**Psychological Stress and Parenting styles Predict Parental Involvement for Children with Intellectual Disabilities during the COVID-19**

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**Abstract**

We explored how psychological stress and parenting styles predicted parental involvement for children with intellectual disabilities during the COVID-19 pandemic by administering the Psychological Stress Questionnaire, Parenting Style Index and Parental Involvement Scale to 995 parents of children with intellectual disabilities. Our results indicated that psychological stress significantly negatively predicted parental involvement. In addition, three dimension of parenting styles significantly positively predicted parental involvement, with the results of acceptance/involvement ($\beta$ ranging from 0.19 to 0.55, $p < 0.001$), strictness/supervision ($\beta$ ranging from 0.16 to 0.34, $p < 0.05$), and psychological autonomy ($\beta$ ranging from 0.23 to 0.28, $p < 0.001$). The present research’s significance, limitations, and implications are also discussed.

**Keywords** Psychological stress · Parenting styles · Parental involvement · Intellectual disabilities

**Highlight**
- Parental involvement has five dimensions (parenting, helping with homework, communicating with the school, volunteering at school and participating in school decision making) suggested by Epstein et al.
- The present research aims to explore how psychological stress and parenting styles predicted parental involvement for children with intellectual disabilities during the COVID-19.
- Results indicated that psychological stress significantly negatively predicted parental involvement, while parenting styles significantly positively predicted parental involvement.

Numerous empirical studies have demonstrated that parental involvement greatly influences children’s development across different domains, including academic development (e.g., Barger et al., 2019; Camacho-Thompson et al., 2019), social-emotional development (e.g., Wang et al., 2019; Yap & Baharudin, 2016), behavioural outcomes (e.g., Ucus et al., 2019), and career development (Dietrich & Salmela-Aro, 2013). For instance, Barger et al., (2019) quantitatively synthesised 448 independent studies, including 480,830 families and identified consistent small positive relationships ($r = 0.13$ to 0.23) between parental involvement and children’s academic adjustment (i.e., achievement, engagement, and motivation) over time. In addition, parental involvement was also positively associated with children’s social ($r = 0.12$) and emotional adjustment ($r = 0.17$) and negatively associated with their delinquency ($r = -0.15$), concurrently. The associations between parental involvement and children’s academic and social-emotional development were invariant across demographic variables, including age, ethnicity, or socioeconomic status. Parental involvement means parents devote time, energy, and resources to facilitate their children’s learning endeavours (Grolnick & Slowiaczek, 1994). Hence, how to enhance parental involvement deserves serious attention and exploring its influential factors is significant.

We investigated how psychological stress and parenting styles are related to parental involvement in intellectual disabilities in mainland China during the COVID-19 pandemic.
for three reasons. First, according to Reio & Forines, (2011), parents of children with intellectual disabilities experience a high degree of stress concerning their children’s futures. If these parents are deeply involved in their children’s education, their stress levels are reduced, and their sense of fulfilment and self-confidence are simultaneously increased (Reio & Forines, 2011). Therefore, it is meaningful to investigate parental involvement in educating children with intellectual disabilities.

Second, in January 2020, all provinces across China declared COVID-19 a first-level public health emergency response. On January 23, 2020, the city of Wuhan was closed to prevent the spread of the disease. During the outbreak, tension, anxiety, and other negative emotions began to breed in the country, subjecting parents of children with intellectual disabilities to much more work and psychological pressures than parents of typically-developing children (Baker et al., 2003; Webster et al., 2008), possibly impacting their involvement. Hence, it is worthwhile exploring how parents’ psychological stress is related to their involvement in the context of COVID-19. In our study, parents’ psychological stress refers to their psychological status after the outbreak of COVID-19.

In addition, both theoretical and empirical evidence indicate that parenting styles (the dimension of parental psychological control) moderate parental involvement’s impact on children’s developmental outcomes (Darling & Steinberg, 1993; Zong et al., 2018); however, another dimension (parental autonomy support) has shown no impact. Hence, exploring how parenting styles relate to parental involvement in educating children with intellectual disabilities during the COVID-19 pandemic is valuable. Parenting styles refer to “a constellation of attitudes toward the child that are communicated to the child and that, taken together, create an emotional climate in which the parents’ behaviors are expressed” (Darling & Steinberg, 1993, p. 488).

Third, by 2019, there were 823,000 students with intellectual disabilities in China (per China Disabled Persons’ Federation statistics), and their education has drawn much government and scholarly attention in China. It is worth identifying ways to improve parental involvement in intellectual disabilities across mainland China, given its importance for children’s development.

**The Theoretical Framework for Parental Involvement and its Influential Factors**

Parental involvement has various aspects, including parental behaviours and parenting practices (Fan & Chen, 2001). Parental involvement is perceived as either unidimensional (Turney & Kao, 2009) or multidimensional (Wong & Hughes, 2006). Despite some difficulties in operationally defining the term (e.g., Christenson et al., 1992; Englund et al., 2004; Georgiou 1997; Hong & Ho, 2005), most researchers agree with Epstein et al., (1997) that parental involvement has five dimensions (parenting, helping with homework, communicating with the school, volunteering at school, and participating in school decision-making). Consistent with this classification, parental involvement means that parents devote time, energy, and resources to facilitating their children’s learning endeavours (Grodnick & Slowiàcek, 1994).

There are two lines of studies regarding the factors influencing parental involvement. The first relates to demographic variables, including children’s school year, gender, and family demographics (e.g., Garbacz et al., 2015; Oswald et al., 2018). The second concerns individual difference variables; for instance, positive parental attributes—such as parent attributions (Georgiou and Tourva, 2007) and fathering self-efficacy and marital satisfaction (Kwok et al., 2013)—significantly positively predict parental involvement, while negative parental attributes significantly negatively predict it. Additionally, parental conflict strongly impacts fathers’ involvement (Coley & Hernandez, 2006). In the first quantitative study, 313 parents completed the Parental Attributions Scale and Parental Involvement Scale, with data analysed through confirmatory factor analysis. In the second quantitative study, 2029 valid questionnaires were collected from fathers with children aged 2–6 from 48 nurseries in Hong Kong. Our study adopted several measures, including the Parenting Sense of Competency Scale’s self-efficacy subscale, the Index of Marital Satisfaction, and the Inventory of Father Involvement, analysing the data using hierarchical regression. In the third quantitative study, 239 fathers of preschool-aged children responded to the measures regarding parental conflict and fathers’ involvement, with the data analysed using structural equation models.

To sum up, demographic and individual difference variables significantly influence parental involvement. Positive individual difference variables, such as fathers’ human capital characteristics, healthy psychosocial functioning, and maternal warmth, are associated with higher levels of parental involvement, while negative individual difference variables, such as parental conflict, are related to lower levels of parental involvement (e.g., Coley & Hernandez, 2006; Kwok et al., 2013). However, most studies only relate to demographic or individual difference variables; few consider both. Given the importance of both for parental involvement, testing their contributions simultaneously is necessary.

**The Theoretical Framework for Psychological Stress and its Influence on Parenting**

Stress is a common physical and psychological phenomenon defined as the body’s response to harmful stimuli.
(Wu et al., 2020). A stressor is a stimulus that leads to stress. All stressors—physical, chemical, biological, social, psychological, cultural, or of other origins—are related (Wei & Tang, 1998), can be important sources of stress, and can cause psychological stress responses (Wang et al., 2020). Public health events, such as the novel coronavirus, affect public emotional behaviour and break people’s inner balance due to their suddenness, uncertainty, and harmfulness, making humans feel insecure and unstable. In this study, parents’ psychological stress was considered parental stress, referring to their psychological status following the COVID-19 outbreak.

No previous study has directly tested the relationships between parental stress and parental involvement. However, a possible link between these two variables may exist, one with theoretical and empirical foundations. At the theoretical level, parental stress refers to parents’ bodily responses to harmful stimuli (Wu et al., 2020), and parental involvement to parental behaviours and parenting practices (Fan & Chen, 2001). Both constructs emphasise parental behaviours, suggesting a possible conceptual link between the two. At the empirical level, previous research has related parenting stress and parental involvement to parenting styles (e.g., Frontini et al., 2016; Monteiro et al., 2017; Ponnet et al., 2013); as such, the two could be strongly related, as they share a common space over parenting styles. The first quantitative study’s sample comprised 223 children/adolescents and their mothers (125 children/adolescents with a healthy weight and 98 with obesity). Children and adolescents completed the Quality of Life measure (KIDSCREEN-10) and their mothers completed parenting stress (Parenting Stress Index) and parenting styles (Parenting Styles and Dimensions Questionnaire) measures, with data analysed through MANOVA and path analysis. In the second quantitative study, 465 two-parent Portuguese families with preschool-aged children responded to measures regarding parental involvement and parenting styles, with data analysed through multiple regressions. The third quantitative study analysed data from 227 couples through structural equation models, with mothers and fathers rating their parenting stress and marital relationship and children rating their mothers’ and fathers’ parenting styles.

### The Theoretical Framework of Parenting Styles and its Influence on Parenting

Parenting styles refer to “a constellation of attitudes toward the child that are communicated to the child and that, taken together, create an emotional climate in which the parents’ behaviors are expressed” (Darling & Steinberg, 1993, p. 488). “Parenting styles” typically involve multidimensional patterns, such as an authoritarian style, characterised by a high degree of control and rule-setting, combined with a lack of warmth and responsiveness (Baumrind 1973). They are distinct from “parenting practices” or “parenting behaviours,” which are often loosely defined and lack validated measurement approaches (Lucas et al., 2011).

Parenting styles theories and research are usually based on either dimensional or typological approaches. The dimensional approach has limitations in detecting the interactional influences of different parenting dimensions, leading scholars to adopt the typological approach. Baumrind (1967, 1971) developed the most well-known and fruitful typological theory of parenting styles, identifying three parenting styles: authoritative, authoritarian, and permissive. Subsequent research proposed variations of Baumrind’s categories by differentiating between two categories of permissive parenting; indulgent and neglectful (Lamborn, Mounts; Maccoby & Martin, 1983; Steinberg et al., 1992). Baumrind’s threefold and fourfold typologies are widely used in many studies on parenting styles. Because of parenting type utilisation issues in different cultures, the dimensional approach can provide a much closer look at specific aspects of parenting and still has strength in research (Parke, 2001).

We adopted Steinberg et al., (1992) theoretical framework for parenting styles to assess the main dimensions of parenting and types of parenting styles (Parenting Style Index; Steinberg et al., 1992). The framework proposes three dimensions of parenting styles: acceptance/involvement, strictness/supervision, and psychological autonomy. Acceptance/involvement is the extent to which adolescents perceive their parents as loving, responsive, and involved. Strictness/supervision refers to parental monitoring and limit-setting. Psychological autonomy concerns how parents employ noncoercive, democratic discipline and encourage adolescents to express their individuality within the family.

Parenting styles significantly influence parental involvement. For 465 Portuguese fathers, the authoritative parenting style was positive and significantly correlated to all involvement dimensions except Direct Care (Monteiro et al., 2017). Authoritative parenting style includes the meaning of both acceptance/involvement (the extent to which adolescents perceive their parents as loving, responsive, and involved) and strictness/supervision (parental monitoring and limit-setting).

Parenting styles moderated the relationships among parenting practices and achievement and conduct. Stright & Yeo, (2014) found that the relationship between maternal school-based involvement and children’s achievement was increased by maternal warmth (one parenting style dimension), while the relationship between home-based involvement and appropriate
school conduct was increased by behavioural control (another parenting style dimension). Maternal warmth includes acceptance/involvement (the extent to which adolescents perceive their parents as loving, responsive, and involved), while behavioural control includes strictness/supervision (parental monitoring and limit-setting) and psychological autonomy (how parents employ noncoercive, democratic discipline and encourage adolescents to express their individuality within the family). In this study, students (N = 712) in the 3rd, 4th, 5th, and 6th grades completed questionnaires on their mothers’ parenting styles and school-focused parenting practices. Student achievement and conduct were assessed using achievement tests and conduct grades. Data were analysed through hierarchical regression and simultaneous regression.

While previous studies have generally shown that parenting styles significantly positively influence parental involvement, most were conducted among parents of normal children; few focused on parents of children with developmental disabilities. As the number of children with developmental disabilities is increasing rapidly (China Disabled Persons’ Federation), the relationship between parenting styles and parental involvement among parents of children with developmental disabilities merits further exploration.

Our study raised three research questions:

1. Are the Psychological Stress Questionnaire, Parenting Style Index, and Parental Involvement Scale reliable and valid among parents of children with intellectual disabilities?
2. How do demographic variables influence parental involvement?
3. What are the relationships among psychological stress, parenting styles, and parental involvement?

The Present Research

Given the above background, our research investigated the contributions of psychological stress and parenting styles to parental involvement in intellectual disabilities in mainland China. Considering the importance of demographic variables to parental involvement (Garbacz et al., 2015), these factors need to be considered when analysing how psychological stress and parenting styles relate to parental involvement.

We expected psychological stress to be negatively related to parental involvement and parental styles to be positively related. Our hypotheses’ empirical foundations (e.g., Coley & Hernandez, 2006; Kwok et al., 2013) revealed that negative individual difference variables like parental conflict were related to lower parental involvement levels, while parental styles significantly positively predicted parental involvement (e.g., Monteiro et al., 2017; Stright & Yeo, 2014).

As measures’ reliability and validity determine whether they can be applied, the measures’ psychometric properties were examined before the research questions were explored.

Methods

Participants

Parents in our study were drawn from across the whole country. All targeted participants were recruited via the researchers’ contact with principals and responsible teachers in special schools for children with intellectual disabilities. The sampled parents’ children lived at home, and one parent (the primary caregiver) completed each self-report survey. The final research cohort comprised 995 parents from 23 of mainland China’s 31 provinces. The children’s ages ranged from three to 18 years. See Table 1 for the parents’ demographic details and specific information on their developmentally disabled children. See Table 2 for the distribution of parents by province.

Measures

We used a demographic sheet and the three inventories mentioned above to collect data. The demographic sheet collected the parents’ personal information (e.g., gender and educational level) and information specific to their children (e.g., grade). While the Psychological Stress Questionnaire was in Chinese, the Parenting Style Index and Parental Involvement Scale were originally in English and had to be translated and back-translated by a teacher from the Department of English to check the accuracy of their translation into Chinese. The three inventories are detailed below.

The Psychological Stress Questionnaire (Wang et al., 2020)

The Psychological Stress Questionnaire (PSQ) is a new self-report Chinese inventory developed by Wang et al., (2020). Originally developed in Chinese, it includes nine items covering three dimensions: (a) risk awareness, which reflects the subject’s self-evaluation of the risk stoicism of their environment; (b) physical and mental response, which reveals the subject’s stress response to their current environment; and (c) optimistic hope, which mirrors how confident the subjects were in defeating the epidemic and their optimism regarding the current outbreak. In our research, the internal consistency reliability of the scale was 0.63, consistent with Wang et al., (2020) original findings.
Parenting Style Index (Steinberg et al., 1992)

The Parenting Style Index (PSI) is a self-reported questionnaire used to evaluate children’s perceptions of parenting behaviours in three dimensions: acceptance/involvement, strictness/supervision, and psychological autonomy. Our study modified it to evaluate parenting behaviours from the parents’ perspectives.

The acceptance/involvement scale has nine items measuring the extent to which parents perceived themselves as loving, responsive, and involved. Sample items include: “Children can count on me to help them out if they have some kind of problem”; “When I want my children to do something, I explain why”; and “How often does your family do something fun together”? The strictness/supervision scale contains eight items assessing parents’ monitoring and supervision of their children. Sample items include “How much do you try to know where your children go at night”; “How much do you really know what your children do with their free time”; and “In a typical week, what is the latest your children can stay out on school nights.” The psychological autonomy granting scale includes nine items assessing the extent to which parents employ noncoercive, democratic discipline and encourage their children to express their individuality within the family. Sample items (reverse-scored) include “How often do you tell your children that your ideas are correct and that your children should not question them?”; “How often do you answer your children’s arguments by saying something like ‘You’ll know better when you grow up’?”

The PSI has been used in different cultures and has shown good reliability and validity data (e.g., Chao, 2001, Steinberg et al., 1992). It was recently translated into Chinese and applied successfully among high school and university students in China (Chen & Fan, 2010; Fan & Zhang, 2014). In our study, the three subscales’ reliability values were 0.81, 0.76, and 0.64, respectively, which was comparable to previous studies (e.g., Chen 2010; Fan 2013).
The Parental Involvement Scale (Georgiou, 1997)

The Parental Involvement Scale (PIS) is a self-reported inventory with 30 items in two categories—home-based and school-based involvement. The home-based category is divided into three sub-categories: homework activities (e.g., “I examine my child after he/she finishes his/her homework” and “I go over the corrected tests or papers he/she brings home from school”), daily activities (e.g., “I check the programs my child watches on TV” and “I want to know who my child’s friends are”), and activities related to children’s interests or hobbies (e.g., “I send my child to private lessons in art, music and/or sports” and “I encourage my child to read for pleasure”). The school-based category includes items such as “I visit my child’s school to talk to teachers” and “I attend events organised by my child’s school.” In our study, the five subscales’ reliability values were: involvement in school activities = 0.86 (items 1 to 6); anxiety and over-protection = 0.82 (items 7 to 12); monitoring = 0.84 (items 13 to 18); help with homework = 0.88 (items 19 to 24); and interest development = 0.92, (items 25 to 30). The values are comparable in magnitude with previous studies (Georgiou, 1997; Georgiou & Tourva, 2007).

Procedures

Ethical approval for the study was obtained from Institutional Review Board. Principals and responsible teachers were contacted before questionnaire administration. We explained the survey to teachers, including the benefits parents might derive, and the teachers conveyed the information to the targeted parents. The researchers were well-trained to conduct the survey, which was administered online to 1047 parents; 995 parents provided valid responses (95%).

All research participants completed and returned informed consent forms online highlighting that their participation was voluntary and that all information obtained would be kept strictly confidential and used only for research purposes. The anonymous demographic sheet and three inventories were administered online and took around 20 min to complete. Participants were informed that their participation would be reinforced; parents were given random red packets (with one-in-three odds of containing a reward) in appreciation of their participation.

Data Analysis

We used SPSS 21.0 and AMOS 24 to analyse the data. As the survey was conducted online and only fully completed surveys could be submitted, there were no missing data. The three inventories’ reliability values (mentioned above) were first estimated using Cronbach’s alpha coefficients, after which confirmatory factor analysis (CFA) was conducted via AMOS 24 to test their validity. Descriptive statistics were then calculated. Data were screened, and “frequency” and “explore” analyses were conducted.

To answer Research Question 2, we conducted a series of MANOVAs exploring how demographic variables related to parental involvement. Results showed that parents’ educational level, family monthly income, and the disabled children’s school level significantly affected parental involvement. Specifically, Pillai’s trace revealed a significant effect of educational level on parental involvement (V = 0.06, F(15, 2967) = 4.08, p = 0.00); a significant effect of family monthly income on parental involvement (V = 0.07, F(15, 2967) = 4.95, p = 0.00); and a significant effect of school level of disabled children on parental involvement (V = 0.04, F(15, 2967) = 2.56, p = 0.00). Accordingly, these demographic variables were controlled for in the following multiple regressions.

Finally, we conducted multiple regressions to predict parental involvement from psychological stress and parenting styles, controlling for relevant demographic factors. Specifically, multiple regressions were performed separately for each of the five parental involvement scales, with all dimensions of psychological stress and parenting styles serving as predictor variables in each analysis and being entered individually into the regression model. “R²” was adopted as the indicator for effect sizes, with small, medium, and large effect sizes represented by the values of 0.01, 0.09, and 0.25, respectively (Cohen 1992).

Results

Descriptive Statistics

Descriptive analyses were conducted; the means, standard deviations, and confidence intervals for each psychological stress scale, parenting style, and parental involvement measure are reported in Table 3. Descriptive statistics for the key variables showed that all dimensions were normally distributed.

Validity of the Three Investigated Inventories

To answer Research Question 1, we conducted confirmatory factor analysis (CFA) to test the inventories’ validity. The model fit indices were χ²/df = 4.1, RMSEA = 0.06, CFI = 0.90, GFI = 0.91 for the three-factor parenting styles model; χ²/df = 4.2, RMSEA = 0.06, CFI = 0.97, GFI = 0.99 for the three-factor psychological stress model; and χ²/df = 3.9, RMSEA = 0.05, CFI = 0.94, GFI = 0.90 for the five-factor parental involvement model. As Byrne (1989), Bentler and Bonnett (1980), Browne and Cudeck (1993), and Hu and
Specifically, the Psychological Stress Questionnaire, Parenting Style Index, and Parental Involvement Scale were proven reliable and valid among parents of children with intellectual disabilities. Parents’ educational level, family monthly income, and disabled children’s school level significantly affected parental involvement. Psychological stress significantly negatively predicted parental involvement, while parenting styles significantly positively predicted it, supporting this study’s general hypothesis. For three reasons, these results are statistically significant and likely to be meaningful data rather than statistical anomalies.

First, the parents’ educational level finding was congruent with previous research (e.g., Wylie, 2001), suggesting that parents with higher levels of education tend to be more involved in their children’s education overall. This adds to the extant literature and further addresses the need, cited by other researchers (e.g., Waanders et al., 2007), to investigate the relationship between parents’ education and parental involvement. Our study echoes Wang et al., (2018) finding that parents with higher grade levels were more involved in their children’s education.

The findings concerning family monthly income were consistent with previous research showing that parents from higher-income families reported more school-based involvement (Anicama et al., 2018). The findings concerning the disabled children’s school level align with previous studies’ (e.g., Hill & Tyson, 2009; Kim & Hill, 2015; Patall et al., 2008) findings that parental involvement functions differently across their children’s developmental phases.

Second, parental involvement may be rife with difficulties and challenges for parents of children with intellectual disabilities; understandably, parents who score higher on parenting styles dealt with these difficulties and challenges better and had more parental involvement than those experiencing psychological stress. However, this does not indicate a causal relationship between the three constructs; it is equally likely that some individuals’ greater parental involvement led to higher parenting style scores, while others’ lower parental involvement levels led to psychological stress.

Furthermore, this finding was consistent with findings in the extant literature that negative individual difference variables like parental conflict were related to reduced parental involvement (e.g., Coley & Hernandez, 2006; Kwok et al., 2013), while parental styles significantly positively predicted parental involvement (e.g., Monteiro et al., 2017; Stright & Yeo, 2014).

Third, the present research results are meaningful due to the relationships’ considerable magnitude; per Cohen’s (1992) criteria, the identified relationships’ had medium effect sizes, ranging from \( R^2 = 0.16 \) to \( R^2 = 0.21 \). Furthermore, the findings correspond well with previous studies (e.g., Monteiro et al., 2017; Stright & Yeo, 2014).

### Table 3: Means (M), Standard Deviations (SD), and confidence interval of psychological stress questionnaire, parental involvement scale, and parenting style index

| Scale                        | M      | SD     | Confidence Interval |
|------------------------------|--------|--------|---------------------|
| Psychological Stress         |        |        |                     |
| Risk awareness               | 8.43   | 1.84   | 8.43 ± 0.11         |
| Physical and mental response | 12.43  | 2.44   | 12.43 ± 0.15        |
| Optimistic hope              | 3.87   | 1.43   | 3.87 ± 0.09         |
| Parental involvement         |        |        |                     |
| Involvement in school activities | 21.57 | 5.32   | 21.57 ± 0.33        |
| Anxiety and over-protection  | 15.68  | 5.31   | 15.68 ± 0.33        |
| Monitoring                   | 17.65  | 5.07   | 17.65 ± 0.32        |
| Help with homework           | 20.07  | 5.12   | 20.07 ± 0.32        |
| Interest development         | 21.57  | 5.23   | 21.57 ± 0.33        |
| Parenting styles             |        |        |                     |
| Involvement                  | 30.43  | 3.89   | 30.43 ± 0.24        |
| Psychological autonomy       | 19.97  | 4.39   | 19.97 ± 0.27        |
| Supervision                  | 18.42  | 2.38   | 18.42 ± 0.15        |

Bentler (1999) determined that acceptable values for these fit indices are \( \chi^2/df \) (<1.50 to <0.50); RMSEA (<0.06 to <0.10), GFI and CFI (around 0.90), all three models were deemed acceptable for parents of children with intellectual disabilities.

### Predicting Parental Involvement from Psychological Stress and Parenting Styles

We used hierarchical multiple regression analyses to answer Research Question 3 and test the hypothesis that psychological stress would be negatively related to parental involvement while higher parental style levels would be positively related. As predicted, psychological stress significantly negatively predicted parental involvement, while parenting styles significantly positively predicted parental involvement. Specifically, acceptance/involvement (\( \beta \) ranging from 0.19 to 0.55, \( p < 0.001 \)), strictness/supervision (\( \beta \) ranging from 0.16 to 0.34, \( p < 0.05 \)), and psychological autonomy (\( \beta \) ranging from 0.23 to 0.28, \( p < 0.001 \)) significantly predicted parental involvement. Risk awareness, physical and mental response, and optimistic hope also predicted parental involvement, albeit with less significance (\( \beta \) ranging from \(-0.41\) to \(-0.19\), \( p < 0.05 \)). See details in Table 4.

### Discussion

Our study’s principal objective was to investigate how psychological stress and parenting styles contributed to parental involvement, considering demographic variables. Results showed that the three research questions were addressed, and the general research hypothesis was supported.
Significance, Limitations, and Implications

This study makes three significant contributions to the existing research. First, it targets mainland China, which has many children with developmental disabilities and is far from well-researched. Second, it explores two important factors (psychological stress and parenting styles) influencing parental involvement in developmental disabilities during the COVID-19 pandemic, greatly expanding the research domain of parental involvement. Third, its results regarding the three inventories’ psychometric properties enrich the databases for the Psychological Stress Questionnaire, Parenting Style Index, and Parental Involvement Scale.

However, our study has five major limitations. First, it only sampled parents whose children with intellectual disabilities were educated in special schools; our findings need replication among parents of children with intellectual disabilities educated in inclusive settings. Second, the male/female distribution (298/697) of parents was uneven, with a ratio of approximately 2:5. Third, due to COVID-19’s influence, we employed an online questionnaire instead of a paper-based version. In addition, the random red rewards packages (with one-in-three odds of containing a reward in appreciation of parents’ participation) could have been a confounding factor and may have influenced participants’ decision to enter the study. Fourth, the findings were obtained by examining self-reported data; although this is a widely-used data collection method, it may be less objective than behavioural measures. Fifth, for various reasons, information was not gathered regarding the number of special schools for intellectual disabilities, family structure, ethnicity, and marital status, which may have influenced the results. As such, our findings should be considered preliminary rather than definitive. However, since there are good reasons to believe the present data are meaningful, they have some implications for university/school administrators, counsellors, teachers, and parents of children with developmental disabilities.

The first implication is that using the Parental Involvement Scale (PIS) will help university/school administrators, counsellors, and teachers understand parental involvement more comprehensively and successfully involve parents in their children’s education. For instance, university/school administrators could offer resources and inform parents of various involvement strategies or compare data on university/school-level parental involvement across districts; if university/school-level parental involvement

| Table 4 Predicting parental involvement from psychological stress and parenting styles |
|---------------------------------|-------|-------|-------|-------|-------|
|                              | S     | A     | M     | H     | I     |
| R²                            | 0.21  | 0.13  | 0.15  | 0.17  | 0.18  |
| B (SE)_involvement            | 0.52(0.04)**  | 0.19(0.04)**  | 0.37(0.04)**  | 0.47(0.04)**  | 0.55(0.04)**  |
| B (SE)_sup                    | 0.34 (0.07)**  | –      | 0.16(0.07)  | 0.23(0.07)**  | 0.17(0.07)*   |
| B (SE)_pa                     | –     | 0.28(0.04)**  | 0.23(0.04)**  | –      | –     |
| B (SE)_ra                     | –     | –     | –      | 0.19(0.09)*   | –     |
| B (SE)_optimistic_hope        | –     | –     | –      | –      | –     |
| B (SE)_pmr                    | –     | –     | –      | –      | –     |
| F                              | 31.15 | 24.98 | 20.97 | 23.69 | 25.38 |
| df                            | (9,985) | (9,985) | (9,985) | (9,985) | (9,985) |

* p<0.05, ** p<0.01, *** p<0.001

Table 4 results are from hierarchical multiple regression analyses. Demographic variables, including parents’ educational level, family monthly income, and school level of disabled children, are covariates.

The subscales S, A, M, H, and I describe parental involvement. The subscales of risk awareness, optimistic hope, and physical and mental response delineate physical and mental response. Involvement, sup, and pa are used to describe parenting styles.

S = involvement in school activities
A = anxiety and over-protection
M = monitoring
H = help with homework
I = interest development-extra curriculum activities
ra = risk awareness
pmr = physical and mental response
involvement = acceptance/involvement,
sup = strictness/supervision
pa = psychological autonomy
“–” means there is no significant influence.
is low, counsellors could work with administrators and parent-teacher associations to create more welcoming environments and provide parents with more opportunities to engage in university/school activities—e.g., by arranging flexible times for working parents to attend parent-teacher meetings and other events or providing child care or refreshments at evening events (Wang et al., 2019).

Second, as parents who scored higher on parenting styles showed higher levels of parental involvement, university/school counsellors and teachers might facilitate parental involvement by promoting parenting styles. This could be enhanced by giving parents more opportunities at home and school to understand their parenting styles; become more loving, responsive, and involved; monitor and supervise their children more appropriately; employ noncoercive, democratic discipline; and encourage their children to express their individuality within the family, thus improving parental involvement.

Our findings can also help parents of children with developmental disabilities understand how psychological stress and parenting styles are related to parental involvement and inspire them to improve their involvement by reducing their psychological stress and enhancing their parenting styles; for instance, rational emotive behaviour therapy could help parents reduce their psychological stress. Specifically, the ABC model encourages parents to look at their ‘activating events’ (e.g., their goals and difficulties) and ‘emotional disturbances’ (their own largely negative ‘beliefs’ or interpretations of these events), then directs their attention to the ‘beliefs’ and inferences that powerfully influence emotional disturbance. This model can be taught effectively and quickly, and most parents can grasp it, apart from those who are seriously ill or confused. Parents are encouraged to learn relaxation procedures, like yoga or meditation, and how to dispute irrational beliefs.

Behaviour therapy can be used to promote parenting styles. Specifically, the initial assessment was conducted to comprehensively understand participants’ parenting styles. Observational learning or modelling can help parents by showing them videotapes of parenting styles that can be undertaken in calm and non-threatening ways. Positive reinforcement can also help parents systematically reinforce desired parenting styles while ignoring undesirable ones.

Compliance with Ethical Standards

Conflict of Interest The authors declare no competing interests.

Informed Consent Informed consent was obtained from all individual participants in the study.

Ethical Approval This research was approved by Institutional Review Board.

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