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Effect of Family Cohesion on Depression of Chinese College Students in the COVID-19 Pandemic: Chain Mediation Effect of Perceived Social Support and Intentional Self-Regulation

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ABSTRACT

Individuals' perceptions, attitudes, and patterns of getting along with family members are important factors influencing Chinese people's self-evaluation. The aim of this study was to investigate the effect of family cohesion on depression and the role of perceived social support and intentional self-regulation in this association. A hypothesized model of the association of family cohesion, perceived social support, intentional self-regulation, and depression was examined. A convenience sampling method was used to survey 1,180 college students in Yunnan Province using self-report. Data were collected using the Family Cohesion Scale, the Perceived Social Support Scale, the Intentional Self-Regulation Scale, and the Center for Epidemiological Studies Depression Scale. The findings revealed low to moderate correlation between the variables studied. College students' family cohesion was a negative predictor of their depression. This association was also mediated by the knock-on effect of perceived social support and intentional self-regulation. These findings show how family cohesion affects college students' depressive status. Specifically, these results help demonstrate the importance of family cohesion, perceived social support, and intentional self-regulation in optimizing students' depression, which in turn can promote better psychological states.

KEYWORDS

Depression; family cohesion; perceived social support; intentional self-regulation

1 Introduction

The COVID-19 pandemic is the most severe health crisis in a century. As of April 12, 2022, more than 6 million lives have been lost globally, countless livelihoods destroyed, health systems disrupted, underserved and marginalized people pushed into poverty, and the global economy plunged into its deepest recession since World War II. Although we are now seeing a decline in reported deaths, the



pandemic is still far from over [1]. Small outbreaks can occur spontaneously and persist, ensuring new variants create far-reaching effects on all aspects of social life [2]. The pandemic persisting nature is especially relevant for college students—who are not only a vulnerable population to experiencing heightened stress and mental health issues compared to the overall population but are also in a unique developmental stage—establishing identity and transitioning to adulthood.

Recent study noted that the prevalence of depressive disorders increased during the COVID-19 pandemic and was higher levels than previously recorded following mass traumatic events [3]; although just one example, these effects demonstrate how the pandemic can exacerbate mental health issues—in which college students are not excluded. In order to prevent the spread of epidemic infections, Chinese colleges and universities used preventive measures, such as limiting students from leaving campus for extended periods to reduce the potential transmission of the virus when an infected person is found in or near their area. The pandemic, in addition, to the college experience—somewhat restricted due to these preventive measures—may make college students more vulnerable to experiencing negative emotions such as worry and panic or depression (i.e., the most dominant mood disorder).

Over 350 million people worldwide suffer from depression, which is characterized by significant and persistent depression and lack of pleasure [4] and is a high prevalence generally, cross-culturally, across ages, can be both recurrent and persistent, and has a low cure rate. Fu et al. [5] have found that the detection rate of depression among Chinese college students was 24.6%, and the rate increased with grade level. More importantly, the detection rate of depression was significantly higher in the economically disadvantaged western region of China than in the eastern region, which may imply that depression has become a major threat to the healthy development of college students in ethnic areas under the double acceleration of psychological upheaval and environmental changes, which not only seriously affects college students' lives and studies, but can also lead to higher suicidal tendencies [6]. A great deal of research is currently dedicated to finding the causes of depression and effective treatments to minimize the risk factors for depression and improve the lives of people with depression [7,8]. Studies have found that social roles, stressors, attachment patterns, and personality traits may significantly increase the risk of depression [7]. For example, people with depression have higher neuroticism scores, more attachment and self-blame and low self-esteem [9]. Prolonged exposure to high stress or activation of preexisting depression susceptibility qualities can also lead to the development of individual depression. Thapar et al. [10] noted that depression disorders peak around the age of 18, rising 500% from childhood to adolescence and 400% into adulthood.

As the primary site of adolescent socialization, the importance of the family environment has been historically valued by scholars because it influences adolescents' cognitive styles, behaviors, and values and affects their physical and mental health. Family systems theory emphasizes the importance of the family environment for adolescents' psychological development [11]. While families with harmony in their environment and a good atmosphere function as high-quality families, those with high levels of conflict and tension are important risk factors for child and adolescent psychological health problems. A basic function of the family is to offer an environment for the development of healthy family members in terms of physical, mental and social health. Family cohesion is an important indicator of family function. Family cohesion is the degree to which family members are accepted and recognized by other members in the family environment and involves many aspects, such as the length of time spent with family members, consistency of interests, emotional distance, and sameness of decision-making behavior. The level of closeness of family members is strongly correlated with individual mental health status. Jia et al. [12] found that family cohesion is important in predicting depression among Chinese private university students. Yang [13] found that the less intimacy secondary school students experienced in their families, the more probable they were to experience both depression and anxiety, which led to the development of problem behaviors. This importance of family cohesion for emotionally relevant relationships was also

found in the study of family structure. Fang et al. [14] found significant correlations between rigid or loose families and variables such as anxiety, depression, helplessness, and loneliness among high school students. The same was found with Moreira et al. [15], who focused on the relationship between family cohesion and depression during a period of academic transition for adolescents; 338 college freshmen were examined in the two months before they started college and after their first semester of college. Results found that changes in family cohesion were associated with changes in depression symptoms during the transition from high school to college. Adolescents who reported an increase in family cohesion experienced a decrease in depression symptoms during the college transition. While previous research has focused on the negative effects of a low-income family environment on adolescent physical and mental health [16,17], the present study is grounded in the role of a positive family environment in promoting adolescent mental health, focusing on the predictive role of family cohesion on college students' depression.

1.1 Hypothesis 1 (H1): Family Cohesion Negatively Predicts Depression

The role of social support is seen as one of the most important mediators in determining the relationship between psychological stress and health. Individuals receive moral support during their development from social environments outside of themselves, such as within the family, among relatives, friends at school, and the network and community, which are collectively referred to as social support [18]. Social support reflects the closeness and quality of one's social relationships and is simply the practical help that a person can expect from family, friends, and significant others in times of need [19]. Researchers have different understandings of social support from their respective theories and research purposes, generally focusing on two aspects, objective, actual or visible support—including direct material assistance, on the one hand; and support of subjective experiences, on another side, which refers to the emotional experience or fulfillment of individuals who feel respected, supported, and understood in society. However, it is not necessarily the objective reality that influences individuals' attitudes and behaviors but rather how they perceive their experiences [20]. Objectively, actual support is the basis, while the subjective support experienced by the individual is the psychological feeling. On this basis, the "perceived social support theory" was proposed by researchers, emphasizing the importance of the level of support experienced and felt by individuals from various sources of social support, including family, friends and others [21,22], and manifested as evaluative feelings of support from intra-family members, intimate partners and significant others [23]. Based on this, researchers have developed a measure for assessing perceived social support: the Perceived Social Support Scale (PSSS), which emphasizes an individual's self-understanding and self-perceived social support [24]. The scale also assesses this perceived level of social support from various sources such as family, friends, and others. Perceived social support is suggested to be an intrinsic and stable individual trait; that is when an individual evaluates the quality of their relationships with the outside world, they have more solid beliefs [25]; for example, an individual with higher intimacy between family members hold higher perceived social support than those with less intimate family relations. Concerning mental health, greater perceived social support has been found to be beneficial for psychological well-being [26]. Moreover, higher levels of perceived social support can relieve individuals' stress as well as suppress and even overcome negative emotions [27].

1.2 Hypothesis 2 (H2): Family Cohesion Negatively Predicts Depression through Perceived Social Support

The adolescent period is a time of "storms and stress" [28], developmental disorders [29], or crisis [30] and is also viewed as a time of adventure, conflict, and ambivalence. Action theory highlights that individuals' behaviors, and the controls over those behaviors, have a significant impact on their development [31]. From a theory of action perspective, an element of self or environment is affected or adjusted by individuals to promote positive and minimal goal-related outcomes through intentional self-

regulation [32]. Intentional self-regulation refers to an individual's intentional self-regulation as a set of actions in which an individual actively coordinates the relationship between environmental demands, resources, and personal goals to enhance self-function and optimize self-development. Conscious self-regulation helps people regulate the relationship between the individual and the environment and manage external and internal resources for better development, mainly through three goal-related strategies: selection, optimization, and compensation [33]. Intentional self-regulation is affected by the family environment, and individuals in positive family environments have higher intentional self-regulation [34]. Intentional self-regulation is a goal-oriented behavior. Individuals with high intentional self-regulation are good at reconciling needs, resources, and personal goals in their environment [35]. It can be hypothesized that intentional self-regulation positively helps adolescents face “storm and stress,” developmental disturbance, or crises. The family's emotional closeness offers adolescents encouragement and support on which to base their cognitive formation goals to enhance their functioning or optimize their development. It also helps them correct behaviors that are not in line with their goals. From the initial choice of goals to the implementation of adjustments in the process, parental emotional support and encouragement in the family are inseparable, and more importantly, the self-regulatory activities of these goals influence students' psychological well-being, such as positive coping with challenges and setbacks [20]. Based on this, we suggest that college students' family cohesion will negatively predict depression through the chain mediation of perceived social support and intentional self-regulation.

1.3 Hypothesis 3 (H3): Family Cohesion Negatively Predicts Depression through Intentional Self-Regulation

1.4 Hypothesis 4 (H4): Family Cohesion Negatively Predicts Depression through Perceived Social Support and Intentional Self-Regulation

Researchers have been trying to explore the causes and influences of depression [7,8], but research on the underlying mechanisms needs to be explored deeper. Few studies examined the effects of perceived social support and intentional self-regulation on depression from the perspective of family cohesion. Thus, this study will aim to answer the question of does family cohesion influences depression through perceived social support and intentional self-regulation. The hypothesis model of this study is shown in Fig. 1.

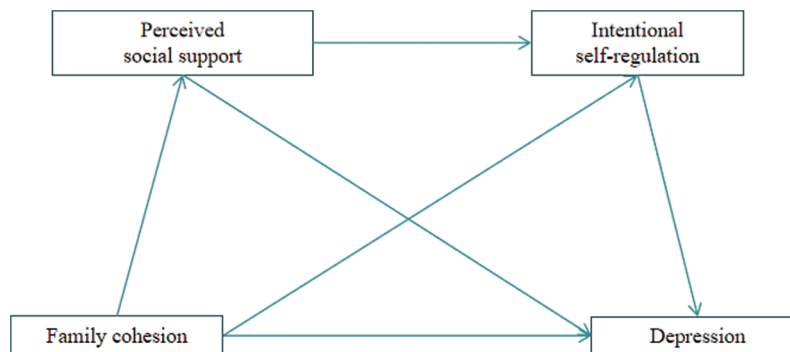


Figure 1: Assumptions model

2 Method

2.1 Participants

The required sample size of the present study was calculated using G*Power 3.1 [36]. With a small effect size (0.02), 99% power and 5% error, the minimum required sample size was 921. A total of 1,300 college students in Yunnan, China participated in the offline survey. After excluding missing responses, the final sample size was 1,180 which was above the minimum required sample size. Yunnan Province is the region with the largest number of ethnic minorities in China, and this survey involved college students of 21 ethnic groups. Including 943 female students (79.9%) and 237 male students (20.1%); 256 (21.7%) first-year college students, 568 (48.1%) second-year college students, and 356 (30.2%) third-year college students. The age of participants included a range from 18 to 23 years ($M = 19.6$ years, $SD = 1.5$ years). Demographic information of the participants are presented in the [Table 1](#).

Table 1: Demographic information of the participants

Variables	Groups	Frequency (%)
Sex	Female	943 (79.9%)
	Male	237 (20.1%)
Grade	Freshmen	256 (21.7%)
	Sophomores	568 (48.1%)
	Juniors	356 (30.2%)
Province	Towns	238 (20.2%)
	Rural areas	942 (79.8%)
Ethnic Group	Han Chinese	913 (77.4%)
	Minorities	267 (22.6%)

2.2 Procedure

In accordance with the principle of convenient sampling, a total of 1,300 students in 24 classes at Yuxi Teachers College in Yunnan Province, China, were selected and professionally trained classroom teachers administered anonymous class-based field tests. The answered scales were examined, and 120 invalid questionnaires with missing answers and irregularities were excluded, and a valid questionnaire of 1180 was used, with a validity rate of 90.7%.

2.3 Statistical Analysis

Data management and data analysis were performed using IBM SPSS v26.0 and PROCESS v.3.3. Statistical analysis of the data consisted of descriptive statistics, correlational analysis and regression analysis and concluded with structural equation modeling to validate the four relationships and construct a model. The PROCESS model 6 in SPSS V26 macro developed by Hayes [37] (in line with the theoretical hypothesis model of this current study) was utilized to examine the mediating effect of perceived social support and intentional self-regulation in the relationship between family cohesion and depression. In the analysis, the bias-corrected percentile Bootstrap method is used to test for mediation effects, and a Bootstrap 95% confidence interval without 0 indicates a significant mediation effect. The mediating model test requires estimating the arguments of two of the regression variables. Firstly, the direct effect of the dependent variable (depression) by the independent variable (family cohesion); and secondly, testing the mediating variables (perceived social support, intentional self-regulation) of the independent variable (family cohesion) and the dependent variable (depression). Mediating effects existed if the model met the following conditions: (1) significant predictive effects of family cohesion on

depression; (2) significant predictive effects of family cohesion on perceived social support and intentional self-regulation; (3) significant predictive effects of perceived social support and intentional self-regulation on depression; and (4) significant predictive effects of perceived social support on intentional self-regulation.

2.4 Measures

2.4.1 Family Cohesion Scale

The Chinese version [38] of the Family Cohesion subscale of the Family Cohesion and Adaptability Scale [39] was used to assess the emotional ties between family members. There are 16 questions for the subscale (e.g., “All family members get together to do activities,” “At home, we do things together,”). Participants answered each question on a 5-point Likert-type scale that ranged from “not at all” (1) to “always” (5). The higher the score, the higher the participant perceived family cohesion. The scale has been shown to have good reliability and validity [36], and in the present study, Cronbach’s $\alpha = 0.82$.

2.4.2 Intentional Self-Regulation Scale

The intentional self-regulation scale [33] from the Chinese version [40] was employed to evaluate students’ internal self-regulation. The Scale is composed of nine questions and includes three dimensions: Goal Selection (i.e., “I never stop setting and pursuing goals for you”), Goal Optimization (i.e., “I will do my best to achieve my goals”), and Goal Compensation (i.e., “I devote the necessary time and energy to the task”). Participants’ answers on this scale made use of a five-point Likert-type scale ranging between “not at all consistent” (1) and “fully consistent” (5). Higher scores indicate greater intentional self-regulation, and Zhou et al. [20] have reported that the reliability and validity of this scale are excellent. In the present study, the Intentional Self-Regulation Scale also had excellent internal consistency reliability ($\alpha = 0.91$).

2.4.3 Perceived Social Support Scale

The Perceived Social Support Scale highlights an individual’s self-understanding and self-perceived social support. It gauges the extent to which individuals perceive support from various sources of social support such as their family, their friends, and other people [41]. It contains 12 self-assessment items, such as “There are people in my life who care about my feelings” and “There are people who are there for me when I have problems.” Every item was graded on a seven-point scale, ranging from “strongly disagree” (1) to “strongly agree” (7). The total sum of the items generates the overall social support score. The scale has proven to have good robustness [39], and in this study, Cronbach’s $\alpha = 0.93$.

2.4.4 Center for Epidemiological Studies Depression Scale

A Chinese version of the Center for Epidemiologic Studies Depression Scale [42,43] was used to assess the frequency of current depressive symptoms, focusing on depressed mood or emotion. The scale included 20 questions, four of which were re-verse-scored (e.g., “I feel as good as anyone else”). When completing the form, participants were asked to indicate the frequency of their symptoms in the past week. Participants answered using a four-point Likert-type scale ranging from 0 “occasionally or not at all [less than one day]” to 3 “most of the time or for a sustained period of time [5–7 days].” Total scores varied from 0 to 60, with higher scores associated with more severe depressive symptoms. The scale has both good reliability and validity [9], and the Cronbach’s α for the scale in this study was 0.87.

2.5 Ethics

The study used human participants, so we complied with the Declaration of Helsinki and its subsequent amendments. This study was approved by the Ethics Committee of Yuxi Normal University, Yuxi, China (ERB No. 202201, dated: 4/1/2022). Prior to the start of the investigation, students were advised of the intention of the investigation, the benefits and costs, the time required to complete the investigation, and the confidentiality of the data. To ensure that students understood the nature of the study, they were provided with informed consent to be involved in this study.

3 Results

3.1 Common Methodological Deviations

This study has utilized self-assessment scales that may be influenced by common method bias (CMB) issues. Therefore, while protecting participant privacy, reverse scoring controls were applied to some items during testing. During data processing, Harman's one-way analysis of variance was used to examine the issue of common method bias. The findings show 19 eigenvalues greater than 1, explaining 61.78% of the variance. The first factor explains 20.17% of the variance, which is well below the 40% threshold, indicating that the effect of common method bias is not significant.

3.2 Descriptive Statistical Analysis

Table 2 shows the descriptors statistics of the variables studied. Kim [44] suggested that data are non-normal when the skewness value is greater than or equal to 2 and the kurtosis value is greater than or equal to 7. In the present study, the skewness of the data for the variables was between -0.90 and 0.63 , and the kurtosis was between -0.13 and 0.81 , both of which are below the recommended thresholds for evaluating normality. The associations among family cohesion, intentional self-regulation and perceived social support were positively correlated, and depression was associated negatively with the three other variables. The associations among the variables were statistical significant ($p < 0.01$, $p < 0.05$).

Table 2: Statistical results of correlation analysis of main study variables ($n = 1180$)

Variable	<i>M</i>	<i>SD</i>	<i>Skewness</i>	<i>Kurtosis</i>	1	2	3	4
1. Family cohesion	66.92	9.15	-0.11	-0.13	1			
2. Perceived social support	4.97	1.01	-0.58	0.26	0.53**	1		
3. Intentional self-regulation	3.58	0.69	-0.90	0.81	0.28**	0.27*	1	
4. Depression	16.78	9.91	0.63	-0.01	-0.35**	-0.37**	-0.21**	1

Note: *M* = Mean; *SD* = Standard deviation; ** $p < 0.01$, *** $p < 0.001$.

3.3 Mediating Effects of Perceived Social Support and Intentional Self-Regulation

The regression analysis results are presented in Table 3 where family cohesion, perceived social support, and intentional self-regulation were all independent predictors of depression. Family cohesion positively predicts perceived social support ($B = 0.06$, $p < 0.001$), intentional self-regulation ($B = 0.01$, $p < 0.001$), and negatively predicted depression ($B = -0.22$, $p < 0.001$). Perceived social support positively predicted intentional self-regulation ($B = 0.12$, $p < 0.001$) and negatively predicted depression ($B = -2.29$, $p < 0.001$). Intentional self-regulation negatively predicted depression ($B = -1.34$, $p < 0.001$). Thus, there was a chain mediating effect of perceived social support and intentional self-regulation in the effect of family cohesion on depression (Fig. 2).

Table 3: Intermediary effect model test ($n = 1180$)

Variable	Model 1			Model 2			Model 3		
	Perceived social support			Intentional self-regulation			Depression		
	<i>B</i>	<i>SE</i>	<i>t</i>	<i>B</i>	<i>SE</i>	<i>t</i>	<i>B</i>	<i>SE</i>	<i>t</i>
Family cohesion	0.06	0.00	21.39***	0.01	0.00	5.75***	-0.22	0.03	-6.41***
Perceived social support				0.12	0.02	5.20**	-2.29	0.31	-7.41***
Intentional self-regulation							-1.34	0.40	-3.34***
R^2	0.28			0.10			0.18		
F	457.48***			63.59***			84.06***		

Note: *** $p < 0.001$.

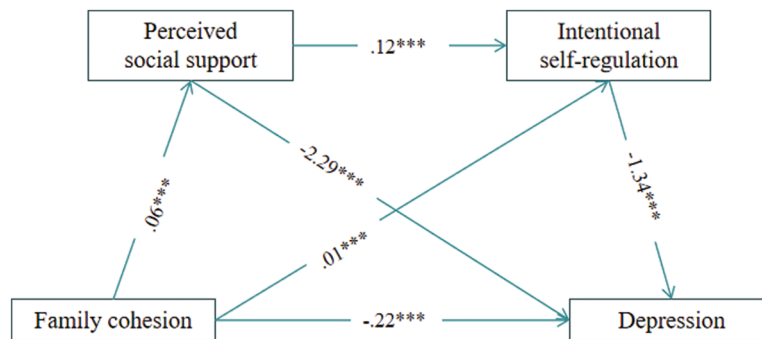


Figure 2: A model of the relationship between family cohesion, perceived social support, intentional self-regulation, and depression

A bias-corrected nonparametric percentage Bootstrap was further employed to obtain reliable findings of mediating effects. 95% confidence interval of Bootstrap without 0 indicates a clear mediating effect. The outcome is presented in Table 4, where the direct effect of family cohesion on depression is -0.22 , accounting for 57.89% of the total effect, and the 95% Bootstrap confidence interval is $[-0.29, -0.15]$, indicating a significant direct effect. The direct effect of perceived social support and intentional self-regulation produced a total indirect effect value of -0.16 in the effect of family cohesion on depression, accounting for 42.11% of the total effect, with a 95% Bootstrap confidence interval of $[-0.2, -0.12]$, indicating a significant mediating effect. This mediating effect consisted of three indirect effect paths (see Table 3): first, the indirect effect consisting of Family Cohesion→Perceived Social Support→Depression was -0.13 , accounting for 34.21% of the total effect; second, the indirect effect consisting of Family Cohesion→Intentional Self-Regulation→Depression was -0.02 , accounting for 5.26% of the total effect; third, the indirect effect of Family Cohesion→Perceived Social Support→Intentional Self-Regulation→Depression was -0.02 , accounting for 5.26% of the total effect; fourth, the chain mediated effect of Family Cohesion→Perceived Social Support→Intentional Self-Regulation→Depression was -0.01 , accounting for 2.64% of the total effect.

Table 4: Bootstrap analysis of significance tests for intermediate effects ($n = 1180$)

Path	Effect	Effect size	Boot LLCI	Boot ULCI
A→B→D	-0.13	34.21%	-0.17	-0.09
A→C→D	-0.02	5.26%	-0.03	-0.01
A→B→C→D	-0.01	2.64%	-0.02	-0.01
Total indirect effect	-0.16	42.11%	-0.2	-0.12
Direct effect (A→D)	-0.22	57.89%	-0.29	-0.15
Overall effect	-0.38	100%	-0.44	-0.32

Note: A = Family Cohesion; B = Perceived Social Support; C = Intentional Self-Regulation; D = Depression; Boot LLCI, Bootstrap lower level confidence interval; Boot ULCI = Bootstrap Upper Level Confidence Interval.

4 Discussion

4.1 Effect of Family Cohesion on Depression

This study showed that family cohesion is negatively associated with depression among college students. The outcomes of this study revealed that the more intimate the emotional experience in the family environment, the lower the experience of depression among college students, which is consistent

with existing literature [12]. These results were further supported by Li et al. [45], who investigated adolescents and their parents in Shenyang, Liaoning Province, China, during the COVID-19 pandemic and identified a significantly negative relationship between depressive symptomatology and family cohesion and family adjustment. Families play an essential role in both personal growths as well as development, and whose psychological development, behavior shaping, and outlook on life cannot be separated from the subtle influence of their family backgrounds. Parents are the first and main mentors to which their children are exposed, and the family is an important foundational environment during the stages of life that parents build. The family is the most direct source of emotional support for individuals, and its degree of emotional connection significantly impacts one's social adjustment. Fei [46] argued that Chinese people are relational people and that the Chinese self is unique, just like the differential order relationship formed by the ripples that spread out in circles when a stone is thrown into the water. Chinese people tend to perceive their environment in terms of their roles and relationships and be attentive to their relationships with others. In general, social relationships have a critical role in personal growth [47]. In addition, the Chinese self-gains influence from close others such as parents, children, siblings, and blood-related family members, especially parents or children, who occupy a central place in the Chinese self [48]. Prolonged exposure to intense family conflict can cause adolescents to perceive higher levels of sadness, fear, and insecurity, which can cause a variety of psychological health problems. In a meta-analysis that included 52 studies, researchers found that parent-child relationships with excessive arguing and hostility gradually transformed negative emotions into misperceptions and judgments, which seriously affect the normal psychological development of children and adolescents [49]. This study verified that family cohesion remains an important predictor of depression and that emotional support given by family may be especially salient to college students—even during a pandemic—and can be a predictive factor in overcoming depression.

4.2 The Interlocking Mediating Role of Perceived Social Support and Intentional Self-Regulation

The findings of the current study suggest that family cohesion both has a direct negative impact on depression and indirectly affects depression through the interlocking mediating effects of perceived social support and intentional self-regulation. The mediating role of perceived social support was greater compared to intentional self-regulation. This study suggests that family cohesion can influence depression through individual cognitive factors, i.e., an individual's perceived family emotional closeness influences their depression experience through perceived social support and intentional self-regulation. The family environment is the main site of individual socialization and is important for studying individual psychological development and one's outlook on life. The family's emotional closeness helps build positive parent-child relationships and provides adolescents with social support, which in turn provides them with good models for managing their emotions and behaviors both as adolescents and adults. Adolescents who experience strong emotional and psychological support from their families have high perceived social support, and this can stem from evaluative perceptions of support from members of the family, intimate partners, and significant others [23]. The social support threat model suggests that individuals who experience traumatic or stressful events reduce their perceptions of support from others [50]. Similarly, adolescents who accumulate emotional support from their families can promote their perceived social support, which improves their negative emotions such as depression, thus demonstrating that social support can buffer depression. To that same effect, lower levels of social support may predict future depression symptoms and diagnosis [51,52].

Intimate emotional experiences in the family can promote adolescents' sense of security and self-confidence, increasing one's positive exploration of self and control. However, adolescents with poor self-control are vulnerable to "goal drift" and engage in less desirable or risky behaviors. Emotional closeness among family members can provide adolescents with encouragement and support, allowing them to

experience a greater sense of social support, helping them to correct off-target behaviors, and promoting them to enhance their functioning or optimize their development—which is key for college students on their identity formation. From the selection of goals to the optimization of implementing adjustments in the process, these processes are inseparably tied to parental emotional support and family encouragement; more importantly, self-regulatory activities towards these goals influence adolescents' positive responses to challenges and setbacks [20]. Thus, this study demonstrates the potential of intentional self-regulation in helping college students positively face periods of developmental disturbance, or crisis, during “storms and stress.” The present study also helps to expand the role intentional self-regulation has beyond adolescent learning—to college students.

5 Limitations and Future Implications

This research also has some limitations that can be modified in future research. First, this research is a cross-sectional design, so the findings of this study cannot be extrapolated to a cause-and-effect relationship. Future research should use longitudinal designs or experimental studies to explore the causal relationships between family cohesion and depression through converging cross-sectional designs, multilayer linear models, or manipulation of the independent and mediating variables. Second, the survey was conducted in teacher-training universities. More female students were in Chinese teacher training universities, and male students were less represented in the samples. The present study is not representative of the gender, but its results are reasonable because there is no comparative study of the two genders in the prior literature.

Moreover, this restriction generally applies because of practical considerations (i.e., cost, time). In future studies, the data on college graduates ought to be more comprehensive so that male students can be evaluated as well. In addition, this current study found that family cohesion was significantly associated with perceived social support and intentional self-regulation of depression in the pathway model. Generally, this predictor effect could help mental health experts ensure effective intervention programs to treat depression in college students during the COVID-19 pandemic. Apart from that, this research has certain practical significance for confronting the depression of college students. Firstly, since family cohesion predicts depression significantly, improving the support between family members and strengthening the cohesion depression state of college students can be improved. Secondly, the relevant training can improve the student's intentional self-regulation ability, which has a mediating effect in this study. Finally, we call on families, schools and society to pay more attention to and care for college students' mental health so they can get more social support experience.

6 Conclusions

Combining the above findings, this study is significant in exploring the correlation between family cohesion and depression during the COVID-19 pandemic. The findings of this study exemplify the factors associated with college students' depression during the COVID-19 pandemic and reveal the effects of family cohesion, perceived social support, and intentional self-regulation on college students' depression. We found that family cohesion in college students predicted depression, and perceived social support and intentional self-regulation played a chain mediating role. This study provides a new perspective for improving depression among college students during the pandemic. In addition, family cohesion may be an important approach to reducing depression. Still, it may vary between individuals-as for university students, perceived social support and intentional self-regulation both need to be taken into account.

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