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Associations Between Protective Factors and Psychological Distress Vary by Gender: The Buffalo Cardio-Metabolic Occupational Police Stress Study

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Abstract

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Previous research by this group identified gender interactions between some protective factors and psychological distress in police officers. This study extends this result to include a larger sample of police officers and a more comprehensive list of protective factors. These results confirm the conclusion that the commitment dimension of hardiness appears to have a stronger protective association with psychological distress among women. Furthermore, an avoidant coping style appears to be somewhat more positively associated with psychological distress among women. The personality trait of openness was also positively associated more strongly with PTSD symptoms in women than in men, while the trait of agreeableness was significantly protective in women and not in men. Hostility was generally positively associated with psychological distress with stronger association for PTSD symptoms and hostility in women.

Keywords

Police; stress; resilience; hardiness; personality; PTSD

Introduction

Police officers are exposed to traumatic events as well as organizational stressors (Abdollahi, 2002). Traumatic exposures are known to increase the risk of psychological distress, including posttraumatic stress disorder (PTSD), anxiety and depression. However, stress and trauma do not always lead to psychological distress (Escolas, Pitts, Safer, & Bartone, 2013; Florian, Mikulincer, & Taubman, 1995; Moran & Colless, 1995; Paton, Violanti, & Smith, 2003; Tedeschi & Calhoun, 2004). Positive outcomes are possible when police officers develop and use psychological skills, like hardiness, to manage traumatic events or stressful organizational environments in meaningful ways (Arnetz, Arble, Backman, Lynch, & Lublin, 2013). In a previous study of hardiness and psychological distress among officers from the Buffalo New York Police Department, Andrew and colleagues (2008) found that hardiness was inversely associated with psychological distress and found evidence of effect modification on this association by gender. However, this earlier study was based on a random sample of 105 individuals from the Buffalo, New York, Police Department resulting in limited power to examine gender specific associations. The present study clarifies and extends the results using data from a later examination of the same population, in which the entire police department was recruited. Additional protective or potential risk factors for psychological distress added to this study include the following: coping styles, personality dimensions and hostility, with a particular focus on examining gender differences in associations between these factors and psychological distress.

METHODS

We examined the cross-sectional associations of protective factors with symptoms of depression, post-traumatic stress disorder (PTSD), and anxiety in police officers. Protective factors included the following: a) hardiness components (*commitment, control and challenge*); b) coping (*active coping/cognitive restructuring, passive coping/avoidance, and support seeking*); c) personality (*neuroticism, extraversion, openness, agreeableness, and conscientiousness*); and d) hostility (Cook Medley Hostility). The study population included

412 officers (105 women and 307 men), with complete data for variables of interest, from the Buffalo Cardio-Metabolic Occupational Police Stress (BCOPS) full study (Violanti et al., 2006) conducted from 2004 to 2009.

Hardiness

Components of hardiness were measured using the Bartone (2007) 15-item hardiness scale. The hardiness *commitment* dimension reflects a tendency to find purpose and meaning in potentially stressful events, the *control* dimension a tendency to believe that one can effectively manage stressful events, and the *challenge* dimension a tendency to perceive stressful events as opportunities for personal growth.

Depressive symptoms, PTSD symptoms and anxiety symptoms

Depressive symptoms were measured using the Center for Epidemiological Studies Depression scale (CESD) (Radloff, 1977), PTSD symptoms were measured using the Impact of Events Scale Revised (IES-R) (Weiss & Marmar, 1996) and anxiety symptoms were measured using the Beck Anxiety Inventory (BAI) (Creamer, Foran, & Bell, 1995).

Dispositional Coping-Brief Cope

Dispositional coping was measured using the Brief COPE instrument (Carver, 1997). The Brief COPE is a shortened and focused version of the COPE instrument, which was developed in order to provide a theory guided measure of coping (Carver, Scheier, & Weintraub, 1989). The Brief COPE consists of 28 items that measure 14 aspects of coping including the following: active coping, planning, positive reframing, acceptance, humor, religion, using emotional support, using instrumental support, self-distraction, denial, venting, substance use, behavioral disengagement, and self-blame. Each item has four possible responses including the following: 0 (I have not done this at all); 1 (I have done this a little bit); 2 (I have done this a medium amount); and 3 (I have done this a lot). Each aspect of coping is summarized by adding the appropriate two items together. Although the reported factor structure of the Brief COPE is slightly different from the original COPE instrument, it is quite similar.

The abbreviated scales have also been shown to have acceptable internal reliability (Carver, 1997). Other studies have demonstrated the usefulness, both from practical and theoretical standpoints, of reducing these 14 aspects of dispositional coping to a shorter list of theoretically meaningful constructs (Lester et al., 2007; Welbourne, Eggerth, Hartley, Andrew, & Sanchez, 2007). This reduction has been accomplished using factor analysis in which a shorter list of factors emerges with one factor containing the following: active, planning, acceptance, and positive reframing coping subscales. This typically is identified as Problem Solving and Cognitive Restructuring. Two other factors typically found include the following: Avoidance Strategies, which includes the more negative coping aspects of behavioral disengagement and denial; and Support Seeking, which includes the emotional and instrumental support items.

Using data from the Brief COPE in the BCOPS cohort, we performed a similar factor analysis to the one presented by Welbourne et al. (2007) and found the same three factors,

except that we included the self-blame, substance abuse, and behavioral disengagement items and found them all to load on the “avoidance strategies” factor. Based on these results we propose to use three coping variables as follows: “active coping/cognitive restructuring” (average of the items for active coping, problem solving, positive reframing and acceptance); “passive/avoidance coping” (average of the items for self-distraction, denial, substance abuse, behavioral-disengagement, venting, and self-blame); and “support seeking” (items for instrumental support and emotional support) as our major coping variables for analyzing associations with psychological distress. In our data these scales had good internal consistency with alpha coefficients ranging from 0.70 to 0.79.

Personality – NEO Five Factor Inventory (Neo-FFI)

Personality characteristics were measured using the NEO Five Factor Inventory (NEO-FFI), which represents a 60 item version of the longer 240 item Revised NEO Personality Inventory. The NEO-FFI provides scores for the five personality domains including *Neuroticism* (N), *Extraversion* (E), *Openness* (O), *Agreeableness* (A) and *Conscientiousness* (C) (Costa & McCrae, 2009). Each item has responses on a five-point scale ranging from 0 (Strongly disagree) to 4 (Strongly agree). Each of the five subscales includes 12 items with 27 items needing reverse coding. The NEO-FFI is a widely used and has high factor correlations with the original 240 item NEO-PI instrument. The NEO-FFI has shown high internal validity resulting high alpha coefficients, higher than 0.9 for the neuroticism scale, across samples from various adult populations (Costa & McCrae, 2009). *Neuroticism* is defined as a domain of personality that quantifies “adjustment or emotional stability with maladjustment.” Stated another way, *Neuroticism* measures a characteristic tendency for an individual to experience negative affect. Individuals with higher levels of neuroticism tend to have difficulty coping with stressors and may experience “disruptive emotions that interfere with adaptation” (Costa & McCrae, 2009). *Extraversion* is defined as a dimension of personality that refers to sociability, assertiveness, being active and talkative. It is also characterized as a tendency to like engagement with large groups, excitement, having a cheerful disposition. Being low in extraversion (i.e., introversion) refers to a tendency to be reserved, independent and even paced, but should not be interpreted as a negative trait or one leading to unhappiness (Costa & McCrae, 2009). The personality dimension of *Openness* is defined as having curiosity “about both inner and outer worlds” and being open to new ideas, “unconventional values,” a general tendency to be “open” to a variety of experiences and ideas. Lower *Openness* refers to a tendency to be more conventional and have more focused interests (Costa & McCrae, 2009). The dimension labeled *Agreeableness*, an interpersonal dimension, is defined as being “fundamentally altruistic” or an intrinsic tendency to want to help others and look for others to be helpful in return; while low agreeableness tends to interpersonal skepticism, competitiveness, critical thinking, and willingness to fight for one’s point of view or interests (Costa & McCrae, 2009). The personality dimension labeled *Conscientiousness* refers to a tendency to be more active in “planning, organizing and carrying out tasks” as well as “purposeful, strong-willed, and determined” (Costa & McCrae, 2009).

Hostility – Cook-Medley Hostility Scale (HO)

Hostility is measured using the Cook-Medley Hostility Scale, originally developed as a scale for the Minnesota Multiphasic Personality Inventory (MMPI) to be used in identifying teachers who may have difficulty getting along with students (Cook & Medley, 1954). It has been successfully used in studies relating hostility to CVD risk and mortality (Berry, Lloyd-Jones, Garside, Wang, & Greenland, 2007; Bongard, Al'Absi, & Lovallo, 1998; Gottdiener et al., 2003; Jorgensen et al., 2001; Niaura et al., 2002; Stoney & Engebretson, 2000; Suarez, 2003). This instrument consists of 50 “true”/“false” items where “true” is scored as a 1 and “false” is scored as 0. Items 16, 20, and 33 are exceptions where “true” is coded as 0 and “false” is coded as 1. Barefoot, Dodge, Peterson, Dahlstrom, and Williams (1989) proposed six subscales for this instrument as follows: *Cynicism*; *Hostile Attributions*; *Hostile Affect*; *Aggressive Responding*; *Social Avoidance*; and an *Other* subscale consisting of miscellaneous items. Subscale scores are obtained by summing the appropriate items and the global hostility score by summing all items.

Associations were assessed using linear regression analysis and are reported as unstandardized regression coefficients with related standard errors and standardized regression coefficients for comparison between independent variables and related p values. Models were adjusted for age, education and marital status. Because of significant gender interactions ($p < 0.05$), analyses were stratified by gender.

RESULTS

Descriptive statistics for demographic and lifestyle characteristics are presented in Table 1. Table 2 presents summary statistics for the independent and dependent variables included in this study. It is interesting to note that women police officers have significantly higher scores for *support seeking coping*, *passive/avoidance coping*, *agreeableness*, *neuroticism* and *openness*. Women had significantly lower scores on *hostility* but higher scores on anxiety symptoms.

Hardiness

Results for associations between hardiness dimensions and psychological distress are presented in Table 3. Among women, the hardiness *challenge* dimension was not significantly associated with depressive symptoms ($\beta = -0.02$, $p = 0.87$), PTSD symptoms ($\beta = -0.12$, $p = 0.23$) or anxiety symptoms ($\beta = -0.13$, $p = 0.19$). Among men, the hardiness *challenge* dimension was significantly associated with depressive symptoms ($\beta = -0.16$, $p = 0.006$), PTSD symptoms ($\beta = -0.14$, $p = 0.012$) and anxiety symptoms ($\beta = -0.17$, $p = 0.003$). Gender interactions for the hardiness *challenge* dimension were not statistically significant ($p > 0.05$). The hardiness dimension of *commitment* was inversely associated with psychological distress among both women and men as follows: a) women: depressive symptoms ($\beta = -0.57$, $p < 0.001$), PTSD symptoms ($\beta = -0.44$, $p < 0.001$), and anxiety symptoms ($\beta = -0.36$, $p < 0.001$); and b) men: depressive symptoms ($\beta = -0.42$, $p < 0.001$), PTSD symptoms ($\beta = -0.22$, $p < 0.001$), and anxiety symptoms ($\beta = -0.34$, $p < 0.001$), with lower magnitude of association for depressive symptoms and PTSD symptoms in men, consistent with significant gender interactions ($p < 0.05$). Association between hardiness

commitment and anxiety symptoms were not different between men and women ($p = 0.41$). Among women, the *control* dimension of hardiness was significantly inversely associated with depressive symptoms ($\beta = -0.32$, $p = 0.001$) and PTSD symptoms ($\beta = -0.30$, $p = 0.002$) but not anxiety symptoms ($\beta = -0.18$, $p = 0.068$). Among men, the *control* dimension was significantly inversely associated with depressive symptoms ($\beta = -0.33$, $p < 0.001$), PTSD symptoms ($\beta = -0.12$, $p = 0.041$) and anxiety symptoms ($\beta = -0.33$, $p < 0.001$). Gender interactions for the *control* dimension of hardiness were not significant ($p > 0.05$); however, the p value for the gender interaction relative to PTSD symptoms was $p = 0.051$, consistent with the observed difference in regression coefficients between women ($\beta = -0.30$) and men ($\beta = -0.12$).

Coping

Associations between coping dimensions and psychological distress are presented in Table 4. Active coping/cognitive restructuring was inversely associated with depressive symptoms among both men ($\beta = -0.16$, $p = 0.008$), and women ($\beta = -0.23$, $p = 0.02$). The interaction term involving coping/cognitive restructuring and gender interaction for depressive symptoms as an outcome was not significant ($p = 0.38$) indicating that these two associations are similar. Active coping/cognitive restructuring was inversely associated with anxiety symptoms among men ($\beta = -0.12$, $p = 0.046$) but not women ($\beta = -0.06$, $p = 0.534$). Active coping/cognitive restructuring was not associated with PTSD symptoms in men or women. Passive coping/avoidance was associated with depressive symptoms among both men ($\beta = 0.44$, $p < 0.001$) and women ($\beta = 0.50$, $p < 0.001$), and there was no passive coping/avoidance by gender interaction ($p = 0.20$) meaning this association does not differ across gender. Passive coping/avoidance was also associated with PTSD symptoms among both men ($\beta = 0.45$, $p < 0.001$) and women ($\beta = 0.57$, $p < 0.001$), with the association in women being significantly stronger than that in men (gender interaction $p = 0.03$). Passive coping/avoidance was associated with symptoms of anxiety among both men ($\beta = 0.43$, $p < 0.001$) and women ($\beta = 0.46$, $p < 0.001$), and there was no passive coping/avoidance by gender interaction ($p = 0.098$) indicating that this association does not differ significantly across gender. The support seeking dimension of coping was not significantly associated with symptoms of depression, PTSD or anxiety in men or women.

Personality

Associations between dimensions of personality and psychological distress are presented in Table 5. It is not surprising that neuroticism is significantly associated with all three measures of psychological distress in both men (depressive symptoms: $\beta = 0.62$, $p < 0.001$; PTSD symptoms: $\beta = 0.45$, $p < 0.001$; anxiety symptoms: $\beta = 0.51$, $p < 0.001$) and women (depressive symptoms: $\beta = 0.63$, $p < 0.001$; PTSD symptoms: $\beta = 0.45$, $p < 0.001$; anxiety symptoms: $\beta = 0.51$, $p < 0.001$). These associations were not different between men and women (gender interaction p values > 0.5).

Extraversion was inversely associated with depressive symptoms in men ($\beta = -0.41$, $p < 0.001$) and women ($\beta = -0.32$, $p < 0.001$) and this association did not differ by gender (gender interaction p value = 0.4). *Extraversion* was inversely associated with PTSD symptoms among men ($\beta = -0.16$, $p = 0.006$) but not among women ($\beta = -0.11$, $p = 0.28$).

The gender interaction was not significant (p value = 0.68) pointing to a slightly smaller effect and smaller sample size in women as a potential explanation for the lack of association among women. Similarly, *extraversion* was inversely associated with anxiety symptoms among men ($\beta = -0.25$, $p < 0.001$) but not among women ($\beta = -0.10$, $p = 0.35$), and the gender interaction was not significant (p value = 0.26). *Openness* was only associated with PTSD symptoms among women ($\beta = 0.27$, $p = 0.006$) and the gender interaction test was significant ($p = 0.004$) meaning that the relationship among women is statistically different from that among men. *Openness* was not associated with depressive symptoms or anxiety in men or women.

Agreeableness (Table 6) was inversely associated with depressive symptoms, PTSD symptoms, and anxiety in women (depressive symptoms: $\beta = -0.34$, $p = 0.009$; PTSD symptoms: $\beta = -0.30$, $p = 0.004$; anxiety symptoms: $\beta = -0.28$, $p = 0.006$), while *agreeableness* was inversely associated with depressive symptoms, the hyperarousal dimension of PTSD symptoms, and anxiety symptoms among men (depressive symptoms: $\beta = -0.25$, $p < 0.001$; PTSD hyperarousal: $\beta = -0.15$, $p = 0.008$; anxiety symptoms: $\beta = -0.21$, $p < 0.001$). There were no significant associations between agreeableness and the avoidant, intrusive and total IES scores among men. Interestingly, the test for agreeableness by gender interaction was significant for the PTSD symptoms providing statistical support for this difference in patterns of association between men and women.

Conscientiousness was significantly associated with depressive symptoms, PTSD symptoms and anxiety symptoms among men (depressive symptoms: $\beta = -0.31$, $p < 0.001$; PTSD symptoms: $\beta = -0.12$, $p = 0.030$; anxiety symptoms: $\beta = -0.27$, $p < 0.001$). Yet, the subscale scores in Table 6 indicate that for men the association for PTSD symptoms is for symptoms dominated by the physiological hyperarousal subscale while the avoidant and intrusive symptom subscales were not significant. Among women *conscientiousness* was significantly associated with depressive symptoms and anxiety symptoms (depressive symptoms: $\beta = -0.28$, $p = 0.004$; anxiety symptoms: $\beta = -0.26$, $p = 0.008$) but not PTSD symptoms. Interestingly, the subscale scores in Table 6 indicate that for women the physiological hyperarousal subscale for PTSD symptoms is of the same magnitude as that for men and nearly significant. This lack of significance with similar magnitude of effects may arise from the fact that women have smaller sample size than men.

Hostility

The Cook Medley hostility score was positively associated with depressive symptoms, PTSD symptoms and anxiety symptoms for both men and women (Table 6), with statistically significant gender by hostility interactions ($p < 0.05$) for all three measures of psychological distress. These interactions point to significantly, approximately two-fold, higher positive associations among women when compared to men.

DISCUSSION

The finding that women officers had higher scores for the personality dimensions of openness, neuroticism and agreeableness is consistent with results from a large cross-cultural study of gender differences in personality traits (Costa, Terracciano, & McCrae,

2001). Interpretations for these differences include genetic explanations, gender-role explanations, and measurement artifact explanations. This study focuses on how these characteristics correlate with psychological distress among women and men; therefore, exploring potential explanations for mean differences between these groups is outside the scope of this discussion.

These results are in general agreement with the earlier study by our group based on a smaller preliminary sample from the same population (Andrew et al., 2008). Associations between the hardiness commitment dimension and psychological distress indicate significantly larger regression coefficients among women for both symptoms of depression and PTSD but not anxiety. The protective factor of commitment for PTSD symptoms has a two-fold larger regression coefficient in women compared to men. It is perhaps not surprising that the *commitment* dimension of hardiness is most strongly protective of psychological distress in both men and women police officers. Finding meaning and purpose in community service is a touchstone of many individuals working in law enforcement. Of interest is the finding that the associations between hardiness *commitment* and two of the measures of psychological distress, depressive symptoms and PTSD symptoms, are higher among women than among men. This suggests that higher levels of hardiness *commitment* are approximately two-fold more protective among women than among men. Perceiving stressful events as opportunities for personal growth—the *challenge* dimension of hardiness—appears to be more strongly protective for psychological distress among men. While this difference is most pronounced for depressive symptoms, it appears less so for anxiety and PTSD symptoms and may only be a reflection of the smaller number of women in this sample for these two measures of psychological distress.

Much of the work on hardiness as a protective factor has been performed using military populations. King, King, Fairbank, Keane, and Adams (1998) found that hardiness played a protective mediating role in the relationship between levels of exposure to warfare related stressors and the presence of PTSD. Hardiness was also found to predict successful completion of U.S. Army Special Forces training (Bartone, Roland, Picano, & Williams, 2008). In another study of U.S. soldiers deployed in a peacekeeping mission in Bosnia, hardiness measured during deployment was shown to predict perceived benefits of deployment measured after return from deployment (Britt, Adler, & Bartone, 2001). Hardiness has also been shown to modify the relationship between exposure to stressful events and various symptoms of psychological distress (Bartone, 1999). Results from this study of police officers are consistent with the results from military occupations. However, our study may be the only existing study to report gender interaction in associations between hardiness and psychological distress in police officers.

The associations between psychological distress and active coping/cognitive restructuring were parallel given that tests for gender interaction were not significant. Support seeking coping was not significantly associated with any measure of psychological distress for men or women, yet passive/avoidance coping had highly significant associations with all three measures of psychological distress. This strong relationship between an avoidant coping style and mood and anxiety disorder symptoms is not surprising given the fact that experiential avoidance is a known risk factor and aspect of depression and anxiety (Hong,

2007; Kashdan, Barrios, Forsyth, & Steger, 2006; Moulds, Kandris, Starr, & Wong, 2007; Ottenbreit & Dobson, 2004). This association does appear to be somewhat stronger, for the intrusive symptoms of PTSD only, among women (gender interaction $p = 0.02$). It is not surprising that the association between the personality dimension of *neuroticism* was significantly associated with all three measure of psychological distress. The associations were not different in magnitude between men and women. Since higher *neuroticism* represents the tendency for an individual to experience higher negative affect the presence of these associations needs no further interpretation. Since gender interactions were not significant for the associations between *extraversion* and psychological distress, these can be considered similar, and inverse, for men and women as would be expected. Again, since *extraversion* represents sociability and assertiveness, its confirmation as a protective factor in this population is not surprising. Interestingly, the personality dimension of *openness* is associated with PTSD symptoms in women officers but not men. This result is consistent with one existing study of personality traits and PTSD symptoms (Knezevic, Opacic, Savic, & Priebe, 2005). The personality dimension of *agreeableness* was significantly protective for both depression and anxiety in both men and women but only for PTSD symptoms in women. *Agreeableness* has been reported as protective of PTSD symptoms in other studies of law enforcement populations (Haisch & Meyers, 2004). Consistent with other reports (Haisch & Meyers, 2004), *conscientiousness* was protective of PTSD symptoms in this study. As expected, *conscientiousness* from previous literature was also protective of depressive symptoms and anxiety in both men and women, with no gender difference in these associations (Costa & McCrae, 1992). The measure of hostility was generally associated with psychological distress with stronger association in women (Fitzgerald, 2010).

Limitations of this study include the inability to make causal inferences due to the cross-sectional study design and limited sample size for women officers possibly limiting the power to estimate some gender specific associations. Strengths include a comprehensive evaluation of protective factors, personality and psychological distress in a sample of police officers. Future analyses of longitudinal associations may provide clarification of potential causation that may be reflected in these results.

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Table 1

Demographic characteristics by gender, Buffalo Police Health Study

Characteristic	Women (N=105)		Men (N=307)		Total (N=412)	
	N	%	N	%	N	%
Age Group, years						
<40	42	40.0	120	39.2	162	39.4
40–49	54	51.4	126	41.2	180	43.8
50 +	9	8.6	60	19.6	69	16.8
Education						
High School/GED	5	4.8	41	13.4	46	11.2
College < 4 years	67	63.8	159	51.9	226	55.0
College 4 + years	33	31.4	106	34.7	139	33.8
Marital Status						
Single	23	21.9	26	8.5	49	11.9
Married	61	58.1	246	80.4	307	74.7
Divorced	21	20.0	34	11.1	55	13.4
Years Served						
1–5	10	9.6	23	7.6	33	8.1
6–10	34	32.7	66	21.9	100	24.6
11–15	14	13.5	54	17.9	68	16.8
15+	46	44.2	159	52.6	205	50.5
Rank						
Police Officer	81	77.1	191	62.4	272	66.2
Sergeant/Lieutenant	11	10.5	41	13.4	52	12.7
Captain/Detective	9	8.6	39	12.8	48	11.7
Other	9	8.6	35	11.4	39	9.4

Table 2

Hardiness, coping strategies, personality, hostility, depressive symptoms, anxiety symptoms, and PTSD symptoms by gender and adjusted for age.

Measure	Women (N=105)	Men (N= 307)	p-value*
	Mean (SE)	Mean (SE)	
Hardiness (Bartone scale)	27.84 (0.50)	28.05 (0.30)	0.718
Challenge	8.47 (0.26)	8.04 (0.15)	0.150
Commitment	9.96 (0.22)	10.17 (0.13)	0.405
Control	9.37 (0.19)	9.80 (0.11)	0.071
Coping Strategies (Brief Cope)			
Active/Cognitive Restructure	3.97 (0.10)	3.87 (0.06)	0.379
Support Seeking	3.75 (0.13)	3.24 (0.08)	0.001
Passive/Avoidance	1.83 (0.08)	1.63 (0.05)	0.037
Personality (NEO)			
Extraversion	29.10 (0.59)	28.95 (0.35)	0.827
Neuroticism	16.73 (0.69)	14.35 (0.40)	0.003
Agreeableness	32.48 (0.51)	30.79 (0.30)	0.004
Conscientiousness	33.46 (0.59)	33.93 (0.35)	0.494
Openness	25.74 (0.50)	23.36 (0.30)	<0.001
Hostility (Cook-Medley)	15.91 (0.87)	18.70 (0.50)	0.006
Depression symptoms (CESD)	8.45 (0.68)	7.56 (0.40)	0.262
PTSD symptoms score (IES-R)	13.75 (1.25)	11.42 (0.73)	0.109
Intrusive subscale	0.67 (0.07)	0.56 (0.04)	0.179
Avoidant subscale	0.68 (0.06)	0.57 (0.04)	0.139
Hyperarousal subscale	0.50 (0.05)	0.40 (0.03)	0.090
Anxiety (Beck)	8.69 (0.69)	5.57 (0.40)	<0.001

* p-value for tests differences between groups

Notes. Bartone Scale = Dispositional Resilience Scale-15; NEO = NEO Five Factor Inventory; Cook-Medley = Cook-Medley Hostility Scale; CESD = Center for Epidemiological Studies Depression Scale; IES-R = Impact of Events Scale Revised; Beck = Beck Anxiety Inventory

Table 3

Associations between hardiness dimensions and psychological distress defined by CESD, IES, and Beck Anxiety scores stratified by sex. Adjusted for age, education, and marital status

Variable	Hardiness Dimension								
	Challenge		Commitment		Control				
	B (SE)	p value	B (SE)	p value	B (SE)	p value			
Women									
CESD	-0.05 (0.29)	0.871	-0.02	-1.97 (0.28)	<0.001	-0.57	-1.21 (0.37)	0.001	-0.32
IES-R total score	-0.63 (0.53)	0.233	-0.12	-2.78 (0.57)	<0.001	-0.44	-2.12 (0.67)	0.002	-0.30
Intrusive	-0.04 (0.03)	0.199	-0.13	-0.17 (0.03)	<0.001	-0.49	-0.12 (0.04)	0.001	-0.32
Avoidant	-0.02 (0.03)	0.451	-0.08	-0.09 (0.03)	0.002	-0.30	-0.08 (0.03)	0.025	-0.22
Hyperarousal	-0.03 (0.02)	0.167	-0.14	-0.11 (0.02)	<0.001	-0.44	-0.09 (0.03)	0.002	-0.31
Anxiety (Beck)	-0.40 (0.31)	0.191	-0.13	-1.31 (0.34)	<0.001	-0.36	-0.74 (0.40)	0.068	-0.18
Men									
CESD	-0.41 (0.15)	0.006	-0.16	-1.29 (0.16)	<0.001	-0.42	-1.13 (0.19)	<0.001	-0.33
IES-R total score	-0.68 (0.29)	0.012	-0.14	-1.21 (0.31)	<0.001	-0.22	-0.73 (0.36)	0.041	-0.12
Intrusive	-0.03 (0.01)	0.072	-0.10	-0.06 (0.02)	<0.001	-0.20	-0.03 (0.02)	0.070	-0.10
Avoidant	-0.04 (0.01)	0.007	-0.15	-0.05 (0.02)	0.006	-0.16	-0.02 (0.02)	0.351	-0.05
Hyperarousal	-0.03 (0.01)	0.014	-0.14	-0.06 (0.01)	<0.001	-0.26	-0.05 (0.01)	<0.001	-0.20
Anxiety (Beck)	-0.43 (0.14)	0.003	-0.17	-1.01 (0.16)	<0.001	-0.34	-1.11 (0.18)	<0.001	-0.33

Notes. B = unstandardized regression coefficient; SE = standard error β = standardized regression coefficient. CESD = Center for Epidemiological Studies Depression Scale; IES-R = Impact of Events Scale Revised; Beck = Beck Anxiety Inventory

Associations between coping strategies and psychological distress defined by CESD, IES, and Beck Anxiety scores stratified by sex. Adjusted for age, education, and marital status.

Table 4

Variable	Coping strategies								
	Active/Cognitive Restructuring		Support Seeking		Passive/Avoidance				
	B (SE)	p value	β	B (SE)	p value	β			
Women									
CESD	-1.71 (0.75)	0.020	-0.23	-0.77 (0.58)	0.186	-0.14	4.85 (0.86)	<0.001	0.50
IES-R total score	-0.09 (1.45)	0.950	-0.01	1.41 (1.09)	0.197	0.13	10.39 (1.54)	<0.001	0.57
Intrusive	-0.02 (0.08)	0.752	-0.03	0.04 (0.06)	0.541	0.06	0.53 (0.09)	<0.001	0.53
Avoidant	0.04 (0.07)	0.612	0.05	0.10 (0.05)	0.052	0.20	0.45 (0.08)	<0.001	0.50
Hyperarousal	-0.03 (0.06)	0.619	-0.05	0.05 (0.05)	0.299	0.11	0.44 (0.07)	<0.001	0.57
Anxiety (Beck)	-0.57 (0.91)	0.534	-0.06	0.79 (0.68)	0.253	0.12	5.16 (1.05)	<0.001	0.46
Men									
CESD	-1.10 (0.42)	0.008	-0.16	-0.51 (0.28)	0.083	-0.10	3.60 (0.44)	<0.001	0.44
IES-R total score	-0.21 (0.77)	0.786	-0.02	-0.45 (0.54)	0.397	-0.05	6.68 (0.80)	<0.001	0.45
Intrusive	0.01 (0.04)	0.849	0.01	-0.003 (0.03)	0.909	-0.01	0.32 (0.04)	<0.001	0.40
Avoidant	-0.01 (0.04)	0.711	-0.02	-0.04 (0.03)	0.131	-0.09	0.29 (0.04)	<0.001	0.38
Hyperarousal	-0.03 (0.03)	0.446	-0.05	-0.02 (0.02)	0.513	-0.04	0.30 (0.03)	<0.001	0.46
Anxiety (Beck)	-0.83 (0.41)	0.046	-0.12	-0.30 (0.29)	0.313	-0.06	3.52 (0.44)	<0.001	0.43

Notes. B = unstandardized regression coefficient; SE = standard error; β = standardized regression coefficient. CESD = Center for Epidemiological Studies Depression Scale; IES-R = Impact of Events Scale Revised; Beck = Beck Anxiety Inventory

Table 5

Associations between personality factors and psychological distress defined by CESD, IES, and Beck Anxiety scores stratified by sex. Adjusted for age, education, and marital status.

Variable	Personality											
	Neuroticism			Extraversion			Openness					
	B (SE)	p value	β	B (SE)	p value	β	B (SE)	p value	β	B (SE)	p value	β
Women												
CESD	0.63 (0.08)	< 0.001	0.63	-0.39 (0.12)	0.001	-0.32	0.14 (0.13)	0.329	0.09			
IES-R total score	0.84 (0.17)	< 0.001	0.45	-0.24 (0.22)	0.280	-0.11	0.69 (0.25)	0.006	0.27			
Intrusive	0.04 (0.01)	< 0.001	0.43	-0.01 (0.01)	0.254	-0.12	0.03 (0.01)	0.027	0.22			
Avoidant	0.04 (0.01)	< 0.001	0.40	-0.01 (0.01)	0.557	-0.06	0.04 (0.01)	< 0.001	0.35			
Hyperarousal	0.03 (0.01)	< 0.001	0.44	-0.01 (0.01)	0.150	-0.15	0.02 (0.01)	0.096	0.17			
Anxiety (Beck)	0.55 (0.09)	< 0.001	0.52	-0.12 (0.13)	0.350	-0.10	-0.04 (0.15)	0.774	-0.03			
Men												
CESD	0.59 (0.04)	< 0.001	0.62	-0.46 (0.06)	< 0.001	-0.41	-0.05 (0.08)	0.499	-0.04			
IES-R total score	0.80 (0.09)	< 0.001	0.45	-0.33 (0.12)	0.006	-0.16	-0.11 (0.14)	0.435	-0.04			
Intrusive	0.04 (0.01)	< 0.001	0.40	-0.02 (0.01)	0.014	-0.14	-0.001 (0.007)	0.931	-0.004			
Avoidant	0.03 (0.01)	< 0.001	0.37	-0.01 (0.01)	0.018	-0.13	-0.01 (0.01)	0.190	-0.08			
Hyperarousal	0.04 (0.004)	< 0.001	0.50	-0.01 (0.005)	0.004	-0.17	-0.004 (0.006)	0.428	-0.05			
Anxiety (Beck)	0.49 (0.05)	< 0.001	0.51	-0.26 (0.06)	< 0.001	-0.24	0.06 (0.08)	0.429	0.05			

Notes. B = unstandardized regression coefficient; SE = standard error; β = standardized regression coefficient. CESD = Center for Epidemiological Studies Depression Scale; IES-R = Impact of Events Scale Revised; Beck = Beck Anxiety Inventory

Associations between personality factors, hostility and psychological distress defined by CESD, IES, and Beck Anxiety scores stratified by sex. Adjusted for age, education, and marital status.

Table 6

Variable	Personality/Hostility											
	Agreeableness			Conscientiousness			Cook Medley Hostility					
	B (SE)	p value	β	B (SE)	p value	β	B (SE)	p value	β			
Women												
CESD	-0.53 (0.15)	0.009	-0.34	-0.36 (0.12)	0.004	-0.28	0.64 (0.12)	<0.001	0.56			
IES-R total score	-0.85 (0.29)	0.004	-0.30	-0.29 (0.23)	0.217	-0.12	1.20 (0.21)	<0.001	0.57			
Intrusive	-0.04 (0.02)	0.025	-0.23	-0.02 (0.01)	0.099	-0.16	0.06 (0.01)	<0.001	0.52			
Avoidant	-0.04 (0.01)	0.003	-0.30	-0.001 (0.01)	0.888	-0.01	0.05 (0.01)	<0.001	0.50			
Hyperarousal	-0.04 (0.01)	0.002	-0.31	-0.02 (0.01)	0.057	-0.19	0.05 (0.01)	<0.001	0.58			
Anxiety (Beck)	-0.47 (0.17)	0.006	-0.28	-0.36 (0.13)	0.008	-0.26	0.66 (0.13)	<0.001	0.54			
Men												
CESD	-0.31 (0.07)	<0.001	-0.25	-0.34 (0.06)	<0.001	-0.31	0.36 (0.05)	<0.001	0.41			
IES-R total score	-0.23 (0.13)	0.078	-0.10	-0.25 (0.11)	0.030	-0.12	0.47 (0.10)	<0.001	0.30			
Intrusive	-0.01 (0.01)	0.261	-0.06	-0.01 (0.01)	0.143	-0.08	0.02 (0.01)	<0.001	0.23			
Avoidant	-0.01 (0.01)	0.143	-0.08	-0.01 (0.01)	0.065	-0.11	0.02 (0.01)	<0.001	0.29			
Hyperarousal	-0.01 (0.01)	0.008	-0.15	-0.01 (0.004)	0.002	-0.18	0.02 (0.004)	<0.001	0.32			
Anxiety (Beck)	-0.26 (0.07)	<0.001	-0.21	-0.29 (0.06)	<0.001	-0.27	0.25 (0.06)	<0.001	0.29			

Notes. B = unstandardized regression coefficient; SE = standard error; β = standardized regression coefficient. CESD = Center for Epidemiological Studies Depression Scale; IES-R = Impact of Events Scale Revised; Beck = Beck Anxiety Inventory