The impact of parental phubbing on social withdrawal in preschool children: the serial mediating roles of parent–child conflict and negative emotions

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Abstract

Background The positive association of parental phubbing with internalizing and externalizing problems among adolescents has gained academic traction. However, current researches on the negative impacts of parental phubbing have focused primarily on adolescents, with a noticeable lack of studies concerning preschool children, and there is also a deficiency in investigations from the perspective of the Risky Family Model. These gaps limit our understanding of how parental phubbing affects problem behaviors among preschool children. To address this gap, the present study constructed a chain mediation model to examine the association between parental phubbing and social withdrawal in preschool children, by introducing two mediating variables—parent–child conflict and negative emotions.

Methods A sample of 739 preschool children (mean age 5.04 years, *SD* = 0.84) and their parents participated in the study. The parents completed measures of the Parental Phubbing Scale, Child–Parent Relationship Scale, Children's Behavior Questionnaire, and Child Social Preference Scale. The Cronbach's alpha coefficient of the four scales were 0.75, 0.84, 0.74, and 0.83, respectively. All the measures showed good reliability and validity in the present study. The data were analyzed via SPSS 26.0 and SPSS PROCESS.

Results The results indicated that (1) parental phubbing had a significant positive effect on social withdrawal in young children; (2) parent–child conflict and negative emotions independently mediated the relationship between parental phubbing and social withdrawal in young children; and (3) parent–child conflict and negative emotions served as serial mediators in the relationship between parental phubbing and social withdrawal in young children.

Conclusions These findings in the present study contribute to understanding the mechanisms underlying the association between parental phubbing and social withdrawal and have important implications for interventions aimed at improving social withdrawal among preschool children in China. Furthermore, the present study first introduced parental phubbing into the Risky Family Model, expanding the applicability of this model.

Keywords Parental phubbing, Parent–child conflict, Negative emotions, Social withdrawal, Preschool children

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Introduction

Social withdrawal refers to behaviors in which children engage in solitary play and spend time alone in familiar and unfamiliar environments [1]. Social withdrawal has become a common internalizing problem behavior in children. There are a range of negative impacts associated with children's social withdrawal, including psychological disorders such as anxiety and depression [1], difficulties adapting to new environments [2], and lower academic performance [3]. Therefore, understanding the influencing factors of social withdrawal and adopting appropriate interventions may enhance children's social-emotional competence. The present study, which is based on Family System Theory [4] and Risky Family Model [5], examines the influencing factors and mechanisms of young children's social withdrawal from the perspectives of both environmental factors (parental phubbing and parent–child conflict) and individual factors (young children's negative emotions).

Parental phubbing and children's social withdrawal

As of December 2023, the number of internet users in China reached 1.092 billion, with an average weekly internet usage time of 26.1 h per person. The proportion of users accessing the internet via mobile phones reached 99.9% [6]. While the widespread use of smartphones has significantly enhanced convenience in people's lives, it has also led to an increase in the prevalence of phubbing. Phubbing, a type of social exclusion and interpersonal neglect, is a portmanteau of the words "phone" and "snubbing" and is used to describe the interruption that mobile phone usage causes in social relationships [7]. Parental phubbing refers to the extent to which parents use or are distracted by their phones during interactions with their children [8]. In Mangan et al.'s [9] observations of 50 parents or carers of children aged 0–5 years, 76% of the parents used mobile devices, with the longest usage time reaching 17.5 min within 20 min. According to family systems theory, parents can influence children's development through their behavioral interactions with various subsystems within a family [4]. Concurrently, the risky family model posits that families characterized by conflict, aggression, and cold, unsupportive, and neglectful interactions among members present risk factors that can lead to deficits in social competence and emotional regulation in children [5]. Furthermore, parental phubbing tends to overlook the presence and needs of children, inevitably becoming a significant family risk factor. Wang et al. [10] reported that parental phubbing has a positive effect on social withdrawal in Chinese children aged 4–10 years. McDaniel and Radesky [11, 12] conducted both cross-sectional and longitudinal studies to examine the relationship between problematic technology use and the resulting disruptions in parent–child

interactions—referred to as parental phubbing [13]—and various internalizing and externalizing problems in children aged 0–5 years. Their findings indicated that parental technological interruptions significantly predict children's social withdrawal. Current researches on the negative impacts of parental phubbing have focused primarily on adolescents [8, 10, 14], with a noticeable lack of studies concerning preschool children. Moreover, there is a deficiency in investigations from the perspective of the Risky Family Model. Therefore, this study proposes Hypothesis 1: parental phubbing can significantly and positively predict social withdrawal in young children.

The mediating role of parent–child conflict

Parent–child conflict refers to unhealthy and tense interactions between parents and children. Parental phubbing negatively predicts parent–child relationship [15]. According to the Displacement Hypothesis [16], parents spending time on their phones can displace or reduce quality parent–child interactions. Therefore, parent–child conflict may be influenced by parental phubbing. Research by Hong et al. [17] supports this view, finding that parental phubbing occupies more of parents' time and attention, which in turn reduces the time and attention allocated to their children. Consequently, frequently neglecting children's attention, emotions, and needs can lead to a conflicted parent–child relationship [18]. Additionally, Knitter and Zemp [19] reported that parental phubbing not only reduces parents' attention, responsiveness, and warmth toward their children but also leads to lower parental awareness and sensitivity, fewer verbal and nonverbal interactions, dissatisfaction with parent–child time, and negative responses to children's needs [20]. As a result, this negatively impacts the quality of the relationship [21].

Children who experience such conflicted relationships with their parents tend to exhibit more behavioral problems [22]. The insecure parent–child attachment relationship has been associated with and predictive of increases in social withdrawal over time [23]. Parent–child conflict can predict children's aggressive behavior, misconduct issues, and anxiety problems [24], and is a significant factor influencing children's development of emotional problems. Parental phubbing can diminish the quality of parent–child communication [25], resulting in children's inability to acquire appropriate social skills and attitudes, which may exacerbate their social withdrawal. Furthermore, parental phubbing can promote negative parenting practices, which are closely associated with parent–child conflict. Parent–child conflict stemming from low-quality parenting practices may lead to children's social withdrawal [10, 26]. Therefore, the present study posits Hypothesis 2: parent–child conflict mediates

the relationship between parental phubbing and children's social withdrawal.

The mediating role of children's negative emotions

Negative emotions refer to irritability, low mood, difficulty in soothing, and intense negative reactions [27]. Poulain et al. [28] reported that children feel neglected and ignored, triggering emotional issues due to parental phubbing. According to Expectancy Violations Theory, when individuals' expectations are not met, negative emotions are likely to arise [29]. Knausenberger et al. [30] conducted two experiments and reported that phubbing elicited negative emotions, feelings of rejection, and a sense of being disregarded in the phubbed individual. Compared with a single incident of phubbing, when phubbing occurred three times, the emotions experienced by the phubbed individual were more intense, and their trust in the phubber was diminished. Poulain et al. [28] revealed that mothers' prolonged phubbing was linked to behavioral and emotional issues in children. During parent–child interactions, parents may demonstrate withdrawal or unresponsiveness because of their phubbing, leading to unreciprocated emotions and causing young children to exhibit distress or confusion [31]. In other words, phubbing signifies emotional rejection [13], and children who experience emotional rejection from parents are likely to experience negative emotions such as sadness and sorrow.

Studies have revealed a correlation between elevated levels of social withdrawal and increased negative emotions [32]. For example, during conflicts with parents, adolescents who are prone to experiencing negative emotions such as self-blame and resentment are more likely to exhibit social withdrawal [33]. Children of parents addicted to their phones are more likely to feel neglected and overlooked [28], resulting in prioritizing others' evaluations, exhibiting increased shyness and emotional sensitivity, and displaying withdrawal behaviors [34]. Additionally, Wang et al. [10] suggested that parental phubbing can contribute to children's social withdrawal through negative parenting practices. Parenting styles such as behavioral control, criticism, negative emotions of caregivers and relative lack of support may evoke negative emotions such as fear, dissatisfaction and even anger in young children, potentially leading to social withdrawal in preschool-aged to elementary-school-aged children [35]. Therefore, this study proposes Hypothesis 3: Children's negative emotions mediate the relationship between parental phubbing and children's social withdrawal.

The serial mediation effect of parent–child conflict and children's negative emotions

According to Risky Families Model, children may experience adverse impacts on their emotional well-being when raised in environments marked by neglect, conflict, and indifference during their early years [5]. Yeh [33] reported that negative emotions play a mediating role in the relationship between parent–child conflict and adolescent social withdrawal. Suppose adolescents tend to blame themselves or feel regret and guilt during conflicts with their parents. In such case, prolonged conflicts may trigger negative emotional reactions and subsequent behavioral issues, particularly psychosomatic symptoms and social withdrawal. Research on young children has shown that infants whose parents are excessively engrossed in their phones encounter challenges in forming secure attachment relationships with their caregivers during early development [36]. When the parent–child relationship is tense and conflict–ridden, children are prone to displaying feelings of frustration and experiencing anxious emotions, as well as showing a reduced willingness to communicate with their parents [37]. Additionally, they may exhibit withdrawal behaviors when faced with new environments [38]. Conflict–ridden environments, including parent–child conflicts and parental conflicts, can evoke negative emotions in young children, leading to behavioral challenges. Therefore, this study proposes Hypothesis 4: parent–child conflict and young children's negative emotions serve as a chain mediating mechanism linking parental phubbing to young children's social withdrawal.

Method

Participants

In this study, all participants (aged 3–7) were from two public kindergartens in Nanjing Province, China, and were children with normal development. The informed consent forms were distributed to parents, and those who agreed to participate in the survey voluntarily completed the questionnaire. The questionnaires were completed by parents (either fathers or mothers) via the Questionnaire Star online survey platform (https://www.wjx.cn/). 805 questionnaires were distributed and collected, and invalid questionnaires such as those with short or long response times, repeated responses, regular responses, and failed lie detection questions were deleted. Finally, 739 valid questionnaires were retained, with 147 completed by fathers and 592 completed by mothers, yielding an effective rate of 91.80%. A total of 739 children (355 girls and 384 boys) participated in the survey. A total of 40.6% of the participants were only children, and 59.4% were non-only children. The mean age of the participants was 5.04 years ($SD = 0.84$).

Instrument

Parental phubbing

Parental phubbing was measured via the Parents Phubbing Scale [39], revised by Ding et al. [40]. The scale comprises 9 items, such as "My parents use their mobile phone when I eat with them." Considering the young age of the children, the phubbing in this study was reported by the parents. The phrasing was adapted from the child's perspective to the parent's perspective without altering the meaning of the sentences, for example, "I use my mobile phone when I eat with my child." The participants rated each item on a 5-point Likert scale ranging from 1 (never) to 5 (always). Higher scores indicate more severe parental phubbing. The Cronbach's alpha coefficient for this scale in the present study was 0.75. Confirmatory factor analysis (CFA) of the Parental Phubbing scale suggested that the model fit the data well: $\chi^2/df = 3.316$, GFI = 0.975, CFI = 0.965, TLI = 0.952, RMSEA = 0.056.

Child–parent conflict

Child–parent conflict was measured via the conflictual dimensions of the 12-item Child–Parent Relationship Scale (CPRS) [41], which was revised from the original CPRS developed by Pianta [42]. This scale was completed by parents and included items such as "My child becomes easily upset with me." The participants rated each item on a 5-point Likert scale ranging from 1 (completely disagree) to 5 (completely agree). The Cronbach's alpha coefficient for the CPRS in the present study was 0.84. CFA of the Child–Parent Relationship Scale suggested that the model fit the data well: $\chi^2/df = 4.492$, GFI = 0.942, CFI = 0.918, TLI = 0.900, RMSEA = 0.069.

Negative emotions

Children's negative emotions were measured via the negative emotions subscale of the Children's Behavior Questionnaire (CBQ), a revised Chinese version developed by Putnam and Rothbart [43]. The scale comprises 12 items and is completed by parents. For example, "He/she becomes frustrated when prevented from doing what he/she wants." The participants rated each item on a 7-point Likert scale from 1 (completely disagree) to 7 (completely agree). Higher scores indicate higher levels of children's negative emotions. The Cronbach's alpha coefficient of the CBQ in the present data was 0.74. CFA of the CBQ suggested that the model fit the data well: $\chi^2/df = 4.950$, GFI = 0.944, CFI = 0.873, TLI = 0.835, RMSEA = 0.073.

Children's social withdrawal

Children's social withdrawal was measured via the Child Social Preference Scale (CSPS), revised by Zhu et al. [44]. This 11-item scale comprises two dimensions: (a) shyness (7 items, e.g., "My child seems to want to play with other children but is sometimes nervous") and (b) unsociability (4 items, e.g., "My child seems content to play alone"). These items are reported by parents. The participants rated each item on a 5-point Likert scale from 1 (completely disagree) to 5 (completely agree). The Cronbach's alpha coefficient of the CSPS in the present data was 0.83. CFA of the CSPS suggested that the model fit the data well: $\chi^2/df = 4.208$, GFI = 0.959, CFI = 0.946, TLI = 0.929, RMSEA = 0.066.

Research process

The current study was approved by the Ethics Committee of the author's university. In this study, all scales were completed by parents (either fathers or mothers) with their consent. Before the scales were completed, the parents were informed by the researcher about the purpose of the study and the precautions for completing it. After completing the scales, parents had the opportunity to participate in a prize draw to receive small gifts as compensation.

Data collection and analysis

All analyses were performed using SPSS 26.0. First, the data follows a normal distribution, and common method bias (CMB) was assessed. Then, descriptive statistical analysis was performed on all variables, as well as bivariate correlations among all variables were calculated, given that CMB was not revealed in the present data. Thereafter, the serial mediation analyses were performed to test the indirect effects using SPSS macro-PROCESS Model 6. The mediation effects of parent–child conflict and young children's negative emotions were considered significant if the 95% CI for the index of multiple mediations did not include zero.

Results

Test for common method bias

We used Harman's single-factor test to measure common method bias (CMB). The results of the CMB model revealed that there were 10 factors with eigenvalues greater than 1, and the variance explained by the first factor was 18.44%, which is below the critical value of 40%, indicating that there was no serious common method bias in this study.

Descriptive statistics and correlation analysis

The results of the descriptive statistics and correlation analysis for each variable are presented in Table 1. We found significant positive correlations among parental phubbing, parent–child conflict, negative emotions, and social withdrawal. Only-child or not was significantly negatively correlated with both parental phubbing and social withdrawal. Children's age was significantly positively correlated with parent–child conflict and social withdrawal. Therefore, in the subsequent mediation

Table 1 Results of the descriptive statistics and correlation analysis ($N = 739$)

	M	SD	1	2	3	4	5	6	7
Parental phubbing	2.545	0.531	—						
parent–child conflict	2.436	0.709	0.245**	—					
Negative emotions	3.702	0.910	0.305**	0.558**	—				
Social withdrawal	1.967	0.650	0.168**	0.354**	0.275**	—			
Gender	1.48	0.500	-0.008	-0.006	0.063	-0.007	—		
Only-child or not	1.59	0.491	-0.086*	0.028	0.029	-0.074*	0.056	—	
Age	5.04	0.844	-0.047	0.086*	0.015	0.073*	-0.003	0.034	—

Note: *M is the mean*, and *SD is the standard deviation*. Gender and Only-child or not are dummy variables: 0 = boy, 1 = girl; 0 = only child, 1 = not only child; *p < 0.05, **p < 0.01, ***p < 0.001, the same below

Table 2 Regression analysis of variable relationships in the serial mediation model

Regression equation		Overall fit index			Significance of regression coefficients	
Outcome Variables	Predictive variables	R	R2	F	β	t
parent–child conflict	Parental phubbing	0.268	0.072	18.900***	0.253	7.096***
	Only-child or not				0.047	1.316
	Age				0.096	2.701**
Negative emotions	parent–child conflict	0.585	0.343	95.603***	0.514	16.562***
	Parental phubbing				0.181	5.814***
	Only-child or not				0.030	1.004
	Age				-0.022	-0.734
Social withdrawal	Negative emotions	0.384	0.148	25.368***	0.102	2.418*
	parent–child conflict				0.279	6.727***
	Parental phubbing				0.065	1.783
	Only-child or not				-0.081	-2.367*
	Age				0.053	1.547

Table 3 Analysis of the mediating effects of parent–child conflict and negative emotions

Pathway	Indirect effect	Boot SE	Boot CI Lower	Boot CI Upper	Relative me-diation effect
Total indirect effect	0.125	0.021	0.086	0.169	61.27%
Parental phubbing → parent–child conflict → social withdrawal	0.087	0.019	0.053	0.127	42.65%
Parental phubbing → negative emotions → social withdrawal	0.022	0.010	0.004	0.044	10.78%
Parental phubbing → parent–child conflict → negative emotions → social withdrawal	0.016	0.007	0.003	0.031	7.84%

effect analysis, only-child or not and children's age were included as control variables.

The serial mediating effect of parent–child conflict and negative emotions

Regression analysis was employed to examine the impact of parental phubbing on social withdrawal, and the results showed that parental phubbing significantly positively predicted social withdrawal ($\beta = 0.168$, $p < 0.001$). Using Model 6 (the serial mediation model) from Hayes' PROCESS macro, the non-parametric percentile bootstrap method was employed to test the mediation effect. After controlling for only-child or not and children's age, the mediating roles of parent–child conflict and negative emotions in the relationship between parental phubbing and social withdrawal were examined. The results

showed that parental phubbing significantly positively predicted parent–child conflict ($\beta = 0.253$, $p < 0.001$). Both parental phubbing ($\beta = 0.181$, $p < 0.001$) and parent–child conflict ($\beta = 0.514$, $p < 0.001$) significantly positively predicted negative emotions. Parent–child conflict ($\beta = 0.279$, $p < 0.001$) and negative emotions ($\beta = 0.102$, $p < 0.05$) significantly positively predicted social withdrawal. However, after adding mediator variables, parental phubbing did not directly predict social withdrawal ($\beta = 0.065$, $p > 0.05$) (see Table 2).

The mediation effect analyses (Table 3; Fig. 1) showed that parent–child conflict and negative emotions served as both individual and serial mediators between parental phubbing and social withdrawal. Specifically, the indirect effect value of the pathway from parental phubbing to parent–child conflict to social withdrawal was 0.087.
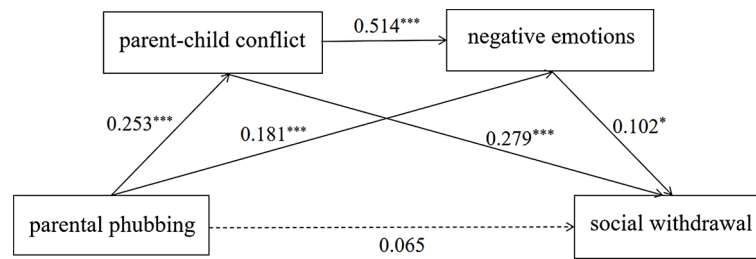
Fig. 1 Serial mediation effects of parent–child conflict and negative emotions

The indirect effect value of the pathway from parental phubbing to negative emotions to social withdrawal was 0.022. Lastly, the indirect effect value of the pathway from parental phubbing to parent–child conflict to negative emotions to social withdrawal was 0.016. The total indirect effect value was 0.125, accounting for 61.27% of the total effect (0.204). The 95% confidence intervals for each mediation pathway did not include zero, indicating that all the mediation effects were statistically significant.

Discussion

On the basis of Family System Theory [4] and Risky Family Model [5], the present study investigated the effects of parental phubbing on young children's social withdrawal, as well as the mediating role of parent–child conflict and young children's negative emotions. The findings revealed that parental phubbing significantly predicted young children's social withdrawal, but the direct predictive effect was not significant after the addition of the mediating variable, suggesting that parental phubbing can indirectly contribute to young children's social withdrawal through parent–child conflict and young children's negative emotions.

The effect of parental phubbing on children's social withdrawal

The current study revealed that parental phubbing positively predicted young children's social withdrawal, which is consistent with the findings of previous studies [10, 12]. This finding may be explained by the fact that parents allocate more of their attention to their mobile phones when parental phubbing arises, ignoring their children's verbal, expressions and behaviors, and further lacking positive and effective verbal and eye contact with their children. In this process, they may overlook the important information in the children's expressions and request them to re-express the information or cope with the situation, resulting in the children gradually losing the willingness to express themselves, preferring to play alone, and ultimately becoming social withdrawal. In addition, the more frequent parental phubbing was, the stronger the children's feelings of being neglected, left out and isolated, leading to the development of internalized problematic behaviors, including social withdrawal. The other

reason may be that children are poorly emotionally regulated. When faced with the act of parental phubbing, they may express their dissatisfaction through problematic behaviors, such as withdrawal, to attract their parents' attention [45]. In addition, the direct effect of parental phubbing on young children's social withdrawal was not significant after the addition of mediating variables, indicating that there are several mediating variables (e.g. parent–child conflict, young children's negative emotions) between parental phubbing and young children's social withdrawal.

The mediating role of parent–child conflict

These findings suggested that parent–child conflict mediates the relationship between parental phubbing and children's social withdrawal, which were not only consistent with the results of previous studies [45] but could also be explained by Risky Family Model [5]. The reason for this is that parental phubbing, which is characterized by indifference, unsupportiveness and neglect, is a family risk factor that may lead to parent–child conflict, which is also a conflictual characteristic of the risky family model. Parent–child conflict may influence children's social withdrawal [1, 5]. On the one hand, when parents' phubbing occurs, the mobile phone distracts parents' attention from their children, which leads to a decrease in positive parent–child interactions [46], and some parents may respond negatively, incorrectly, or even outrightly ignore their children's needs, which triggers young children's dissatisfaction thus leading to parent–child conflict. On the other hand, parents who are addicted to mobile phones do not want to be disturbed by the other, and when they are disturbed by their children, some parents may display impatience and irritability, which can lead to parent–child conflict [25]. Therefore, young children in parent–child conflict environments are prone to negative emotions such as frustration and anxiety, reduce their willingness to communicate with their parents [37], and are more prone to social withdrawal when facing new environments [38]. Consequently, parents should cultivate positive, warm, and supportive parent–child relationships with their children to provide a favourable family environment for the healthy development of their mental health.

The mediating role of children's negative emotions

On the basis of the quantitative analysis, this research suggested that children's negative emotions mediate the relationship between parental phubbing and children's social withdrawal. In other words, the more frequent parental phubbing was, the more likely it was to induce negative emotions in young children, leading to social withdrawal. This finding was consistent with previous research [10]. Expectation Violation Theory explains that when parents engage in phubbing, it reduces the quality of parent–child communication, thereby undermining young children's basic psychological needs. When these needs are not met, negative emotions arise in children. Furthermore, empirical research has confirmed that extensive media use by caregivers is associated with emotional issues in children and adolescents [28, 47]. When faced with parental phubbing, young children do not feel love, warmth, or support from their parents, leading to negative emotions such as sadness, disappointment, and a sense of loss, which manifests as emotional instability. Parental phubbing during parent–child interactions can easily cause children's aversion, with some children exhibiting angry emotional responses and even adopting extreme behavior in response to parental phubbing [48]. On the one hand, children focus solely on themselves due to negative emotions, which leads to excessive concentration on distress, making it difficult to engage with peers' communication and thus choosing to be alone and play alone. On the other hand, children have weaker emotional regulation and management competencies and lack effective strategies to regulate their emotions, thus they may resort to withdrawal to alleviate negative emotions.

Furthermore, the results of the mediation effects across different pathways indicated that the mediating role of parent–child conflict was stronger, while the impact of children's negative emotions were relatively weaker, suggesting that the family environment (parent–child conflict) exerted a stronger mediating effect than the individual characteristics of the child (negative emotions). Parental phubbing predominantly influences young children's social withdrawal through the mediation of parent–child conflict. Young children's negative emotions, as an individual factor, were found to be more influenced by parent–child conflict than by parental phubbing. In other words, parent–child conflict is more likely to trigger negative emotions in young children compared to parental phubbing.

Serial mediation of parent–child conflict and children's negative emotions

We also found that parent–child conflict and children's negative emotions serve as a serial mediating model between parental phubbing and children's social withdrawal. Specifically, increased parental phubbing is more likely to provoke parent–child conflict, which in turn leads to children's negative emotions, resulting in social withdrawal. This is consistent with the perspective of the risk family model, which posits that parental phubbing—characterized by neglect, indifference, and lack of support—directly leads to parent–child conflict, characterized by conflictual and aggressive interactions. These risk factors subsequently trigger negative emotions in young children. However, the ability to be alone is an important indicator of emotional maturity [49] and can alleviate negative emotions. In other words, young children may engage in social withdrawal to mitigate their negative emotions. Once a conflictual parent–child relationship is established, both parents and children may express negative emotions. This strain, coupled with the children's reduced perception of parental love, warmth, and support, further exacerbates the emergence of negative emotions, distortions in emotional understanding and expression, and failures in emotional control and regulation [50]. Therefore, prolonged parental phubbing may lead young children to live in a long-term conflict-ridden family environment, and negative emotions may persist as a result, ultimately leading to emotional outcomes directed towards themselves or others, or both. When directed inwards, this may result in internalizing problem behaviors such as social withdrawal [51]. From a neurological perspective, negative emotions such as fear induced by conflicts in young children can lead to increased frontal delta-beta coupling [52]. Young children exhibiting higher levels of frontal delta-beta coupling tend to experience greater anxiety and social withdrawal [53, 54]. The mediating roles of parent–child conflict and children's negative emotions deepen our understanding of the underlying mechanisms of parental phubbing in young children's social withdrawal. This finding supports previous research on the influence of family risk factors on young children's social withdrawal from both theoretical and empirical perspectives.

Implications and limitations

First, this study advances our understanding of how family risk factors (parental phubbing) indirectly influence child development outcomes (social withdrawal) through family factors (parent–child conflict) and individual child factors (negative emotions). This contributes theoretically to clarifying the influence mechanisms of parental phubbing on young children's social withdrawal. Additionally, this study is the first to introduce parental phubbing into the risk family model, further extending the model's applicability. Second, parents should be vigilant about their phubbing and recognize the negative impact on the parent–child relationship. In the screen era, parents need to consistently regulate their phubbing with

their young children. This will help build a supportive family environment conducive to healthy child development. Additionally, parents should actively guide their children's negative emotions, teaching them effective emotion regulation strategies to prevent behavior problems such as social withdrawal that may arise from prolonged or chronic negative emotions. Finally, this study can offer useful guidance for education and intervention strategies addressing children's social withdrawal.

This study also has several limitations. First, this study employed a cross-sectional design, collecting data on the variables at a single time point, which makes it challenging to accurately verify causal relationships between the variables. Future research could adopt a longitudinal design to conduct a more in-depth exploration. Second, the data for this study were all from parent reports with a single source. Future research could use various data collection methods, such as experimental methods or observation methods, to collect relevant data. Third, due to the insufficient sample of fathers, this study did not examine parental phubbing separately. Future research should investigate whether there is a significant difference in the impact of fathers' phubbing and mothers' phubbing on preschool children's development.

Conclusion
In summary, the current study examined the relationship between parental phubbing and social withdrawal in young children. Our findings suggest that parental phubbing (1) is significantly positively correlated with young children's social withdrawal, (2) can influence young children's social withdrawal through the independent mediating roles of parent–child conflict and children's negative emotions, and (3) can indirectly affect young children's social withdrawal through the serial mediating roles of parent–child conflict and children's negative emotions. This study enhances our understanding of the mechanisms linking parental phubbing and social withdrawal in preschool children, helping parents focus on the negative aspects of phubbing and use their phones rationally. In addition, our results provide insightful coping strategies for preventing and intervening in social withdrawal among preschool children.

Declarations

Ethics approval and consent to participate
This manuscript is not under review elsewhere, and the results have not been published previously or accepted for publication. All methods were carried out in accordance with relevant guidelines and regulations. All participants provided written informed consent for their participation, and their legal guardians gave approval. This study received ethical approval from the Ethics Committee of Northeast Normal University.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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