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Relationship between Authoritative Parenting Style and Preschool Children's Emotion Regulation: A Moderated Mediation Model

Yan Jin and Wei Chen*

School of Education Sciences, Huizhou University, Huizhou, 516007, China

*Corresponding Author: Wei Chen. Email: chenwei5088@126.com

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ABSTRACT

An authoritative parenting style has been shown to promote children's emotion regulation in European-American family studies. However, little is known about how sleep problems and the child's sibling status in Chinese families affect this relationship. Based on family system theory, this study attempts to better understand the relationship between authoritative parenting style and emotion regulation. Mothers of preschool children in Chinese kindergartens completed questionnaires about their children's sleep habits, their authoritative parenting styles, and children's emotion regulation. A total of 531 children participated in this study. Results showed that authoritative parenting was positively associated with emotional regulation. Sleep problems mediated the effects of authoritative parenting style on emotion regulation. The child's sibling status moderated the mediating effects of sleep problems in authoritative parenting and emotion regulation relationships. Specifically, the relationship between the authoritative parenting style and sleep problems was significant for only children, while birth order had no significant influence on the authoritative parenting style and sleep problems in two-child families. These findings suggest that a low-authoritative parenting style predicts low emotion regulation through sleep problems, and this depends on the child's sibling status, indicating that children without siblings may impair emotion regulation due to increased sleep problems.

KEYWORDS

Sleep problem; emotional regulation; authoritative parenting; child's sibling status; preschool children

Introduction

Emotion regulation is an important foundational skill for future development. Over the past decade, researchers studying emotion regulation in childhood have emphasized the significant influence of the family context [1]. European-American family studies have demonstrated that authoritative parenting is the optimal strategy for enhancing emotional competence and psychosocial adjustment [2]. However, this same parenting can have different consequences for child adjustment in different cultural contexts [3]. In China, older-generation Chinese parents tend to favor an authoritarian parenting style, which has been associated with positive outcomes, especially in terms

of academic achievement [4], but also has negative effects, such as strengthening children's emotional dysregulation [5].

In recent years, with the implementation of the "Law of the People's Republic of China on the Promotion of Family Education", Chinese parents have become aware of scientific parenting. Furthermore, since the implementation of China's two-child policy in 2016, family structures, especially those with or without sibling relationships, have become increasingly complicated for children's emotional development. Given the importance of emotional regulation in children's social adjustment, updated norms of family-level experiences in China, and changes in family structures, it is necessary to thoroughly examine the relationship between authoritative parenting styles and emotion



regulation. Therefore, the present study mobilizes the family system theory and emotional security model [6] to explore the relationship between authoritative parenting style and emotion regulation, as well as the mediating effect of sleep problems and the moderating effect of a child's sibling status.

Authoritative parenting style and children's emotion regulation

Maccoby et al. [7] adopted the two dimensions of responsiveness and demandingness, identified four primary parenting styles: authoritarian (low responsiveness and high demandingness), neglectful (low responsiveness and low demandingness), indulgent (high responsiveness and low demandingness), and authoritative (high responsiveness and high demandingness). However, the same parenting styles have different children's development in different sociocultural contexts [8]. In European-American families, the authoritative parenting style was related to higher psychosocial adjustment in children [3], whereas authoritarian parenting was connected to higher academic achievement in Chinese American families [9]. Other studies found that, in South American countries, children with indulgent parenting had better psychosocial competence than children with authoritative parenting [10]. In addition, parenting style also reflects the parent-child relationship [9], responsiveness and demandingness of parenting styles may be interpreted with different meanings across cultural contexts. For example, in China, parental demandingness of authoritarian parenting may be interpreted as parental concern and involvement [8]. Thus, different studies indicate that a perceived warm parent-child relationship may explain the different results between parenting and child psychosocial adjustment in different cultural environments.

According to the family systems perspective on emotion regulation [11], parents influence children's emotion regulation in the family context through observation, parenting practices, and the family emotional climate [1]. Previous study has found that parental warmth combined with parental strictness, similar to authoritative parenting, promote children's emotional development [12]. While previous studies have reported a direct association between authoritative parenting style and children's emotional development, most of them focused on older school-aged children [13,14]. There is relatively little research on this topic for preschool-aged children. For example, in a study among Palestinian preschool children, authoritative parenting was positively correlated with emotion regulation [15]. In Arab preschool children, a positive association was found between authoritative parenting style and social-emotional adjustment [16]. Lower authoritarian and higher authoritative levels in Chinese parents and grandparents predicted better emotion regulation ability in 3–6-year-old children [17]. Given that preschool children are progressively acquiring rules and learning to plan their behaviors, a warm and supportive parenting style will help them regulate emotions better than in other age groups [18]. Therefore, examining the potential mechanism of the association between authoritative parenting style and emotion regulation can help elucidate how authoritative

parenting is linked to children's emotional development. Based on the effect of family dynamics on children's emotion regulation [1], it is reasonable to speculate that children nurtured by authoritative parenting would demonstrate better emotional regulation abilities.

The mediation role of sleep problem

Sleep is one of the most fundamental family activities, especially for children, and is vital for emotion regulation. According to the emotional security model [6], emotional security in family relationships promotes sleep among children [19]. Several studies have reported that positive parenting is associated with fewer sleep problems, increased sleep stability [20], and longer subjective sleep duration [21]. On the other hand, previous studies have found that sleep consolidates emotional reactivity [22]. Good sleep increased functional connectivity between prefrontal control networks and the amygdala compared to sleep loss [23], which is beneficial for child emotion regulation, whereas sleep-restricted individuals altered children's positive emotional response [24] and reacted more negatively in response to positive stimuli [22].

However, sleep problems frequently occur in preschool children [25,26]. The prevalence of sleep disorders among preschool children ranges from 20% to 45% [25,26]. Importantly, previous studies have confirmed that children with sleep disturbances show more maladaptive emotion regulation processes [27,28]. Although there is preliminary correlation evidence between authoritative parenting, sleep, and emotional regulation [29], few studies have examined sleep mediation impact mechanisms in children. Erath and Tu's self-regulation model proposed that the parent-child relationship may promote or undermine children's sleep, which influences children's capacity to regulate emotions [30]. Parenting is a dynamic parent-child interaction. Therefore, the present study speculates that sleep is an important mediator in the association between parenting and emotion regulation in children, and that an authoritative parenting style may encourage children to engage in healthy sleep, which benefits children's emotion regulation.

Moderating role of child's sibling status

With the implementation of China's three-child policy in 2021, family structure, and child number, especially with or without sibling relationships, have become increasingly complicated in childhood psychological development. A child's sibling status refers to the presence or absence of siblings and the child's birth order. Negative parenting styles lead to different emotional problems in only children and non-only children [31]. In addition, research into sibling relationships has found a "birth order effect" among siblings. Some studies found that parents spend less time parenting [32] and are less strict with later-born children [33] than with first-born children.

Although studies show that children without siblings are more susceptible to negative parenting style [34], more likely to associate with depression symptoms [31] and develop sleep disturbance [35] than children with siblings, previous literature has been inconsistent regarding the child number

on authoritative parenting style. Some studies found that the authoritative parenting style was the most commonly used style when the child number increased [36], other studies showed that child numbers had a negative correlation with the authoritative parenting [37]. Thus, the effects of authoritative parenting style and a child's sibling status on the various factors are not yet clear. According to the emotional security model [6], sibling companions establish children's psychological security. When children experience more positive and warm relationships with siblings, sibling companions serve secure functions to enhance sleep quality [38]. There may be a moderated mediation model that includes sleep problems and the child's sibling status in the association between authoritative parenting style and emotion regulation. Therefore, this study also hypothesizes that the mediating effect of sleep problems on the relationship between authoritative parenting and emotion regulation will be moderated by the child's sibling status.

The present study

The present study tested the mechanism underlying the relationship between authoritative parenting style and emotion regulation in preschool children, advancing our understanding of the factors that contribute to children's emotion regulation and having key implications for family parenting practice. Fig. 1 illustrates the proposed theoretical model. The moderated mediation model not only examined the mediating role of sleep problems in the relationship between authoritative parenting and children's emotion regulation but also tested whether the indirect path between authoritative parenting and emotion regulation would be moderated by the child's sibling status. Specifically, based on the above literature, the following hypotheses were proposed: (1) children nurtured by an authoritative parenting style have better emotional regulation abilities; (2) sleep problems mediate the association between authoritative parenting style and children's emotional regulation; (3) child's sibling status moderates the mediating effect of sleep problems in the relationship between authoritative parenting style and emotion regulation, with the mediating effect being significant for only children with more severe sleep problems. These findings provide insight into how to improve emotion regulation among preschool children in the face of family structure changes in China.

Methods

Participants

The participants were recruited from public kindergartens in Guangdong Province of China. Sampling began by contacting kindergarten principals and introducing the research purpose. Next, the principals distributed the research introduction and consent forms to the children's mothers before the start of the study. Written informed consent was obtained from the kindergarten children's mothers. In addition, voluntary participation and confidentiality of responses were emphasized. All data were automatically collected using Questionnaire Star. The

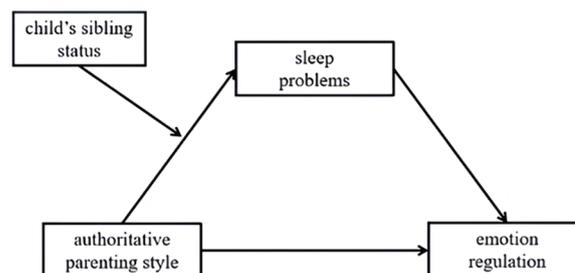


FIGURE 1. The proposed moderated mediation model.

participants did not receive any incentive. The study design was approved by Huizhou University ethics review board.

After removing incomplete questionnaires ($N = 15$) and those from three-child families ($N = 11$) because the number of three-child family samples was too small, the study included 531 samples, of which 295 were boys (55.6%) and 236 were girls (44.4%). The age range of the children was three to six years ($M = 4.23$, $SD = 0.96$). Regarding birth order, 168 (31.6%) were only children, 175 (33%) were the first child in two-child families, and 188 (35.4%) were the second child. Detailed information about the participants is presented in Table 1.

Measures

Children's demographic characteristics

The mothers completed a self-report questionnaire with information collected for each child, including sex, age, number of siblings, birth order, mother's age, and occupation, as well as family socioeconomic status (SES). The SES factors included in this study were maternal education, paternal education, and per capita annual family income. Participants reported their own and their spouse's education achieved from 1–4 (1 = junior high school or below; 2 = senior high school; 3 = junior college or undergraduate; 4 = postgraduate or above). Participants were also asked to rate their per capita annual family income using 1–4 (1 = under RMB 30,000; 2 = RMB 30,000–60,000; 3 = RMB 60,000–100,000; 4 = over RMB 100,000). As some participants' occupations were categorized as 'other', SES did not count the occupation index. The responses to the above three questions were summed to obtain the total SES score. Higher scores indicate higher family SES.

Children's sleep habits questionnaire (CSHQ)

The Chinese version of CSHQ has been widely used in various studies on 2–10 years of children's sleep [39]. The parent-reported CSHQ examines children's sleep habits and identifies sleep problems. The instrument includes 33 items with eight subscales: sleep onset, bedtime behavior, sleep duration, night waking, sleep anxiety, parasomnias, sleep-disordered breathing, and daytime sleepiness. Parents were asked to rate each item's frequency based on the observation of the children in the recent week. Items were rated by parents on a 3-point scale ranging from 0 to 2: "rarely" (0–1 time per week), "sometimes" (2–4 times per week), and "usually" (5–7 times per week). The CSHQ total score was

TABLE 1

Demographic variables of different birth orders of children (N = 531)

Variables	Variable levels	Only-child		The first child		The second child	
Child sex	Female	79	47%	88	50.3%	69	36.7%
	Male	89	53%	87	59.7%	119	63.3%
Mother age	20 to 30 years old	61	36.3%	93	53.2%	102	53.3%
	30 to 40 years old	102	60.7%	76	43.4%	81	43.1%
	40 to 50 years old	5	3%	6	3.4%	5	2.7%
Mother occupation	Education & training	29	17.3%	24	13.7%	19	10.1%
	Health service	8	4.8%	14	8%	8	4.3%
	Accounting, legal, and financial occupation	25	14.9%	28	16%	27	14.4%
	Other	106	63%	109	62.3%	134	71.2%
Mother educational background	Junior high school or below	0	0	5	2.9%	6	3.2%
	Senior high school	13	7.7%	18	10.3%	38	20.2%
	Junior college or undergraduate	138	82.1%	135	77.1%	129	68.6%
	Postgraduate or above	17	10.1%	17	9.7%	15	8%
Annual family income	Under RMB 30,000	11	6.6%	18	10.2%	17	9.1%
	RMB 30,000–60,000	16	9.5%	17	9.7%	15	8%
	RMB 60,000–100,000	45	26.8%	27	15.4%	40	21.3%
	Over RMB 100,000	96	57.1%	113	64.6%	116	61.7%

calculated as the sum of the items, with a total range of 0 to 66. Higher scores indicate worse sleep quality and severe sleep problems. The validity and reliability of the Mandarin version of the CSHQ have been verified in several studies [40,41]. Cronbach's alpha for the current sample was 0.86.

The authoritative parenting style scale

Yang and her colleagues [42] compiled the measure of the authoritative parenting style used in the study. In the present study, the authoritative parenting style scale is comprised of ten items. Sample items reflecting an authoritative parenting style were "Encourage the child to do what he/she can do", "When telling the child to do something, make him/her know why or how to do it" and "Seriously answer the questions raised by the child." The frequency was rated using a 5-point rating scale (1 = *never*, 5 = *always*). Higher scores represent higher levels of authoritative parenting behaviors and attitudes. The internal consistency reliability was 0.81 and the test-retest reliability of 0.87 [42]. The appropriateness of the scale in Chinese children [43] has been confirmed. In this study, Cronbach's alpha was 0.74.

Children's emotion regulation questionnaire

Children's emotion regulation questionnaire was assessed using eight items from the 27-item Emotion Management questionnaire [44]. The children's emotion regulation subscale includes two dimensions: self- and other-emotion regulation. Items representing other regulations were "When he/she is sad, he can recover his/her emotions from the comfort of others", and "When he/she gets angry, no one can persuade him/her". Items representing self-regulation

were "When there is a conflict with his/her peers, he/she can control his/her anger", and "When he/she is angry, he/she can calm himself/herself down". Parents were asked to rate the consistency of each item based on the observations of the children in recent weeks on a 5-point scale (1 = "extremely inconsistent," 2 = "not very consistent," 3 = "basically consistent," 4 = "relatively consistent," and 5 = "extremely consistent"). Higher scores indicate better emotion regulation. Cronbach's alpha was 0.92 for the emotion regulation subscale [44]. Cronbach's alpha was 0.94 in the current study, and the fit index of confirmatory factor analysis showed that: $\chi^2 = 124.95$, $df = 19$, Comparative Fit Index (CFI) = 0.91, Tucker-Lewis Fit Index (TLI) = 0.86, Root Mean Square Error of Approximation (RMSEA) = 0.09, Standardized Root Mean Square Residual (SRMR) = 0.06. The construct validity of the emotion regulation subscale was acceptable.

Data analysis

All analyses were conducted by IBM SPSS Statistics 21. First, we calculated descriptive statistical data for each variable, followed by bivariate relationships between these variables. Next, based on recommendations by Preacher et al. (2008) [45], we used the SPSS PROCESS macro with the bootstrapping method to analyze the moderated mediation hypothesis. As the moderator variable (child's birth status) is a nominal variable with three categories, PROCESS created two indicator variables that collectively represent the variable of the child group. Since China began implementing a two-child policy in 2016, many Chinese families have only children as before 2016. Only children were set as the reference group. The two indicator variables

(child sibling status) represent the contrast of the only-child condition (reference group) with the first-child (W1) and second-child (W2) conditions in a two-child family. The 95% percentile bootstrap confidence intervals (CI) were calculated via 5,000 bootstrap samples. Based on a previous study [46], the lower limit confidence interval (LLCI) and upper limit confidence interval (ULCI) did not contain zero, indicating a significant mediation effect.

Results

Preliminary analyses

The means with standard deviations and correlations between the main variables are presented in Table 2. As expected, the authoritative parenting style was positively associated with emotion regulation ($r = 0.37$); higher scores for the authoritative parenting style indicated better emotion regulation. Authoritative parenting style had a negative correlation with children's sleep problems ($r = -0.15$), and sleep problems were negatively correlated with children's emotion regulation ($r = -0.21$). In addition, SES was significantly and positively correlated with authoritative parenting ($r = 0.13$) and children's sleep problems ($r = 0.11$).

Testing of the proposed model

Mediation model results

The direct and indirect effects of authoritative parenting styles on children's emotion regulation are presented in Table 3. In linear regression, authoritative parenting style had a positive association with children's emotion regulation ($\beta = 0.37$, $p < 0.001$, 95% CI [0.27, 0.47]). In the mediation model, the authoritative parenting style had significant direct effects on sleep problems ($\beta = -0.17$, $p < 0.001$, 95% CI [-0.25, -0.08]), and sleep problems had a direct effect on children's emotion regulation ($\beta = -0.15$, $p < 0.001$, 95% CI [-0.23, -0.07]). In addition, the authoritative parenting style had indirect effects on children's emotion regulation via sleep problems ($\beta = 0.03$, $p < 0.01$, 95% CI [0.01, 0.05]). When adding sleep problems as a mediator: the direct effect of the authoritative parenting style on children's emotion regulation decreased but remained significant ($\beta = 0.34$, $p < 0.001$, 95% CI [0.26, 0.42]).

Moderated mediation model results

As Table 4 illustrates, the interaction between authoritative parenting style and second-child status in two-child families had a significant interaction effect in the moderated

TABLE 2

Means, standard deviations, and correlations between main variables

	<i>M</i> ± <i>SD</i>	1	2	3	4	5	6
1. Sex ^a	–	–					
2. Age	4.23 ± 0.96	-0.01*	–				
3. SES	9.29 ± 1.23	0.01	-0.03	–			
4. Authoritative parenting style	37.91 ± 4.48	-0.02	0.04	0.13**	–		
5. Sleep problem	49.64 ± 5.22	0.02	0.07	0.11*	-0.15**	–	
6. Emotion regulation	26.93 ± 4.24	-0.09*	-0.02	0.05	0.37**	-0.21**	–

Note: ^a Male = 1, female = 0; M, mean; SD, standard deviation; SES, socioeconomic status; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE 3

Direct and indirect effects of authoritative parenting style on children's emotion regulation through sleep problems

Predictors	Model 1		Model 2		Model 3	
	Emotion regulation		Sleep problem		Emotion regulation	
	β	<i>t</i>	β	<i>t</i>	β	<i>t</i>
Child sex	-0.19	-2.27*	0.04	0.51	-0.18	-2.21*
Child age	-0.05	-1.07	0.08	1.84	-0.03	-0.78
SES	0.001	0.02	0.13	3.02**	0.02	0.51
APS	0.37	9.10***	-0.17	-3.92***	0.34	8.45***
Sleep problem					-0.15	-3.78**
Indirect effect (95% bootstrap CI)						
Sleep problem					0.03 [0.01, 0.05]	
<i>R</i> ²	0.14		0.04		0.17	
<i>F</i>	22.55***		6.12***		21.35***	

Note: SES, socioeconomic status; APS, authoritative parenting style; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE 4

Direct and indirect effects model coefficients for the moderated-mediated model

Predictors	Model 1		Model 2	
	Sleep problem		Emotion regulation	
	β	t	β	t
Child sex	0.09	1.16	-0.18	-2.21*
Child age	0.04	1.01	-0.03	0.78
SES	0.11	2.62**	0.02	0.51
W1	0.03	0.26		
W2	-0.39	-3.79***		
Authoritative parenting style (APS)	-0.29	-4.30***	0.34	8.45***
Sleep problem			-0.15	-3.79***
APS×W1	0.14	1.39		
APS×W2	0.22	2.25*		
Conditional indirect effect [95% CI]				
Only-child			0.04 [0.02, 0.08]	
The first child			0.02 [-0.002, 0.06]	
The second child			0.01 [-0.01, 0.03]	
Index of moderated mediation [95% CI]				
W2			-0.03 [-0.08, -0.002]	
R^2	0.09		0.17	
F	6.44***		21.35***	

Note: W1 and W2 are indicator variables in the models; only-child is the reference group; W1 is the first child status in two-child families; W2 is the second child status in two-child families; SES, socioeconomic status; APS, authoritative parenting style; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

mediation models. The child's sibling status moderated the association between an authoritative parenting style and sleep problems: the authoritative parenting style negatively predicted sleep problems ($\beta = -0.29$, $p < 0.001$, 95% CI [-0.42, -0.16]), and the second child status ($\beta = -0.39$, $p < 0.001$, 95% CI [-0.59, -0.19]) negatively predicted sleep problems. The interactions between authoritative parenting style and second-child status ($\beta = 0.22$, $p < 0.05$, 95% CI [0.03, 0.42]) significantly predicted sleep problems (Table 4). The child's sibling status was a multi-categorical variable, the only-child group of the bootstrap confidence intervals for the conditional indirect effect did not contain zero. Therefore, the indirect effect of authoritative parenting on children's emotion regulation through sleep problems was moderated by the child's sibling status.

Probing the moderation of mediation required determining whether the relative indirect effects varied in the three levels of the moderator variable. The significant relative indirect effect was found in the only children condition. As indicated in Table 4, only children had confidence intervals that did not include zero. The result indicates that the relative indirect effect of authoritative parenting on children's emotion regulation through sleep problems was significant in only children but not in the first or second child in a two-child family.

To facilitate the interpretation of the interaction effect, the relationship between variables is plotted predicted sleep

problems by authoritative parenting style separately for only children, and the first and second children of a two-child family. Simple slope analysis showed that authoritative parenting style was significant and negatively correlated with sleep problems when the child was an only child ($\beta = -0.27$, $p < 0.001$, 95% CI [-0.42, -0.16]). However, when the child was in a two-child family, the association was not significant for the first child ($\beta = -0.14$, $p > 0.05$, 95% CI [-0.29, 0.01]) and the second child ($\beta = -0.06$, $p > 0.05$, 95% CI [-0.21, 0.08]) in a two-child family (Fig. 2).

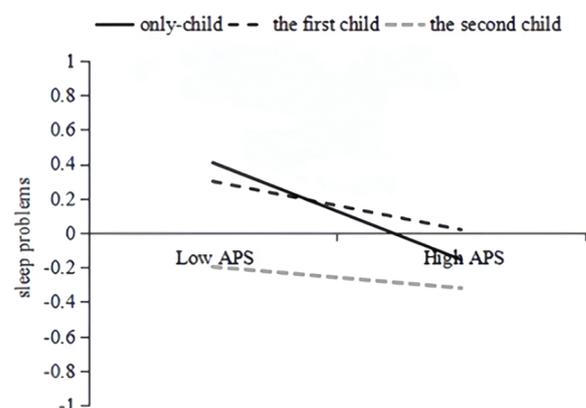


FIGURE 2. The association between authoritative parenting style (APS) and children's sleep problems moderated by the child sibling status.

Discussion

The present study examined the relationship between authoritative parenting and emotion regulation in Chinese preschool children. Sleep problems play a mediation role in the association between authoritative parenting and emotion regulation, supporting Erath and Tu's conceptual model, which contends that parenting influences children's sleep and affects their capacity to regulate emotions [30]. Importantly, the child's sibling status moderated the relationship between authoritative parenting and sleep problems, the links between authoritative parenting and sleep problems were significant for only children, indicating that the indirect effect of authoritative parenting on emotion regulation through sleep problems depends on the child's sibling status.

Authoritative parenting style and children's emotion regulation

This study indicated that more authoritative parenting was associated with better emotional regulation in children. The relationship between authoritative parenting and children's emotion regulation may be explained by the three processes in the family context on children's emotion regulation: observation, parenting practices, and the family emotional climate [1]. Authoritative parents exhibit better emotion regulation [14], and children are more likely to learn how to regulate emotions through adaptive strategies from their parents in a supportive family climate [47,48], highlighting the exemplary parental model of authoritative parenting style in terms of children's emotion regulation. This result was consistent with previous studies on children [15–17], which showed that authoritative parenting leads to higher emotion regulation in preschool children. Furthermore, this result extends that the authoritative parenting style links with positive outcomes in Chinese families and not only European-American families.

The mediating role of sleep problems

Our study reports the mediating role of sleep problems. In other words, authoritative parenting helps children develop the good self-regulatory sleep required to promote emotional regulation. One possible mechanism to explain these associations is the safe and comfortable parent-child relationship of authoritative parenting, which promotes children's psychological comfort, thereby establishing better conditions for children's sleep and improving their emotion regulation. This result coincides with previous studies that have revealed that effective parental practices are related to good sleep quality [20,21]. In turn, poor sleep compromises neural systems supporting emotion regulation [23,24,27,49]. Previous studies have shown that harsh parenting influences the neuroendocrine regulation of sleep [50], and in turn, the biological rhythms in sleep regulation can impact functional connectivity of emotion regulation between prefrontal control networks and the amygdala [23]. Taken together, our findings confirm that a low-authoritative parenting style is associated with severe sleep problems, leading to poor emotion regulation in children, which supports Erath and Tu's conceptual model [30].

Moderating role of child's sibling status

Our results showed that a child's sibling status moderated the mediating effect between authoritative parenting style and emotion regulation through sleep problems in preschool children. Specifically, the relationship between authoritative parenting and sleep problems was significant among only children. The moderating effect of a child's sibling status on the association between authoritative parenting and sleep problems may be interpreted by an emotional security model [6]. According to the emotional security model, sibling companions seem to function much like sleep aids such as blankets or soft toys. Only-children are reared in a low-authoritative parenting style, which may lead to reduced parental guidance and care. Meanwhile, only children lacking siblings may lose their function as a secure base, thereby increasing sleep problems [51]. In contrast, siblings can serve as attachment figures in emotional support, children with siblings with a low authoritative parenting level would receive greater emotional security from siblings [38], reducing sleep problems. This speculation was supported by Keller et al. study [19], which found that security in the parent-child relationship negatively predicted sleep problems. In other words, in two-child families with a lower level of authoritative parenting style, sibling accompany may serve an emotional security function, thereby reducing sleep problems compared to only children.

Relationship between family SES, authoritative parenting style, sleep problems and children's emotional regulation

This study found that family SES significantly and positively affected mothers' authoritative parenting styles. This finding is in agreement with a previous study by Almudhee et al. [36], in which the father's income was positively correlated with authoritative parenting style. However, family SES positively correlated with sleep problems and significantly predicted sleep problems in children. This result is inconsistent with that of a previous study [52] that showed that poor family SES correlated with higher sleep disturbances among children. This finding may be because SES in the current study mainly included parental education level since a recent study showed that a higher education level was associated with poorer sleep quality [53]. In addition, family SES has no correlation with children's emotional regulation, indicating that high SES does not always promote emotional regulation.

Implications and limitations

This study is the first attempt to test the moderation effect of the child's sibling status in the relationship between authoritative parenting style, sleep problems, and emotion regulation in preschool children. Our findings have several important implications. First, considering the significant relationship between an authoritative parenting style and sleep problems for children without siblings, the target intervention programs aim to improve low-authoritative parenting among only-child families and will be more effective in improving only-child sleep quality, indirectly enhancing children's emotional regulation. The findings indicate that the companionship of siblings may be a

protective factor for sleep problems that impair emotional regulation. Second, the mediating role of sleep problems on the relationship between authoritative parenting style and emotional regulation indicates that the joint intervention of improving parents' parenting styles and children's sleep quality would be more effective in improving children's emotion regulation.

This study has several limitations. First, this cross-sectional study did not conclude any causal associations from the results. Future studies should design longitudinal studies to investigate the relationship between authoritative parenting style and emotional regulation as well as the role of sleep. Second, the data collection method used in this study was conducted only through parent-report questionnaires, which may have biased estimates. Future studies should employ a multi-method to improve the effectiveness of the results. Third, children were recruited from only three kindergartens in Guangdong Province in China, which may not be fully representative of the general population. Future studies should expand the scope of sample selection. Fourth, SES does not include occupation prestige, which affects the family SES index. Future studies should elaborately involve various occupations.

Conclusion

The findings of this study demonstrate the mediating role of sleep problems and the moderating role of the child's sibling status in the relationship between authoritative parenting style and emotion regulation among preschool children. The results reveal that the relationship between authoritative parenting and emotion regulation was mediated by sleep problems. The mediating effect of sleep problems also depends on the child's sibling status. When the children were only children, the indirect effect of sleep problems became significant. Understanding the mechanism between authoritative parenting style and sleep problems in preschool children will help develop tailored intervention strategies to improve emotion regulation in preschool children.

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Availability of Data and Materials: Due to institutional ethical specifications, the data used in this study is not

publicly available. On reasonable request, data will be made available by the corresponding author.

Ethics Approval: Before collecting data, informed consent was obtained from all the children's parents. The principles of voluntary participation and confidentiality of the responses were emphasized. The study design was approved by Huizhou University ethics review board.

Conflicts of Interest: The authors declare that they have no conflicts of interest to report regarding the present study.

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