

# Influence of Maternal Mobile Phone Addiction on Preschool Child Neglect in Urban China: A Cross-Sectional Study

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## Abstract

**Objective:** The primary aim of this study is to explore the association between maternal mobile phone addiction and preschool child neglect in urban areas of China across a large sample range. **Methods:** A school-based sampling survey and a self-administered questionnaire were used to collect relevant information from 1,126 urban preschool children's mothers in northern China. Binary logistic regression analysis and multiple linear regression analysis were employed to determine the significant differences and correlations between maternal mobile phone addiction and preschool child neglect. **Results:** The prevalence of preschool child neglect in urban areas was 42.3%, and the average degree of child neglect was  $43.69 \pm 9.34$ . Besides, the rate of mobile phone addiction for mothers was 45.5%. The prevalence of child neglect for children whose mothers was addicted to mobile phones were considerably higher than for those whose mothers were not addicted, and the difference was statistically significant ( $P < 0.01$ ). The average degree of child neglect for children whose mothers suffered from mobile phone addiction was higher than for those who did not ( $P < 0.01$ ). Binary logistic regression analysis confirmed that maternal mobile phone addiction ( $OR = 2.510$ , 95% CI = 1.919 - 3.282) was a risk factor for child neglect. **Conclusion:** The problem of maternal mobile phone addiction in Chinese urban areas is serious, and it greatly increases the risk of child neglect. Therefore, effective precautions should be taken to protect preschool children from maternal neglect.

## Keywords

Urban Preschool Children, Child Neglect, Maternal Mobile Phone Addiction

## 1. Introduction

In recent years, with the development of the internet, a growing number of people are beginning to suffer from mobile phone addiction (Li et al., 2020). Mobile phone addiction refers to when improper or excessive use of mobile phones hinders individual psychological or social functions, thus affecting regular life. The current generation of young parents, who grew up with the development of the internet, habitually use mobile phones when they accompany their children. When parents use their mobile devices in front of infants, they are physically present but most likely distracted and unresponsive. This parental indifference may have negative consequences on the social-emotional development of children (Sarah et al., 2017).

Parental mobile phone addiction not only negatively influences their own health but also has a detrimental effect on their child's physical and mental development. Some studies have found that mobile phone addiction can have various adverse effects on the individual body and mind. It is physiologically related to carpalometacarpal arthritis (Ming et al., 2006) and sleep problems (Lee et al., 2017), and psychologically related to negative emotions such as anxiety and depression (Chen et al., 2016; Jun, 2016). Mobile phone addiction will reduce the coordination of family members in cooperation, hinder the interaction between husband and wife, and reduce the quality of joint parenting, intimacy, and satisfaction between husband and wife (Mcdaniel & Coyne, 2016). This kind of bad parent-child relationship or family atmosphere will affect the development of the parent-child relationship. When the mobile phone addiction of children's parents is more serious in the family, they can't respond to children and other family members in time, and can't meet the emotional needs of children and family members in time. In the long run, it will lead to disharmony in the family atmosphere and reduce the intimacy of family members, which will affect the parent-child attachment relationship and even more children's problems.

Due to most parents are working every day, they are busy during working hours and seldom use mobile phones excessively, but when they return to family life, there will be a lot of fragmented time, so many children's parents spend this time using mobile phones. Research shows that about half of parents will use mobile phones during their interaction with their children (Blackman, 2015). Some studies have pointed out that in the family, parents use mobile phones with high frequency and low-quality parent-child communication, which reduces children's sense of family belonging and makes children show more problem behaviors (Mcdaniel & Radesky, 2018). In some cases, parental negligence can even lead to accidents involving their children in the home, including non-intentional burns (Loos et al., 2021). Research has also shown that the action of parents bowing their heads to look at their phones can have serious consequences, affecting the parent-child relationship and leading to problematic behaviour in children (Yang, 2020). Nearly a quarter of parents are addicted to smartphones, which prevents parents from attending to their children, thus in-

creasing the risk of accidents or loss (Wang, 2016).

However, there are no reports on whether the addictive behaviour of parents of preschool children has an impact on child neglect and to what extent. In China, the primary caregiver for children is generally the mother, so in this study, we selected the mothers of preschool children in Tangshan city as the survey subjects. Through an anonymous questionnaire survey, we assessed the current situation to determine the influence factors of preschool child neglect by analysing the correlation between maternal mobile phone addiction and child neglect.

## 2. Material and Methods

### 2.1. Study Design

The Ethics Review Board of North China University of Science and Technology approved the study design (15,069). We implemented a school-based three-stage random cluster sampling in Tangshan, Hebei province. The study population was chosen as children aged 3 to 6 years and attending nursery schools in Tangshan. In the first stage of sampling, the main two districts were selected from the Tangshan jurisdiction. In stage two, two nursery schools, one public and one private were randomly selected. In the final stage, the three grades within the chosen nursery schools were completely determined, and the mothers of 3 - 6-year-old students within the determined classes were chosen as eligible study subjects.

Simple random sampling probability was used to estimate the required sample size. Based on the literature, the prevalence of child neglect in preschool children aged 3 to 6 years in Tangshan city is 36.4%, according to the formula

$$n = 400 \times q/p,$$

where  $p$  is the prevalence of child neglect and  $q = 1 - p$ . Therefore, the estimated ideal sample size is 699 people in the urban area. The sampling error for multi-stage clustered sampling is higher than simple random sampling, so we chose a conservative design effect value of 2 to multiply the sample size, resulting in an adjusted required sample size of 1048.

The survey was conducted between 2<sup>nd</sup> June and 20<sup>th</sup> June 2021. In the four selected nursery schools, we successfully interviewed a total of 1500 eligible participants and included 1126 subjects who provided complete information in the final analysis of this study.

### 2.2. Measurements

The self-administered questionnaire was used to collect relevant information from the participants. It was a comprehensive survey containing different sections that measured the general characteristics of households and mobile phone use, mobile phone addiction index (MPAI), and child-neglect scale. This study included data from the following sections.

### 2.2.1. General Characteristics

In this self-developed section, we asked factual questions of the respondents concerning demographics (such as sex, age, etc.), maternal status (occupation, educational level, etc.), family status (annual household income, housing area, the character of the parent and child, etc.), and social support (parental attitude towards education, closeness of family members, etc.).

### 2.2.2. Information on Child Neglect

For this section, we applied the evaluation questionnaire of urban children aged 3 to 6 years in China prepared by Prof. Pan (Pan et al., 2003). The scale consisted of five elements of neglect: physical, emotional, educational, safety, and medical neglect, with a total of 91 items. The method in the neglect norm of urban children aged 3 to 6 in China was used for evaluation (Pan et al., 2003). Using the scale, we calculated the scores of the various components of neglect and the total neglect scores of the respondents. Higher scores reflected more serious extents of neglect, and if the score exceeded the specified threshold point in any component, it was deemed that the child had been neglected. The situation of neglect was reflected by both the rate of neglect and the average degree of neglect. The rate of neglect was equal to the number of neglected children divided by the total number of children surveyed, expressed as a percentage, indicating the frequency of child neglect. The average degree of neglect signified the total neglect score of a certain child (or the score of a particular element) divided by the full neglect score (or the full score of that component) and multiplied by 100, indicating the extent of child neglect. For the overall scale, internal reliability was 0.94, split-half reliability was 0.88, test-retest reliability was 0.77, and structural validity was 0.93.

### 2.2.3. Mobile Phone Addiction Index

In this study, we adopted the mobile phone addiction index (MPAI), compiled by Prof. Leung of the Chinese University of Hong Kong (Leung, 2008). The scale contained 17 items and was divided into four dimensions: out of control (items 1 to 7, total score: 5 to 35), withdrawal (items 8 to 12, total score: 5 to 35), avoidance (items 13 to 15, total score: 3 to 15), and inefficiency (items 16 and 17, total score: 2 to 10). The evaluation was divided into five categories: from almost never (1 point) to always (5 points). Higher scores represented higher degrees of mobile phone addiction. The addiction index was divided into three levels, with a total score of 34 to 51 representing mild mobile phone addiction, 52 to 68 for moderate mobile phone addiction, and 69 to 85 signifying severe mobile phone addiction. The Cronbach's alpha value for internal consistency was 0.85 (Bootstrap 95% CI: 1.945 - 3.332).

## 2.3. Data Management and Statistical Analysis

Pre-trained graduate students used EpiData 3.1 to perform double entries of the survey data. Entry discordances were compared and examined before we performed the data analysis. To delineate the distributional characteristics of the

study subjects, we utilised descriptive statistics. Besides, we applied statistical tests, mainly comprising the *t*-test and chi-squared test, to compare differences between the subgroups. We also used univariate and multivariate logistic regression analysis, as well as multiple linear regression analysis, to evaluate crude and adjusted associations between child neglect and maternal mobile phone addiction. Because of the unequal sampling probability inherent in clustering sampling design, we calculated all descriptive and analytical statistics using design-based methods. The significance level for the remaining statistical inferences was set as a two-tailed *p*-value less than 0.05. We employed SPSS software (version 25.0) to perform the statistical analysis and used the “Survey” package to compensate for the effects of cluster sampling.

### 3. Results

#### 3.1. General Features of Study Subjects

Among these participants, there were 548 boys and 578 girls, and their ages ranged from 3 to 6 years, with an average age of  $4.9 \pm 0.9$  years. Besides, 61.8% of the children were the only child and 75.3% of them were the eldest child in the family. Regarding personality, most were moderate or extroverted, accounting for 92.9%. The age of the mothers ranged from 23 to 49 years, with an average age of  $33.4 \pm 4.5$  years. Company employees accounted for the largest proportion of maternal occupations, at 25.7%, and a vast majority of mothers were in good health. Besides, 96.4% of the mothers had a moderate or extroverted personality. The general features of the 1126 participants are summarized in **Table 1**.

#### 3.2. Child Neglect Analysis

The prevalence of preschool child neglect in Tangshan city was 42.3% (476 of 1126), and the average degree was  $43.69 \pm 9.34$ . The neglect rates for boys and girls were 42.7% (234/548) and 41.9% (242/578) respectively, while the average degrees of neglect were  $44.19 \pm 9.57$  for boys and  $43.21 \pm 9.10$  for girls. We established that there was no significant difference in the prevalence and average degree of neglect between boys and girls ( $\chi^2 = 0.080$ ,  $P = 0.778$ ,  $t = 1.750$ ,  $P = 0.209$ ). By considering the rate of neglect and average degree of neglect as dependent variables, 20 factors were analysed using univariate analysis. Ultimately, we selected 17 statistically significant influencing factors of child neglect, which are presented in **Table 1**.

#### 3.3. Maternal Mobile Phone Addiction

The prevalence of mobile phone addiction (MPIA score greater than 34 points) for mothers of preschool children in Tangshan city was 45.5% (512/1126). More specifically, the rate of mild addiction (MPIA: 34 to 51) was 40.0% (450/1126), moderate addiction (MPIA: 52 to 68) was 4.9% (55/1126), and severe addiction (MPIA: 69 to 85) was 0.6% (7/1126). **Table 2** displays detailed information regarding mobile phone addiction rates.

**Table 1.** Univariate analysis of child neglect in Tangshan, China, 2021.

Features	Subgroup	Number	Prevalence [n, (%)]	Average degree ( $\bar{x} \pm s$ )
Child's age (years)	3	49	14 (28.6)	43.59 $\pm$ 9.08
	4	338	138 (40.8)	44.01 $\pm$ 9.47
	5	386	156 (40.4)	43.24 $\pm$ 9.60
	6	353	168 (47.6)	43.88 $\pm$ 8.98
$\chi^2/F$			8.698*	0.480
The only child	Yes	696	328 (47.1)	44.63 $\pm$ 9.86
	No	430	148 (34.4)	42.17 $\pm$ 8.21
$\chi^2/t$			17.589**	4.334**
Child's ranking	Eldest child	848	383 (45.2)	44.20 $\pm$ 9.59
	No eldest child	278	93 (33.5)	42.13 $\pm$ 8.36
$\chi^2/t$			11.768**	3.221*
Child's personality	Introverted	80	63 (78.8)	51.83 $\pm$ 9.28
	Moderate	465	203 (43.7)	44.16 $\pm$ 9.15
	Extrovert	581	210 (36.1)	42.19 $\pm$ 8.88
$\chi^2/F$			52.926**	41.237**
Mother's age	20-	212	119 (56.1)	47.22 $\pm$ 9.99
	30-	782	316 (40.4)	43.11 $\pm$ 9.09
	40 - 49	132	41 (31.1)	41.47 $\pm$ 8.25
$\chi^2/F$			24.600**	21.121**
Mother's occupation	Unskilled worker	120	69 (57.5)	47.31 $\pm$ 9.74
	Teacher, medical staff, civil servant	272	135 (49.6)	45.75 $\pm$ 10.67
	Company employee	289	110 (23.1)	42.35 $\pm$ 8.06
	Business owner	186	74 (15.5)	43.19 $\pm$ 9.37
	Unemployed or other	259	88 (34.0)	41.70 $\pm$ 8.04
$\chi^2/F$			27.315**	12.894**
Mother's health	Good	1090	451 (41.4)	43.49 $\pm$ 9.27
	Average or poor	36	25 (69.4)	49.74 $\pm$ 9.69
$\chi^2/t$			11.251**	-3.978**
Mother's personality	Introverted	40	32 (80.0)	50.41 $\pm$ 9.31
	Moderate	534	219 (41.0)	43.74 $\pm$ 8.89
	Extrovert	552	225 (40.8)	43.15 $\pm$ 9.59
$\chi^2/F$			24.196**	11.465**

## Continued

Family types	Nuclear family	748	322 (43.0)	43.76 ± 9.59
	Extended family	333	129 (38.7)	43.03 ± 8.61
	Single parent or other	45	25 (55.6)	47.31 ± 9.73
$\chi^2/F$			5.142	4.256*
Family members supported in the most recent year	≤3	565	264 (46.7)	44.43 ± 9.83
	4-	362	140 (38.7)	42.69 ± 8.70
	≥5	199	72 (36.2)	43.41 ± 8.88
$\chi^2/F$			9.538**	3.957*
Average monthly income	≤5000	279	144 (30.3)	46.18 ± 9.97
	5001-	557	234 (49.2)	43.69 ± 9.23
	10,000-	290	98 (20.6)	41.29 ± 8.26
$\chi^2/F$			18.535**	20.164**
Family member relationship	Harmonious	1030	411 (39.9)	43.21 ± 9.25
	Average or reserved	96	65 (67.7)	48.77 ± 8.76
$\chi^2/t$			27.822**	0.666
Primary caregiver	Both parents	851	340 (40.0)	43.15 ± 9.28
	Not both parents	275	136 (49.5)	45.35 ± 9.36
$\chi^2/t$			7.689**	-3.406**
Educational approach	Persuasive	571	245 (42.9)	43.73 ± 9.84
	Disciplinarian	13	10 (76.9)	51.88 ± 8.56
	Combination of the two methods	542	221 (40.8)	43.44 ± 8.72
$\chi^2/F$			6.989*	5.233**
Educational attitude towards children	Consistent	462	182 (39.4)	43.08 ± 10.07
	Essentially consistent	630	271 (43.0)	43.85 ± 8.64
	Inconsistent	34	23 (67.6)	48.89 ± 10.09
$\chi^2/F$			10.682**	6.420**
Foster care for more than 1 year	Yes	48	30 (62.5)	49.66 ± 9.63
	No	1078	446 (41.4)	43.42 ± 9.24
$\chi^2/t$			8.405**	4.569**
Mobile phone addiction	Yes	512	294 (57.4)	41.23 ± 8.35
	No	614	182 (29.6)	46.63 ± 9.61
$\chi^2/t$			88.293**	-10.090**

**Table 2.** Fitting results for the association between maternal mobile phone addiction and the prevalence of child neglect.

Variables	No addiction (n = 614)	Addiction (n = 512)	$\chi^2$	<i>P</i>
PH	95 (15.5)	117 (22.9)	9.948	0.002
EM	83 (13.5)	230 (44.9)	137.186	<0.001
ED	34 (5.5)	57 (11.1)	11.767	0.001
SA	100 (16.3)	146 (28.5)	24.453	<0.001
ME	49 ( 8.0)	89 (17.4)	22.952	<0.001
TOTAL	182 (29.6)	294 (57.4)	88.293	<0.001

### 3.4. Maternal Mobile Phone Addiction and Child Neglect

For children whose mothers were addicted to mobile phones, the total and all levels rate of child neglect were higher than for those whose mothers did not suffer from addiction, and the difference was statistically significant ( $\chi^2 = 88.293$ , 9.948, 137.186, 11.767, 24.453, 22.952,  $P < 0.01$ ). Greater degrees of maternal mobile phone addiction resulted in a more severe impact on the total rate of child neglect and the extent of emotional neglect, with statistically significant difference ( $\chi^2 = 22.721$ , 36.384,  $P < 0.001$ ). Maternal mobile phone addiction had the greatest influence on emotional neglect, followed by safety neglect, but the lowest effect on education neglect. The total score of maternal mobile phone addiction and the dimensions of out of control and inefficiency were all positively correlated with the average degree of neglect in every element of neglect as well as the total rate of neglect, as **Tables 2-4** illustrate.

### 3.5. Multivariate Logistic Regression Analysis of the Prevalence of Child Neglect

The dependent variable was whether children suffered from neglect (no = 0, yes = 1), and we selected the statistically significant factors as independent variables by univariate analysis (inclusion criteria  $\alpha = 0.05$ , rejection criteria  $\alpha = 0.10$ ). The results of the multivariate logistic regression analysis (forward method) showed that the risk factors of urban preschool child neglect included older children, introverted children, younger mothers, occupations as unskilled workers, teachers, medical staff, or civil servants, mothers with average or poor health status, average or poor family relationships, and maternal mobile phone addiction ( $P < 0.05$ ). **Table 5** presents more information regarding these risk factors.

### 3.6. Multiple Linear Regression Analysis of the Average Degree of Child Neglect

By considering the average degree of child neglect as the dependent variable and the statistically significant factors selected by single-factor analysis as the independent variables, we conducted a multiple linear regression analysis. The results presented in **Table 6** indicate that the factors affecting the average degree of



**Table 3.** Fitting results for the influence of different levels of maternal mobile phone addiction on child neglect.

Variables	Mild addiction (n = 450)	Moderate-severe addiction (n = 55)	$\chi^2$	<i>P</i>
PH	106 (23.6)	11 (17.7)	1.045	0.307
EM	180 (40.0)	50 (80.6)	36.384	<0.001
ED	52 (11.6)	5 (8.1)	0.671	0.413
SA	133 (29.6)	13 (21.0)	1.972	0.160
ME	82 (18.2)	7 (11.3)	1.823	0.177
TOTAL	241 (53.6)	53 (85.5)	22.721	<0.001

**Table 4.** Fitting results for the association between maternal mobile phone addiction and the average degree of child neglect.

Variables	Total score	Out of control	Withdrawal	Avoidance	Inefficiency
PH	0.099**	0.150**	0.022	0.024	0.144**
EM	0.438**	0.478**	0.259**	0.245**	0.431**
ED	0.085**	0.123**	0.040	0.018	0.081**
SA	0.108**	0.150**	0.043	0.032	0.127**
ME	0.136**	0.173**	0.061*	0.057	0.152**
TOTAL	0.338**	0.389**	0.189**	0.171**	0.337**

Note: \* indicates  $P < 0.05$ , \*\* indicates  $P < 0.01$ .

**Table 5.** Multivariate logistic regression fitting results for the association between maternal mobile phone addiction and child neglect.

Variables	$\hat{\beta}$	<i>SE</i>	<i>Wald</i> $\chi^2$	<i>P</i>	<i>OR</i> ( <i>OR</i> 95% <i>CI</i> )
Child's age	0.296	0.079	14.189	<0.001	1.345 (1.153 - 1.568)
Child's personality (compared with "extrovert")					
Introverted	1.347	0.317	18.076	<0.001	3.844 (2.066 - 7.151)
Mother's age	-0.428	0.138	9.613	0.002	0.652 (0.497 - 0.854)
Mother's occupation (compared with "unemployed or others")					
Unskilled workers	0.843	0.250	11.353	0.001	2.324 (1.423 - 3.795)
Teachers, medical staff, civil servants	0.509	0.200	6.513	0.011	1.664 (1.125 - 2.460)
Mother's health: average or poor	0.902	0.424	4.528	0.033	2.464 (1.074 - 5.655)
Family relationship: average or reserved	0.898	0.258	12.167	<0.001	2.456 (1.482 - 4.068)
Mobile phone addiction	0.934	0.137	46.327	<0.001	2.546 (1.945 - 3.332)

**Table 6.** Multiple linear regression fitting results for the association between maternal mobile phone addiction and child neglect.

Variables	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>P</i>
Child's personality: introverted	-2.267	0.446	-0.151	-5.083	<0.001
Mother's age	-1.800	0.517	-0.106	-3.480	0.001
Mother's occupation: unskilled worker	-0.898	0.198	-0.126	-4.528	<0.001
Average monthly income: low	-1.743	0.408	-0.120	-4.272	<0.001
Educational attitude: inconsistent	1.100	0.483	0.064	2.277	0.023
Mobile phone addiction	3.937	0.535	0.210	7.357	<0.001

neglect of urban preschool children included introverted children, younger mothers, maternal occupation as unskilled workers, low average monthly income, inconsistent educational attitude, and mobile phone addiction, among others.

#### 4. Discussion

The results of this study revealed that the prevalence of preschool child neglect in urban areas of Tangshan was 42.3%, and the average degree was  $43.69 \pm 9.34$ . This was noticeably higher than the survey results of children aged 3 to 6 in urban areas of China in 2002 and demonstrated that the frequency and intensity of preschool child neglect in urban areas of Tangshan were much higher than the national level (28.0%, 42.2; Pan et al., 2005). It was also considerably higher than the rate of neglect of children aged 3 to 6 years in nine urban districts of Chongqing (22.95%) in southwest China (Zhou et al., 2015), Xinyang city (31.7%) of Henan province in central China (Zhao & Zhang, 2013), Jiamusi city (34.43%) in northeastern Heilongjiang province (Zhang et al., 2015), and ten cities in the Pearl River Delta (35.31%) of Guangdong province, southern China (Wang et al., 2012). Child neglect continued to be the most commonly reported form of child maltreatment, which affected almost 30 children out of every 1000 in the United States, accounting for 70% of all reported abuse victims in that country (Sedlak & Broadhurst, 1996). It was estimated that there were 826,000 victims of child abuse in the United States in 1999, of which 58.4% suffered from child neglect (Child Welfare League of America, 2001).

This study revealed that the prevalence and average degree of child neglect in all aspects were higher for mothers with mobile phone addiction than those without. In addition to the total average degree of child neglect, the emotion, safety, and medicine average degree of child neglect for mothers with mobile phone addiction were higher than those who were not addicted. This confirmed that maternal mobile phone addiction was a risk factor for child neglect, which might be due to addiction to short video apps, mobile games, or WeChat (Montag et al., 2018). As a result, young mothers did not spend enough time accompanying their children and lacked communication with their children. This in-

sufficient companionship harmed the parent-child relationship (Liao et al., 2017), increasing the risk of child neglect (Zhou et al., 2020; Radesky et al., 2016). Generally, previous empirical research concerning child neglect primarily focused on mothers who neglected their children. Therefore, much more information was known regarding the mothers' role in child neglect (Marianne et al., 2003).

Furthermore, our study revealed that the prevalence of child neglect due to maternal mobile phone addiction was the highest for the elements of emotional neglect, but the lowest for educational neglect. In terms of the average degree of child neglect, maternal mobile phone addiction was the strongest factor in emotion and education neglect, but the weakest in medicine neglect. Maternal mobile phone addiction was most common and had the greatest influence on child neglect. The reason for this might be that in the mobile phone era, addiction to mobile phones is becoming more common. It was inevitable that mothers paid more attention to their mobile phones and gradually reduced daily communication with their children, resulting in a lack of time to consider their child's emotional requirements or safety. At the same time, preschool children's speech function was immature, and might not be able to express their emotional needs in language communication. However, mothers were addicted to mobile phones and could not immediately capture the children's inner thoughts, so children were more vulnerable to emotional neglect. However, mothers in the urban area of Tangshan paid more attention to their child's education. They concentrated on cultivating their child's abilities in all aspects from an early age, to prevent their children from falling behind at the starting line. Additionally, they also focused on their children's health and living habits.

Mobile phone addiction and the neglect of their children's emotional expression and safety not only cause accidents, but also lead children to be unable to share, communicate, encourage, and manage their emotions. After feeling negative emotions, neglected children may not receive timely communication and effective guidance, which can reduce the quality of parent-child communication (Jiang et al., 2021) and cause inner resistance from the children and an aversion to their parents. According to the results of our study, habitual mobile phone use results in less effective communication between mothers and children. This is consistent with previous research, which suggests that greater parental mobile phone use is related to less interaction with children (Radesky et al., 2014) and insensitive or aggressive parental responses to emotional bids for connection (Radesky et al., 2015). During adolescence, emotionally neglected children are less likely to report high levels of self-esteem and more likely to display symptoms of depression (Shah et al., 2021). The relationship between teenagers and their parents is indifferent (Kong et al., 2021), leading to adolescent mobile phone addiction (Lauricella et al., 2015), inattention, or a decline in academic performance, which adversely affects their studies and produces undesirable consequences for their future lives. In addition to emotional and safety neglect,

maternal mobile phone addiction may also result in an unhealthy lifestyle for children. The findings of our study suggested that persistent mobile phone use might reduce the successful restoration of interaction following disruptions and make the child show more problem behaviors. Examples include mobile phone addiction, eye strain caused by long-term staring at mobile phone screens (Maya et al., 2019), unhealthy eating habits (Milkovich et al., 2020), and depression (Yu et al., 2021). Child neglect has been widely acknowledged to impact long-term physical and mental health, including a high risk of schizophrenia and psychosis (Chaiyachati & Gur, 2021).

The key period for child neglect occurs when children are younger, especially from 3 to 6 years old (Milot et al., 2010). This is also a crucial stage during a child's growth and development. According to previous literature, neglected children presented more instances of feeling hurt, sad, or anxious than physically abused, sexually abused, or non-maltreated children (Kathryn & David, 2002). The healthy cultivation of the parent-child relationship is inseparable from maternal meticulous care. For the healthy development of the child's body and mind, mothers should put down their mobile phones, frequently accompany their child, constantly endeavour to improve their relationship, strive to create a warm family atmosphere, and thus reduce the risk of child neglect.

## 5. Conclusion

Our findings contribute to the understanding of the influence of maternal mobile phone addiction on preschool child neglect in urban China. Results from this study indicate that maternal mobile phone addiction mainly has a great impact on children's emotional neglect. The more serious the mother's mobile phone addiction is, the more children will be neglected.

Rational use of mobile phones is more urgent, especially for preschool children's mothers. In terms of prevention, first of all, children's caregivers, especially mothers, should be educated about the rationalization of mobile phone use and the harm of mobile phone addiction, put down their mobile phones, and relax and decompress with children through interactive games and other entertainment activities. The community and society can also increase some entertainment facilities, and vigorously promote parents to accompany their children to exercise and play together.

This study has significant implications for child neglect prevention and intervention programs for parental mobile phone addiction and child protection in urban China. Our research suggests that maternal mobile phone addiction is a potential risk element that should be incorporated into interventions to reduce child neglect and its associated negative consequences in urban areas of China.

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## Contributors

DB conceived the study. DB, PW, LC, LX, and LP collected, verified, and analysed the data. DB drafted the manuscript. All authors provided critical revisions of the manuscript for important intellectual content.

## Conflicts of Interest

The authors have no conflicts of interest to disclose.

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