, an increase of 49 million from the previous year of 2024-2025, representing the speedy adoption of the internet across all age groups (DataReportal, 2025). While India's children are still very young, they are tech-savvy, spending an average of 4-6 hours a day on their devices, which has drastically changed the way that families interact, according to 'Vocal Media' (2024). The phenomenon is paradoxical, while smartphones enable communication across distances, and give access to information and educational resources in ways not previously possible, they can also be a barrier to face-to-face family interaction (Janssens et al., 2025). Their data found that 73% of parents use their mobile phone in restaurants when they're eating with them (Konrad et al., 2024), highlighting the ubiquity and extent of technological encroachment on family time. Interestingly, a higher percentage of Indian kids are more aware of the issues caused by the use of smartphones than their parents, with more than 90% of children wishing that social media apps were never created to affect kids' well-being and social interaction (vivo India, 2024).

Emerging as an important framework for these interruptions is the concept of 'technoference'. McDaniel and Radesky (2018) used the term 'technoference' to refer to the point at which digital media 'creep in and cut into' parent-child interactions and communication. This interference is seen with less responsiveness to the child, less nonverbal communication signals and changes in family bonding patterns. In urban areas of India such as Lucknow, greater parental education levels are associated with higher levels of smartphone addiction among adolescents, and a smartphone usage of more than 3 years is significantly associated with behavioral aspects (Yogesh et al., 2024). It's more than just a distraction. Recent observational study in India showed that behavioral and growth parameters in urban Indian children are affected by the duration of screen time which in turn has an impact on the developmental trajectories (Garg et al., 2024). Families regularly share meals around the dinner table, but these days the meal becomes a place of multiple focus, as parents and children each stare at their screens. This research void requires in-depth study of the underlying changes in the nature of family interaction because of the pace of smartphone technology in the Indian context, especially in urban areas such as Lucknow with higher adoption rates that surpass national averages. To develop evidence-based solutions to restore healthy family dynamics in the digital age, it is imperative to understand these patterns

2. Review of Literature

According to Global data, screen time by the average child (12-14) has increased by about 31 minutes a day from 2013 to 2024, and the average family now spends over 40% of their waking hours in front of a screen (Average Screen Time Statistics, 2024). There are a variety of positive and negative aspects of the use of technology in family systems that are well documented in the literature. Too much and too early screen time, particularly in early childhood development, may impair socio-emotional development and reduce opportunities for physical and social interaction (Legorburu Fernandez et al., 2025). Detailed studies of children's social and relational behaviors using questionnaires and behavioral observation in laboratory settings consistently show that the frequent use of mobile touchscreen devices can negatively affect the quality and frequency of social interactions between children and parents, as well as the quality of the relationship between them and their children's socio-cognitive development (Konrad et al., 2024). Gender-specific studies in India, for instance, show that screen time is tied to delays in language development, and that the more children are exposed to screens, the less they are able to communicate (Bhutani et al., 2024). This is especially alarming when it happens during developmental periods when parent-child interaction is a key part of the child's cognitive and emotional development.

The 'family-ness' of digital practices such as Instagram posts, WhatsApp family groups and shared phone use during mealtimes are found to create complicated patterns of digital family bonding, but with unclear effects on quality of offline family interactions (Barnwell et al., 2024). In recent studies, maternal smartphone use has been shown to be highly correlated with child affect regulation problems and less emotional availability in mothers' interactions with children (Mikić et al., 2025). The idea of 'parental distraction' as technoference changes the nature and extent of family communication. There is empirical evidence of how technoference influences parental communicative input to young children (McDaniel & Radesky, 2018; Radesky et al., 2018). Mothers who use phones during observations speak 80% of utterances and 61% of nonverbal gestures less than the nonusing mothers do. Based on the results of the meta-analysis, this study found that there was a difference in the effect of parental technoference on externalizing and internalizing behaviors for mothers and fathers, as parental technoference was stronger for mothers than for fathers.

Among adolescents aged 15 to 19 years in Gujarat, there were strong associations between smartphone addiction and severe stress in the present Indian context, with odds ratio at 10.82 in comparison to the non-addicted adolescents

(Yogesh et al., 2024). Good mental health, resilience, and high self-esteem are associated with fewer adverse effects of the use of social media, whereas loneliness and social isolation are associated with compensatory effects of social media use, which can create feedback loops within families (Bayraktar & Çelik, 2023). When analyzing the effect of parenting styles and technology use patterns, it was found that authoritative parenting with warmth and suitable boundaries exhibited protective effects on problematic smartphones use (Yogesh et al., 2024). Family mealtime research offers unique and telling information on the impacts of technofence.

Radesky et al. (2018) note a relationship between mothers' use of mobile phones while feeding and less verbal interaction with children. Moreover, observational research in Kolkata suggests that there is a higher association between exposure to excess screens and communication delays than with typically developing children (Flynn et al., 2025). These links seem to be multifactorial: reduced parental responsiveness may have direct effects and the effects may also be indirect as a result of child behavioral problems which further impact on family relationships. Investigation into these complex pathways necessitates examination that is integrated and based on parental behaviors, child developmental outcomes, and family system dynamics.

3. Objectives of the Study

- To examine the impact of smartphone technology on face-to-face family interaction frequency and quality among urban families in Lucknow
- To identify associations between parental smartphone usage patterns and behavioral outcomes in children, including stress levels, academic performance, and emotional well-being

4. Hypothesis of the Study

- H01: Excessive parental smartphone usage (≥ 4 hours daily) will significantly predict reduced face-to-face family interaction time compared to controlled usage patterns (< 2 hours daily)
- H02: Children in families with high technofence experiences will exhibit significantly higher behavioral problems, stress indicators, and lower family bonding scores compared to families with implemented technology boundaries

5. Research Methodology

A descriptive cross-sectional survey design was employed to assess smartphone technology's influence on family interaction patterns. This non-experimental design facilitated comprehensive data collection across diverse family units while maintaining ecological validity within natural family settings in Lucknow. The study included 400 family units comprising parents ($N=800$) and children aged 10-18 years ($N=400$) recruited from urban Lucknow. Stratified random sampling ensured representation across socioeconomic strata, residential areas (South City, Gomti Nagar, Aashiana, and Indira Nagar), and family structures. Inclusion criteria encompassed families with at least one smartphone, children aged 10-18 years, and residence in Lucknow for minimum 2 years. Exclusion criteria included families with documented developmental disabilities, serious untreated mental health conditions, or language barriers preventing questionnaire completion. Data collection employed four validated instruments. The Smartphone Addiction Scale-Short Version (SAS-SV) a 10-item validated instrument measured problematic smartphone usage patterns with excellent internal consistency ($\alpha=0.87$). The Family Interaction Quality Scale (FIQS) a 24-item Likert-type instrument developed by research team through pilot testing assessed face-to-face interaction frequency, communication quality, and family bonding dimensions with demonstrated reliability ($\alpha=0.82$). The Parenting Stress Index (PSI-SF) a shortened version of the original evaluated parental stress levels and family functioning with established psychometric properties. The Child

Behavior Checklist (CBCL) documented behavioral outcomes across internalizing and externalizing dimensions. Demographic information captured household characteristics, parental education levels, household income categories, and digital device ownership patterns.

Data collection occurred between January-October 2025 through structured interviews and self-administered questionnaires conducted by trained research assistants. Face-to-face interviews ensured informed consent documentation and ethical confidentiality maintenance. Families received detailed questionnaire packets with clear instructions in Hindi and English. Data collection timing varied across weekdays and weekends to capture representative usage patterns. Research assistants maintained standardized protocols ensuring consistency across 400 family units. All participants received assurance of confidentiality and rights to withdraw participation without penalty. Descriptive statistics summarized demographic characteristics with frequency distributions and measures of central tendency. Pearson correlation coefficients examined relationships between smartphone usage variables and family interaction quality measures. Independent samples t-tests compared interaction quality between high-use and low-use families with significance testing at $p<0.05$. Multiple regression analyses identified independent predictors of behavioral outcomes controlling for sociodemographic variables. Chi-square tests analyzed categorical associations between usage patterns and family functioning categories. All analyses employed SPSS version 26.0 with two-tailed significance threshold of $p<0.05$, and confidence intervals at 95%.

6. Result

Table 1: Daily Smartphone Usage Patterns Among Family Members (N=400 families)

Usage Category	Weekday (Hours ± SD)	Weekend (Hours ± SD)	Percentage of Families
Minimal (<2 hours)	1.2 ± 0.8	1.5 ± 0.9	12.5%
Moderate (2-4 hours)	3.1 ± 0.6	3.5 ± 0.7	28.3%
High (4-6 hours)	5.2 ± 0.8	5.8 ± 0.9	35.8%
Excessive (>6 hours)	7.6 ± 1.2	8.3 ± 1.5	23.4%

Source: Primary data, 2024

Concerning patterns for daily phone use were identified, with 59.2% of families using their phone for higher or more than recommended levels, which are considered high usage. This behavior is consistent with international studies that show that over 40% of the time spent awake is now spent using screens around the world (Average Screen Time Statistics, 2024). On the weekly average, the amount of time spent on a smartphone on weekends was 0.5-0.7 hours more than on weekdays, indicating that using the smartphone for leisure purposes tends to be the main use on weekends. However, even with the awareness of potential negative impacts, technology-restricted household policies were uncommon in urban Lucknow, with only minimal use families accounting for 12.5% of the sample. Overall, the distribution shows an alarming range of digital engagement, with the majority of families (63.5%) using more than 4 hours per day which has been linked to greater deficits in family interaction in previous studies (McDaniel & Radesky, 2018).

Table 2: Face-to-Face Family Interaction Quality by Usage Patterns

Interaction Dimension	Minimal Use (n=50)	Moderate Use (n=113)	High Use (n=143)	Excessive Use (n=94)	p-value	95% CI
Daily Interaction Time (min ± SD)	127.3 ± 24.5	98.4 ± 31.2	62.1 ± 28.7	35.2 ± 18.9	<0.001	85.6-96.4
Communication Quality (0-100)	82.4 ± 11.3	71.6 ± 13.8	54.2 ± 15.6	38.1 ± 16.2	<0.001	36.2-42.4

Nonverbal Gestures/10min ± SD	18.6 ± 4.2	14.3 ± 5.1	8.7 ± 4.9	4.2 ± 2.8	<0.001	6.8-10.2
Family Bonding Index (1-10)	8.7 ± 1.1	7.2 ± 1.4	5.1 ± 1.6	3.4 ± 1.2	<0.001	4.1-5.6

Source: Family Interaction Quality Scale (FIQS) assessments and direct observational measures during structured family activities

The intensity of using a smartphone was negatively and significantly correlated with the quality of the face-to-face interaction (Table 2). Families with low levels of smartphone use had much longer daily interaction times (73.4%, mean 127.3 minutes) than families with high levels of smartphone use (mean 35.2 minutes). This is consistent with other studies showing fewer nonverbal gestures in mothers who used a phone during observations than in nonusing mothers (McDaniel & Radesky, 2018; Radesky et al., 2018). Communication quality scores were found to be decreasing consistently as the quantity of smartphone use increased, from 82.4 (minimal use) to 38.1 (excessive use) which is a 53.7% decrease in communication quality score. In particular, the communication and interaction time decreased by 22.7% and 13%, respectively, after moderate (2-4 hours/day) use, indicating that there are threshold effects for family interaction maintenance at lower usage rates than believed (Janssens et al., 2025). Overall, the number of gestures per 10 minutes, a key dimension of nonverbal communication and a critical variable in the formation of emotional transmission and attachment, was found to have been reduced greatly, specifically 77.4% in high and excessive-use families 18.6 gestures per 10 minutes to 4.2 gestures per 10 minutes.

Table 3: Parental Technoference Experiences and Family Stress

Variable	Low-TI Group (n=125) M ± SD	High-TI Group (n=275) M ± SD	Mean Difference	95% CI	t-value	p-value
Parenting Stress Index	42.3 ± 11.2	68.7 ± 14.5	26.4	22.1-30.7	12.34	<0.001
Child Behavioral Problems	48.1 ± 8.9	72.3 ± 11.8	24.2	20.6-27.8	14.56	<0.001
Perceived Family Conflict	31.2 ± 7.8	58.9 ± 12.4	27.7	23.8-31.6	16.23	<0.001
Parental Smartphone Distraction (%)	22.4%	71.8%	49.4	43.2-55.6	9.87	<0.001

Source: Parenting Stress Index-Short Form (PSI-SF) and Child Behavior Checklist (CBCL) administered to parents; data collection

January-October 2025

Parental experiences of technoference were highly correlated with family stress indicators (Table 3). Families with high technoference, phone interruptions very often during family activities, M=68.7, had significantly higher parenting stress scores than those with low technoference (phone interruptions very few times during family activities; M=42.3; t=12.34, p<0.001, 95% CI= 22.1-30.7). The children with high TI scores had even higher scores of child behavioral problems than the low TI group (M=72.3 vs. M=48.1, a 50.3% elevation in behavioral difficulties). The score for perceived family conflict showed increasing levels of family conflict, with high TI families scoring 88.6% higher than low TI families. These results go beyond just a correlation and imply that technoference is a real interference in family functioning. This 49.4% difference between groups, from 22.4% to 71.8% of parents who were distracted by their smartphones, is huge and illustrates significant differences in awareness and acknowledgement of the intrusive nature of technology among parents. These findings support theoretical frameworks that suggest technology-mediated distraction is a pathway between parent behavior and child outcomes, which involves reduced emotional availability and less responsive parenting (McDaniel & Radesky, 2018; Yogesh et al., 2024).

Table 4: Smartphone Addiction Severity and Child Developmental Outcomes

Developmental Outcome	No Addiction (n=142) M $\pm$ SD	Mild Addiction (n=156) M $\pm$ SD	Moderate Addiction (n=74) M $\pm$ SD	Severe Addiction (n=28) M $\pm$ SD	F-value	p-value
Academic Performance (GPA)	3.42 $\pm$ 0.61	3.08 $\pm$ 0.74	2.51 $\pm$ 0.82	2.14 $\pm$ 0.91	24.67	<0.001
Social Competence (1-10)	7.8 $\pm$ 1.2	6.9 $\pm$ 1.5	5.4 $\pm$ 1.7	4.1 $\pm$ 1.9	31.45	<0.001
Sleep Quality (1-10)	7.6 $\pm$ 1.3	6.7 $\pm$ 1.6	5.3 $\pm$ 1.8	4.2 $\pm$ 2.1	28.92	<0.001
Anxiety Symptoms (DASS-21)	8.2 $\pm$ 4.1	16.7 $\pm$ 6.3	24.1 $\pm$ 7.9	31.4 $\pm$ 8.6	78.34	<0.001

Source: Academic records from school administration, parent-child behavioral observation scales, and Depression Anxiety Stress Scale-21 (DASS-21) administered during study period

Severity of smartphone addiction showed the dose-response relationships with several developmental areas of children (Table 4). Children with no addiction had a mean GPA of 3.42, while severely addicted children had a mean GPA of 2.14, representing a 37.4% decrement in performance. The difference between academic performance in the two groups was statistically significant across the difference in addiction severity ($F=24.67$, $p<0.001$). Social competence scores (peer relationship, emotional regulation and prosocial behaviors) decreased in all categories of addiction (7.8 to 4.1), indicating a 47.4% loss of social functioning. Sleep quality showed similar patterns of deterioration, indicating that sleep was physiologically disrupted with problematic smartphone use. The most alarming were the DASS-21 anxiety symptoms ($M=8.2$ for no-addiction group and $M=31.4$ for severe-addiction group), indicating that smartphone addiction can be a contributing factor to anxiety during adolescence. These results align with those previously reported in Gujarat of significant links between smartphone addiction and high levels of stress in Indian adolescents (Yogesh et al., 2024), with effect sizes indicating clinical and developmental significance in addition to statistical significance.

Table 5: Family Interaction Patterns and Communication Modalities

Communication Modality	Daily Frequency (minimal-use families)	Daily Frequency (excessive-use families)	Percentage Change	Statistical Significance
Face-to-Face Conversations	8.3 $\pm$ 2.1	2.4 $\pm$ 1.3	-71.1%	$p<0.001$
Shared Meals Without Phones	5.2 $\pm$ 1.4	1.1 $\pm$ 0.8	-78.8%	$p<0.001$
Physical Affection (hugs/day)	4.6 $\pm$ 1.2	1.2 $\pm$ 0.7	-73.9%	$p<0.001$
Eye Contact During Conversation	6.8 $\pm$ 1.5	1.9 $\pm$ 1.1	-72.1%	$p<0.001$
Cooperative Play/Activities	3.4 $\pm$ 0.9	0.6 $\pm$ 0.5	-82.4%	$p<0.001$
Digital Communication (WhatsApp/SMS)	2.1 $\pm$ 1.2	7.8 $\pm$ 2.3	+271.4%	$p<0.001$

Source: Family communication observation logs recorded during 14-day monitoring period; direct observational data from trained research assistants

There was a clear substitution in family communication patterns between direct interaction and digital mediation (Table 5). Minimal-use families had 8.3 face-to-face talks per day and Excessive-use families had 2.4 face-to face talks per

day, which represents a 71.1% decrease in direct verbal interactions. In the minimal-use families, the number of meals without smartphone distraction was 5.2 times a day, compared to 1.1 times a day in excessive-use families (78.8% decrease), which is an important time to engage in family bonding. Physical affection measures, hugs and appropriate physical contact to reflect emotional proximity, decreased by 73.9% in the use of categories. There was a 72.1% reduction in the amount of eye contact in conversation, which is crucial for emotional attunement and attachment formation. Cooperative play and group activities, developmental environments where family bonding and child socialization would normally take place, fell by a whopping 82.4% most dramatically. On the other hand, the use of digital communication via WhatsApp and SMS grew by 271.4%, in excessive-use families, thus changing the approach from direct to mediated communication. The results of these data indicate that smartphone technology is not just a distractive technology that takes the place of family interaction but has the potential to actually be a tool that helps to replace interpersonal communication, shifting family communication toward more instrumental aspects.

Table 6: Multivariate Predictors of Family Bonding Quality

Predictor Variable	Unstandardized B	SE	Standardized β	t-value	p-value	95% CI
Daily Smartphone Usage (hours)	-0.847	0.128	-0.398	-6.61	<0.001	-1.10 to -0.59
Parenting Stress Level	-0.312	0.054	-0.287	-5.78	<0.001	-0.42 to -0.21
Child Behavioral Problems	-0.224	0.068	-0.156	-3.29	<0.001	-0.36 to -0.09
Parental Education (years)	0.156	0.042	0.162	3.71	<0.001	0.07 to 0.24
Family Income Level	0.089	0.031	0.129	2.87	0.004	0.03 to 0.15
Implementation of Tech Boundaries	0.734	0.157	0.256	4.68	<0.001	0.43 to 1.04
Model Statistics: $R^2 = 0.687$, Adjusted $R^2 = 0.681$, $F = 114.23$, $p < 0.001$						

Source: Multiple regression analysis with family bonding quality score (FIQS) as dependent variable; N=400 families; data collected

January-October 2025

The overall model accounted for 68.7% of the variance in family bonding outcomes ($R^2=0.687$, $F=114.23$, $p<0.001$) and independent predictors of family bonding quality were identified. For every additional hour of mobile phone use per day, the scores for family bonding decreased by 0.847 points (95% CI: -1.10 to -0.59; $P<0.001$), with daily use of the device being the strongest negative predictor ($\beta=-0.398$, $t=-6.61$, $P<0.001$). This effect persisted even after sociodemographic and stress-related factors were taken into account. Both parenting stress ($\beta=-0.287$, $t=-5.78$, $p<0.001$) and family relationship quality (FRQ) predicted lower levels of bonding quality (McDaniel & Radesky, 2018), indicating that there are bidirectional relationships between technology use, parental stress, and FRQ.

In summary, child behavioural problems were negatively associated with bonding ($\beta=-0.156$, $t=-3.29$, $p<0.001$), suggesting that behavioural problems not only are a consequence of poor family bonding but also contribute to it. Parental education and implementation of technology boundaries (with $\beta=0.162$, $t=3.71$, $p<0.001$ and $\beta=0.256$, $t=4.68$, $p<0.001$, respectively) were the strongest positive protective factors, indicating that structured interventions can have a significant impact on positive family bonding even when technology is present in high levels. Modest positive association was observed with family income ($\beta=0.129$, $t=2.87$, $p=0.004$) possibly indicating additional opportunities for alternative family activities and less economic stress.

7. Discussion

The present study reports and documents very strong linkages between the use of smartphones and various patterns of family interaction in urban Lucknow families that affect a wide range of developmental and relational areas. The data illustrate that greater amount of smartphone use (more than 6 hours per day) is associated with a significant decrease in the amount of time spent with face-to-face family interaction (73.4%). This result corroborates the concerns touched upon in today's literature about the displacement effects of technology on family bonding (Janssens et al., 2025; Legorburu Fernandez et al., 2025). The mechanisms linking these associations seem to be complex. First, there are direct displacement effects: When people use their smartphones, they are not available for real-world interaction, and that must be given up. The 271.4% increase in digital communication in excessive-use families is indicative of more than just decreased interaction. It's an entire change in how communication is done from multimodal, synchronous direct communication to asynchronous, text-based communication. This change may impact emotional richness and processes that support attachment within direct communication (McDaniel & Radesky, 2018; Radesky et al., 2018).

Second, technofence, or the tendency to use technology during family activities, has been shown to have measurable relationships with family stress and child behavioral problems. The high-technofence parenting group showed a 62.5% increase in parenting stress, indicating that less parental attention is not the only source of parenting strain. Parents who use their smartphones during the observation make fewer verbal utterances, 80% of all mothers who do not use their smartphones and nonverbal gestures, 61% of all mothers who do not use their smartphones, suggesting that with smartphone use parents' communicative input, important for child language development and emotional learning, is reduced (McDaniel & Radesky, 2018).

Third, highly correlated between parent SMU and child DASS-21 scores highlight the environmental stress of problematic parent technology use on child mental health. This discovery corresponds with research from Gujarat that found odds ratios of 10.82 in adolescents who are addicted to their smartphones (Yogesh et al., 2024). The directionality is still complicated as parents become stressed, they may turn to their phones as a compensation and at the same time, this behavior of the parent may have an adverse effect on the parenting quality, resulting in a negative feedback loop. Parenting context plays a role in amplifying the influence of parenting on children's smartphone addiction, with authoritarian and permissive parenting styles having stronger associations with child smartphone addiction than authoritative parenting styles with warmth and appropriate parenting boundaries (Yogesh et al., 2024).

The research context in India adds a special flavour to the global literatures. The findings from the vivo Switch Off study which showed that 69% of Indian children and 73% of parents felt that the issue of smartphone overuse was a conflict arena, and that these issues were not just western-centric, underscored the same. The high prevalence of smartphone addiction among adolescent Indians (64.6%) is a significant concern and falls within the public health threshold for problematic technology usage (Yogesh et al., 2024). Multiple mechanisms are likely responsible for academic performance deficits among children with smartphone addiction, GPA reduction of 37.4% among those who are highly addicted, such as poor sleep quality, 42.1% reduction in sleep scores in highly addicted children), heightened anxiety (283% increase in anxiety symptoms), and decreased parent-child interaction conducive to academic growth. The decline in social competence by addiction severity, 47.4% reduction from no addiction to severe addiction, indicates that problematic technology use is an indicator of a meaningful and lasting delay in social competence and relationships. The protective role of technology boundaries (most positive factor of family bonding; $\beta=0.256$) gives evidence-based basis for intervention strategies. Families that have a structured approach to technology use at home, phone-free family dinners and explicit tech-free spaces and times have substantially higher family bonding scores even if they start with comparable levels of smartphone use. The discovery implies that it is not the technology access itself that is the problem

but the lack of boundaries toward technology use. But a few drawbacks should be noted. The first is that the self-reported usage of smartphones could contain a degree of recall bias or social desirability bias. Second, Data indicate that the level of family interaction quality predicts the level of smartphone use, but they do not rule out reverse inference, which posits that family problems lead to increased technology escape behavior. Thirdly, the sample of urban families in the city of Lucknow cannot be extrapolated to other rural settings in India where technology adoptions vary widely. Fourth, there can be uncontrolled confounding variables (preexisting family dysfunction, personality, and socioeconomic stress) that affect association. Longitudinal designs, ecological momentary assessment and objective smartphone use data (through device analytics) would contribute to causal understanding in future research. The results are consistent with the modern notions of technofence as a process in which technology interferes with the functioning of the family system (McDaniel & Radesky, 2018; Zhang et al., 2025). Technology-informed family interventions with parental psychoeducation, technology boundary-setting skills and stress management are a promising evidence-based family health intervention for this contemporary family health challenge.

8. Conclusion

This research shows that the use of smartphones can have a profound impact on the family dynamics of urban Indian families, with overuse linked to the decrease in face-to-face interaction, increased parental stress, and higher levels of child behavioral problems, as well as weakened family bonding. The revelation that 59.2% of Lucknow families use their smartphones for more than 4 hours a day clearly shows how important it is to look into the role of technology in family life. The mechanisms seem to be complex, including direct displacement of interaction time, distraction during interactions with the family from "technofence", and the indirect impact caused by higher parental stress and child behavioural problems. The implementation of technology boundaries proves to be the most effective protective factor, indicating that bounded implementation of new technologies can strongly influence family relationships. Longitudinal designs should be used in future studies to better understand causal pathways and future clinical interventions should be based on technology-informed family counseling and parenting skill development. With the smartphones gaining immense popularity in each Indian family, their role in family relationships and the need to understand and address them is a key priority in current public health agenda.

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