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Family Economic Strain and Adolescent Aggression during the COVID-19 Pandemic: Roles of Interparental Conflict and Parent–Child Conflict

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Abstract
Although the link from family economic strain to adolescent aggression has frequently been hypothesized, the results are mixed. Both interparental conflict and parent–child conflict are considered to be potential mediators of this link. However, the empirical evidence supporting this proposition is lacking. The present study investigated the direct effect of family economic strain on adolescent aggression as well as indirect effects through interparental conflict and parent–child conflict. Based on multi-informant data from 971 families with a child in middle and high schools in Y City, in Shanxi Province, structural equation modeling is conducted to examine the proposed theoretical model. Findings show that family economic strain has no significant direct impact on adolescent aggression. Interparental conflict and parent–child conflict mediate the link between family economic strain and adolescent aggression simultaneously and sequentially. This study expands current literature and deepens our understanding of the mechanisms underlying the relationship between family economic strain and adolescent aggression. Implications for policies and interventions to reduce the risk of adolescent aggression are discussed.

Keywords Family economic strain · Interparental conflict · Parent–child conflict · Adolescent aggression

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Introduction

The Covid-19 pandemic has had a large economic impact worldwide and millions of children have been pushed further below the poverty line (Save the Children and UNICEF, 2020). Children raised in economically disadvantaged families are at a higher risk for engaging in problem behaviors (Berti & Pivetti, 2019; Voisin et al., 2020), such as aggression (Baker et al., 2020). Especially for adolescents, several developmental changes during this period make them more susceptible to aggression (Yoon et al., 2004; Zimmer-Gembeck et al., 2014). Aggression is defined as a wide rage of behaviors that target another individuals and cause harm intentionally (Anderson & Bushman, 2002). It can be manifested in many types, including physical aggression, verbal aggression, and displays of anger and hostility (Buss & Perry, 1992). A growing body of studies has demonstrated that adolescent aggression adversely affect development, such as poor academic performance and subsequent psychological problems, delinquency and even crime (Chang et al., 2021; Vuoksimaa et al., 2021).

The empirical evidence on the relationship between family economic strain and youth aggression is mixed: some studies have found that family economic strain strongly predict adolescent aggression (Hong et al., 2020; Mazza et al., 2017), while others have found a weak or non-significant relationship (Jiang & Dong, 2020; Kim & Um, 2018). The mixed findings may be explained by variables that mediate the relationship between family economic strain and youth aggression. Some theories and perspectives (e.g., family stress model) have proposed that both interparental and parent–child conflict may be potential mediators between family economic strain and adolescent aggression (Conger et al., 2002; McLoyd & Wilson, 1990), but empirical evidence is lacking. In addition, most of the previous studies on family economic strain are usually based solely on data from children, ignoring the importance of reports from parents (Jiang et al., 2018; Li et al., 2018). Children lack a comprehensive understanding of family economic strain, thus their reports may not reflect the real condition of their family economic strain, while parents are regarded as direct bearers of the family economic strain and perceive those pressure more accurately (Chen et al., 2020). In addition, children may also underreport conflicts with their parents because of social desirability (Benbenishty and Astor, 2005; Munsell et al., 2016), which can inflate the association between variables and reduce the validity of research findings (Boyer & Verma, 2000; Gerard et al., 2006). Therefore, in order to address those shortcomings in previous research and increase research validity, the current study aims at simultaneously exploring the potential mediation roles of interparental conflict and parent–child conflict in the relationship of family economic strain with adolescent aggression using multi-informant data (parent report on family economic strain and parent–child conflict and child report on interparental conflict and aggression).

Literature Review

Family Economic Strain and Adolescent Aggression

Economic strain is defined as an individual's subjective evaluation of his or her economic situation, rather than an objective assessment, including perceptions of financial resources and concerns, and expectations about future economic conditions (Voydanoff & Donnelly, 1988). The link between family economic strain and aggression among adolescent has been hypothesized by several theories. For example, from the perspective of the general strain theory (Agnew, 1999, 2013), family economic strain can result in a series of negative emotions, such as anger and fear, which will increase the risk of maladaptive behaviors. That is, adolescents suffering from family economic strain are highly likely to engage in aggression to release relevant negative emotions. The family adjustment and adaptation response model also asserts that family stressors can reduce the family's ability to perceive resources and coping strategies (Patterson, 1988). Specifically, when parents or caregivers have to face some stressful events such as family economic strain, their ability to cope with the needs of children will be reduced, which increases the likelihood of them having behavior problems (Nebbitt et al., 2014; Voisin et al., 2016).

Although many theories consistently agree on the influence of family economic strain on adolescent aggression, the findings of empirical studies are controversial. For example, Mazza et al. (2017) found that family economic pressure was related to a higher likelihood of physical aggression. Children raised in impoverished families are often exposed to a series of risk factors (e.g., unemployed parents, disrupted parenting and single-parent status) that are related to a greater frequency of aggressive behavior (Baker et al., 2020; Qi & Kaiser, 2003). However, one study conducted by Jiang and Dong (2020) showed that there is no significant direct effect of family economic pressure on juvenile aggression among Chinese middle and high school students. Kim and Um (2018) has also found the non-significant relationship between the two variables. Therefore, the link from family economic strain to adolescent aggression remain unclear.

Interparental Conflict, Parent–Child Conflict and Adolescent Aggression

There are several controversies regarding the nexus between interparental conflict and parent–child conflict: some theories proposes that interparental conflict and parent–child conflict is positively correlated and others support the negative relationship between them. Specifically, according to the spillover hypothesis (Zimet & Jacob, 2001), interparental conflict can cause some emotional distress for both parents, which will deplete their emotional resources and reduce their sensitivity to the needs of their children. This can reduce parental social support for their children, and thus threat the relationship between parents and children (Erel & Burman, 1995). Sherrill et al.(2017) found that parents who often engage in conflict with their spouse are highly likely to experience conflict with their children subsequently. A good relationship between husband and wife is conducive to reducing conflicts

between parents and children (Li et al., 2020). However, some perspectives of the compensatory hypothesis (Engfer, 1988) have proposed that there may also be a negative correlation between marital conflict and parent–child conflict. In families with high level of interparental conflict, parents are inclined to meet their emotional needs from the relationship with their children as a compensation. Accordingly, interparental conflict may enhance the relationship between parents and children. This theoretical dispute remains unresolved, and an exploration of the link between the two types of conflict is appropriate.

Both conflicts between parents and between parents and children are risk factors for adolescent aggression. The standard family environment model (Amato & Cheadle, 2008) assumes that family dysfunction characterized by marital conflict and parent–child conflict increases the risk of a variety of child behavioral problems, including aggression. When children witness conflicts between their parents, exposure to destructive conflict make children highly likely to engage in aggressive behavior (Cummings et al., 2004). Adolescent aggression is severely affected by coercive conflict between parents, because those conflicts shape children's conflict resolution strategies and unwittingly strengthen children's aggressive responses (Ingoldsby et al., 2006; Kazdin, 1992). In addition, some studies also support that parent–child conflicts cause the lack of effective communication and interaction between parents and children, and simultaneously reduce the level of parental support and attachment. Those changes contribute to the increased psychological pressure on children, which then increases the possibility of physical aggression (Iniewicz et al., 2011; Savage, 2014).

Family Economic Strain, Interparental Conflict, Parent–Child Conflict and Adolescent Aggression

Studies have shown that family economic strain is associated with interparental conflict and parent–child conflict (Letourneau et al., 2013; Rouchun et al., 2019; Shen et al., 2013). Parents who are suffering from family economic strain are more likely to experience negative emotions such as anger, fear, and frustration (Agnew, 1992). Due to frequent contact and communication with spouse and children, the resulting tension seems to have direct effect on them, which increases the probability of interparental conflict and parent–child conflict (Paat, 2011). For example, Nepplet al.(2016) found that parents living in a family with financial strain are increasingly likely to attack each other on financial issues, thereby increasing the risk of conflict between them. And compared with other marital conflicts, such economic disputes are longer lasting, more frequent, and are more difficult to resolve (Papp et al., 2009). In addition, family economic strain determines the material conditions and activities that parents can provide for their children (Rouchun et al., 2019). Families with low economic strain have more capital to invest in their children and more time to accompany them, thereby creating a good parent–child relationship (Shi et al., 2013). However, for families under high economic strain, because parents cannot meet the material needs of their children, conflicts between parents and children involving money are expected to occur (McLoyd & Wilson, 1990).

In summary, the controversy regarding the association between family economic strain and adolescent aggression implies that there may be a variety of potential mediating mechanisms underlying this relationship. Interparental conflict and parent–child conflict have been regarded as potential simultaneously and serial mediators of the link between family economic strain and adolescent aggression. There are two main theoretical and emprical arguments supporting this proposition. First, family economic strain can increase interparental conflict and parent–child conflict at the same time (Conger et al., 1993; Neppl et al., 2016), thereby increase the risk of adolescent aggression (Amato & Cheadle, 2008; Bowlby, 2005). Second, family economic strain is hypothesized to predict increased interparental conflict and subsequently interparental conflict may negatively or positively affect parent–child interaction and communication. This in turn, can impact adolescent aggression (Conger et al., 2002; Cummings et al., 2004; Savage, 2014). However, there is a paucity of empirical evidence to support this proposed model.

Method

Data

Using multi-stage cluster random sampling method, all the participants (971 adolescents and one of their parents) were sampled from two middle schools (grades 7–9) and two high schools (grades 10–12) in Y City, in Shanxi Province in mainland China during the period from September to October 2020. Before the data collection, all adolescents and their parents signed an informed consent from. After the research assistants explained the instructions, adolescents completed the questionnaires in their classrooms.The parental part of the questionnaire was taken home by students to be completed by their father or mother and brought back to school the next day. The sample included 469 boys and 468 girls. With in this sample, 59% of the participants were left-behind children who stay in rural areas while their parents go to work in cities and 41% were non-left-behind children. In addition, in the sample of parents, mothers accounted for 76.6% and fathers accounted for 21.6%. About half of the parents had finished middle school (42.5% for fathers, 48.7% for mothers). The average annual income of the surveyed households is about RMB72,000, which is significantly lower than the national average of RMB120,000 in 2020. A large proportion of the fathers (64%) were engaged in manual labour such as factory workers and more than half of the mothers (55.2%) were unemployed (the national unemployment rate is 5.2% in 2020).

Measurements

Family Economic Strain

The Family Economic Strain Scale was used to assess family primary caregiver's (father or mother) perception of family economic strain (Hilton & Devall, 1997).

Because this scale had not been used in Chinese in previous studies, we translated it into Chinese based on the back-translation method. Specifically, we invite professional translators in this field to translate the completed translation back into the original language. Then we compared that new translation with the original version and reconciled any meaningful differences between the two. After confirmatory factor analysis, all the items were retained, as their factor loadings were greater than 0.4 (Brown, 2015; Harrington, 2009). Participants indicated how often they experienced a specific type of stress on a 5-point scale (from never to almost always), such as "I encounter money problems," "I worry about financial matters," and "I worry that there is no enough money to celebrate holidays and participate in other special occasions." Level of family economic strain was calculated by creating a mean value of the 13 items with higher scores indicating higher level of family economic strain. Previous studies have demonstrated that the scale had good internal consistency (Falconier, 2010; Rusu et al., 2018). In the present study, the Cronbach's α for the scale was 0.940.

Interparental Conflict

The Children Perception of Interparental Conflict Scale was applied to assess interparental conflict (Grych et al., 1992). It is a 19-item scale with three subscales including conflict frequency, conflict intensity, and conflict resolution. Each item is rated on a 4-point scale from never to always. The average of all items in each subscale was calculated, with higher scores indicating higher levels of conflict frequency, intensity, and resolution, respectively. The conflict frequency subscale includes six items, such as "Even if my parents don't tell me, I know they are arguing" (factor loading = 0.860). The conflict intensity subscale includes a total of seven items, such as "When my parents quarreled, they would start to fight each other" (factor loading = 0.884). The conflict resolution subscale includes six items, for example, "When my parents have different opinions on something, they will come up with a solution" (factor loading = 0.765). The reliability and validity of this scale in Chinese version were satisfactory in previous empirical studies (Wang et al., 2021; Yang et al., 2018). The Cronbach's α of the scale in this study was 0.913.

Parent–Child Conflict

Family primary caregiver (father or mother) reported the level of conflict with their children using the conflict subscale of the Parental Environment Questionnaire (PEQ) (Elkins et al., 1997). Using the back-translation method, we translated this scale into Chinese, because it has not been used in China in previous studies. After conducting confirmatory factor analysis, one item was deleted because its factor loading was below 0.4, so as to increase research validity (Brown, 2015; Harrington, 2009). The remaining eleven items include, "I criticize my child," "I interrupt my child," "There are some misunderstandings between me and my child," "My child and I get into arguments," etc. Each item was rated on a 4-point scale from never to often. All eleven items were averaged and higher scores reflected higher level of parent–child conflict. This scale was demonstrated to have fair internal reliability and

good validity in many previous studies (Klahr et al., 2011; Samek et al., 2018), and Cronbach' s α for the scale in present study was 0.900.

Adolescent Aggression

The Buss-Perry Aggression Questionnaire was used to measure adolescent aggressive behavior in this study (Buss & Perry, 1992). It is a self-report 29-item scale covering four dimensions: physical aggression, verbal aggression, anger and hostility. Ratings were completed on a 5-point scale from strongly disagree to strongly agree. The mean of all the items in each dimension were calculated with the higher score indicating higher level of aggression. The physical aggression subscale includes nine items (factor loading = 0.590). The verbal aggression subscale includes five items (factor loading = 0.411). The subscales for anger and hostility have seven and eight items (factor loading = 0.773 for anger and factor loading = 0.711 for hostility). The Chinese version of this scale has been proved to have good reliability and validity (Chen & Qin, 2020; Xie et al., 2020). And the Cronbach's alpha of this scale is 0.872 in this study.

Control Variables

The analyses controlled for some sociodemographic variables, including grade (from 0 = first grade of middle school to 5 = high school senior), gender (0 = male; 1 = female), left-behind status (0 = left-behind children; 1 = non-left-behind children).

Analysis

Descriptive statistics (means, standard deviations and correlations for the core variables) were computed in SPSS 21.0. Structural equation modeling including measurement modeling and structural modeling was carried out using Amos 24.0. First, confirmatory factor analysis was implemented to ensure that the measurement model had a good fit (Bentler, 1990), then structural modeling was carried out to examine direct and indirect effects of family economic strain on adolescent aggression. The following indices were employed to assess goodness of fit: the chi-square coefficient (χ^2), the comparative fit index (CFI), and the root mean square error of approximation (RMSEA). When CFI is above 0.90 and RMSEA is below 0.08, that indicates that the model fits data well (Hu & Bentler, 1999; Kline, 2015). In order to further test the mediation effects, we conducted bootstrapping analyses with 2,000 bootstrapped samples and 95% confidence intervals. The influence is judged to be significant if zero is not included within the interval scope (Preacher & Hayes, 2008). In addition, gender, grade and left-behind children status were included as control variables in this study.

Results

Descriptive Statistics

Table 1 shows the means, standard deviations, and bivariate correlations of core variables in this study. Among the four types of aggression, hostility had the highest mean score, followed by anger, then verbal aggression, and the lowest was physical aggression. Family economic strain was positively associated with all of the three dimensions of interparental conflict and parent–child conflict. Of the four types of aggression, only verbal aggression was not significantly related to family economic strain. Parent–child conflict was positively associated with interparental frequency, interparental intensify and interparental resolution. All the four types of aggression were positively correlated with parent–child conflict..

Overall Model

The results of the analysis showed a good fit to the data: $\chi^2 = 193.561$, df = 43, $p < 0.001$, CFI = 0.947, and RMSEA = 0.060. The estimates of the structural model were presented in Table 2. Family economic strain was positively associated with interparental conflict, parent–child conflict, but not significantly directly associated with adolescent aggression. Both interparental conflict and parent–child conflict were significant predictors for adolescent aggression. Interparental conflict showed a remarkable effect on parent–child conflict. Table 3 showed the results of bootstrap for specific indirect effects. As can be seen, family economic strain had significant indirect effects on adolescent aggression through interparental conflict and parent–child conflict respectively. The results also found the significant mediating path from family economic strain to interparental conflict to parent–child conflict to adolescent aggression.

In summary, interparental conflict and parent–child conflict fully mediated the association between family economic strain and adolescent aggression. The standardized solution for the structural model was exhibited in Fig. 1. All the variables in this study accounted for 23.3% of the explained variance in adolescent aggression. In addition, gender was the only control variable significantly related to interparental conflict, which suggests that the family with girls may have more interparental conflicts. Grade was positively related with adolescent aggression, which indicates that students in higher grades are more likely to engage in aggressive behavior than students in lower grades.

Discussion

Based on a random sample in Y City, in Shanxi Province, this study explored the direct and indirect effects of family economic strain on adolescent aggression by examining the potential mediators of interparental conflict and parent–child conflict

Table 1 Correlations among core variables

		M	*SD*	1	2	3	4	5	6	7	8	9
1	Family economic strain	2.546	0.934	1								
2	Interparental conflict frequency	1.874	0.780	0.181**	1							
3	Interparental conflict intensity	1.915	0.740	0.148**	0.759**	1						
4	Interparental conflict resolution	1.936	0.745	0.148**	0.663**	0.674**	1					
5	Parent–child conflict	2.153	0.602	0.261**	0.263**	0.283**	0.200**	1				
6	Physical aggression	2.408	0.836	0.065*	0.159**	0.187**	0.137**	0.182**	1			
7	Verbal aggression	2.567	0.843	0.009	0.088**	0.137**	0.067*	0.086**	0.324**	1		
8	Anger	2.617	0.952	0.086**	0.247**	0.293**	0.240**	0.202**	0.468**	0.340**	1	
9	Hostility	2.800	0.832	0.179**	0.347**	0.337**	0.318**	0.262**	0.398**	0.236**	0.546**	1

*$p < 0.05$; **$p < 0.01$

Table 2 Estimates of the structural model

	B	β	*SE*	*p*
Interparental conflict ← Family economic strain	0.134	0.168	0.025	***
Parent–child conflict ← Interparental conflict	0.239	0.266	0.030	***
Parent–child conflict ← Family economic strain	0.140	0.216	0.020	***
Aggression ← Parent–child conflict	0.145	0.178	0.031	***
Aggression ← Family economic strain	0.018	0.035	0.019	0.331
Aggression ← Interparental conflict	0.268	0.365	0.031	***
Interparental conflict ← Grade	0.013	0.038	0.012	0.267
Interparental conflict ← Gender	0.089	0.075	0.040	*
Interparental conflict ← Left-behind status	0.007	0.005	0.047	0.876
Parent–child conflict ← Grade	-0.006	-0.018	0.010	0.556
Parent–child conflict ← Gender	-0.010	-0.009	0.032	0.759
Parent–child conflict ← Left-behind status	0.036	0.029	0.038	0.344
Aggression ← Grade	0.024	0.091	0.009	**
Aggression ← Gender	0.026	0.029	0.030	0.384
Aggression ← Left-behind status	0.037	0.037	0.035	0.288

B = unstandardized path coefficient; β = standardized path coefficient; *SE* = standard error; *p* = significance level. *** $p < 0.001$;** $p < 0.01$;* $p < 0.05$

Table 3 Bootstrap results for specific indirect effects

				95% CI	
Effects	β	*SE*	*p*	Lower	Upper
Aggression ← Interparental conflict ← Family economic strain	0.036	0.008	0.001	0.036	0.053
Aggression ← Parent–child conflict ← Family economic strain	0.020	0.005	0.001	0.011	0.033
Aggression ← Parent–child conflict ← Interparental conflict ← Family economic strain	0.003	0.001	0.001	0.001	0.006

β = standardized coefficient; *SE* = standard error; *p* = significance level; CI = confidence interval

simultaneously, using a multi-informant approach (parent report on family economic strain and parent–child conflict and child report on interparental conflict and aggression). Although the results did not support the direct effect of family economic strain on adolescent aggression, interparental conflict and parent–child conflict both simultaneously and sequentially mediated the association between family economic strain and adolescent aggression. The specific results are dicussed in following paragraphs.

We found that family economic strain had no significant direct effect on adolescent aggression. The finding is inconsistent with the family adjustment and adaptation response model which hypothesizes that family stressors can increase the risk of children behevioral problems (Patterson, 1988). Specifically, family with economic strain will encounter the reduced ability of perceiving resources and coping strategies. Once those capacity declines, children's needs in the family may be coped

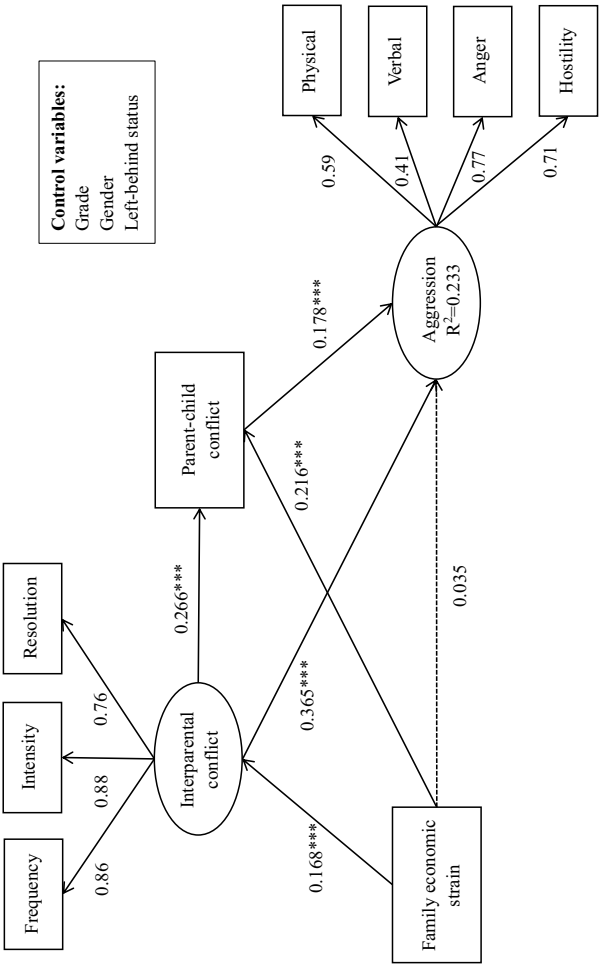

Fig. 1 Structural equation model with standardized solution. **Note.** For simplify the diagram, control variables are omitted. *** $p<0.001$;** $p<0.01$;* $p<0.05$

less well, thereby increasing the risk of their aggression (Nebbitt et al., 2014; Voisin et al., 2016). But the finding is in line with some previous empirical studiese (Jiang & Dong, 2020; Kim & Um, 2018) that showed non-significant relationship between family economic strain and adolescent aggression. One possible explanation is that children are not particularly aware of the real economic situation of the family (Munsell et al., 2016). And family economic strain is mainly borne by the parents, while children's perception of family economic strain is relatively weak, because in many relatively poor families, parents usually sacrifice their own needs so as to ensure their children's material needs are met (Ogwumike & Ozughalu, 2018). In such households, it is difficult for children to intuitively feel family economic strain, and the influence of family economic strain on behavior will be very weak. In addition, the study suggests the positive association between interparental conflict and parent–child conflict, which is consistent with the findings of most of previous studies (Li et al., 2020; Sherrillet al., 2017). One possible explanation is that interparental conflict can increase parental emotional distress, which will reduce their sensitivity to the needs of their children, and reduce their social support for their children, therefore causing the relationship between parents and children to deteriorate (Erel & Burman, 1995; Zimet & Jacob, 2001).

Moreover, the findings show that interparental conflict and parent–child conflict simultaneously mediate the relationship of family economic strain with adolescent aggression, which is congruent with previous assumptions. Parents living in economically stressed families are more likely not only to experience interparental conflict, but also to have more conflicts with their children regarding the distribution and use of limited financial resources (Letourneau et al., 2013; Rouchun et al., 2019). And both interparental conflict and parent–child conflict increase the risk of adolescent aggression (Amato & Cheadle, 2008; Bowlby, 2005). Furthermore, consistent with the family stress model (Conger et al., 2002), we also found that interparental conflict and parent–child conflict work as serial mediators of the link between family economic strain and juvenile aggression. That is, parents in families with high economic strain are more likely to experience interparental conflict, which is associated with parent–child conflict, thereby increasing the likelihood of children's aggressive behavior. The findings of this study highlight the important roles played by family interaction processes, including the conflict between parents and between parent and children, in the relationship between family economic strain and adolescent aggression, and imply that there may be other potential family process underlying this relationship that deserve to be explored. For example, family system theory (Cox & Paley, 2003) proposes the mutual influences among family subsystems. Interparental conflict could produce effects on the other family system that feed back into the family system again.

Implications

At the theoretical level, this study extended the knowledge by testing the indirect effect of family economic strain on adolescent aggression through interparental conflict and parent–child conflict based on multi-informant data from parents and

children simultaneously. This theoretical framework potentially could also apply to other groups and cultural contexts to examine the relationship between family economic strain and adolescent aggression. In addition, the results spoke to the divergence of results of previous studies regarding the association between family economic strain and adolescent aggression and indicated that Chinese adolescents' aggressive behavior was not directly affected by family economic strain and some family interaction process played important roles underlying this link. The question if a positive or negative correlation between interparental conflict and parent–child conflict was also addressed by the results of this research. Moreover, the study also examined the reliability and validity of the Family Economic Strain Scale and the conflict subscale of the Parental Environment Questionnaire in the Chinese cultural context, which is helpful for the application of the two scales in China.

At the practical level, the present study indicated that the serial indirect effect of family economic strain on adolescent aggression through both interparental conflict and parent–child conflict was significant. Thus, in order to reduce the risk of adolescent aggression more efficiently, social work interventions should focus on creating harmonious family interactions. Parents need to be educated about the interdependence between the various family subsystems such as the interaction between the parental system and the parent–child system (van Dijk et al., 2020). Some interventions such as brief psychological education can be adopted to teach families constructive methods of addressing conflicts, which have been shown to have a positive impact on children development (Miller-Graff et al., 2016). Social workers can assist children in adopting coping strategies on interparental conflicts and parent–child conflicts, which may help reduce their risk of aggression (Silva et al., 2020). In addition, although the findings showed a non-significant direct effect of family economic strain on adolescent aggression, family economic strain can indirectly influence adolescent aggression by increasing family conflict. Thus, policymakers should also focus on reducing family economic strain. It is important to solve the problem of unemployment and housing, and increase family income (Berti & Pivetti, 2019). A series of programs, such as family economic support and parenting programs, could be used to attenuate the risk of externalizing behaviors in adolescents (Fergusson et al., 2004).

Limitations

There are several noteworthy limitations of present study. First, this study used a cross-sectional survey data, which cannot be used to identify the causal relationships among family economic strain, interparental conflict, parent–child conflict and adolescent aggression. Future research should examine this issue via a longitudinal design that allows for causal inferences. Second, most of the parents of this study are mothers; fathers only accounts for a small percentage of the whole sample of parents. Future studies should include more father data, or collect data from both parents for the same variable so as to increase research validity. Third, in the present study, we only controlled grade, gender and left-behind status in the analysis. Other important potential influencing factors, such as delinquent peer affiliation and

community conditions, should be taken into consideration in future studies (Jiang & Dong, 2020). Finally, the study used a random sample from two middle schools and two high schools in Y City, in Shanxi Province, so caution should be exercised in generalization this study's findings to other groups and cultural contexts. Future studies should aim to replicate this study in other groups and areas so as to have a comprehensive understanding of these relationships among family economic strain, interparental conflict, parent–child conflict, and adolescent aggression.

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