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Exploring the Relationship Between Personality Traits and Depressive Disorder: The Mediating Effects of Self-Esteem among Chinese Adolescents

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Abstract: Numerous research investigations have shown the correlation between psychopathology and personality traits, as well as between the Five Factor Model (FFM) of personality and self-esteem (SE). However, the relevant research is limited. The purpose of this study is to investigate the relationship between FFM and depression among Chinese adolescents, and to find whether SE acts as a mediator in the relationship. This study recruited 325 adolescents from Jiangsu Province in China. Three self-reported questionnaires were employed to assess their personality traits, depression and SE respectively. Pearson correlation and mediation were applied in data analyses. The results showed that the association between FFM of personality and depression is significantly mediated by SE. High neuroticism was linked to low SE, which in turn correlated with higher levels of depression; higher extraversion, agreeableness, openness and conscientiousness were linked to higher SE, which subsequently corresponded with lower levels of depression. Therefore, future interventions should focus on social and educational training to promote mental health and boost SE.

Keywords: Five Factor Model of personality, self-esteem, depression.

1. Introduction

Unipolar depressive disorder is among the most prevalent mental issues worldwide [1]. The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) lists a variety of somatic and non-somatic symptoms that cause functional impairment for at least two weeks as the clinical and diagnostic criteria of depressive disorder. These symptoms include insomnia, changes in appetite, cognitive impairment, thoughts of suicide, anhedonia, or an overwhelming sense of worthlessness [2]. The one-year prevalence of depression in teenagers is expected to be 4-5% in the middle to late stages of adolescence [3]. Adolescence is a confusing transitory time that includes profound shifts in physiological, psychological, and emotional aspects of life. They are exposed to various forms of stress, which can lead to psychological disorders [4]. Their social, professional, and educational functioning is negatively impacted by these incapacitating symptoms.

Numerous studies in the field of clinical research have been conducted on the environmental factors that contribute to depression, including exposure to intense stressful situations [5]. Also, the

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twin study provides evidence to support the influence of hereditary factors on depression [6]. Apart from the aforementioned aspects, personality traits and depressive disorder have been the subject of increasing attention over an extended period.

Personality traits are characterized as a set of consistent and long-lasting psychological attributes that shape distinctive behavioral patterns throughout time and in different circumstances [7]. The five dimensions of the Five-Factor Model (FFM) of personality—neuroticism (N), extraversion (E), agreeableness (A), openness (O) and conscientiousness (C)—were measured with the NEO Five-Factor Inventory (NEO FFI) [8]. N is the propensity to react to stimuli with negative emotions and mental distress; E is the level of sociability, positive emotions, and general engagement in activity; O refers to the level of curiosity about novel experiences, autonomy in judgement and conservatism; A is the altruistic, empathetic, and cooperative tendencies; C is one's degree of self-control and planning in an organization [9]. Personality traits have the capacity to shape an individual's risk of developing depression by influencing how they interpret, perceive, and respond to life experiences. For instance, those with high neuroticism may be more likely to feel stressed and have negative feelings, which could make them more susceptible to depression [10].

Self-esteem (SE) is defined as the subjective opinion of individuals of their value, significance, worth, or abilities [11]. SE fluctuates significantly during adolescence and can be impacted by things like parental expectations, peer pressure, and academic pressure. According to the self-consistency theory, people are driven to preserve consistency in their self-perceptions and other aspects of their self-concept [12]. Adolescents who fail to think well of themselves are more vulnerable to external influences that might undermine their intrinsic worth. As a result, they might engage in ways to shield themselves from possible failures, such as delaying tasks, avoiding difficulties, or making incredibly low goals.

Various studies have delved into the connection between depressive disorders and personality traits as well as SE. The role of SE as a mediator in predicting the relationship between depression and FFM of personality has only been somewhat studied. Empirical research indicates that E, O, A and C are positively connected with SE, while N and SE are negatively related [13]. Moreover, a negative correlation between depressive disorder and SE was discovered [14]. It is necessary to reevaluate the influencing mechanism between SE and personality traits and depression as Chinese adolescents' SE has been greatly impacted by high-quality education.

This study aimed to look at the interaction between depression, SE, and FFM of personality in Chinese adolescents living in Jiangsu Province. FFM of personality are assumed to have an impact on how depressive disorders manifest in adolescents. It was also hypothesized that SE roles as a mediator between FFM of personality and depression.

2. Methodology

2.1. Design

This study employed cross-sectional research to examine whether there is an association between FFM of personality and depression and whether there is a mediating effect of SE between the two variables.

2.2. Participants

325 adolescents aged 11 and 18 from Jiangsu Province in China were selected by volunteer sampling (155 males, 170 females). The mean age of this sample is 14.8 years (SD = 2.1). 144 participants are from South Jiangsu (includes 33 from Nanjing, 19 Changzhou, 26 Wuxi, 33 Suzhou, 33 Zhengjiang) and 181 of them are from North Jiangsu (18 from Nantong, 5 Suqian, 39 Xuzhou, 21 Yangzhou, 24 Taizhou, 23 Huaian, 34 Yancheng, 17 Lianyungang).

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The data are collected online through Sojump. A permission form explaining the purpose of the study and its anticipated duration was presented to participants prior to the questionnaire being given out. They were also made aware that there was no cost associated with their participation and that they might leave at any moment. They were also assured that the responses they provided would remain anonymous because their names were coded as ID1, ID2, etc.

2.3. Measurement

2.3.1. Personality Traits

The FFM of personality is measured using a 60-item self-report questionnaire named the NEO-Five Factor Inventory (NEO-FFI): N, E, O, A and C [9]. A 5-point Likert scale is used to score each item, with 1 denoting strongly disagree and 5 denoting strongly agree. Every subscale comprises 12 items, and the overall score for each subscale varies from 0 to 60. A higher score indicates a stronger manifestation of that personality trait. All the NEO-FFI's items show excellent internal consistency, ranging from 0.68 to 0.86 [8]. The Chinese edition of this survey has been validated [15]. The results of this study revealed that the Cronbach's α coefficients of C, E, O, and N were 0.865, 0.867, 0.876, and 0.930, respectively, which indicated high consistency.

2.3.2. Depression

The Center for Epidemiologic Studies Depressive Scale (CES-D), a self-rated questionnaire created to assess the negative emotions experienced during the previous week in the general population [16]. It comprises 20 items in total, and each one is given a score on a 4-point Likert scale, where 0 means that something happens seldom or never (less than one day), and 3 means that something happens most of the time (5-7 days). An overall score is derived from calculating the total scores on all questions; a higher score denotes a higher level of depression. The validity of the questionnaire was proved to be good [17]. And this questionnaire was verified in Chinese version among adolescents [18]. The Cronbach's α coefficient of CES-D in this study was 0.978.

2.3.3. Self-esteem

Rosenberg's Self-Esteem Scale (RSES) was designed to measure the general feelings about self-worth and self-acceptance of individuals [19]. It is composed of 10 items, and each item has a score on a 4-point Likert scale, with 0 denoting rarely never (less than one day) and 3 denoting the majority of the time (5-7 days). An increased score corresponded to an elevated degree of self-worth. A recent study verified the Chinese version of the questionnaire [20]. The Cronbach's α coefficient of CES-D in this study was 0.915.

2.4. Statistical Analysis

Statistical analyses were performed using SPSS v.29.0. Before conducting any analysis, missing data were checked to ensure data completeness. Some items in NEO-FFI and RSES were reversely coded since higher scores indicated undesirable traits, ensuring internal consistency in interpretation across scales. The difference in CES-D scores for the demographic variables was tested by t-test and one-way ANOVA. Person correlation was conducted to examine the correlations between FFM of personality, depression and SE. The PROCESS macro 4.3 was utilized for the mediational analysis in order to investigate the potential mediating effect of SE between depression and FFM of personality. In Fig. 1, the hypothesized model was displayed. The path coefficients (a, b, and c / c') report the relationships between FFM of personality and SE (indirect effect), depression and SE (indirect effect), and depression and FFM of personality (total/direct effect).

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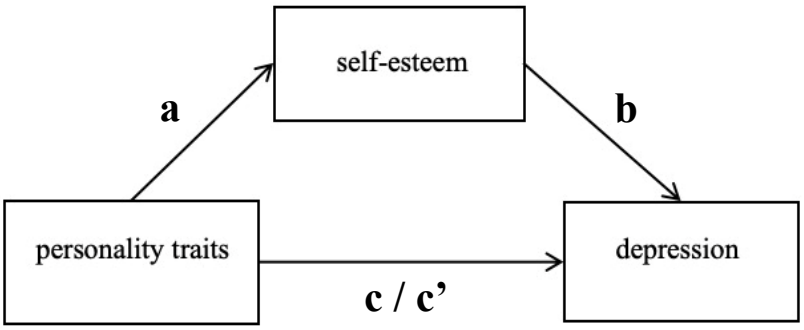

Figure 1: The theoretical models employed to test the mediating effect of SE in the relationship between FFM of personality and depression.

3. Results

3.1. Demographic Characteristics

Table 1: Demographic variables & differences in depression (N = 325).

Variables	N	%	CES-D (M ± SD)	t/F	p
Gender					
Male	155	47.7	2.19 ± .89	1.774	.77
Female	170	52.3	2.02 ± .83		
Age (years)					
11-13	116	35.7	2.17 ± .88	.610	.544
14-16	126	38.8	2.07 ± .84		
17-18	83	25.5	2.05 ± .87		
Region					
South Jiangsu	144	44.3	2.09 ± .86	-.227	.821
North Jiangsu	181	55.7	2.11 ± .87		

CES-D: the Center for Epidemiologic Studies Depression Scale.

Table 1 displays the distribution of depression in different categories as well as the demographic characteristics of middle and high school adolescents. All 325 participants were comprised in the final analysis. In general, there is no significant difference in CES-D score between all demographic variable groupings. The result indicated that depression in boys was relatively higher than in girls, those between 11-13 years were relatively higher than those in older age groups, and those from North Jiangsu were relatively higher than those from South Jiangsu.

3.2. Correlations among FFM of Personality, Depression, and SE

Table 2: Pearson correlations between variables.

Variables	Mean	SD	1	2	3	4	5	6	7
1. CES-D	2.10	.86	1						
2. Self-esteem	3.03	.73	-.580**	1					
3. Neuroticism	2.14	.86	.279**	-.358**	1				
4. Extraversion	3.72	.73	-.249**	.353**	-.919**	1			
5. Openness	3.73	.75	-.299**	.358**	-.923**	.900**	1		
6. Agreeableness	3.45	.45	-.319**	.348**	-.854**	.830**	.823**	1	
7. Conscientiousness	3.76	.73	-.296**	.350**	-.921**	.905**	.905**	.836**	1

** $p < 0.01$ (two-tailed).

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Bivariate correlations between depression, SE and FFM of personality were presented in Table 2, revealing that the correlations between all variables were significant ($p < 0.01$). There was a negative correlation between depression and SE. E, C, A, and O were all found to be negatively correlated with depression, while N was positively related to them. In addition, the results showed that N was adversely correlated with SE, while C, A, O, and E were all positively correlated with it. Besides, results revealed that there were moderate correlations ($0.3 < |r| \leq 0.5$) between all FFM of personality and depression as well as between all traits and SE. Whereas the intercorrelations between the FFM of personality were strong ($|r| \geq 0.5$).

3.3. The Mediator of SE in the Relationship between Depression and FFM of Personality

Table 3: The mediating function of SE on the association between FFM of personality and depression.

Predictors	Path coefficients				Indirect effect (a*b)	95% CI (a*b)
	c	a	b	c’		
Neuroticism	.2809***	-.3067***	-.6494***	.0818	.1991***	.1330, .2768
Extraversion	-.2923***	.3522***	-.6629***	-.0588	-.2335***	-.3257, -.1554
Openness	-.3430***	.3492***	-.6398***	-.1195*	-.2234***	-.3110, -.1517
Agreeableness	-.6166***	.5707***	-.6291***	-.2575**	-.3590***	-.5074, -.2415
Conscientiousness	-.3501***	.3511***	-.6400***	-.1254*	-.2247***	-.3161, -.1479

Note: path c: associations of personality traits and depression without accounting SE (total effect); path a: associations of personality traits and SE (indirect effect); path b: associations between SE and depression(indirect effect); path c’: associations between personality traits and depression after accounting for SE (direct effect). a*b: the product of a and b (total indirect effect); 95% CI: the 95% confidence interval.
* $p < 0.05$ (two-tailed).
** $p < 0.01$ (two-tailed).
*** $p < 0.001$ (two-tailed).

The path coefficients (path a, b, c, c'), size effects of the mediator (a*b), and 95% CI for the mediation analysis results are shown in Table 3. SE can be significantly predicted by each of the FFM of personality (path a). SE was highly negatively correlated with N ($p < 0.001$), while positively correlated with SE were E, O, A, and C. Besides, there is a strong inverse relationship ($p < 0.001$) between SE and depression (path b). The bootstrapping approach revealed that the five predictors' 95% CI for indirect effects (a*b) did not contain zero, suggesting that SE had a statistically significant mediating impact on the relationship between depression and all FFM of personality ($p < 0.001$).

All FFM of personality had significant associations with depression in the total effect (path c), before SE was taken into consideration. N strongly positively predicted depression, while the other four personality traits showed an adverse relationship ($p < 0.001$). N and E in the direct effect (path c') were not significantly associated with depression after accounting for SE ($p = 0.0945$ and $p = 0.3023$, respectively). It so demonstrates the full mediating effects of SE in the links between depression and N / E. Furthermore, after accounting for SE, A, O and C had a significant negative association with depression ($p = 0.0057$, $p = 0.0318$, and $p = 0.0281$, respectively). This showed that the association between these traits and depression may be partially mediated by SE. A showed a greater effect on depression than C and O.

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4. Discussion

The findings in this study corroborated the hypotheses and suggested that some personality traits might contribute to the development of depression. Overall, the major findings showed that higher levels of E, O, A and C were linked to higher levels of SE, which corresponded with decreased levels of depressive symptoms; higher levels of N were linked to lower levels of SE, which corresponded to more severe depressive symptoms. This outcome was consistent with prior studies [21] [22]. Moreover, a meta-analysis showed that compared to non-clinical samples, depression patients had lower levels of N, E and C [23].

The opposite effect of N compared to other personality traits is due to its intrinsic qualities. Neurotic people tend to dwell on their flaws and mistakes, which makes them particularly vulnerable to depression. Depression is regarded as a component of the internalizing spectrum of common psychological disorders [23]. Research suggests a strong association between N and internalizing diseases [24]. The spectrum model can explain the association between depression and N, suggesting that they are fundamentally contrasting points on a spectrum of emotional suffering. The underlying emotional processes that contribute to N could be viewed as having an excessive manifestation in depression, according to this paradigm.

Additionally, it was discovered that SE acted as a mediator in the association between depression and all FFM of personality. People with low SE withdraw from social situations more frequently, exhibit greater self-consciousness, and are also more at risk for depression [19]. The results indicated that N and E did not appear to have a significant direct impact on depressive symptoms after accounting for SE. Their lowered sense of self-worth is mostly responsible for the correlation between N and depressive symptoms. N and SE should be evaluated in combination while analyzing depression disorders [25]. There is less of a connection between N and depression when one takes SE into account. It could be due to low SE completely capturing its depressing consequences. Moreover, extraverts typically seek out social support and relish interactions with others, which boosts their SE [26]. When considering that the primary antidepressant is SE rather than extraversion, the direct impact of E on depression is no longer significant.

Furthermore, A, O, and C were found to have significant direct effects on depression even after accounting for SE. It suggests that although SE is an essential mediator in the relationship, these traits may also have other effects on depression. Independent of SE, those with high agreeableness levels may benefit from more interpersonal harmony and social support, which directly lessen depressive symptoms. This, however, did not align with previous findings, which discovered that A had a greater connection with depression than N [22]. Prior studies have shown that the relatively collectivistic Chinese culture is responsible for this connection [27]. Individuals who tend to be highly agreeable may experience greater pressure to live up to social norms in collectivist cultures. Compared to more individualistic societies, depression might appear more forcefully if individuals believe they fall short of social expectations.

Besides, perception of emotions, imagination, and intellectual curiosity are all associated with openness to new experiences [9]. These traits may make it easier for people to discover fulfilling experiences and manage stress, which may lower depression. Conversely, the meta-analysis found that there is little association between O and depression [23]. Likewise, conscientious people are organized, disciplined, and goal-oriented, they could potentially alleviate depressive symptoms by fostering mental well-being, efficient problem-solving, and goal achievement. More severe depression is linked to a lack of self-control in planning and organizing [9]. However, this contradicts the findings of another research, which found that elevated C—in particular, the aspect that emphasizes striving for achievement—predicted an increase in manic symptoms over time [28].

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It is necessary to recognize the limitations of this study. Firstly, it was a cross-sectional design, so the causality of the relationship is unclear. Therefore, additional longitudinal research can be done to investigate the reciprocal relationship between depression and FFM of personality. More importantly, a meta-analysis revealed that the Big Five predictors of SE may vary from childhood to adulthood due to a developmental shift in the structure of the self-concept [29]. Future studies should evaluate if certain personality traits can predict fluctuations in depression and measure the targeted variables multiple times at different points in time. Secondly, as all participants were chosen through voluntary sampling in Jiangsu Province, generalizations about adolescents in other Chinese provinces cannot be made since adolescents in different regions may be exposed to diverse cultural and educational contexts. Aside from that, there aren't any noticeable demographic differences between South and North Jiangsu because socioeconomic status has not been considered and the sample size is small. Hence, it is better to recruit more participants to examine the differences in depression levels between rural and urban areas. Thirdly, participants may tend to select extreme responses or stay within the middle range of the scale, which could lead to self-report bias.

Apart from that, the reliability score of A is low (Cronbach's alpha = 0.513). As a personality trait encompasses various sub-traits like empathy, altruism, trust, cooperation, compliance, modesty and kindness. However, the items in the questionnaire are tapping into very different aspects of A which are not highly correlated. For instance, one item focuses on kindness, one focuses on trust, another focuses on modesty etc. Also, the agreeableness scale includes more reverse-coded items than other personality traits, which makes participants misinterpret reverse-coded items, leading to inconsistent responses. Thus, it is important to revise the assessment criteria of A in order to improve internal consistency.

The findings suggested that intervention strategies should prioritize fostering positive traits in Chinese adolescents, such as E and O, and promoting their mental health. Programs for education such as music or art could encourage curiosity and creativity, which strengthens students' sense of self and mental resilience. Schools should concentrate on providing students with social skills lessons, teaching them how to communicate effectively and form healthy bonds. To foster possibilities for positive social involvement and lessen feelings of isolation, peer mentoring or group activities could be implemented. Alternatively, psychotherapy could focus on building SE, especially for those with high N. A more positive self-concept and an encouraging atmosphere can also be fostered and reinforced by regular feedback from parents and teachers. Individuals may benefit from learning coping skills like mindfulness-based cognitive therapy in addition to lowering their emotional intensity and enhancing their perception of self-worth [30]. Lastly, future investigations in personality studies may focus more on diseases like bipolar disorder, which are less prevalent [23]. Regarding the wide range of personality traits, it's extremely important to address various psychiatric diseases and offer suitable interventions and coping mechanisms.

5. Conclusion

In conclusion, the objective of this study was to explore the relationship between FFM of personality and depression and the mediating impact of SE among Chinese adolescents in Jiangsu Province. Three closed-question measures (NEO-FFI, CES-D, and RSES) were used to collect online self-reports of participants' emotions and behaviors. Using SPSS v.29.0, data analyses were carried out using Pearson correlation and mediational analysis. Overall, the findings demonstrated that SE functioned as a mediator between a relationship of depression and all FFM of personality, each of which strongly predicted depression. Several limitations were addressed, including sample bias, low internal consistency in the scale, and the ambiguity of casual relationships. To improve SE and build mental resilience, future research and interventions should concentrate on social and creative skills training and emotional management techniques.

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