Coping as a Mechanism Linking Stressful Life Events and Mental Health Problems in Adolescents*

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Abstract

Objective Although stressful life events represent an etiologic factor of mental health problems in adolescents, few studies have been conducted to address mechanisms linking the stress-psychopathology relation. The present study was designed to examine coping as a mediate factor on the relationship between stressful life events and symptoms of anxiety and depression.

Methods The participants were 13 512 students from eight cities of China, who participated in a school-based survey. Data were collected by a questionnaire comprising coping, stressful life events, anxiety, and depressive symptoms. As a model, a series of regression equations were used to examine whether coping mediated the association between stressful life events and symptoms of anxiety and depression.

Results Each dimension of stressful life events showed significant correlation with anxiety, depression and coping (all $P<0.001$). In the model to analyze mediate effects, all standardized coefficients (β) were significant (all $P<0.01$), indicating marked mediator effects. Furthermore, negative coping might account for more mediate effects than positive coping on this relationship.

Conclusion Coping partially mediated the relationship between stressful life events and mental health during adolescence. This study highlighted an important public health priority for preventive interventions targeting stress-related psychopathology, and for further promoting adolescents' mental health.

Key words: Coping; Stressful life events; Anxiety; Depression; Adolescents

INTRODUCTION

Across cultures and centuries, adolescence has been noted as dramatic changes in emotions, cognition and behaviors, described as a period of "storm and stress"[1-2]. It is not surprising that adolescence is linked to greater negative effects and more perceiving stress than adulthood, and is characterized by high risks for increase of a variety of mental health problems, including anxiety and depression[3-4]. There is consistent evidence that stressful life events are significantly related to the onset of mental health problems in childhood and adolescence[5-8], but the psychological mechanisms remain unclear. Thus, it is important to identify this mechanism for developing prevention

and intervention programs in order to reduce the prevalence of stress-related psychiatric morbidity and to further foster adolescents' well-being.

Stress and coping theory is a framework for studying psychological stress[8-9]. The theory holds that coping is cognitive and behavioral efforts to manage internal and external demands of stressful events. Coping and psychological stress share some formal characteristics[10]. Coping, like stress, is contextual and complex. Coping has a cognitive and behavioral base that contains information and goals; it has both positive and negative emotional tones, which lead to good or adverse mental health. Previous studies have documented that coping and stressful experiences are central to understanding psychological distress and psychopathology during adolescence. For example, depressive symptoms were greater among adolescents who experienced negative life events and used negative coping strategies than those using positive coping strategies[11].

Furthermore, coping has been identified as a psychosocial mediator of the stress-psychopathology association, which has received much attention since the 1980s. Folkman and Lazarus indicated that coping acted as a mediator of emotion, with some forms of coping associated with increase of positive emotions and other forms associated with increase of negative emotions[12]. Similarly, coping strategies expressed mediate effects in the path from automatic negative thoughts to depression, especially emotion-focused coping as a partial mediator between negative thoughts and depression[13]. In addition, coping acted as a mediator between interparental conflict and adolescents' romantic attachment[14]. Moreover, high negative coping had mediate effects on the relationship between social anxiety and eating disorder symptoms[15]. However, little data have focused on coping as a mediator linking stressful life events and symptoms of anxiety and depression.

The purpose of the present study was to explore psychosocial mechanism linking stressful life events to mental health in adolescents. We hypothesized that there were significant correlations among coping, stressful life events, symptoms of anxiety and depression. Furthermore, we predicted that coping would mediate the association between stressful life events and the symptoms of anxiety and depression.

SUBJECTS AND METHODS

Subjects

According to the principle of randomization and cluster sampling, 13 512 adolescent students were recruited from 8 cities of China: Beijing, Shaoxing, Guangzhou, Ezhou, Harbin, Taiyuan, Guiyang, and Chongqing. Totally, 12 470 valid questionnaires were obtained with a response rate of 92.3%. There were 6 216 (49.8%) boys and 6 254 (50.2%) girls; the age range was from 12 to 19 (14.70±1.86). Of the participating students, 6 263 (50.2%) were from middle schools and 6 207 (49.8%) were from high schools. The ethnicity composition was as follows: 11 874 (95.2%) were of Han nationality and 596 (4.8%) were of other ethnic minorities. 7 269 (58%) participants were from urban households and 5 201 (42%) participants from rural households. The family economic statuses of the participants were collected by self-reporting. The proportion of poor, moderate and rich students were 13.4%, 68.5%, and 18.1%, respectively.

Procedure

All of the investigators were trained by using same protocol and instructions. Each participant was also assured that the survey was anonymous and confidential. The questionnaire was completed in 20 min during a regular class period. The study was approved by the Ethics Committee of Anhui Medical University in China.

Measurements

Coping   The Trait Coping Style Questionnaire (TCSQ), developed by Jiang[16], was used to assess coping styles. It comprises two dimensions: (1) Positive coping (10 items), and (2) Negative coping (10 items). Each item is rated on 5-point from 1 (never) to 5 (often). The higher the scores, the higher the levels of positive coping or negative coping.
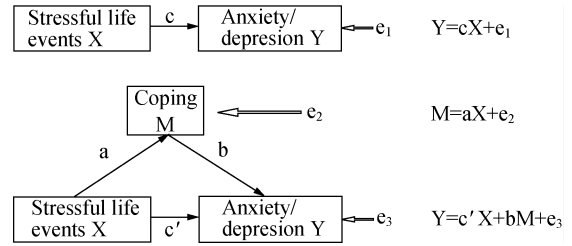
Stressful Life Events   The Stressful Life Events Questionnaire (SLEQ) was developed by our research teams after literature review and semi-structured interview[17]. It is comprised of 43 items and five dimensions (1) family life stress (12 items), e.g., "*Not being taken seriously by your parents*"; (2) school life stress (10 items), e.g., "*Parents expecting too much from you*"; (3) peer pressure (9 items), e.g., "*Pressure to fit in with peers*"; (4) health stress (6 items), e.g., "*Injury or illness*"; and (5) romantic relationships stress (6 items), e.g., "*Not getting along with your boy/girl-friend*". Each item (stressor) is rated on a 5-point Likert scale from 0 (Not at all stressful) to 4 (Very stressful). Participants were inquired about stressor exposure in the past 6 months. Cronbach's alphas coefficient, split-half reliability coefficient and test-retest reliability coefficient of the SLEQ were 0.923, 0.880, and 0.891, respectively.

Mental Health Problems (1) The Zung Self-Rating Anxiety Scale (SAS) was used to assess anxiety symptoms. (2) The Zung Self-Rating Depression Scale (SDS) was used to measure depressive symptoms. Both SAS and SDS, developed by Zung (1960s), are 20-item self-report scales, using a 4-point Likert scale ranging from 1 (never) to 4 (often). Items describe a number of commonly experienced but essentially non-clinical anxiety or depression symptoms. The higher the scores, the higher the levels of anxiety or depression.

Data Analysis

All statistical analyses were performed by SPSS 11.5 (SPSS Inc., Chicago, IL). The association between coping, stressful life events and anxiety/depressive symptoms was examined by conducting spearman correlate analyses. Mediation effects were examined by using a model suggested by Baron & Kenny[18], and Wen[19]. As shown in Figure 1, the mediate analyses comprise three regression equations, in which the independent variable (X) is stressful life event and the dependent variable (Y) is anxiety or depressive symptoms, and the mediate variable (M) is coping. The regression coefficients were tested step by step. (1) In the first regression equation, the stressful life event was the independent variable and anxiety or depression was the dependent variable; then their coefficient of correlation was defined as coefficient c. (2) In the second regression equation, the stressful life event was the independent variable and coping was the dependent variable; then their coefficient of correlation was defined as coefficient a. (3) In the third regression equation, stressful life events and coping were independent variables, anxiety or depression was the dependent variable; then their coefficients of correlation were defined as coefficient c' and b respectively. In these equations, c was the total effects of Variable X for Variable Y; $a \times b$ was the mediate effects of Variable M. Coefficient c' was direct effects, and there was an equation: $c' = c - a \times b$. The percentage of the mediate effects in the total effects was obtained by such a formula as $a \times b/c$. Mediation analyses were performed separately for anxiety and depressive symptoms. Demographic variables were included in each step of the mediation regressions as covariates.

Figure 1. Schematic diagram to analyze mediate effects.

RESULTS

Correlations among Coping, Stressful Life Events and Symptoms of Anxiety and Depression

Table 1 displays the means and standard errors of coping, stressful life events, anxiety, and depression. The valid percentage of each symptom is also shown. Although each dimension of stressful life events showed various prevalence, most participants (94.9%, n=11 830) experienced life stress to a different extent. More seriously, there were 52.4% (n=6 535) of participants in a depressive mood, and there were 15.4% (n=1 915) in an anxious mood.

The correlations among all variables showed a significant association after control of demographic information ($P<0.001$). All dimensions of stressful life events (family, school, peer, health and romantic) and the general stress showed positive correlation with anxiety symptoms and depressive symptoms ($P<0.001$). In addition, negative coping was also positively associated with anxiety symptoms and depressive symptoms ($P<0.001$). On the contrary, positive coping showed negative correlation with anxiety symptoms and depressive symptoms.

Table 1. Correlation Coefficients among Coping, Stressful Life Events, Anxiety, and Depression (r)

	1	2	3	4	5	6	7	8	9	10
1 Positive Coping	—									
2 Negative Coping	0.17[***]	—								
3 Family Stress	-0.10[***]	0.36[***]	—							
4 School Stress	-0.05[***]	0.47[***]	0.60[***]	—						
5 Peer Stress	-0.03[**]	0.47[***]	0.55[***]	0.63[***]	—					
6 Health Stress	-0.04[***]	0.47[***]	0.55[***]	0.61[***]	0.57[***]	—				
7 Romantic Stress	-0.02[***]	0.33[***]	0.37[***]	0.44[***]	0.40[***]	0.40[***]	—			
8 General Stress	-0.07[***]	0.53[***]	0.78[***]	0.88[***]	0.78[***]	0.78[***]	0.57[***]	—		

(Continued)

	1	2	3	4	5	6	7	8	9	10
9 Depression	-0.53[***]	0.17[***]	0.28[***]	0.26[***]	0.21[***]	0.27[***]	0.15[***]	0.31[**]	—	
10 Anxiety	-0.32[***]	0.32[***]	0.34[***]	0.33[***]	0.32[***]	0.38[***]	0.24[***]	0.41[***]	0.64[***]	—
Mean	29.55	21.76	5.72	7.77	3.79	2.57	1.20	21.06	49.61	41.50
(SE)	(0.08)	(0.07)	(0.05)	(0.06)	(0.46)	(0.03)	(0.02)	(0.17)	(0.09)	(0.07)
Valid Percentage										
No	—	—	16.0%	10.7%	32.4%	34.8%	64.6%	5.1%	47.6%	84.6%
Yes	—	—	84.0%	89.3%	67.6%	65.2%	35.4%	94.9%	52.4%	15.4%

Note. [**]Correlation is significant at the 0.01 level (2-tailed). [***]Correlation is significant at the 0.001 level (2-tailed). Numbers in the table represent Correlation Coefficient (r) and valid percentage.

Mediate Effects of Coping on the Relationship between Stressful Life Events and Anxiety Symptoms

The mediate effects were analyzed with the regression model in three steps (Table 2). At Step 1, the associations between stressful life events (family, school, peer, health, romantic, and general) and anxiety symptoms were significant (β=0.37, 0.38, 0.39, 0.29, 0.48, 0.35 respectively, all $P<0.01$). At Step 2, stressful life events (family, school, peer, health, romantic, and general) were also significantly associated with positive coping (β=-0.07, -0.05, -0.03, -0.05, -0.03, -0.05 respectively, all $P<0.001$) and negative coping (β=0.35, 0.41, 0.43, 0.42, 0.29, 0.48 respectively, all $P<0.001$). At Step 3, all standardized

coefficients (β) were significant ($P<0.001$), indicating significant mediator effects. Positive coping between stressful life events (family, school, peer, health, romantic, and general) and anxiety symptoms accounted for 20%, 21%, 22%, 27%, 16%, and 29%, whereas the negative coping model accounted for 22%, 22%, 22%, 26%, 20%, and 27%.

As Table 4 shows, the percentage of mediate effects of positive coping on the relationship between stressful life events (family, school, peer, health, romantic, and general) and anxiety symptoms were 4.73%, 3.29%, 2.00%, 2.72%, 2.69%, and 2.25% respectively, whereas the percentage of mediate effects of negative coping were 30.27%, 32.37%, 33.85%, 23.74%, 36.00%, and 23.00% respectively (Table 4).

Table 2. Stepwise Regression–Mediate Effects of Coping on the Relationship between Stressful Life Events and Anxiety

	Stress	Positive Coping and Anxiety				Negative Coping and Anxiety			
		Step1 c	Step2 a	Step3 b	Step3 c'	Step1 c	Step2 a	Step3 b	Step3 c'
Family	β	0.37[***]	-0.07[***]	-0.25[***]	0.36[***]	0.37[***]	0.35[***]	0.32[***]	0.26[***]
	$\triangle R^2$	0.14[***]	0.06[***]	0.20[***]		0.14[***]	0.23[***]	0.22[***]	
	F	207.76[***]	86.78[***]	283.72[***]		207.76[***]	365.69[***]	326.50[***]	
School	β	0.38[***]	-0.05[***]	-0.25[***]	0.37[***]	0.38[***]	0.41[***]	0.30[***]	0.26[***]
	$\triangle R^2$	0.16[***]	0.06[***]	0.21[***]		0.16[***]	0.287[**]	0.22[***]	
	F	230.10[***]	86.28[***]	307.32[***]		230.10[***]	477.66[***]	323.20[***]	
Peer	β	0.39[***]	-0.03[***]	-0.26[***]	0.38[***]	0.39[***]	0.43	0.31[***]	0.26[***]
	$\triangle R^2$	0.16[**]	0.06[***]	0.22[***]		0.16[**]	0.29[***]	0.22[***]	
	F	236.76[***]	83.88[***]	321.44[***]		236.76[***]	506.44[***]	323.87[***]	
Health	β	0.46[***]	-0.05[***]	-0.25[***]	0.44[***]	0.46[***]	0.42[***]	0.26[***]	0.35[***]
	$\triangle R^2$	0.21[***]	0.06[***]	0.27[***]		0.21[***]	0.28[***]	0.26[***]	
	F	338.78[***]	85.80[***]	419.56[***]		338.78[***]	481.54[***]	405.03[***]	
Romantic	β	0.29[***]	-0.03[**]	-0.26[***]	0.29[***]	0.29[***]	0.29[***]	0.36[***]	0.18[***]
	$\triangle R^2$	0.09[**]	0.06[***]	0.16[***]		0.09[**]	0.19[***]	0.20[***]	
	F	126.08[***]	83.62[***]	208.21[**]		126.08[***]	293.79[***]	280.05[***]	
General	β	0.48[***]	-0.05[***]	-0.24[***]	0.46[***]	0.48[***]	0.48[***]	0.23[***]	0.37[***]
	$\triangle R^2$	0.23[***]	0.06[***]	0.29[***]		0.23[***]	0.34[***]	0.27[***]	
	F	379.76[***]	86.61[***]	458.95[***]		379.76[***]	633.58[***]	413.10[***]	

Note. [*]$P<0.05$; [**]$P<0.01$; [***]$P<0.001$. Numbers in the table represent standardized coefficients (β). Age, gender, grade, nationality, household registration, parents' education, and family income level act as covariates in each regression equation.

Mediate Effects of Coping on the Relationship between Stressful Life Events and Depressive Symptoms

The results of the three-step mediate analyses were presented in Table 3. First, stressful life events (family, school, peer, health, romantic, and general) were significantly associated with depressive symptoms (β=0.30, 0.31, 0.26, 0.33, 0.18, and 0.35 respectively, all $P<0.001$). Second, stressful life events (family, school, peer, health, romantic, and general) were significantly associated with positive coping (β=-0.06, -0.06, -0.03, -0.05, -0.03, and -0.05 respectively, all $P<0.001$) and negative coping (β=0.35, 0.41, 0.43, 0.42, 0.29, and 0.48 respectively, all $P<0.001$). In the third equation, depressive symptoms were simultaneously regressed on both stressful life events (family, school, peer, health, romantic and general) and coping, resulting in

statistical significance of all standardized coefficients (β) ($P<0.001$). Positive coping and each dimension of stressful life events contributed a significant amount of variance to depressive symptoms (34%, 36%, 34%, 37%, 30%, and 38% respectively). In addition, negative coping and each dimension of stressful life events also contributed a significant amount of variance to depressive symptoms (13%, 14%, 12%, 15%, 10%, and 15% respectively).

Furthermore, we computed the mediate effects and the percentage of mediate effects in total effects, as shown in Table 4. Results showed that the percentage of mediate effects of positive coping were 10.33%, 8.06%, 6.15%, 7.58%, 8.67%, and 7.14% respectively, while the negative coping accounted for 22.00%, 20.96%, 31.54%, 19.09%, 38.67%, and 16.46% respectively (Table 4).

Table 3. Stepwise Regression–Mediate Effects of Coping on the Relationship between Stressful Life Events and Depression

Stress		Positive Coping and Depression				Negative Coping and Depression			
		Step1 c	Step2 a	Step3 b	Step3 c′	Step1 c	Step2 a	Step3 b	Step3 c′
Family	β	0.30***	-0.06***	-0.51***	0.27***	0.30***	0.35***	0.19***	0.23***
	$\triangle R^2$	0.11***	0.06***	0.34***		0.11***	0.23***	0.13***	
	F	147.96***	86.78***	594.44***		147.96***	365.69***	147.86***	
School	β	0.31***	-0.06	-0.50***	0.29***	0.31***	0.41***	0.16***	0.24***
	$\triangle R^2$	0.12***	0.06***	0.36***		0.12***	0.28***	0.14***	
	F	167.24***	86.28***	626.70***		167.24***	477.66***	180.93***	
Peer	β	0.26***	-0.03***	-0.51***	0.25***	0.26***	0.43***	0.19***	0.18***
	$\triangle R^2$	0.09***	0.06***	0.34***		0.09***	0.29***	0.12***	
	F	125.66***	83.88***	575.83***		125.66***	506.44***	149.85***	
Health	β	0.33***	-0.05***	-0.50***	0.31***	0.33***	0.42***	0.15***	0.27***
	$\triangle R^2$	0.13***	0.06***	0.37***		0.13***	0.28***	0.15***	
	F	185.94***	85.80***	659.07***		185.94***	481.54***	194.79***	
Romantic	β	0.18***	-0.03**	-0.52***	0.17***	0.18***	0.29***	0.24***	0.11***
	$\triangle R^2$	0.06**	0.06***	0.30***		0.06***	0.19***	0.10***	
	F	74.68***	83.62***	496.94***		74.68***	293.79***	129.25***	
General	β	0.35***	-0.05***	-0.50***	0.33***	0.35***	0.48***	0.12***	0.30***
	$\triangle R^2$	0.15***	0.06***	0.38***		0.15***	0.34***	0.15***	
	F	240.76***	86.61***	693.56***		240.76***	633.58***	206.11***	

Note. *$P<0.05$; **$P<0.01$; ***$P<0.001$. Numbers in the table represent standardized coefficients (β). Age, gender, grade, nationality, household registration, parents' education, and family income level act as covariates in each regression equation.

Table 4. Mediate Effects and its Proportion in Total Effects of Coping on the Association between Stressful Life Events and Anxiety/ Depression

Stress	Positive Coping				Negative Coping			
	Anxiety		Depression		Anxiety		Depression	
	Mediate Effect	Proportion	Mediate Effect	Proportion	Mediate Effect	Proportion	Mediate Effect	Proportion
Family	0.0175	4.73%	0.031	10.33%	0.112	30.27%	0.066	22.00%
School	0.0125	3.29%	0.025	8.06%	0.123	32.37%	0.065	20.96%
Peer	0.0078	2.00%	0.016	6.15%	0.132	33.85%	0.082	31.54%
Health	0.0125	2.72%	0.025	7.58%	0.109	23.74%	0.063	19.09%
Romantic	0.0078	2.69%	0.016	8.67%	0.104	36.00%	0.070	38.67%
General	0.012	2.25%	0.025	7.14%	0.110	23.00%	0.058	16.46%

DISCUSSION

The present study found that coping partially mediated the relationship between stressful life events and symptoms of anxiety and depression during adolescence. Furthermore, negative coping exerted stronger mediate effects than positive coping on the relationship between stressful life events and symptoms of anxiety and depression. These findings suggested that coping shall enjoy important public health priority for preventive interventions targeting stress-related psychopathology, and for further promoting adolescents' mental health.

It is well established that stressful life events appear to be as an etiologic factor in the pathogenesis of mental health problems; however, psychological mechanisms are less well understood. Recent findings have addressed several possible mediators on the relationship between stress life events and mental health, such as personality[20], spirituality[21], loneliness[22], hope[12], and emotion regulation[5]. To our knowledge, the present study has provided the first national, school-based evidence that coping mediates the association between stressful life events and symptoms of anxiety and depression among adolescents. Consistent with our research, data in juvenile justice have showed coping as a mediator of the effects of stressors (experiences of abuse and other negative life events) and depressive symptoms[23]. Furthermore, positive coping styles markedly decreased the incidence of major depression, while negative coping increased its incidence in negative life-events the participants had difficulties in dealing with[24]. In sum, coping plays an important mediate role on the relationship between stress and mental health among adolescents.

The period of adolescence is crucial to the development of coping skills. Results of mediator analyses in the present study indicated that negative coping had stronger effects on the relationship between stressful life events and symptoms of anxiety and depression, whereas positive coping had weaker effects on this relationship. A similar study showed that high negative affectivity predicted anxiety and depressive symptoms, whereas low positive affectivity was uniquely linked to greater depressive symptoms[25]. A recent prevention program specifically targeting anxiety sensitivity, a negative coping to anxiety, showed promising results in reducing levels of anxiety sensitivity among adolescents who had been exposed to stressful life events[26]. Therefore, the cognitive-behavioral intervention shall focus on helping young adolescents to avoid negative coping strategies and cultivate optimistic thinking styles to reduce risks for the onset of mental health problems[27].

There is sound available evidence to support a multifactorial cause for mental disorders in young people[3]. Most stressful life events from families, schools, peers, and physiological drive might interact with social and psychological vulnerabilities to give rise to anxiety and depressive symptoms in childhood and adolescence[2]. However, most previous research examined stressful life events only as one factor and failed to indicate the exact effect of each dimensional stress. For example, several studies independently emphasized that family factors[28], school failure[29], and peer stress[30] were unlikely to be associated with different mental health problems in boys and girls. This study used a global assessment scale to assess stressful life events and divided stress into several dimensions, such as family, school, peer pressure, health, romance, and general stress. Our results provided evidence that not only general stress but also each dimension had a significant effect on the symptoms of anxiety and depression among adolescents. Thus, this study highlighted a view of comprehensive stress management in order to promote mental health and well-being of adolescents.

There were several methodological strengths in the present study. In particular, mediate analyses with a model comprising a series of regression equations, contributed to our understanding of coping as a psychosocial mechanism linking stress and mental health. A large sample with substantial diversity of demographic characteristics of the participants represents Chinese adolescent population as far as possible. However, limitations of the present study must also be acknowledged. The self-reported questionnaires may have subjective and recall bias. In addition, the Stressful Life Events Questionnaire (SLEQ) is developed by our research teams. Although its reliability and validity was well verified[17], the results should be replicated in future researches.

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REFERENCES

1. Patton GC, Viner R. Pubertal transitions in health. Lancet, 2007; 369, 1130-9.
2. Patel V, Flisher AJ, Hetrick S, et al. Mental health of young people: a global public-health challenge. Lancet, 2007; 369, 1302-13.
3. Paus T, Keshavan M, Giedd JN. Why do many psychiatric disorders emerge during adolescence? Nat Rev Neurosci, 2008; 9, 947-57.
4. Lupien SJ, McEwen BS, Gunnar MR, et al. Effects of stress throughout the lifespan on the brain, behavior and cognition. Nat Rev Neurosci, 2009; 10, 434-45.
5. McLaughlin KA, Hatzenbuehler ML. Mechanisms linking stressful life events and mental health problems in a prospective, community-based sample of adolescents. J Adolesc Health, 2009; 44, 153-60.
6. O'Connor RC, Rasmussen S, Hawton K. Predicting depression, anxiety and self-harm in adolescents: the role of perfectionism and acute life stress. Behav Res Ther, 2010; 48, 52-9.
7. Fox JK, Halpern LF, Ryan JL, et al. Stressful life events and the tripartite model: Relations to anxiety and depression in adolescent females. J Adolesc, 2010; 33, 43-54.
8. Lazarus RS, Folkman S. Stress, Appraisal, and Coping. Springer: New York 1984.
9. Compas BE, Orosan PG, Grant KE. Adolescent stress and coping: implications for psychopathology during adolescence. J Adolesc, 1993; 16, 331-49.
10. Folkman S. Stress, coping, and hope. Psychooncology, 2010; 19, 901-8.
11. Sawyer MG, Pfeiffer S, Spence SH. Life events, coping and depressive symptoms among young adolescents: a one-year prospective study. J Affect Disord, 2009; 117, 48-54.
12. Folkman S, Lazarus RS. Coping as a mediator of emotion. J Pers Soc Psychol, 1988; 54, 466-75.
13. Clarke D, Goosen T. The mediating effects of coping strategies in the relationship between automatic negative thoughts and depression in a clinical sample of diabetes patients. Pers Individ Dif, 2009; 46, 460-4.
14. Rodrigues LN, Kitzmann KM. Coping as a mediator between inter parental conflict and adolescents' romantic attachment. J Soc Pers Relat, 2007; 24, 423-39.
15. Wonderlich-Tierney AL, Vander Wal JS. The effects of social support and coping on the relationship between social anxiety and eating disorders. Eat Behav, 2010; 11, 85-91.
16. Jiang QJ. The Chinese Trait Coping Style Questionnaire. In: Wang XD, Wang XL, Ma H. (Eds.), Rating Scales for Mental Health. 2nd. Chin J Ment Health, 1999, 120-2. (In Chinese)
17. Hu Y, Tao FB, Su PY, et al. Compilation and Reliability and Validity Assessment of Multidimensional Life Events Rating Questionnaire for Middle School Students. Chin J Sch Health, 2010; 31, 146-9. (In Chinese)
18. Baron RM, Kenny DA. The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. J Pers Soc Psychol, 1986; 51, 1173-82.
19. Wen Z, Chang L, Hau KT, et al. Testing and Application of the Mediating Effects. Acta Psychol Sinica, 2004; 36, 614-20.
20. Carver C S, Connor-Smith J. Personality and coping. Annu Rev Psychol, 2010; 61, 679-704.
21. Pérez JE, Little TD, Henrich CC. Spirituality and depressive symptoms in a school-based sample of adolescents: a longitudinal examination of mediated and moderated effects. J Adolesc Health, 2009 ; 44, 380-86.
22. Fontaine RG, Yang C, Burks VS, et al. Loneliness as a partial mediator of the relation between low social preference in childhood and anxiety/depressed symptoms in adolescence. Dev Psychopathol, 2009; 21, 479-91.
23. Goodkind S, Ruffolo MC, Bybee D, et al. Coping as a Mediator of the Effects of Stressors and Supports on Depression Among Girls in Juvenile Justice. Youth Violence Juv Justice, 2009; 7, 100-18.
24. Wingenfeld K, Mensebach C, Rullkoetter N, et al. Relationship between coping with negative life-events and psychopathology: major depression and borderline personality disorder. Psychol Psychother, 2009; 82, 421-5.
25. Fox JK, Halpern LF, Forsyth JP. Mental health checkups for children and adolescents: a means to identify, prevent, and minimize suffering associated with anxiety and mood disorders. Clin Psycho: Sci Pract, 2008; 15, 182-211.
26. McLaughlin KA, Hatzenbuehler ML. Stressful Life Events, Anxiety Sensitivity, and Internalizing Symptoms in Adolescents. J Abnorm Psychol, 2009; 118, 659- 69.
27. Schneier FR. Clinical practice. Social anxiety disorder. N Engl J Med, 2006; 355, 1029-36.
28. Xing XY, Tao FB, Wan YH, et al. Family factors associated with suicide attempts among Chinese adolescent students: a national cross-sectional survey. J Adolesc Health, 2010; 46, 592-9.
29. McCarty CA, Mason WA, Kosterman R, et al. Adolescent school failure predicts later depression among girls. J Adolesc Health, 2008; 43, 180-7.
30. Bakker MP, Ormel J, Verhulst FC, et al. Peer stressors and gender differences in adolescents' mental health: the TRAILS study. J Adolesc Health, 2010; 46, 444-50.