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Research Article

Dysfunctional Parenting and Family Adversities in Association with Depressive Symptoms in Female Adolescents: The Roles of Personality Traits

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Abstract

Purpose: To examine whether personality traits specifically act with dysfunctional parenting or other family adversities on the development of depressive symptoms among female adolescents.

Methods: A total of 1207 female adolescents aged 15 to 18 from two comprehensive high schools in Taichung County, Taiwan were recruited for this study. A series of multivariable regression analyses were conducted to examine the mediational effect of personality traits between family factors and depressive symptoms.

Main Findings: After controlling for grade and academic performance, dysfunctional parenting, family dysfunctioning, poor family economic status, and all personality traits were significantly associated with depressive symptoms, but each accounted for only a small variation (< 8%) except for neuroticism (47%). Neuroticism acted as a mediator between family adversities and female depressive symptoms since effects of family adversities were substantially attenuated, although remained significant, when taking it into account in the multivariable models. However, those effects stayed similar when psychoticism and extroversion were individually put into the models, indicating both personality traits provided another pathway for family adversities to depressive symptoms in addition to their direct relationships.

Conclusion: This study suggests that female adolescents with high scores of some personality types are at an increased risk of developing depressive symptoms in response to a variety of family adversities, though each personality plays a different role in the relationship. Intervention programs that incorporate both personal characteristics and family systems may be of benefit in alleviating the adverse effects of some types of personality traits and negative family factors on depressive symptoms in female adolescents.

Keywords: Personality trait; Parenting; Family adversity; Depressive symptoms; Adolescents

Introduction

Epidemiological and clinical studies have revealed a variety of psychosocial factors that account for the increased risk of depression during adolescence, including being female, [1] personality type, [2] and familial adversities [3]. These vulnerabilities are intertwined and the mechanisms toward the occurrence or recurrence of depression are complex [4]. For example, economic pressures are associated with parental depression, which is in turn related to marital conflict and disrupted parenting. The disrupted parenting then acts as a mediator in the relationship between the family adversity process and adolescent maladjustment in boys [5]. Although a broader overview of the multilevel risk factors has been advocated in psychiatric epidemiology, [6] still little, however, is known about how personal and family environment factors interact to influence depressive symptoms among female adolescents.

An array of childhood family environment factors has long been acknowledged to be associated with concurrent and subsequent depressive symptoms. Dysfunctional parenting is one of the most frequent investigated factors among those family adversities [7,8]. Low care and high control of parent-child bonding (i.e., the 'affectionless control' type of parenting) has been proposed to be related to depression [9,10]. However, it is interesting to note that no synergistic effect of combined care and control was found. Rather, low maternal as well as low paternal care were independently associated with a higher rate of adolescent depressive disorder; [9] while the association between parental control and depression were relatively small both in western [9] and eastern [11] societies. This implies that in exploring the etiology of psychopathology, parenting data from father and mother are both needed. In addition, care and protection of parenting are better separately evaluated, rather than being combined as domains of parenting style, so as not to overlook the independent effect of each dimension of parenting.

Many other family environment factors such as family functioning, marital status of parents, and economic status also

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show an effect, independent or interrelated, on the occurrence of depressive symptoms in children. For instance, increases in parental conflict and decreases in parental monitoring have been associated with increases in child depressive symptomatology [3]. Parental functioning and parenting skills also play a role in adolescent functioning following divorce [12]. For girls, lower family income uniquely predicted increases of subsequent internalizing behavior [13]. These difficulties or adversities derived from a negative family environment that hampers children from developing "the internal and interpersonal coping skills needed to buffer against the family, social, and community stressors that can cause or exacerbate depression [14]." Thus, to understand how risk factors of adolescent depressive symptoms interact, we should consider not only the 'external' family environment factors but also include the 'internal' personal characteristics.

From the context of personal characteristics, our recent study found that females were around three times more likely than males to show major depressive disorder among non-referred adolescents [15] and some specific personality trait (e.g., neuroticism) played an important role on the episode of depressive symptoms. [2] In light of studies containing different levels of risk factors, parenting experience in early life is an important determinant for the development of personality traits [16,17]. Although half or more of the variation in personality dimensions was explained by inheritance, [18-20] the effect of parenting on variations in personality traits was also substantial according to studies in twins reared apart [21,22]. Therefore, researchers speculated that dysfunctional parenting, by influencing the development of personality, predisposed young people to psychopathology in later life [16,23]. From this point of view, personality might serve as a mediator in the relationship between parenting and depressive symptomatology. Moreover, it seems that only some specific temperaments show effects on the relationship in a preadolescent sample [24]. However, few studies have considered whether specific personality traits mediate dysfunctional parenting to adolescent depressive symptoms. Additionally, efforts for exploring the relationships of other family factors (e.g., poor family functioning, marital status, and family economic status) with personality traits on depressive symptoms among adolescents are still lacking. By examining the mediational process, the "black box" between the connection of family adversities and depressive symptoms could be further understood [25,26].

To evaluate effects of dysfunctional parenting and other family adversities on mental problems among youths, it is also valuable to take cultural diversity into account. For example, authoritarian parenting was not as harmful in Islamic societies [27,28] as in Western ones. Whether there is a similar situation in Taiwan, which is a highly controlled society based on many traditions and codes of Chinese-root culture, is worth investigating. This study therefore focuses on: 1) Examining whether specific personality traits mediate dysfunctional parenting to depressive symptoms among Taiwanese female adolescents; and 2) Exploring whether there is also a mediation effect of specific personality traits between the relationships of poor family functioning, marital status, or family economic status and adolescent depressive symptoms. The study framework is presented in (Figure 1).

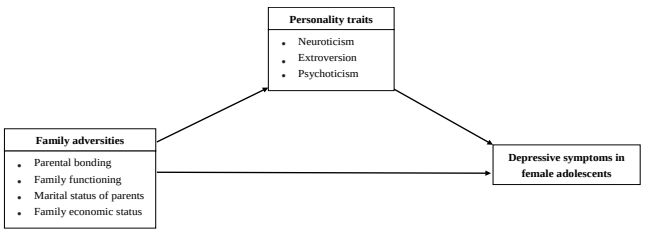

Figure 1: The framework of the present study.

Methods

Participants and procedure

In Taiwan, there are three types of senior high schools for 10th to 12th graders: general, vocational, and comprehensive. A comprehensive high school provides both general and vocational education programs for students. Therefore, students attending a comprehensive high school are more heterogeneous than those attending a pure general or a vocational high school. To enroll a representative sample with a variety of backgrounds, a multi-stage stratified random sampling strategy was conducted from 15-18-year-old female students who attended comprehensive high schools in Taichung County, Taiwan. First, two of 9 comprehensive high schools were selected, with one from a business area and the other from an agriculture area. Second, about one quarter (n = 49) of class in each grade from the two schools were randomly selected. Third, all eligible female students (n = 1230) were invited to participate in the study and informed of its aims and requirements by the research assistants before enrollment. After their written consent for participation was obtained, they were asked to complete a battery of questionnaires including sociodemographic variables, depressive symptoms, parental bonding, family functioning, and personality traits. Parental permission was not obtained in the present study because the survey has been adopted by both schools as a nursing lesson to promote mental health for female students. Before the survey started, a pilot study was conducted with 108 female students from one randomly selected class of each school to make sure the wording and editing of the measurements and the procedure of the study were adequate. During a 2-week enrollment period in November, 2005, a total number of 1207 female students were recruited, with 23 absent on the day of recruitment for an overall attrition rate of only 1.9%. A subsample of 121 students randomly selected from one class in each grade was used for evaluating the test-retest reliabilities of all measurements two weeks later.

Measures

Parental bonding: Parent-child bonding was evaluated according to participants' recollections of the interaction with each parent in the first 16 years of their lives using the Parental Bonding Instrument (PBI) [8]. The PBI contains two dimensions in terms of 'care' and 'protection', consisting of 12 and 13 items, respectively. Participants rated the extent to which each of 25 behaviors was demonstrated by each parent on 4-point scales ranging from '0' (very untrue) to '3' (very true). A high score on the care subscale represents perceptions of a parenting with affection, closeness, and empathy; and a high score of on the protection subscale represents perceptions of overprotective or over controlled parenting. It has been suggested that an optimal cutoff point for paternal protection, paternal care,

Table 1: Distribution of the Center for Epidemiologic Studies-Depression scale (CES-D) scores among subjects, separated by sociodemographic variables.

			CES-D score			Statistical analysis		
Variables	N	%	Mean	SD		t/F	d.f.	p-value
School						2.08	1205	0.04
A	634	52.5	18.8	9.6				
B	573	47.5	17.7	9.2				
Educational system						-1.84	1205	0.07
General	364	30.2	17.8	9.0				
Vocational	843	69.8	18.6	9.6				
Grade						3.89	2, 1204	0.02
10	416	34.5	17.6	9.8				
11	397	32.9	17.9	8.6				
12	394	32.6	19.3	9.7				
Perceived academic performance						7.54	3, 1203	<0.001
1st quartile	333	27.6	17.5	9.1				
2nd quartile	489	40.5	17.4	9.0				
3rd quartile	270	22.4	19.5	9.6				
4th quartile	115	9.5	21.1	11.1				
Paternal educational level (year)						0.72	4, 1202	0.58
6 or less	74	6.1	19.7	10.6				
7-9	257	21.3	17.8	9.1				
10-12	508	42.1	18.4	8.9				
13-16	324	26.8	18.0	10.0				
17 or more	44	3.6	18.4	10.5				
Maternal educational level (year)						1.17	4, 1202	0.32
6 or less	118	9.8	19.1	10.0				
7-9	252	20.9	18.9	9.3				
10-12	560	46.4	18.0	9.2				
13-16	258	21.4	17.6	9.5				
17 or more	19	1.6	20.0	12.6				
Marital status of parents						2.44	1205	0.01
Married	1071	88.7	18.0	9.2				
Single*	136	11.3	20.1	11.2				
Family economic status						11.83	3, 1203	<0.001
Very good	108	8.9	14.8	7.7				
Good	938	77.7	18.1	9.3				
Bad	147	12.2	21.0	10.3				
Very bad	14	1.2	24.3	10.2				

* Including separated, widow, and widower.

maternal protection, and maternal care is 12.5, 24, 13.5, and 27, respectively [29]. One recent study revealed that the PBI is stable over a 20-year follow-up with little influences of mood state and life experience [30]. The Chinese version of PBI has been found to have satisfactory reliability and validity [31]. In this study, satisfactory internal consistencies were shown for both parental care (Cronbach's $\alpha = 0.89 - 0.90$) and protection (Cronbach's $\alpha = 0.82 - 0.83$) subscales. Good test-retest reliabilities were shown with Intraclass Correlation Coefficient (ICC) ranged from 0.77 to 0.81.

Family functioning: The family functioning was evaluated by the third version of the Family Adaptability and Cohesion Evaluation Scale (FACES-III) [32]. The FACES-III is a 20-item questionnaire in which participants respond themselves to each item from 'never' (score = 1) to 'always' (score = 5). Two dimensions in terms of 'cohesion' and 'adaptability' were constructed to define the function or dysfunction in the family [32]. Cohesion is defined as the emotional boundary between family members and it determines the degree of separation and engagement within the family. Adaptability is defined as the

Table 2: Regression models of personality traits on family factors.

	Neuroticism				Extroversion				Psychoticism			
	b	se (b)	p	Adj. R^2	b	se (b)	p	Adj. R^2	b	se (b)	p	Adj. R^2
Parental bonding												
Paternal Care	-1.80	0.26	<0.0001	0.05	0.37	0.22	0.0925	<0.01	-0.44	0.11	<0.0001	0.03
Maternal Care	-1.99	0.25	<0.0001	0.06	0.19	0.22	0.3901	<0.01	-0.52	0.11	<0.0001	0.03
Paternal Protection	1.54	0.26	<0.0001	0.04	0.22	0.23	0.3414	<0.01	0.59	0.11	<0.0001	0.04
Maternal Protection	1.94	0.26	<0.0001	0.06	0.09	0.23	0.6999	<0.01	0.84	0.11	<0.0001	0.06
Family functioning												
Cohesion	-0.12	0.02	<0.0001	0.04	0.05	0.02	0.0023	<0.01	-0.04	0.01	<0.0001	0.03
Adaptability	-0.13	0.02	<0.0001	0.06	0.04	0.01	0.0019	<0.01	-0.03	0.01	<0.0001	0.03
Marital status of parents	0.26	0.28	0.3421	0.01	-0.25	0.24	0.3046	<0.01	0.05	0.12	0.6754	0.02
Family economic status	1.31	0.25	<0.0001	0.03	-0.76	0.22	0.0005	0.01	0.12	0.11	0.2594	0.02

All models were controlled for grade and academic performance.
Adj. R^2 = Adjusted R^2

degree of flexibility within the family and determines the capacity of the family to change its structure, relationships, and the roles of individuals during times of stress. The FACES-III has been reported to have good reliability [32]. The internal consistencies of FACES-III subscales were good in this study, with α of 0.87 for cohesion and of 0.80 for adaptability. A satisfactory test-retest reliability of ICC = 0.80 was found in this study.

Marital status of parents: The marital status of parents was assessed by a single item: "What is the marital status of your biological parents?" Participants rated themselves on this dimension for three options: normal, divorced or separated, and either died. To better interpret the results, only "married" (i.e., the 'normal') and "single" (combined the 'divorced or separated' with the 'either died') were categorized in the analyses.

Family economic status: A self-administered item of "How do you evaluate the economic status in your family?" on a four-point Likert scale (1: very good; 2: good; 3: bad; 4: very bad) was used to assess family economic status.

Personality traits: The Juvenile Eysenck Personality Questionnaire (JEPQ) was adopted to assess personality traits in female adolescents. The JEPQ is a self-administered questionnaire comprising 81 yes/no items regarding three dimensions of personality traits: neuroticism (20 items), extroversion (24 items), and psychoticism (17 items). The other 20 items are used to assess whether the children manifest a social desirability response in rating the questionnaire. The Chinese version of JEPQ has been found to have good psychometric properties in the use of Taiwanese adolescent samples [2,33]. In this study, fair to good internal consistencies were shown, with α s for neuroticism = 0.83, for extroversion = 0.78, and for psychoticism = 0.60. Test-retest reliabilities using ICC ranged from 0.61 (psychoticism) to 0.86 (neuroticism).

Depressive symptoms: Depressive symptoms were assessed by using the Center for Epidemiologic Studies Depression (CES-D) in the present study. The CES-D is a widely used tool which consists of 20 items to be responded according to participants' situation in the past week. Each item is rated from '0' (never or few) to '3' (usually) and therefore a total score ranging from 0 to 60 is obtained by summing all item scores. The Chinese version of CES-D had good reliability and validity in the use of Taiwanese adolescents, with α of 0.90, ICC of 0.93, and Area Under Curve (AUC) of 0.90 for discriminating major depression [15]. In this study, internal consistency of the CES-D among comprehensive high school female students was also found to be good (α = 0.90). The test-retest reliability was found to be good (ICC = 0.80) in the present study.

Data analysis

Scores of depressive symptoms were compared among sociodemographic variables using t-test or one-way ANOVA analyses. To test for the mediation effects of personality traits on the relationship between family factors and depressive symptoms, a series of multivariable regression analyses 34 to examine the effects between variables were conducted: First, regressing personality traits (mediator) on family factors (independent variable) to examine whether family factors significantly predict personality traits. Second, regressing depressive symptoms (outcome variable) on personality traits (mediator). Variations in the mediator are expected to significantly account for variations in the outcome variable. Third, regressing depressive symptoms (outcome variable) on both family factors (independent variable) and personality traits (mediator). The mediation effect is supported when the effect of an independent variable is reduced and the effect of presumed mediator remains significant. The significance level for each test was set based on the Bonferroni correction for multiple comparisons. All data were checked by two research assistants in a double entry procedure using SPSS software version 13.0. Statistical analyses were performed using SAS software version 9.1.

Results

Mean score of the CES-D for total sample was 18.3 (standard deviation = 9.4) in this study. When separated by sociodemographic variables, CES-D mean scores significantly increased with poorer perceived academic performance [$F(3, 1203) = 7.54$, $p < 0.001$] and worse perceived family economic status [$F(3, 1203) = 11.83$, $p < 0.001$] (Table 1). No significant differences were found between or among groups in other sociodemographic variables based on the Bonferroni correction for multiple comparisons.

Table 3: Regression models of depressive symptoms on personality traits and family variables.

	Coefficient estimation			
Model	b	se (b)	p	Adjusted R^2
Personality trait				
Neuroticism	1.42	0.04	< 0.0001	0.47
Extroversion	-0.38	0.07	< 0.0001	0.04
Psychoticism	0.87	0.14	< 0.0001	0.05
Parental bonding				
Paternal Care	4.39	0.53	< 0.0001	0.07
Maternal Care	-4.77	0.52	< 0.0001	0.08
Paternal Protection	3.57	0.55	< 0.0001	0.05
Maternal Protection	4.32	0.54	< 0.0001	0.07
Family functioning				
Cohesion	-0.26	0.04	< 0.0001	0.05
Adaptability	-0.31	0.03	< 0.0001	0.08
Marital status of parents	1.50	0.59	0.0118	0.02
Family economic status	3.06	0.53	< 0.0001	0.05

All models were controlled for grade and academic performance.

To examine whether family factors predicted personality traits, the results in (Table 2) show that, after controlling for subjects' grade and academic performance, all four parenting dimensions significantly predicted neuroticism and psychoticism ($p < 0.0001$), but not extroversion ($p > 0.05$), indicating that extroversion could not be regard as a potential mediator of parenting. Cohesion and adaptability also predicted all three personality traits (all ps < 0.05/8). Marital status of parents did not show associations with any personality trait ($p > 0.05$), whereas poor family economic status significantly predicted neuroticism ($p < 0.0001$) and extroversion ($p = 0.0005$) but not psychoticism ($p = 0.2594$).

The relationships for personality traits and family factors with depressive symptoms are displayed in (Table 3). After controlling for subjects' grade and academic performance, the effects of personality traits and family factors on depressive symptoms were all significant (ps < 0.0001) except for that of marital status of parents ($p = 0.0118$). However, only neuroticism could explain about half (47%) of the variance of the relationship; the other variables accounted for only a very small part of the variance of depressive symptoms (all adjusted R2 < 0.1). The significant relationships between personality and depressive symptoms suggesting that all personality traits could be a potential mediator for family factors to depressive symptoms.

Significant association pairs between family factors and personality traits in (Table 2) were then put into a multivariable model to examine their individual effect on depressive symptoms (Table 4). All models revealed that, after controlling for each other, family factors and personality traits each still had significant effect on depressive symptoms (all ps < 0.05/16). However, only models with neuroticism as an independent variable accounted for a substantial variance (47-49%); the other models explained a relatively small variance (around 10% or less) for depressive symptoms, though the effects of independent variables were significant.

It is interesting to note that the regression coefficient estimates for family factors and personality traits were similar to those in (Table 3) if the models contained extroversion or psychoticism traits, showing that family factors listed in this study influence depressive symptoms not only in a direct way but also through the intermediate of extroversion and psychoticism. However, once the neuroticism trait was put into the multivariable model, regression coefficient estimates for family factors were substantially reduced, though they remained significant, whereas those for neuroticism were not substantially diminished. These results indicate that neuroticism has a partial mediation effect on the relationship between family adversities and depressive symptoms.

Discussion

There are three main findings in this study. First, although many 'external' family factors in terms of dysfunctional parenting, poor family functioning, and poor family economic status were associated with depressive symptoms among female adolescents, these factors accounted for only a small part of the variance. By contrast, the 'internal' personality factors, especially for the neuroticism, showed a strong effect on and explained nearly half of the variance of depressive symptoms. Second, dysfunctional parenting influences girls' depressive symptoms not only through a direct pathway but also through the intermediate of high levels of psychoticism and low levels of extroversion personality traits. However, an elevated neuroticism appeared to act as a mediator so that direct effects of dysfunctional parenting on depressive symptoms substantially diminished in girls with high levels of neuroticism. Finally, the roles of personality traits on the relationship between some other family adversities (i.e., family dysfunctioning and poor economic status) and depressive symptoms were similar to that between dysfunctional parenting and depressive symptoms.

It is interesting to find that the neuroticism trait explained the most variation of depressive symptoms (around 50%) among all the 'internal' and 'external' psychosocial factors, while others accounted for relatively little (less than 10%). Moreover, neuroticism also accounted for approximately one-half variation on the mediation pathway of family adversities to depressive symptoms even though the mediational effect of neuroticism was not full. Although one previous study claimed that personality accounts for a small part of the association between parental behavior and affective symptoms in an adult sample [35], our finding, in some degree, agrees with and is supported by a twin study which indicated that neuroticism shared with genetic factors in contributing to a substantial range of one-third to one-half the variation of genetic risk for internalizing disorders; and individual-specific environmental correlations between neuroticism and internalizing disorders were low [36].

This study further suggested that there are distinct roles for different personality traits on the relationship. Low levels of extroversion and high levels of psychoticism appear to provide another pathway in girls to develop depressive symptoms in addition to the direct effects of family adversities. Although from a recent outlook [6], these results might reflect that the two personality traits not only act as mediators but also play as confounders if interest is restricted to the pathway of family adversities to depressive symptoms. However, the personality traits did not produce mediational effects based on the traditional point of view [34] because effects of family adversities were not

Table 4: Multivariable regression models of depressive symptoms by family factors and personality traits.

	Regression coefficient estimation of family factor (former variable in model)			Regression coefficient estimation of personality trait (latter variable in model)			Model fitting test		
Model	b	se (b)	p	b	se (b)	p	F	p	Adjusted R^2
Paternal Care + Neuroticism	-1.91	0.40	< 0.0001	1.38	0.05	< 0.0001	274.7	< 0.0001	0.4817
Maternal Care + Neuroticism	-2.06	0.40	< 0.0001	1.36	0.04	< 0.0001	279.5	< 0.0001	0.4819
Paternal Protection + Neuroticism	1.43	0.41	0.0005	1.39	0.05	< 0.0001	269.9	< 0.0001	0.4773
Maternal Protection + Neuroticism	1.65	0.41	< 0.0001	1.38	0.05	< 0.0001	274.8	< 0.0001	0.4776
Cohesion + Neuroticism	-0.10	0.03	0.0008	1.39	0.04	< 0.0001	275.1	< 0.0001	0.4762
Adaptability + Neuroticism	-0.13	0.03	< 0.0001	1.37	0.04	< 0.0001	281.5	< 0.0001	0.4819
Family economic status + Neuroticism	1.23	0.39	0.0019	1.40	0.04	< 0.0001	274.4	< 0.0001	0.4755
Cohesion + Extroversion	-0.25	0.04	< 0.0001	-0.34	0.07	< 0.0001	24.4	< 0.0001	0.0720
Adaptability + Extroversion	-0.30	0.03	< 0.0001	-0.33	0.07	< 0.0001	34.5	< 0.0001	0.1001
Family economic status + Extroversion	2.80	0.52	< 0.0001	-0.34	0.07	< 0.0001	21.8	< 0.0001	0.0646
Paternal Care + Psychoticism	-4.06	0.53	< 0.0001	0.76	0.14	< 0.0001	31.4	< 0.0001	0.0935
Maternal Care + Psychoticism	-4.41	0.52	< 0.0001	0.70	0.14	< 0.0001	34.5	< 0.0001	0.1007
Paternal Protection + Psychoticism	3.12	0.55	< 0.0001	0.76	0.14	< 0.0001	24.3	< 0.0001	0.0734
Maternal Protection + Psychoticism	3.78	0.55	< 0.0001	0.64	0.14	< 0.0001	28.5	< 0.0001	0.0841
Cohesion + Psychoticism	-0.24	0.04	< 0.0001	0.76	0.14	< 0.0001	25.5	< 0.0001	0.0750
Adaptability + Psychoticism	-0.29	0.03	< 0.0001	0.73	0.14	< 0.0001	35.5	< 0.0001	0.1028

All models were controlled for grade and academic performance.

attenuated in the multivariable models. We also cannot cull out the possibility that there is another scenario where these personality traits act as an antecedent due to the cross-sectional design of this study. Nevertheless, based on the assumption of developmental context of early family experiences molding an individual's personality, it is less likely for extroversion and psychoticism to act as antecedents.

Accordingly, dysfunctional parenting or other family difficulties in this study appear to dispose the subjects to an elevated level of neuroticism, which then predisposes them to the development of depressive symptoms. Since the neuroticism trait accounts for a major part of the variance of depressive symptoms and the direct effects of family adversities on depressive symptoms were substantially lowered when taking neuroticism into account, it is better to regard it as a mediator, rather than a confounder, in the relationship between family adversities and depressive symptoms. These results are consistent with previous studies [23,37] and further demonstrate that the mediation effect of dysfunctional personality occurs only with neuroticism, but not with extroversion or psychoticism early in late adolescence.

Some previous studies have suggested that maternal parenting behavior showed a greater effect on personality than that of paternal parenting behavior [17,38,39] so that maternal care and personality variables were additive and independent risk factors in predicting a lifetime history of depression [37]. Our results, in contrast, showed that influences of maternal and paternal parenting on personality and depressive symptoms were similar. Both low parental care and overprotection were associated with high levels of neuroticism and psychoticism and exacerbated depressive symptoms. These results demonstrated that, on the one hand, paternal factors were as important as maternal factors in girls' developing depressive symptoms during late adolescence, which is consistent with a recent review article for youth depression in the family context [40]. On the other hand, the apparent effect of overprotection on depressive symptoms in this study, which is more common in Western countries than conservative societies, may reflect the consequence of highly occidentalizing of Taiwan.

Poor family functioning and economic status, like dysfunctional parenting, were associated with females' depressive symptoms. These relationships could also be mediated by high levels of neuroticism, suggesting a similar etiology among family adversities toward the development of depressive symptoms. They might either generate a cascade of stress reactions in a similar mechanism, or closely interact to make depressive symptoms occur [5]. Additionally, although the present result agrees with another study 41 in showing that marital status displays little effect on girls' depressive symptoms and the association did not affect by any personality trait, more detailed categories and analyses for marital status of parents on youth's depression are needed to clarify their relationships.

Limitations and Methodological Considerations

Due to our cross-sectional study design, there might be possibilities for the CES-D and JEPQ getting the information upon the same status conditions or constructs, which may also influence girls' recollection of parenting or other family adversities. Moreover,

the strong hypothesis that family adversities generate effects of personality traits or depressive symptoms might be questionable. Nonetheless, the direction of causation modeling in a cross-sectional analysis between parenting and psychological distress in female twins revealed that parental behavior might better be regarded as a cause of psychological distress than the reverse model [42].

In addition, although the enrollment of only female adolescents in the present study might limit its generalization to male subjects, it provided some methodological advantages. First, adolescence is a period when the prevalence of depressive symptoms started dramatically increasing among individuals, especially for females [43]. A better understanding of the relationships between parenting experiences and personality traits and depressive symptoms is helpful for the prevention or intervention of psychopathology in later life. Second, by late adolescence personality development is nearly complete, and so a stable personality feature can be assessed during this developmental stage. Third, although there is still no sufficient evidence demonstrating that the relationship between parenting behaviors and the development of personality traits is gender-specific, restricting subjects to only female adolescents in this study avoids possible mediation effects of gender on such relationship. Fourth, since the PBI is a self-reporting questionnaire that elicits memory-based answers about how subjects were reared during their first 16 years, our 16-to-18-year-old subjects were less likely than adults to bring the 'recall bias' into the study when responding to the instrument.

Implications and Conclusion

Our findings demonstrated that the complicated mechanism between family adversities and personality traits on depressive symptoms could have effect among females early to late adolescence. Prevention or intervention programs for female depression should commence around the time of adolescence or earlier. In specific, an effective program should consider addressing high levels of neuroticism and related genetic factors sharing with neuroticism and depressive symptoms. Additionally, since personality was affected not only by dysfunctional parenting but also a variety of family adversities such as poor family functioning and family economic status, clinicians need to have a broader view of these interrelated factors in dealing with family issues.

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