The Effect of Pre-Service Teachers’ Family Adaptation on Anxiety: A Moderated Mediating Effect

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Abstract: This study aimed to examine the effects of family adaptation on anxiety, and the role of Zhongyong thinking style and intentional self-regulation in this association. A hypothetical model of the relationship between family adaptation, Zhongyong thinking style, intentional self-regulation, and anxiety was tested. A convenience sampling method was used to survey 1192 pre-service teachers in Yunnan Province on a self-report scale. Data were collected using the Family Adaptability Scale, the Zhongyong Thinking Style Scale, the Adolescent Intentional Self-Regulation Questionnaire, and the Self-Rating Anxiety Scale. The results show significant positive correlations among the three variables of family adaptation, Zhongyong thinking style and intentional self-regulation, and significant negative correlations with anxiety, respectively. Pre-service teachers’ family adaptation had a direct positive predictive effect on anxiety, which in turn indirectly predicted anxiety through the mediating effect of the Zhongyong thinking style, and individuals’ intentional self-regulation had a moderating effect of family adaptation on the Zhongyong thinking style. This study shows how family adaptation affects pre-service teachers’ anxiety; the results of this study also help to demonstrate the academic value of family adaptation and Zhongyong thinking style in optimally reducing pre-service teachers’ anxiety, and thus promoting good psychological status.

Keywords: family adaptation; Zhongyong thinking style; intentional self-regulation; pre-service teachers

1. Introduction

Anxiety is one of the most common mental health symptoms. According to the World Health Organization, depression, anxiety, and conduct disorders are among the leading causes of illness and disability among adolescents [1]. Additional research suggests that 2–15% of children and adolescents experience clinical manifestations of anxiety [2] and that they may also suffer from poor internalizing problems [3], or show high susceptibility to more serious mental and physical health problems in the process [4]. Social and emotional anxious/withdrawn behaviors in middle childhood appear to carry an increased risk for anxiety disorder outcomes in both adolescence and adulthood [5]. During a pandemic outbreak, individuals in a state of extreme stress are more likely to be at risk for anxiety disorder outcomes in both adolescence and adulthood [6]; for example, during the COVID-19 pandemic, high levels of anxiety symptoms were found in student populations and teacher populations in several countries [7–11]. As crowded places, schools face significant risks during a pandemic. For the mental health of teachers and students, it is necessary to explore the influences and pathways of anxiety in order...
to respond to other public health events that may occur in the future. Among them, pre-service teachers, who have the dual identity of both current students and future teachers, are a unique group who are often understudied in research, and thus will be the focal population for this study.

Family is the first social group that individuals experience when they grow up. Different family environments have different effects on their mental health. As an important indicator of family function and family relationships, family adaptation refers to the flexibility of the way members deal with challenges [12], that is, the ability of the family to change its power structure, role relations, and rules to respond to the needs of the situation or development [13]. Studies have shown a significant negative correlation between the number of psychological symptoms and the family adaptation dimension score [14]. In research, family influence has always been considered an important factor leading to individual anxiety [15]. A recent Chinese study has shown that improper parenting styles (e.g., phubbing behavior) exacerbate children’s anxiety [16]. Therefore, we speculate that better family adaptability may enhance individuals’ flexible coping strategies in the face of difficulties, thus reducing their anxiety levels.

In addition to considering family factors, the influence of culture on anxiety cannot be ignored. Oriental thinking emphasizes the connection between things and the environment, and has the principles of change, neutralization, and contradiction theories. As the core theme of Confucianism, the Zhongyong (doctrine of the mean) is a unique and important philosophical style of thought in traditional Chinese culture. “Zhong” refers to centrality, evenness, and balance, neither favoring one side nor the other; “yong” represents ordinariness, universality, and harmony. The goal of Zhongyong is to maintain balance and harmony, to lead the mind to a state of constant balance, and not to seek unprincipled compromises between opposite poles [17]. Some studies have found that the Zhongyong thinking style can enable individuals to flexibly adjust their views when evaluating emotional events to deal with environmental changes effectively. It ultimately promotes individuals to improve their subjective well-being and sense of harmony [18]. Previous studies have confirmed the positive predictive effect of Zhongyong thinking style on the emotional intelligence of college students [19]. Therefore, Zhongyong thinking style is regarded as a meta-cognitive process [20], which can monitor, reflect and re-evaluate the external environment and events to complete the regulation of emotions. Although Yang’s (2016) study found a negative correlation between moderate thinking and anxiety [18], no research has yet discussed the influence of family factors on Zhongyong thinking style. As a kind of ability to flexibly cope with challenges, family adaptation is very similar to the connotation of Zhongyong thinking style. Therefore, this study speculates that family adaptation will support Zhongyong thinking style; that is, family adaptation will positively predict individuals’ Zhongyong thinking style, and Zhongyong thinking style will negatively predict the individual’s anxiety level.

Ecological Systems Theory points out that the interaction of individual characteristics and environmental factors influences the development of adolescents. Adolescents will respond differently to the external environment due to their different personal characteristics [21]. It is not difficult to find that children living in the same family will have completely different cognitive styles or abilities to cope with their environment. Napolitano (2010), for example, found that the characteristics of adolescents at the individual level (intentional self-regulation) and the situational characteristics at the family level (maternal education level and family per capita income) interact with the positive development of adolescents [22]. Intentional self-regulation refers to a series of action processes in which individuals actively coordinate their development goals by selecting, optimizing, and compensating external environmental resources to obtain better functions and strengthen self-development [23]. Intentional self-regulation does not mature until adolescence, so it has an important influence on adolescence and adulthood development [24]. Some scholars believe that when available resources or opportunities are relatively scarce, it is more beneficial for adolescents to pursue limited goals with limited resources [25]. When available
resources or opportunities are abundant, trying different goals becomes more beneficial for positive development. Family often provides resources for individual development, but individual development is not always consistent with family resources. For example, research has found that in adolescents with low levels of intentional self-regulation, parental corporal punishment may increase their deviant peer relationships and thus increase online gaming addiction. In contrast, the relationship was not significant among adolescents with high levels of intentional self-regulation [26]. Therefore, if individuals can make use of the resources provided by the family system and develop a better adaptability to their environment, intentional self-regulation may play a positive moderating role between family adaptation and Zhongyong thinking style. In individuals with higher levels of intentional self-regulation, the relationship between family adaptation and Zhongyong thinking style is stronger.

The research questions of this study are: What is the influence of family adaptation on pre-service teachers’ anxiety? What role do intentional self-regulation and Zhongyong thinking style play in this process?

Therefore, this study hypothesizes (H) the following:

H1. Family adaptation directly predicts anxiety;

H2. Family adaptation indirectly predicts anxiety through Zhongyong thinking style;

H3. At different levels of intentional self-regulation (low, moderate, and high), the strength of the association between family adaptation and Zhongyong thinking style is different, in that the strength of the association is weaker at low intentional self-regulation and stronger at high intentional self-regulation (see Figure 1).

![Figure 1. Hypothetical model of the role of family adaptation and Zhongyong thinking style on anxiety.](image)

2. Methods

2.1. Participants

A power analysis was conducted using the Monte Carlo Power Analysis for Indirect Effect method to calculate the minimum sample size; when the power level reaches 0.8, a sample size of at least 140 subjects is required. In this study, undergraduates of Yuxi Normal University (Yuxi, China) were selected as research subjects, and more than 10,000 university students of were offered to participate via a convenience sample from September to October 2022. Finally, the data of 1300 university students were collected in this study, among which 80% were rural students and 20% were urban students. After reviewing, 108 invalid questionnaires were deleted. A total of 1192 valid questionnaires were considered for this study. Among them, 952 (79.9%) were female, and 240 (20.1%) were male respondents. Table 1 contains the demographic characteristics of the respondents.
Table 1. Demographic characteristics of participants.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Gender</th>
<th>Urban</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>7 (10.9%)</td>
<td>19 (9.8%)</td>
</tr>
<tr>
<td>Freshmen</td>
<td>Female</td>
<td>57 (89.1%)</td>
<td>175 (90.2%)</td>
</tr>
<tr>
<td></td>
<td>Sum</td>
<td>64</td>
<td>194</td>
</tr>
<tr>
<td>Sophomore</td>
<td>Male</td>
<td>20 (19.4%)</td>
<td>111 (23.4%)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>83 (80.6%)</td>
<td>363 (76.6%)</td>
</tr>
<tr>
<td></td>
<td>Sum</td>
<td>103</td>
<td>474</td>
</tr>
<tr>
<td>Junior</td>
<td>Male</td>
<td>16 (22.5%)</td>
<td>67 (23.4%)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>55 (77.5%)</td>
<td>219 (76.7%)</td>
</tr>
<tr>
<td></td>
<td>Sum</td>
<td>71</td>
<td>286</td>
</tr>
<tr>
<td>Total</td>
<td>Male</td>
<td>43 (18.1%)</td>
<td>197 (20.6%)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>195 (81.9%)</td>
<td>757 (79.4%)</td>
</tr>
</tbody>
</table>

2.2. Procedure

Psychology teachers conducted offline surveys and anonymous field tests in their classes. Trained classroom teachers also administered an online version of the survey and distributed the questionnaire to each class’s WeChat group. Participants were told not to participate in the study if they had already participated in any mode (online or offline). The response scale was examined, and 108 invalid questionnaires were excluded, yielding a total of 1192 valid questionnaires with a validity rate of 91.7%. The exclusion criteria were dual submission (both online and offline), not providing socio-demographic information, and incomplete submission. Software such as IBM SPSS 26.0 and PROCESS v.3.3 was used for data management and analysis.

2.3. Measures

2.3.1. Family Adaptability Scale

The Family Adaptability and Cohesion Evaluation Scale (FACES: [27], Chinese version [12]) subscale “Family Adaptability Questionnaire” was used in this study. The scale consists of 14 items (e.g., Family members discuss problems together and are satisfied with the solution; When the family situation changes, it is easy for the family to change its usual life rules and household rules accordingly), and the participants responded on a five-point Likert scale with options “not”, “occasionally”, “sometimes”, “often”, and “always”. Total scores ranged from 14 to 70. The higher the total scores, the better the family adaptability. The original scale is divided into two parts: actual feelings about the current situation of the subject’s family and the ideal family situation desired by the subject. For the purpose of the current study, only the actual perception part of the scale was used. Two items had substantially low factor loadings, and these items were excluded from the analysis. In the current study, this scale had good model fit in confirmatory factor analysis (CFA) ($\chi^2 = 133.882$, df = 54, $p \leq 0.001$, CFI = 0.991, TLI = 0.989, RMSEA = 0.035, SRMR = 0.043). This scale also had good reliability (alpha = 0.871, omega = 0.872, composite reliability = 0.874).

2.3.2. Zhongyong Thinking Style Scale

The Zhongyong Thinking Scale, developed by Wu and Lin in 2005 [28], was used in this study. This scale consists of 13 items (e.g., I tend to think about the same thing from many perspectives; I try to find a balance between my own opinions and those of others; I usually consider the overall harmony of the atmosphere when making decisions) and the participants responded on a seven-point Likert scale with options ranging from 1 (not at all) to 7 (fully), with higher total scores indicating higher levels of development of Zhongyong thinking style in individuals. Total scores ranged between 13 and 91. In the current study, this scale had good model fit in confirmatory factor analysis (CFA) ($\chi^2 = 138.20$, df = 65,
\( p \leq 0.001, \text{CFI} = 0.995, \text{TLI} = 0.994, \text{RMSEA} = 0.031, \text{SRMR} = 0.048 \). This scale also had good reliability (alpha = 0.941, omega = 0.941, composite reliability = 0.942).

2.3.3. Adolescent Intentional Self-Regulation Questionnaire

The intentional self-regulation scale was developed by Freund and Baltes (1998) \[29\] and revised by Gestsdottir and Lerner (2007) \[23\]. The Chinese researcher Dai (2010) translated and revised the questionnaire according to the specific situation of adolescents with a Chinese background and Chinese expression habits \[30\]. There are 9 items in the questionnaire. For example, I will try as many ways as possible to achieve my goals and I will devote my time and effort to a task according to its importance. The questions are scored on a five-point Likert scale, from 1 (completely inconsistent) to 5 (completely consistent). Total scores from between 9 to 45. The higher the score, the higher the level of intentional self-regulation. In the current study, this scale had good model fit in confirmatory factor analysis (CFA) \( (\chi^2 = 54.317, df = 27, p = 0.001, \text{CFI} = 0.996, \text{TLI} = 0.995, \text{RMSEA} = 0.029, \text{SRMR} = 0.039) \). This scale also had good reliability (alpha = 0.902, omega = 0.903, composite reliability = 0.904).

2.3.4. Self-Rating Anxiety Scale

The Self-Rating Anxiety Scale (SAS) was developed by Zung in 1971 (SAS: \[31\]; Chinese version: \[32\]). This scale consists of 20 items (e.g., I feel more nervous and anxious than usual and I think I might go crazy). Participants responded on a four-point Likert, with the main item being the frequency of the defined symptom, with the following criteria: 1 (no or very little of the time) and 4 (most or all of the time). The higher total scores represent more severe anxiety symptoms. Total scores ranged from 20 to 80. In the current study, this scale had good model fit in confirmatory factor analysis (CFA) \( (\chi^2 = 582.157, df = 167, p = 0.001, \text{CFI} = 0.971, \text{TLI} = 0.967, \text{RMSEA} = 0.046, \text{SRMR} = 0.053) \). This scale also had good reliability (alpha = 0.851, omega = 0.849, composite reliability = 0.916).

2.4. Ethics

Since our study contained human participants, we adhered to the Declaration of Helsinki and its subsequent amendments. The study was approved by the Ethics Committee of Yuxi Normal University (ERB No. 2022016, dated: 14 June 2022). All the participants were informed about the survey’s intention, time required, cost, and risk. After confirming the confidentiality of the data, all the participants signed the informed consent and started the survey.

3. Results

3.1. Common Methodological Deviations

Utilizing a self-rating scale in this research study runs the risk of common method bias (CMB). As a precautionary measure, the subjects’ confidentiality was maintained during the evaluation process. In some measures, reverse scoring control was employed, and Harman single factor analysis was applied to identify common method bias deviation during data manipulation. The findings revealed that eight eigenvalues, which explained 55.79% of the variation, were greater than one. However, the variance of the first factor explained only 20.46%, which fell well below the 40% benchmark, indicating that common method bias was not a significant influence.

3.2. Descriptive Statistical Analysis

The Table 2 presents descriptive statistics for the variables examined in the study. According to Kim’s criteria \[33\], a skewness value of 2 or greater and a kurtosis value of 7 or greater indicate that the data are not normal. However, the variables in this study displayed skewness values ranging from 0.561 to \(-0.896\) and kurtosis values from \(-0.13\) to 1.084, which are both within the recommended range for assessing normality. Furthermore, the results indicate that family adaptation, Zhongyong thinking style, and intentional
self-regulation were positively associated, while anxiety was negatively associated with the other three variables. These correlations were found to be statistically significant at $p < 0.01$.

### Table 2. Descriptive statistics of the study variables ($n = 1192$).

<table>
<thead>
<tr>
<th>Variables</th>
<th>M</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Family adaptation</td>
<td>47.27</td>
<td>8.63</td>
<td>−0.241</td>
<td>0.198</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Zhongyong thinking style</td>
<td>5.09</td>
<td>0.93</td>
<td>−0.77</td>
<td>1.084</td>
<td>0.362**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Intentional self-regulation</td>
<td>3.58</td>
<td>0.69</td>
<td>−0.896</td>
<td>0.804</td>
<td>0.212**</td>
<td>0.306**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4. Anxiety</td>
<td>38.07</td>
<td>9.14</td>
<td>0.561</td>
<td>−0.13</td>
<td>−0.198**</td>
<td>−0.300**</td>
<td>−0.190**</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: $M =$ mean; $SD =$ standard deviation. ** $p < 0.01$.

3.3. The Mediating Effect of Zhongyong Thinking Style and the Moderating Effect of Intentional Self-Regulation

The SPSS macro program v3.3 program was used to examine the mediation model with moderation. Analysis was performed to determine whether the relationship between family adaptation, Zhongyong thinking style, and anxiety was moderated by intentional self-regulation. In all analyses, 95% confidence intervals for various effects were estimated with 5000 replicated samples using a bias-corrected percentile Bootstrap method test. A moderated mediation model test requires estimating the parameters of three regression equations: first, to examine the predictive effect between the independent variable (family adaptation) and the dependent variable (anxiety); second, it examines the influence of the mediating variable (Zhongyong thinking style) on the relationship between the independent variable (family adaptation) and dependent variable (anxiety); third, the moderating effect of the mediating variable (intentional self-regulation) on the relationship between the independent variable (family adaptation) and dependent variable (Zhongyong thinking style) is tested.

If the model meets the following conditions, there is a moderated mediating effect:
1. The predictive effect of family adaptation on anxiety is significant;
2. Family adaptation has a significant predictive effect on Zhongyong thinking style, and Zhongyong thinking style has a significant predictive effect on anxiety;
3. The interaction effect of family adaptation and intentional self-regulation on the Zhongyong thinking is significant (see Figure 2).

![Figure 2. The path model of anxiety; Note: *** $p < 0.001$.](image)

In order to test the mediating effect of Zhongyong thinking style and the moderating effect of intentional self-regulation, the SPSS macro process Model 7 established by Hayes [34] was adopted (consistent with the theoretical hypothesis model of this study). After controlling for sex, grade, and place of birth, the regression results are shown in Table 3, which verify the mediating effect of Zhongyong thinking style and the moderating effect of intentional self-regulation. First, a regression equation was established with family adaptation as the independent variable, and Zhongyong thinking style and anxiety as the dependent variable. Family adaptation positively predicted the Zhongyong thinking style ($Coeff = 0.03, SE = 0.00, t = 10.96, p < 0.001$). Family adaptation had a significant negative predictive effect on anxiety ($Coeff = −0.11, SE = 0.03, t = −3.48, p < 0.001$). Family
adaptation and intentional self-regulation showed a significant interaction with Zhongyong thinking style (Coeff = −0.01, SE = 0.00, t = −3.01, p < 0.01).

Table 3. Tests for mediating effects with moderation.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Zhongyong Thinking Style</th>
<th>Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff</td>
<td>SE</td>
</tr>
<tr>
<td>Family adaptation</td>
<td>0.03</td>
<td>0.00</td>
</tr>
<tr>
<td>Zhongyong thinking style</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intentional self-regulation</td>
<td>0.28</td>
<td>0.04</td>
</tr>
<tr>
<td>Family adaptation × Intentional self-regulation</td>
<td>−0.01</td>
<td>0.00</td>
</tr>
</tbody>
</table>

| R² | 0.25 | 0.12 |
| F  | 55.98 *** | 28.03 *** |

Note: Coeff = coefficient; SE = standard error. ** p < 0.01, *** p < 0.001.

Secondly, the regression analysis was carried out with Zhongyong thinking as the independent variable and anxiety as the dependent variable. The results show that Zhongyong thinking style significantly negatively predicted anxiety (Coeff = −2.22, SE = 0.30, t = −7.41, p < 0.001). In addition, the 95% confidence intervals for the direct effect of family adaptation on anxiety and the mediating effect of Zhongyong thinking style did not include 0, indicating that family adaptation not only directly predicts anxiety, but also anxiety through the mediating effect of Zhongyong thinking style. Therefore, the influence of family adaptation on anxiety was still significant after adding the Zhongyong thinking style, indicating that Zhongyong thinking style played a mediating role between family adaptation and anxiety. However, there was a regulatory effect when intentionality self-regulation entered the model. Specifically, family adaptation, Zhongyong thinking style, and intentional self-regulation negatively predicted anxiety. Moreover, the interaction terms of family adaptation and intentional self-regulation had a significant negative predictive effect on Zhongyong thinking style (Coeff = −0.01, SE = 0.00, t = −3.01, p < 0.01, 95% confidence interval (−0.02, 0.00)). Therefore, intentional self-regulation moderates the influence of family adaptation on Zhongyong thinking style, and the moderating mediation model is established.

In order to more clearly reveal the interactive effects of family adaptation and intentional self-regulation, we conducted a simple effect analysis, which divided intentional self-regulation into groups of one standard deviation above and below the mean. The mean plus one standard deviation was the group with high intentional self-regulation, and the mean minus one standard deviation was the group with low intentional self-regulation. The direct effect value of the variable family adaptation on the variable mean thinking and its 95% Bootstrap confidence interval are shown in Table 4.

Table 4. Analysis of the mediating effect of family adaptation on Zhongyong thinking style at different intentional self-regulation levels.

<table>
<thead>
<tr>
<th>Intentional Self-Regulation</th>
<th>Coeff</th>
<th>Boot SE</th>
<th>t</th>
<th>Boot LLCI</th>
<th>Boot ULCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>M−1SD</td>
<td>0.038</td>
<td>0.004</td>
<td>10.143 ***</td>
<td>0.031</td>
<td>0.045</td>
</tr>
<tr>
<td>M</td>
<td>0.031</td>
<td>0.003</td>
<td>10.964 ***</td>
<td>0.025</td>
<td>0.036</td>
</tr>
<tr>
<td>M+1SD</td>
<td>0.023</td>
<td>0.004</td>
<td>6.216 ***</td>
<td>0.016</td>
<td>0.030</td>
</tr>
</tbody>
</table>

Note: M = mean; SD = standard deviation; Coeff = coefficient; SE = standard error; LLCI = lower level confidence interval; ULCI = upper level confidence interval. *** p < 0.001.

A simple slope is also used to investigate the role of intentional self-regulation in the relationship between family adaptation and Zhongyong thinking style. Its regulating effect is shown in Figure 3. For subjects with low levels of intentional self-regulation, the positive predictive effect of family adaptation on Zhongyong thinking style was significant, with a
simple slope of 0.038 \( (t = 10.143, p < 0.001) \). For subjects with higher levels of intentional self-regulation, the positive predictive effect of family adaptation on Zhongyong thinking style was significant, with a simple slope of 0.023 \( (t = 6.216, p < 0.001) \). These results indicate that the predictive effect of family adaptation on Zhongyong thinking style increases with the level of intentional self-regulation, but also shows a weakening trend.

![Figure 3](image-url)

**Figure 3.** The moderating effect of intentional self-regulation on family adaptation and anxiety.

### 4. Discussion

The results of this study show that family adaptation of pre-service teachers is negatively correlated with anxiety, and family adaptation can directly negatively predict anxiety levels. For pre-service teachers, the better their family adaptation, the lower their anxiety level; conversely, the less adaptive the family, the higher the level of anxiety. This is consistent with the conclusion of existing studies, which holds that there is a negative correlation between the individual’s family adaptation and mental health [15]. The higher the level of family adaptation, the lower the degree of mental health. Moreover, the influence of family on individuals is also reflected in social development. Family atmosphere has been proven to be a good predictor of adolescent social adjustment [35]. The study supports adolescents learning social skills, such as emotional regulation, in a home environment [36]. We believe individuals can transfer the ability to respond flexibly to challenges learned in the home environment to other scenarios. Especially when negative events happen, individuals with low family adaptation may fall into anxiety because of a lack of rich coping ability; good family adaptation can help individuals comprehensively analyze the form and adopt effective strategies to cope with it. At the same time, it can adjust in the face of emotional distress and reduce anxiety.

This study also found that family adaptation could predict Zhongyong thinking style and Zhongyong thinking style could predict anxiety level; therefore, family adaptation can indirectly predict one’s level of anxiety through an individual’s Zhongyong thinking style. Zhongyong thinking style emphasizes the awareness and speculation of individual internal and external information, including the perception and management of individual emotions, as well as the speculation and adjustment of others’ needs [18]. This means that this way of thinking allows people to consider how to deal with the external environment and manage their thoughts, emotions, and other aspects. At present, the pre-service teachers who are still college students face the external environment mainly from school and family. The imposition of “isolation” policies during the COVID-19 pandemic reinforced the impact of school and home environments on students’ psychological development. Students with good family adaptation are more capable of providing positive external information for Zhongyong thinking style, while individuals with high levels of Zhongyong thinking style...
achieve a harmonious state of emotional regulation by paying less attention to negative emotional stimuli [37].

On the contrary, individuals with poor family adaptation may not be good at adjusting strategies in the family, so it is difficult to develop Zhongyong thinking style. In the face of major public health events, they are more likely to pay attention to negative information, leading to an increased risk of anxiety. Gross argues that cognitive reappraisal (CR) is an effective way to regulate emotions. It involves changing the evaluation of situational cues to alter the trajectory of emotional responses, often to interpret negative emotions such as frustration, anger, or disgust more positively, or rationalizing emotional events [38]. In this study, good family adaptation provides flexible cognitive resources for the development of Zhongyong thinking style, and cognitive reappraisal can affect emotions through the cognitive way of meaning [39] and relieve the intensity of anxiety.

The results of this study also show that family adaptation is positively correlated with intentional self-regulation; intentional self-regulation is positively correlated with Zhongyong thinking style; and individual intentional self-regulation can regulate the effect of family adaptation on Zhongyong thinking style. Overall, the better the family adaptation, the higher the level of Zhongyong thinking style. For an individual with a high level of intentional self-regulation, Zhongyong thinking style can be enhanced with the improvement of family adaptation. For an individual with low intentional self-regulation, when the level of family adaptation improved, Zhongyong thinking style was also increased. In other words, high levels of intentional self-regulation reduced the link between family adaptation and Zhongyong thinking style. This is an interesting finding and opposes hypothesis 3. There are two possible explanations for this result. First, the concept of family in Chinese culture is different from that in the West. The social organization of China is a large family with numerous small families, which can be said to be a “family hierarchy”, in which there is no concept of an “individual” [40]. Intentional self-regulation emphasizes goal orientation and individual autonomy. Therefore, individuals with lower intentional self-regulation can establish a close relationship between the adaptability of a “big family” in Chinese culture and the pursuit of balance and harmony in Zhongyong thinking style. The results of this study can be explained by Ecological Systems Theory. According to this theory, the development of adolescents is influenced by the interaction between personal characteristics and environmental factors, and individuals will react differently to the external environment due to their different personal characteristics [21]. Second, the result may be relevant to the sample in this study. The sample of this study has the characteristics of more women and more rural students. Compared with male college students, female college students pay more attention to and are more sensitive to social interactions, and will invest time and energy to recall and evaluate their own performance repeatedly after a social interaction. Rural college students, on the other hand, bear greater learning pressure and contact with a single form of social activities during their school years. After entering college, the complexity of interpersonal relationships and social environment around them increases significantly [41], which brings challenges to them in adapting to their families and their new environment. Other studies show that rural female college students are weak in using cognitive strategies [42]. Therefore, intentional self-regulation as a metacognitive strategy may not be a strong method for rural female college students to deepen their relationships between family adaptability and using the Zhongyong thinking style, which could be why in this study it shows a negative moderating effect. In this study, this different response could be attributed to the characteristics of individual intentional self-regulation. For those pre-service teachers with weak intentional self-regulation ability, if their family adaptation can be improved, they will benefit more and develop a higher level of Zhongyong thinking style.

Previous studies have proven a mutual relationship between teachers and students’ emotions [43], and teachers’ emotions directly impacting students [44]. Therefore, it is necessary to conduct emotional regulation training for university students in the pre-service stage. Such training for pre-service teachers mainly focuses on emotional intel-
ligence [45] and resilience [46], and has achieved good results. Some scholars believe meditation should be included in the teacher education system to reduce the pressure on pre-service teachers [47]. Teachers can also use strategies in the classroom to support the development of students’ self-regulation [48]. According to our research results, training pre-service teachers in family adaptation and consciously cultivating Zhongyong thinking style in education and teaching will effectively reduce the anxiety risk of this group, and maintain mental health. Relevant educational authorities should consider this aspect in teacher education.

5. Research Limitations and Future Prospects

This study still has some shortcomings. First, this study uses a cross-sectional approach, so it cannot show a causal relationship between family adaptability and anxiety. In the future, longitudinal or experimental research methods can be used to further study the causal relationship between these variables by using multi-layer linear models, an aggregation cross-design, or the manipulation of independent and intermediary variables. Secondly, in the sample of this study, female pre-service teachers accounted for the majority, while the proportion of male teachers was relatively low, and the number of urban students differed greatly from that of rural students. Future studies need to consider gender and geographic differences more comprehensively to explore pre-service teacher anxiety during COVID-19. Only by fully understanding the mechanisms of anxiety can we develop effective educational and mental health programs that address the current landscape’s needs [48].

6. Conclusions

In conclusion, this study uniquely distinguishes the relationship between family adaptation and anxiety among Chinese pre-service teachers. In order to explore the existing literature, the results of this study reflect anxiety and other related factors, revealing the influence of family adaptation, intentional self-regulation and Zhongyong thinking style on pre-service teachers’ anxiety. We found that pre-service teachers’ family adaptation predicted anxiety, Zhongyong thinking style played a mediating role, and intentional self-regulation played a moderating role in this predictive relationship. Based on this study’s results, we suggest that psychological interventions based on family adaptation can improve pre-service teachers’ anxiety.

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Institutional Review Board Statement: Since our study contained human participants, we adhered to the Declaration of Helsinki and its subsequent amendments. The study was approved by the Ethics Committee of Yuxi Normal University (ERB No. 2022016, dated: 14 June 2022).

Informed Consent Statement: All the participants were informed about the survey’s intention, time required, cost, and risk. After confirming the confidentiality of the data, all the participants signed the informed consent and started the survey.

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

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