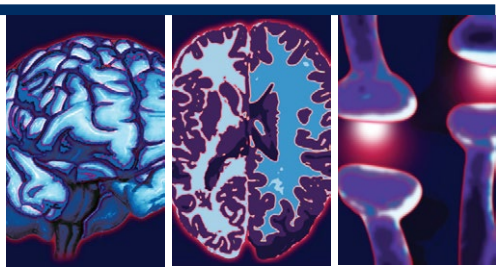

# Association of Stress Coping Strategies with Suicidality in Young Adults: The Mediation Effects of Depression, Anxiety and Hostility

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**Abstract**

**Objective:**

Stress-coping strategies have been found to play a unique role in suicidality. Aims: To examine the mediating effects of depression, anxiety, and hostility on the relationship between stress-coping strategies and suicidality in 500 young adults.

**Methods:**

Stress-coping strategies, suicidality, depression, anxiety, and hostility were measured using the Coping Orientation to Problems Experienced Scale, the questionnaire from the Kiddie Schedule for Affective Disorders and Schizophrenia, and the Symptom Checklist-90-Revised Scale.

**Results:**

The results of the separate analysis indicated that active coping and positive reinterpretation and growth were associated with low depression and anxiety and consequently associated with a low risk of suicidality. By contrast, denial, behavioral disengagement, and mental disengagement were associated with high depression, anxiety, and hostility and consequently associated with a high risk of suicidality. Focusing on and venting of emotions was associated with high hostility and consequently associated with a high risk of suicidality. The results of the joint regression analysis revealed that focusing on and venting of emotions and behavioral disengagement were associated with high depression and consequently associated with a high risk of suicidality.

**Conclusion:**

Motivating people who use the strategies of focusing on and venting of emotions and behavioral disengagement to change their stress-coping strategies is crucial. To reduce the risk of suicidality, depression should be surveyed routinely during the process of coping-skill training programs.

**Keywords**

Anxiety, Depression, Hostility, Stress-coping strategies, Suicidality

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## Introduction

Suicide ranks second to accidents as the leading cause of death in Taiwan for people aged 15-24 [1]. Multiple factors contribute suicidality among adolescents and young adults in Taiwan. In term of psychological problems, depression, anxiety, adjustment problems, alcohol and illicit drug use, and poor sleep contributed to adolescent suicidality [2-5]. In term of family and peer factors, family discord [3] and bullying involvement [6] increase the risk of adolescent suicidality. Of the psychological correlates of suicidality examined in previous studies, stress-coping strategies have been found to play a unique role in suicidality among adolescents [7-8]. Lazarus [9] defined coping as a process of managing specific internal or external sources of psychological stress (or both) through cognitive or behavioral efforts. The most widely used categories of coping are problem-solving, emotional distraction (or emotion-focused), and avoidant (or disengagement) strategies [10-12]. Longitudinal [13,14] and cross-sectional studies [15-18] have reported that emotion-focused coping (e.g., self-blame and denial) and avoidant coping (e.g., behavioral disengagement) are significantly associated with suicidal ideation. Problem-focused strategies, such as help seeking, are associated with a low risk of suicidality [19]. Studies in Western societies as well as those in China [20] and Japan [21] have supported that active coping strategies reduced the probability of suicidal ideation, whereas passive coping strategies increased it. Research has established that coping-skill training programs are efficacious in reducing the risk of suicidality [22,23]; this further supports the influence of coping strategies on suicidality.

Despite the availability of evidence for the relationship between stress-coping strategies and suicidality, how the influence of stress-coping strategies on suicidality develops is still unclear. Failure to cope with stress may cause mental problems [24], and mental disorders are prevalent among people who attempt suicide [25]; therefore, a reasonable hypothesis is that mental health problems may mediate the association between stress-coping strategies and suicidality. However, extremely few studies have examined the mediating effects of mental health problems on the association between stress-coping strategies and suicidality. A previous follow-up study discovered that the effects of stress-coping strategies, such as problem solving and emotional regulation, on reducing suicidal ideation are mediated by reductions in depressive symptoms; however, support seeking directly predicts a reduction in suicidal ideation with no effect on depressive symptoms [26]. Because of the mediating effect of depression reported by Khurana and Romer [26], therapists should monitor the change in the severity of depression during coping-skill training programs for people with risk of suicidality.

Several issues regarding the mediating effects of mental health problems require further study. First, the study by Khurana and Romer [26] focused on a cohort of adolescents aged 14–23. Because of the difference in the developmental stage between adolescents and young adults [27], the mediating role of depression in the association between stress-coping strategies and suicidality may vary between adolescents and young adults. Second, research indicated that certain coping strategies are related to anxiety and hostility. For example, task-focused coping is associated with low anxiety [28], whereas the coping style of self-defense is correlated with increased hostility [29]. Meanwhile, both anxiety [30] and hostility [31] are associated with suicidality. Therefore, a reasonable hypothesis is that anxiety and hostility may mediate the association between certain stress-coping strategies and suicidality. However, the mediating effects of anxiety and hostility have not been examined in previous studies. Third, from our knowledge there are no other studies considering multiple strategies of stress coping and multi-dimensions of mental health problems when examining the association of stress-coping strategies with suicidality.

The current study examined the relationship between stress-coping strategies and suicidality in young adults, as well as the mediating effects of depression, anxiety, and hostility on the relationship between stress-coping strategies and suicidality. We hypothesized that a significant association would exist between certain stress-coping strategies and suicidality and that depression, anxiety, and hostility would mediate the association between certain stress-coping strategies and suicidality.

## Methods

### Participants

Participants were recruited through an advertisement for college students aged between 20 and 30 years. A total of 500 college students (238 men and 262 women) participated in this study, and their mean age was 22.1 years (SD =

1.8 years). Informed consent was obtained from the participants prior to assessment. The study was approved by the Institutional Review Board of a medical university hospital.

## ■ Measures

**Coping ORIENTATION TO PROBLEMS EXPERIENCED:** The self-administrated Coping Orientation to Problems Experienced (COPE) scale comprises 13 subscales and one additional item on drinking alcohol and taking drugs to cope with stress: 5 measure problem-focused coping (active coping, planning, suppression of competing activities, restraint coping, and seeking of instrumental social support), 5 measure emotion-focused coping (seeking of emotional social support, positive reinterpretation and growth, acceptance, denial, and turning to religion), and 3 measure coping responses that are generally less effective than the aforementioned coping responses (focusing on and venting of emotions, behavioral disengagement, and mental disengagement) [32]. The present study did not select the COPE additional item on drinking alcohol and taking drugs into analysis. The COPE scale measures how participants respond when they confront difficult or stressful events in their lives but not to cope with a specific stressful event. Every item is rated on a 4-point Likert scale. Higher total scale scores indicate that participants are more likely to cope with stress by using the highlighted strategies. Research indicates the COPE scale has a high reliability and validity [32]. The internal reliability (Cronbach's α) of the 13 subscales of the COPE scale in the present study ranged from .73 to .92.

**Suicidality:** To assess the occurrence of suicidal attempts and four forms of suicidal ideation in the preceding year, participants were invited to complete a questionnaire containing the following questions from the Epidemiological version of the Kiddie Schedule for Affective Disorders and Schizophrenia (Kiddie-SADS-E) [33,34]: (1) "Has there ever been a period of 2 weeks or longer when you thought a lot about death, including thoughts of your own death, somebody else's death, or death in general?" (2) "Has there ever been a period of 2 weeks or longer when you had a desire to die?" (3) "Have you ever thought of attempting suicide?" (4) "Have you had a suicidal plan?" (5) "Have you ever attempted suicide?" Each question elicits a "yes" (score = 1) or "no" (score = 0) answer. A higher total score indicates a higher risk of suicidality.

**Symptom Checklist-90-Revised Scale:** The three subscales of the Symptom Checklist-90-Revised Scale were applied to measure the participants' depression, anxiety, and hostility in a recent 1 week. Each item on the subscales was rated with a 5-point scale, with anchors ranging from 0 ("not at all") to 4 ("extreme") [35,36]. The validity of each subscale in assessing mental health problems among people in Taiwan was established in a previous study [35]. Higher total scores on the subscales indicate more severe mental health problems. The Cronbach α of the three subscales in the present study ranged from .76 to .89.

### Procedure and statistical analysis

Research assistants explained to the participants individually the procedures and methods of completing the research questionnaire. The participants could ask questions when they encountered problems on completing the questionnaire, and the research assistants would resolve the problems for them. Data analysis was performed using R statistical software [37].

The demographic characteristics and levels of stress-coping strategies on the COPE scale, mental health problems in the SCL-90R, and suicidality in the 500 participants were analyzed by percentages and means with SD. We used multiple regression analysis to examine the mediating effects of mental health on the relationship between coping strategies and suicidality. Because several coping strategies and mental health indices were available, the mediation analysis in the study involved two steps. In the first step, each combination of coping strategies and mental health indices was selected for the mediation analysis to screen potential independent variables and mediators. In the analysis, two direct effects, from coping strategy to mental health and from mental health to suicidality, were estimated by regression. The mediating effect mental health on the association between coping strategy and suicidality was estimated as the product of the two direct effects. Confidence intervals of the direct and mediating effects were estimated through a bootstrapping method [38]. A 95% confidence interval (CI) of β value that did not contain 0 was considered statistically significant. Because there were 13 coping strategies, 3 types of mental health indices, and 3 effects tested in each separate mediation analysis, 13 × 3 × 3 statistical tests were conducted in this step. To prevent alpha inflation, the nominal type I error rate was set

as .05/(13 × 3 × 3) = .0004; alpha = .0004 was used in estimating confidence intervals. Coping strategies and mental health indices in mediation analysis with significant direct and indirect effects were screened as potential independent variables and mediators for further analysis in the second step.

In the second step, the stress-coping strategies that were significantly associated with mental health problems and thus with suicidality in the first step were further selected together into the joint regression analysis to examine their relationships with mental health problems and suicidality. Both direct and mediating effects were analyzed jointly. In each regression analysis, sex and age were entered as control variables.

## Results

Table 1 shows the demographic characteristics and levels of stress-coping strategies on the COPE scale, mental health problems in the SCL-90R, and suicidality in the 500 participants. Tables 2-4 presents the results of multiple regression analyses for each combination model of associations among the stress-coping strategies, mental health indicators, and suicidality. In term of depression (Table 2), three stress-coping strategies, including active coping, seeking social support for emotional reasons, and positive reinterpretation and growth were associated with low depression and consequently associated with a low risk of suicidality. The stress-coping strategies of denial, behavioral disengagement, and mental disengagement were associated with high depression and thereby associated with a high risk of suicidality. Therefore, depression mediated the effects of these six stress-coping strategies on suicidality.

In term of anxiety (Table 3), the stress-coping strategies of active coping and positive reinterpretation and growth were associated with low anxiety and associated with a low risk of suicidality. The stress-coping strategies of denial, behavioral disengagement, and mental disengagement were associated with high anxiety, which in turn was associated with a high risk of suicidality. Hence, anxiety mediated the effects of these five stress-coping strategies on suicidality.

In term of hostility (Table 4), the stress-coping strategies of focusing on and venting of emotions, denial, behavioral disengagement, and mental disengagement were associated with high hostility and thus associated with a high risk of suicidality. Therefore, hostility mediated the effects of these four stress-coping strategies on suicidality.

According to the data obtained from the separate regression analyses in Tables 2-4, the seven stress-coping strategies were significantly associated with mental health problems and thus with suicidality. These strategies were further selected for the joint regression analysis to examine their relationships with mental health problems and suicidality (Table 5). The results indicated that after the seven stress-coping strategies and three mental health problems were entered into the joint regression analysis model, only depression, but not anxiety or hostility, mediated the effects of the following two stress-coping strategies on suicidality: focusing on and venting of emotions (β = .007, CI: .001– .017) and behavioral disengagement (β = .011, CI: .001– .026), which were significantly associated with high depression and consequently associated with a high risk of suicidality. Moreover, the direct effects of these two strategies on suicidality were also examined. The results indicated that the direct effects of these two strategies on suicidality were non-significant (focusing on and venting of emotions: β = –.014, CI: –.055– .024; behavioral disengagement: β = .006, CI: –.035– .050). Hence, the effects of focusing on and venting of emotions and behavioral disengagement on suicidality were completely mediated by depression.

## Discussion

The results of the joint regression analysis indicate that the coping strategies of focusing on and venting of emotions and behavioral disengagement were associated with a high risk of suicidality and that depression completely mediated the effects of these two strategies on suicidality. Both focusing on and venting of emotions and behavioral disengagement were classified as less effective than problem-focused and emotion-focused coping strategies [32]. Focusing on and venting of emotions is an emotional distraction strategy in which people work to alter their own experience of negative emotions resulting from a stressful source [11]. Behavioral disengagement refers to the abandonment of attempts to address a situation. The concepts of focusing on and venting of emotions and behavioral disengagement are also similar to the avoidance coping styles [10-12]. A previous study indicated that avoidance coping, such as simply accepting a problem, resigning oneself to it, or venting one's emotions, is

generally associated with negative psychological outcomes [39]. Holahan et al. [40] suggested that people with a propensity to engage in avoidance coping may avoid addressing difficulties and thus have problems that grow over time and lead to additional stressors. The results of the present study indicate that helping people to identify whether they are used to coping with stress applying the strategies of focusing on and venting of emotions and behavioral disengagement is crucial; if they are, then increasing their motivation to change their stress-coping strategies is helpful. Moreover, monitoring the change in the severity of depression during the process of coping-skill training for people with risk of suicidality is imperative, and this is because depression is a significant mediator of the effects of less effective strategies on suicidality.

Carver et al. [32] classified positive reinterpretation and growth and denial as two emotion-focused coping strategies; however, their relationship with suicidality and mental health problems differed in the present study. The results of the separate analysis reveal that positive reinterpretation and growth was associated with low depression and anxiety and consequently associated with a low risk of suicidality, whereas denial was associated with high depression, anxiety, and hostility and thus associated with a high risk of suicidality. Research has reported that blaming, negative cognitive reframing, and having a negative view and less positive appraisal of oneself are related to suicidality [41,42]. The coping strategy of positive reinterpretation and growth may enable people to learn from experiences from stressful encounters and develop the ability to manage further stress, thus reducing their depression, anxiety, and the risk of suicidality. However, people who deny stressful circumstances may avoid support seeking [43] and engage in an interpersonal style that elicits rejection from others, which may increase the severities of mental health problems [44] and the risk of suicidality [45].

Corresponding to the results of a previous study [26], the results of the separate analysis of the present study indicate that active coping was associated with low depression and anxiety and consequently associated with a low risk of suicidality. A previous study also supported that active coping strategies can mobilize people to analyze stressful situations and attempt to resolve them [46]. However, the present study determined that depression mediated the effect of seeking social support for emotional reasons on suicidality, whereas Khurana and Romer [26] reported that support seeking directly predicts a reduction in suicidal ideation with no effect on depressive symptoms. Seeking social support is a part of coping-skill training programs for people with suicidal risk. Further study is required to examine the mediating role of depression in the effect of seeking social support on suicidality, because it may determine the necessity of monitoring the change in depression during the training program.

**Table 1: Sex, age, stress coping strategies on the COPE, mental health problems and suicidality in college students (N = 500).**

| | *n* (%) | Mean (SD) | Range |
|---|---|---|---|
| Age (years) | | 22.1 (1.8) | 20-30 |
| Sex | | | |
| Female | 262 (52.4) | | |
| Male | 238 (47.6) | | |
| Stress coping strategies on the COPE | | | |
| Active coping | | 12.2 (2.4) | 7-16 |
| Planning | | 12.9 (2.5) | 5-16 |
| Suppression of competing activity | | 11.1 (2.7) | 4-16 |
| Restraint coping | | 10.8 (2.9) | 4-16 |
| Seeking social support for instrumental reason | | 13.2 (2.6) | 4-16 |
| Seeking social support for emotional reason | | 11.8 (3.1) | 4-16 |
| Positive reinterpretation and grow | | 13.1 (2.3) | 6-16 |
| Acceptance | | 12.2 (2.5) | 4-16 |
| Turning to religion | | 7.7 (3.4) | 4-16 |
| Denial | | 5.6 (1.9) | 4-13 |
| Focusing on and venting emotion | | 10.6 (2.8) | 4-16 |
| Behavioral disengagement | | 6.6 (2.1) | 4-15 |
| Mental disengagement | | 8.4 (2.7) | 4-16 |
| Mental health problems | | | |
| Depression | | 8.8 (7.8) | 0-43 |
| Anxiety | | 6.6 (5.7) | 0-33 |
| Hostility | | 3.1 (3.6) | 0-19 |
| Suicidality | | 0.3 (0.7) | 0-5 |

The present study is one of the first studies to examine the mediating role of hostility in the effects of stress-coping strategies on suicidality. In the separate analysis of this study, the mediating effect of hostility was applicable mainly to the association between avoidant coping strategies and suicidality, and this was distinct from those of depression and anxiety. Therefore, the results indicate that hostility may play a role different from those of depression and anxiety in the process of coping to stress unsuccessfully.

Several limitations of this study must be mentioned. First, although we developed the hypothesized model on the relationships among stress-coping strategies, mental health problems, and suicidality on the basis of the results of previous studies [24-26], the cross-sectional research design of this study limited our ability

**Table 2: Direct and indirect effects between stress coping strategies, depression, and suicidality: Separate analysis[a].**

| Coping | Coping -> Depression | | | | Depression -> Suicidality | | | | Coping-> Depression -> Suicidality | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | β | p | CI | | β | p | CI | | β | p | CI | |
| Active coping | -.200 | .000 | -.342 | -.057 | .248 | .000 | .111 | .364 | -.050 | .000 | -.119 | -.014 |
| Planning | -.105 | .020 | -.246 | .023 | .256 | .000 | .129 | .369 | -.027 | .025 | -.069 | .007 |
| Suppression of competing activity | -.136 | .003 | -.297 | .021 | .253 | .000 | .124 | .375 | -.034 | .005 | -.098 | .006 |
| Restraint coping | -.075 | .096 | -.200 | .074 | .257 | .000 | .126 | .365 | -.019 | .101 | -.059 | .021 |
| Seeking social support for instrumental reason | -.106 | .017 | -.234 | .040 | .258 | .000 | .131 | .369 | -.027 | .021 | -.063 | .009 |
| Seeking social support for emotional reason | -.176 | .000 | -.349 | -.043 | .252 | .000 | .125 | .367 | -.044 | .000 | -.091 | -.011 |
| Positive reinterpretation and grow | -.206 | .000 | -.370 | -.054 | .247 | .000 | .122 | .363 | -.051 | .000 | -.128 | -.010 |
| Acceptance | -.089 | .046 | -.240 | .059 | .263 | .000 | .133 | .378 | -.023 | .052 | -.074 | .015 |
| Turning to religion | .028 | .537 | -.116 | .158 | .260 | .000 | .132 | .371 | .007 | .538 | -.036 | .047 |
| Denial | .230 | .000 | .053 | .372 | .256 | .000 | .123 | .383 | .059 | .000 | .013 | .120 |
| Focusing on and venting emotion | .063 | .157 | -.078 | .178 | .262 | .000 | .134 | .377 | .017 | .162 | -.022 | .057 |
| Behavioral disengagement | .336 | .000 | .164 | .482 | .246 | .000 | .120 | .375 | .083 | .000 | .034 | .146 |
| Mental disengagement | .302 | .000 | .145 | .448 | .245 | .000 | .107 | .369 | .074 | .000 | .027 | .133 |

[a]: Controlled for the effects of sex and age

**Table 3: Direct and indirect effects between stress coping strategies, anxiety, and suicidality: Separate analysis[a].**

| Coping | Coping -> Depression | | | | Depression -> Suicidality | | | | Coping-> Depression -> Suicidality | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | β | p | CI | | β | p | CI | | β | p | CI | |
| Active coping | -.172 | .000 | -.310 | -.030 | .238 | .000 | .111 | .384 | -.041 | .001 | -.090 | -.007 |
| Planning | -.026 | .563 | -.148 | .094 | .249 | .000 | .121 | .384 | -.007 | .563 | -.042 | .024 |
| Suppression of competing activity | -.116 | .010 | -.265 | .030 | .243 | .000 | .116 | .380 | -.028 | .014 | -.077 | .006 |
| Restraint coping | -.088 | .049 | -.204 | .056 | .246 | .000 | .116 | .388 | -.022 | .055 | -.056 | .013 |
| Seeking social support for instrumental reason | -.065 | .142 | -.200 | .066 | .248 | .000 | .117 | .387 | -.016 | .148 | -.054 | .015 |
| Seeking social support for emotional reason | -.088 | .050 | -.244 | .051 | .244 | .000 | .107 | .386 | -.021 | .056 | -.070 | .013 |
| Positive reinterpretation and grow | -.168 | .000 | -.322 | -.006 | .238 | .000 | .105 | .383 | -.040 | .001 | -.115 | -.001 |
| Acceptance | -.125 | .005 | -.294 | .014 | .254 | .000 | .122 | .396 | -.032 | .008 | -.102 | .003 |
| Turning to religion | .062 | .163 | -.071 | .214 | .250 | .000 | .120 | .388 | .016 | .168 | -.018 | .064 |
| Denial | .250 | .000 | .083 | .409 | .246 | .000 | .128 | .376 | .061 | .000 | .018 | .112 |
| Focusing on and venting emotion | .118 | .008 | -.013 | .253 | .254 | .000 | .127 | .387 | .030 | .011 | -.003 | .077 |
| Behavioral disengagement | .285 | .000 | .138 | .424 | .233 | .000 | .116 | .365 | .066 | .000 | .027 | .122 |
| Mental disengagement | .286 | .000 | .118 | .445 | .233 | .000 | .115 | .375 | .067 | .000 | .024 | .124 |

[a]: Controlled for the effects of sex and age

**Table 4: Direct and indirect effects between stress coping strategies, hostility, and suicidality: Separate analysis[a].**

| Coping | Coping -> Depression | | | | Depression -> Suicidality | | | | Coping-> Depression -> Suicidality | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | β | p | CI | | β | p | CI | | β | p | CI | |
| Active coping | -.148 | .001 | -.310 | .001 | .163 | .000 | .035 | .305 | -.024 | .006 | -.067 | .000 |
| Planning | -.016 | .733 | -.138 | .126 | .175 | .000 | .057 | .315 | -.003 | .734 | -.032 | .030 |
| Suppression of competing activity | -.072 | .117 | -.225 | .075 | .171 | .000 | .049 | .315 | -.012 | .131 | -.046 | .015 |
| Restraint coping | -.125 | .006 | -.264 | .059 | .170 | .000 | .047 | .311 | -.021 | .013 | -.060 | .010 |
| Seeking social support for instrumental reason | -.032 | .469 | -.168 | .079 | .174 | .000 | .053 | .314 | -.006 | .472 | -.034 | .014 |
| Seeking social support for emotional reason | -.053 | .241 | -.239 | .090 | .172 | .000 | .048 | .309 | -.009 | .250 | -.047 | .016 |
| Positive reinterpretation and grow | -.112 | .013 | -.252 | .048 | .165 | .000 | .044 | .305 | -.018 | .024 | -.052 | .007 |
| Acceptance | -.127 | .005 | -.328 | .018 | .179 | .000 | .060 | .317 | -.023 | .011 | -.069 | .002 |
| Turning to religion | .069 | .126 | -.078 | .220 | .176 | .000 | .058 | .316 | .012 | .139 | -.016 | .051 |
| Denial | .225 | .000 | .079 | .393 | .167 | .000 | .051 | .306 | .037 | .000 | .008 | .094 |
| Focusing on and venting emotion | .194 | .000 | .069 | .329 | .183 | .000 | .067 | .322 | .036 | .000 | .008 | .082 |
| Behavioral disengagement | .279 | .000 | .118 | .444 | .153 | .000 | .033 | .291 | .043 | .000 | .009 | .090 |
| Mental disengagement | .268 | .000 | .121 | .428 | .154 | .000 | .036 | .303 | .041 | .000 | .010 | .088 |

[a]: Controlled for the effects of sex and age

**Table 5: Direct and indirect effects between stress coping strategies, mental health, and suicidality: Joint regression analysis[a].**

| Coping | Mental health | Coping -> Health | | | | Health -> Suicidality | | | | Coping-> Health -> Suicidality | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | β | p | CI | | β | p | CI | | β | p | CI | |
| Active coping | Depression | -.174 | .285 | -.495 | .140 | .017 | .007 | .001 | .034 | -.003 | .333 | -.010 | .003 |
| Seeking social support for emotional reason | | -.532 | .000 | -.853 | -.242 | .017 | .007 | .001 | .034 | -.009 | .050 | -.021 | .000 |
| Positive reinterpretation and grow | | -.271 | .096 | -.607 | .090 | .017 | .007 | .001 | .034 | -.005 | .180 | -.015 | .002 |
| Denial | | .394 | .036 | -.008 | .812 | .017 | .007 | .001 | .034 | .007 | .124 | -.001 | .020 |
| Focusing on and venting emotion | | .441 | .001 | .167 | .722 | .017 | .007 | .001 | .034 | .007 | .065 | .001 | .017 |
| Behavioral disengagement | | .662 | .000 | .244 | 1.056 | .017 | .007 | .001 | .034 | .011 | .056 | .001 | .026 |
| Mental disengagement | | .327 | .024 | .021 | .631 | .017 | .007 | .001 | .034 | .006 | .110 | -.001 | .015 |
| Active coping | Anxiety | -.132 | .278 | -.380 | .103 | .019 | .010 | -.004 | .044 | -.003 | .344 | -.010 | .002 |
| Seeking social support for emotional reason | | -.245 | .015 | -.456 | -.056 | .019 | 010 | -.004 | .044 | -.005 | .130 | -.014 | .001 |
| Positive reinterpretation and grow | | -.205 | .092 | -.466 | .058 | .019 | 010 | -.004 | .044 | -.004 | .204 | -.014 | .002 |
| Denial | | .411 | .003 | .083 | .746 | .019 | 010 | -.004 | .044 | .008 | .107 | -.002 | .022 |
| Focusing on and venting emotion | | .342 | .001 | .155 | .542 | .019 | 010 | -.004 | .044 | .006 | .096 | -.001 | .018 |
| Behavioral disengagement | | .322 | .020 | .001 | .632 | .019 | 010 | -.004 | .044 | .006 | .137 | -.002 | .017 |
| Mental disengagement | | .239 | .027 | .001 | .490 | .019 | 010 | -.004 | .044 | .005 | .146 | -.001 | .014 |
| Active coping | Hostility | -.099 | .193 | -.254 | .057 | .001 | .011 | -.024 | .026 | .000 | .904 | -.004 | .003 |
| Seeking social support for emotional reason | | -.194 | .002 | -.331 | -.062 | .001 | .011 | -.024 | .026 | .000 | .904 | -.005 | .005 |
| Positive reinterpretation and grow | | -.034 | .654 | -.192 | .134 | .001 | .011 | -.024 | .026 | .000 | .907 | -.002 | .002 |
| Denial | | .187 | .033 | -.037 | .425 | .001 | .011 | -.024 | .026 | .000 | .904 | -.005 | .005 |
| Focusing on and venting emotion | | .332 | .000 | .208 | .467 | .001 | .011 | -.024 | .026 | .000 | .904 | -.008 | .008 |
| Behavioral disengagement | | .238 | .006 | .045 | .442 | .001 | .011 | -.024 | .026 | .000 | .904 | -.006 | .007 |
| Mental disengagement | | .114 | .090 | -.024 | .272 | .001 | .011 | -.024 | .026 | .000 | .904 | -.004 | .004 |

[a]: Controlled for the effects of sex and age

to draw conclusions regarding the relationships among stress-coping strategies, mental health problems, and suicidality examined in this study. Second, the study data were exclusively self-reported. The use of one data source could have influenced our findings and may have resulted in shared-method variance. Third, although we measured the severities of depression and anxiety, no further information regarding their psychiatric diagnoses was collected.

## Conclusion

The results of the separate analysis in the present study indicate that active coping and positive reinterpretation and growth were associated with low depression and anxiety and consequently associated with a low risk of suicidality, whereas avoidant coping strategies were associated with high depression, anxiety, and hostility and thus associated with a high risk of suicidality. The results of joint regression analysis reveal that focusing on and venting of emotions and behavioral disengagement were associated with high depression and thereby associated with a high risk of suicidality. The results of this study support the suggestion by Horwitz et al. that teaching problem-focused and adaptive coping styles may be insufficient in resolving mental health problems and reducing suicidality [16]. Eliminating maladaptive coping styles, such as focusing on and venting of emotions and behavioral disengagement, is a necessary supplement to teaching new adaptive styles in reducing mental health problems and suicidality. Motivating people to change their stress-coping strategies from the use of avoidant coping to the use of active coping strategies is crucial. Depression should be surveyed routinely during the process of coping-skill training programs for reducing the risk of suicidality. The National Health Insurance program in Taiwan allows people to visit any medical unit to see a doctor without transfer. It is convenient for the people in Taiwan to receive medical assistance when they need. However, medical professionals cannot resolve all mental health problems. The individuals develop coping strategies in their early stage of life. Thus it is necessary to train parents to help the youths with developing problem-focused and adaptive coping styles. Programs of health promoting and early detection of depression and suicidality in elementary and second schools and communities are also warranted.

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