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The Role of Parent–Child Relationships in Problematic Social Media Use and Mental Health among Chinese Adolescents

Yuxin Jiao

Beijing 101 High School, Beijing, China
jiaoyuxin163@163. com

Abstract. This study asked whether parent–child relationship quality helps explain the association of problematic social media use with self-esteem and depressive symptoms. A cross-sectional survey was completed by 115 high school students in China, aged 15–18. The questionnaire included the Mobile Phone Addiction Index and self-report measures of family relationships and mental health. Pearson correlations and two mediation models were estimated using PROCESS Model 4, one for each outcome. Students with higher problematic-use scores reported poorer parent–child relationships. Better relationship quality was associated with higher self-esteem, and the indirect estimate through relationship quality was significant for self-esteem. The corresponding estimate for depressive symptoms was not significant. The results support examining family relationships when considering adolescent self-esteem in the context of problematic use. They provide less support for the proposed indirect association with depressive symptoms. Measurements taken at a single time point cannot show whether problematic use precedes changes in family relationships or mental health.

Keywords: parent-child relationship, self-esteem, depressive symptoms, social media use

1. Introduction

Adolescents use social media to keep in touch with friends, exchange messages, and look for information [1]. In China, approximately 196 million minors used the internet in 2023, equivalent to 97.3% of the age group, according to the Sixth Survey Report on Internet Use among Minors in China [2]. These figures describe internet access rather than problematic social media use, but they show how widely digital activity is present in young people's lives. Social media can offer entertainment and social support. At the same time, research has raised questions about how problematic use relates to adolescent mental health [3]. Understanding these associations requires attention to adolescents' relationships as well as their online activity.

Social media can enter family life in different ways [4]. Sampasa-Kanyinga et al. found that heavier use was associated with poorer parent–child relationships among adolescents [5]. Time spent online may reduce opportunities to talk at home, and disagreements about excessive use may create further conflict [6, 7]. Yet online communication can also maintain contact between parents and

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children who are apart [8]. Messages about daily activities may give adolescents a way to share concerns and seek support. These possibilities suggest that the family implications depend on how social media is used. Frequent contact with a parent and use that repeatedly interrupts family interaction need not have the same consequences [4].

Parent–child relationships provide one context for understanding adolescent mental health [9]. Difficulties in these relationships have been associated with poorer adjustment, with some reported associations extending beyond adolescence [10]. Limited communication may leave adolescents with fewer opportunities to discuss distress or receive reassurance. Close relationships can offer that support. Consistent with this account, stronger parent connectedness has been linked to fewer depressive symptoms and higher self-esteem [9]. Work on positive parenting has also examined self-esteem alongside problematic social network use [11]. These findings make relationship quality relevant to both outcomes, although they do not establish that the same association will appear in every model.

Family interaction is one of several possible links between digital use and mental health. For example, an adolescent may feel ignored when a parent attends to a phone during a conversation. Studies of parental phubbing have examined parent–child relationships and self-esteem in relation to children's problematic phone use [12]. Online experiences can involve a different set of pressures, including comparison with other users and seeking their approval [1, 13]. Adolescents may also encounter content about depression or suicide. Problematic use may interfere with sleep or schoolwork; sleep difficulties have been examined as a possible connection with mental health [14, 15]. Reviews report associations with depressive symptoms and discuss self-harm and suicidality [3, 16]. Family relationships therefore belong within a wider account of these experiences, rather than serving as an explanation for every psychological difficulty associated with use [14].

The question here is whether family relationship quality accounts for part of the association between problematic social media use and mental health. Previous studies and reviews identify relevant associations, but leave open whether self-esteem and depressive symptoms show the same indirect pattern [5, 17]. Communication and conflict at home may matter because they affect the support available to adolescents. Examining the two outcomes separately in a Chinese sample allows this possibility to be assessed within the setting of the present study. The sample cannot establish whether the pattern applies to other Chinese or East Asian families.

We tested two models with parent–child relationship quality as the proposed mediator. One model examined self-esteem; the other examined depressive symptoms. In each, problematic social media use was the predictor. Figure 1 presents this conceptual model. Keeping the outcomes separate allows us to ask whether the estimated indirect association is supported for each outcome, instead of treating mental health as a single measure. The findings may help families and educators consider how communication at home relates to problematic digital use.

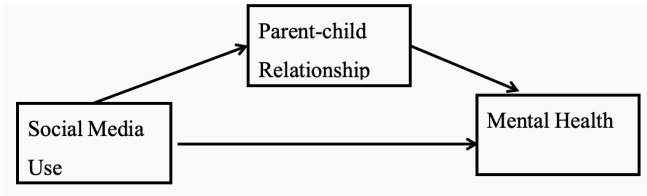

Figure 1. The conceptual model

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2. Methods

2.1. Participants

The sample comprised 115 high school students recruited in China. Ages ranged from 15 to 18 years (M = 17.03, SD = 0.78); 47.83% of participants were male and 52.17% were female. Eligibility was restricted to students within this age range. Before deciding whether to participate, students read the information presented at the start of the survey. Participation was voluntary.

2.2. Procedure

Questionnaires were administered through Wenjuanxing between April and June of the following year. Students first read the instructions and considered their own experiences, a step that took approximately one minute. They then answered the questionnaire items in the order presented. Completion required approximately 5–10 minutes.

2.3. Measures

2.3.1. Social media use addiction

Problematic use was assessed with the Mobile Phone Addiction Index (MPAI), using the Chinese-language version attributed to Leung [18]. Its 17 items cover withdrawal, escapism, loss of control, and inefficiency. Each item is rated from 1 (never) to 5 (always). Examples are "Someone once mentioned that you spend too much time on your mobile phone" and "Your friends and family have expressed concerns to me about your mobile phone usage." Higher MPAI scores indicate more pronounced problematic-use tendencies [18].

2.3.2. Parent-child relationship

Family communication was measured with the 20-item Parent-Adolescent Communication Scale (PACS) [19]. Participants indicated agreement with statements such as "Sometimes I feel hesitant to request things from my parents" and "If I face challenges, I'm able to talk to my parents." Response options ranged from 1 (strongly disagree) to 5 (strongly agree). Items from the Communication Problems subscale were reverse-scored before the total was calculated. A higher total represents more favorable parent–child communication. Internal consistency in this sample was $\alpha = 0.96$ [19].

2.3.3. Mental health

Two self-report instruments assessed the mental health outcomes.

Self-esteem was measured with a 10-item adaptation of the Rosenberg Self-Esteem Scale (RSES) [20]. Participants rated the items on a five-point scale. Example statements were "I feel that I have many good qualities" and "Overall, I am satisfied with myself." Internal consistency was $\alpha = .89$. Depressive symptoms were assessed separately with the 20-item Center for Epidemiologic Studies Depression Scale (CES-D) [21]. The questionnaire asked about experiences during the preceding week, including "I felt depressed" and "I felt lonely." Responses ranged from 1 (rarely or none of the time) to 4 (most or all of the time). Positively worded items were reverse-scored; internal consistency was $\alpha = 0.92$ [21].

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2.4. Analytic strategy

IBM SPSS Statistics was used to summarize the sample, estimate Cronbach's alpha for the scales, and calculate Pearson correlations. Indirect associations were then evaluated using PROCESS Model 4 [22]. Problematic social media use was entered as the predictor and parent–child relationship quality as the mediator. Separate models were estimated for self-esteem and depressive symptoms.

3. Results

The bivariate analyses identified a negative association between problematic social media use and parent–child relationship quality ($r = -0.402$, $p < 0.001$). Self-esteem was positively related to relationship quality ($r = 0.489$, $p < 0.001$) and negatively related to depressive symptoms ($r = -0.295$, $p < 0.001$).

The mediation models included all 115 participants and adjusted for age, gender, and socioeconomic status. Self-esteem and depressive symptoms were analyzed in separate PROCESS Model 4 models. For each indirect association, a 95% confidence interval was estimated from 5,000 bootstrap samples.

In the adjusted models, the coefficient linking problematic social media use with parent–child relationship quality was negative ($b = -.314$, $SE = .095$, $p = .001$). Relationship quality, in turn, had a positive coefficient in the self-esteem model ($b = .313$, $SE = .075$, $p = .001$). Its coefficient in the depressive-symptom model was not statistically significant ($b = -.103$, $SE = -.74$, $p = .165$). For self-esteem, the direct association was significant ($b = -.176$, $SE = 0.078$, $p = 0.026$), and the indirect estimate was −.098 (BootSE = .035, 95% bootstrap CI [−0.172, −0.035]). For depressive symptoms, the direct estimate was marginally significant ($b = .144$, $SE = .076$, $p = .061$). The indirect estimate was .032 (BootSE = .026, 95% bootstrap CI [−0.014, 0.091]).

4. Discussion

The self-esteem model showed an indirect association through parent–child relationship quality. Its confidence interval excluded zero: students with higher problematic-use scores tended to report poorer family relationships, and better relationship quality was associated with higher self-esteem. This pattern is consistent with considering the family relationship measure alongside problematic use when interpreting self-esteem. Woods and Scott reported lower self-esteem among adolescents with greater social media use and emotional investment [15]. Their study measured use and investment, so it does not provide an exact comparison with the present problematic-use measure. Costantini et al. examined positive parenting, self-esteem, and problematic social network use in mediation models [11]. These studies offer context for our result, but neither they nor the present cross-sectional analysis establish the order of influence.

For depressive symptoms, the indirect estimate was not significant because its bootstrap confidence interval included zero. The adjusted association with parent–child relationship quality was also nonsignificant. Thus, this model did not support the proposed indirect association in the sample studied. It would be too broad to conclude that family relationships have no connection with depression. With 115 participants, the estimates may lack the precision needed to detect a small association. A larger sample could improve precision, while measurements at several time points could help assess which changes occur first [23, 24]. These designs would address different

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limitations: sample size concerns uncertainty in the estimates, whereas repeated measurement concerns the timing of the associations.

Parent–child relationship quality accounted for part of the association with self-esteem in this analysis, but the depressive-symptom model did not show a significant indirect estimate. Family communication may be relevant when supporting adolescents who report problematic social media use [4]. The findings do not show that improving communication will, by itself, change either outcome. That practical question requires evidence beyond the present cross-sectional survey.

5. Conclusion

This study explored the mediating role of parent-child relationship quality between problematic social media use and two mental-health outcomes, self-esteem and depressive symptoms, among Chinese high-school adolescents. Based on cross-sectional survey data, our findings suggest that problematic social-media use is linked to lower self-esteem partly through deteriorated parent-child relationships. Yet this family-based indirect pathway was not supported for depressive symptoms in the current sample.

These results remind us that family dynamics should not be overlooked when understanding adolescents' digital-related mental health risks. For educators and parents, improving open family communication may serve as one practical protective factor for teenagers' self-esteem. Nevertheless, given the cross-sectional design and moderate sample size, we cannot draw firm causal conclusions. Future work could adopt longitudinal designs with larger samples to further clarify how digital behaviours and family interactions jointly shape adolescent mental health over time.

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