Unit Cohesion – A Protective Factor For Military Mental Health?

Direct and Mediated Associations

Antje Bühler, Peter Zimmermann, Ulrich Wesemann, Gerd Willmund

Summary

Objectives: In this study, we investigate if social risk and resilience factors and coping strategies allow to distinguish between military service members suffering from deployment-related PTSD, deployed soldiers with no mental health condition, and non-deployed soldiers with high or low chronic stress. In addition, we wanted to know if perceived unit cohesion directly affects mental health (PDS, BSI) or is mediated by coping strategies.

Method: In a cross-sectional study of 135 male soldiers, these were categorized into four groups: deployed soldiers diagnosed with or without deployment-related PTSD, non-deployed soldiers experiencing high or low chronic stress. Measures included adaptive and maladaptive coping strategies (SVF-78), social acknowledgment, isolation and unit cohesion.

Results: Military service members with deployment-related PTSD and non-deployed military personnel experiencing high chronic stress report significantly less social resources and significantly more maladaptive coping strategies than deployed and non-deployed military personnel with lower stress levels, but show no differences in their reported adaptive coping strategies. No significant differences were found between soldiers suffering from PTSD and high chronic stress. Effects of lacking unit cohesion on mental health symptomatology was almost completely mediated by maladaptive coping strategies.

Conclusions: Neither social risk and resilience factors nor coping strategies allow to distinguish a specific combat-related PTSD pattern. Instead, they rather distinguish between resilient soldiers and those at risk, regardless if caused by high duty-related chronic stress or traumatic combat-related events. Prospective studies are needed to assess if the lack of maladaptive coping strategies can be addressed directly or indirectly by facilitating unit cohesion and social integration.

Keywords: coping; unit cohesion; social recognition; social isolation; military deployment; mental health

Introduction/Theory

Since the deployment to Afghanistan and Iraq, risk and resilience factors for deployment-related mental disorders have received high attention. Most of this research had been carried out with the US and UK armed forces. When the German Center for Military Mental Health was founded in 2010, it was unknown if the results could be applied to a German military context, as it differed considerably in respect to deployment realities, screening procedures for joining the Armed Forces, social support structures, and also prevalence as well as incidence rates of deployment-related mental disorders and posttraumatic stress disorder (PTSD) in particular.

Meta-analyses have reported prevalence rates between 10.3 % and 13.2 % for soldiers who were deployed to Afghanistan or Iraq [1]. Rates differ depending on combat intensity: prevalence rates between 9 % for low combat intensity and 29 % for high combat intensity [1]. For European Armed Forces, prevalence rates of 4–7 % were considerably lower [2, 3[. In a German epidemiological study [4], the 12-month prevalence of PTSD among returning soldiers was 2.9 % and the service-related incidence after deployment was 0.9 %.

In international epidemiological research, several risk and resilience factors for deployment-related PTSD have been identified with the hope of early screening of soldiers at risk and the adaptation of early interventions. Often, resilience and risk constitute two extremes of the same continuum, e.g., social support or its lack, social integration or social isolation. In other cases, they seem to be qualitatively different as e.g., in the case of adaptive and maladaptive coping strategies. In this study, we are interested in identifying socio-psychological risk and resilience factors which allow discriminating between four different groups: soldiers suffering from deployment-related PTSD, soldiers who despite of deployment-related traumatic events don't suffer from PTSD, soldiers who have never been deployed, but who suffer from high duty-related chronic stress, and soldiers who have never been deployed and experience low duty-related chronic stress. Potential psychosocial protective factors are differentiated into those that are personal resources, potentially controlled by the individual alone as coping strategies, and perceived social risk and resilience factors, depending also on the behaviour of the general social environment and the military environment.

Coping strategies and mental health, in particular PTSD

Many researchers distinguish between adaptive and maladaptive coping strategies, with adaptive strategies reducing the stress response and facilitating mental health and with maladaptive coping strategies adversely impacting on mental health [5, 6]. Examples of adaptive coping are information seeking, problem solving, self-efficacy,

distraction, or re-evaluation. Examples of maladaptive coping are aggression, withdrawal, avoidance, inactivity, hyperactivity, rumination, resignation, or self-pity [5]. For civilian and military samples alike, maladaptive coping, most often avoidant coping, was associated with PTSD-symptomatology, while adaptive coping more often was a protective factor [7–9]. It is hypothesized that

Hypothesis 1a: Soldiers diagnosed with PTSD employ more maladaptive coping and less adaptive strategies than soldiers without a diagnosis.

Hypothesis 1b: Soldiers with low chronic stress employ more adaptive and less maladaptive coping strategies than soldiers with high chronic stress.

Social resources: social acknowledgment, social integration/isolation, and unit cohesion

Earlier meta-analyses, including civilians and military personnel, have revealed consistent main effects between low perceived support and posttraumatic stress disorder symptoms [10, 11] and nonspecific psychological distress [12], though effect sizes varied. Social resources for *military mental health* have been differentiated in respect to source, point of time and type of social support, e.g., unit cohesion as social support by the military during deployment, general post-deployment social support [13, 14], post-deployment social integration [14] and social acknowledgment [15, 16]. Social integration as opposed to social isolation is interpreted as a means of accessing multiple social resources.

Unit cohesion, a military-specific form of social support has been identified as a vital protective factor for deployed military [17–19], though disputed by a meta-analysis of 32 cross-sectional and longitudinal cohort studies between 1998 and 2014 [20]: In contrast to post-deployment social support, peri-traumatic unit cohesion has not been identified a protective factor in the meta-analysis. In the light of many studies outlining the protective effect of unit cohesion, this surprising result needs further exploration of the potentially underlying mechanisms: The Social Cognitive Processing Model suggests that social support helps people [21, 22] to confront their painful emotional and cognitive reactions to trauma, also an underlying mechanism of psychotherapy. In a longitudinal cohort study, perceived unit cohesion also was found to reduce avoidant coping and thereby indirectly facilitating mental health, also when corrected for general perceived social support [23]. However, to our knowledge it has not been investigated if the effect of perceived unit cohesion also is mediated by maladaptive coping strategies in general and/or by adaptive coping strategies.

Based on previous research, we expect the following pattern for perceived social support and military mental health:

Hypothesis 2a: Soldiers suffering from deployment-related PTSD have less perceived social resources than soldiers with no mental-health-related diagnoses: Perceived social isolation is higher and unit cohesion and social acknowledgment are perceived to be lower for soldiers with deployment-related PTSD than for the other three groups.

Hypothesis 2b: Soldiers with low chronic stress have more perceived social resources than soldiers with high chronic stress: they perceive themselves to be less socially isolated and benefitting from higher social acknowledgment and unit cohesion.

Hypothesis 3: The impact of unit cohesion on mental health is mediated by coping strategies.

Hypothesis 3a: The effect of unit cohesion on PTSD-symptomatology (PDS) is mediated by adaptive coping strategies.

Hypothesis 3b: The effect of unit cohesion on general symptom severity (BSI-GSI) is mediated by adaptive coping strategies.

Hypothesis 3c: The effect of unit cohesion on PTSD-symptomatology (PDS) is mediated by maladaptive coping strategies.

Hypothesis 3d: The effect of unit cohesion on general symptom severity (BSI-GSI) is mediated by maladaptive coping strategies.

Methodology

Recruitment

Male soldiers were recruited from different units of the German Armed Forces, and inpatient and outpatient departments of the Military hospital in Berlin between 2011 and 2014. Participation was voluntary. Participants were only included in the study upon informed written consent.

Measures

Trier Inventory for the Assessment of Chronic Stress (TICS)

Social recognition and social isolation:

The TICS was developed to measure chronic psychosocial stress. Overall, studies have shown very good reliability and validity for the TICS and its scales [24]. In this study, only the scales measuring two aspects of chronic social stress were used: lacking social recognition and social isolation.

Post-traumatic Stress Diagnostic Scale (PDS) (German version)

The original PDS [25] and the German adapted version [26, 27] demonstrated very good reliability and validity and good sensitivity and specificity. Here, only the severity score was used as a dependent variable.

Brief Symptom Inventory (BSI)

The BSI is a short from of the Symptom Checklist, the SCL-90-R [28]. In the German version, the General Severity Index of the BSI (GSI-BSI) has proven good reliability (Cronbach-α = 0.92–0.96, one week test-retest reliability r= .93], convergent and discriminant validity [28].

Strategies Coping with Stress (Stressverarbeitungsfragebogen SVF –78)

The SVF-78 is a stress coping inventory [5]. This is based on a conception of coping as a habitual trait characteristic, which is stable over time. The 78 items are assigned to 13 subtests. These subtests are grouped into coping strategies which facilitate stress relief (positive or adaptive strategies) and into such strategies contributing to stress load (negative or maladaptive strategies). Respective means were computed for adaptive and maladaptive coping strategies. Internal consistencies (α = .86, α = .94), split-half reliabilities (r = .84, r = .96) and test-retest-reliabilities (between r = .72 and r = .88) were assessed as good to and excellent. It showed good construct and external validity.

Perceived unit cohesion

Perceived unit cohesion was assessed by the following four statements

- "The relationship between my superior and me is good.",
- "The relationship between me and my fellow soldiers is good.",
- "My comrades support me.", and
- "I experience good group cohesion".

These statements were rated on a five-point rating scale: 1 = "agree", 5 = "don't agree". Internal consistency was α = .86. Counterintuitively, unit cohesion has been coded reversely, t. e. higher values indicate lower unit cohesion.

Data analysis / Statistics

All statistical tests were performed using SPSS 21. We corrected for multiple testing using Bonferroni's method. Hypotheses 1, 2 and 3 were tested independently of each other. Based on an initial level of significance of α = 0.05 and multiple testing of the sub-hypotheses, the corrected level of significance was set at α = 0.025 for hypothesis 1, α = .008 for hypothesis 2 and α = .0125 for hypothesis 3. Missing data were dealt with according to the instructions of the respective manuals. If the number of missing values did not exceed the defined cutoff, missing values were computed based on the respective means. Missing data exceeding the threshold resulted in an exclusion of the respective measure. Since more than half of the measures violated the assumption of normal distribution, non-parametric statistical tests were applied.

We used a hierarchical approach to data analysis. Systematic differences were first tested by Kruskal-Wallis-Test. For pairwise group comparisons, the Kruskal-Wallis post-hoc tests were applied. Based on the standardized test-statics, effect sizes were calculated.

Results

Sample, descriptive statistics and differences between the four groups

One hundred and thirty-five male German soldiers between 19 and 53 years participated, with a mean of 30.3 years (SD 6.8). 70 had served in deployments abroad, 65 had only served within Germany at the time of recruitment. Depending on deployment experience, level of chronic stress and treatment for deployment-related PTSD diagnosis, they were assigned to four different groups. Of those 70 soldiers with deployment experience, 37 were diagnosed with PTSD and 32 had no diagnosis. Of those 65 soldiers 26 suffered from work-related chronic stress and 33 did not. The assignment of the non-deployed group to the high and low chronic stress category was decided by the median split based on the results of the overall chronic stress scale of the "Trier Inventory for the Assessment of Chronic Stress" (TICS). Seven participants were excluded due to missing, resulting in 127 participants.

Systematic differences between the four groups were tested by ANOVAS applying Kruskal-Wallis-Test in respect to age ($H(3) = 10.171$, $p < .017$), number of deployments ($H(3) = 29.695$, $p < .001$), number of days deployed ($H(3) = 26.742$, $p < .001$), and the severity of the traumatic events (MHAT: ($H(3) = 40.781$, $p < .001$. Though non-traumatized deployed military personnel showed a slight tendency for having been deployed more often, both groups of military personnel do not differ in respect to the complete days deployed ($p = 0.9$) and the severity of traumatic events ($p = 1.0$). Systematic differences between the four groups in respect to education (Kruskall-Wallis: $\chi^2(3) = 9.397$, $p = 0.024$) and rank (Kruskall-Wallis: $\chi^2(3) = 10.577$, $p = 0.014$, $N = 132$) were analyzed by Chi-Square tests for k independent groups. In the full sample (N = 135), PTSD symptom severity ratings on the PDS were: 88 subjects (65.2 %) not clinically significant, 10 subjects (7.4 %) moderate, 19 subjects (14.1 %) moderate to severe, and 18 subjects (13.3 %) severe. The mean (SD) PDS score was 13.07 (16.28) and TICS score 13.90 (10.50).

Check for group assignments

The assignments to the four groups were additionally checked by differences in the severity of PTSD symptomatology and general mental health symptoms (BSI-

GSI). The assignments were supported by significant differences in the severity of PTSD symptomatology (PDS: (H(3) = 76.865, p < .001) and general severity of symptomatology (BSI: (H(3) = 84.817, p < .001). Pairwise comparisons with adjusted p-values showed that soldiers diagnosed with PTSD achieved a significantly higher severity score in the PDS and the BSI than non-diagnosed soldiers with a deployment history (p < 0.001, r = .87), non-deployed soldiers with high chronic stress (p < 0.001, r = .55) and non-deployed soldiers with low chronic stress (p < 0.001, r .9, r = 1.0). Soldiers experiencing high chronic stress had significantly higher severity scores than soldiers with low chronic stress in the BSI (p = 0.001, r = 0.46), but they did not differ significantly in the PDS (p = 0.1, r = 0.3)

Hypothesis 1: Coping strategies

Hypothesis 1 was partially supported: While no systematic differences between the groups were found in respect to adaptive coping strategies (Kruskal-Wallis-Test: H=7.340, N=134, η^2 = 0.031, dCohen = 0.36, p = .062), the groups differed significantly in respect to maladaptive coping strategies (Kruskal-Wallis-Test: H = 60.005, N = 134, η^2 = 0.413, dCohen = 1.678, p < .001). In line with hypothesis 1a, soldiers with deployment-related PTSD use more maladaptive coping strategies than previously deployed soldiers with no mental health condition (z = 5.372, N = 69, η^2 = 0.418, dCohen = 1.696, p < .001) and non-deployed soldiers with low chronic stress (z = 6.839, N = 70, η^2 = 0.668, dCohen = 2.838, p < .001). Contrary to hypothesis 1a, soldiers with deployment-related PTSD and non-deployed soldiers with high chronic stress don't differ significantly in their use of maladaptive coping strategies (z = 1.630, N = 69, η^2 = 0.039, dCohen = 0.4, p = .618). In line with hypothesis 1b, Soldiers with high chronic stress tend to use more maladaptive coping strategies than soldiers with low chronic stress (z = 5.014, N = 65, η^2 = 0.387, dCohen = 1.588, p < 0.001), in line with hypothesis 3b.

Hypothesis 2: Social factors: Unit cohesion, social isolation and social acknowledgment

Hypothesis 2 was also partially supported: Significant differences were found between the groups for unit cohesion (H = 42.907, N = 133, η^2 = 0.291, dCohen = 1.282, p < .001), social isolation (H = 57.768, N = 134, η^2 = 0.397, dCohen = 1.622, p < .001) and social acknowledgment (H = 43.360, N = 133, η^2 = 0.295, dCohen = 1.292, p < .001).

Hypothesis 2a is supported for two of the three comparisons: Social isolation (H = 57.768, N = 134, η^2 = 0.397, dCohen = 1.622, p < .001) is highest, unit cohesion (H = 42.907, N = 133, η^2 = 0.291, dCohen = 1.282, p < .001) and social acknowledgment (H = 43.360, N = 133, η^2 = 0.295, dCohen = 1.292, p < .001) are lowest for soldiers with PTSD. Unit cohesion is higher for deployed soldiers with no diagnosis (z = 4.221, N = 69, η^2 = 0.258, dCohen = 1.18, p < .001) and non-deployed military personnel with low chronic stress (z = 6.246, N = 70, η^2 = 0.557, dCohen = 2.244, p < .001). Social acknowledgment is also higher for deployed soldiers with no diagnosis (Z = 3.201, N = 69, η^2 =, dCohen = , p < .01) and non-deployed military personnel with low chronic stress (Z = 5.417, N = 70, η^2 = 0.419, dCohen = 1.699, p < .001). On the reverse, social isolation is lower for deployed soldiers with no diagnosis (Z = 4.166, N = 69, η^2 = 0.252, dCohen = 1.159, p < .001) and non-deployed military personnel with low chronic stress (Z = 7.192, N = 70, η^2 = 0.74, dCohen = 3.372, p < .001).

Contrary to hypothesis 2a, no significant difference was found between soldiers suffering from PTSD and soldiers experiencing high chronic stress for unit cohesion (Z = 1.890, N = 69, η^2 = 0.072, dCohen = 0.556, p = .156), social isolation (Z = 1.890, N = 69, η^2 = 0.052, dCohen = 0.467, p = .352) and social acknowledgment (Z = -.346, N = 69, η^2 = 0.002, dCohen = 0.083, p = 1.0).

Hypothesis 2b is supported: Unit cohesion (Z = 3.887, N = 65, η^2 = 0.232, dCohen = 1.101, p = .001) and social acknowledgment (Z = 5.566, N = 65, η^2 = 0.477, dCohen = 1.909, p < .001) is higher and social isolation (Z = 5.101, N = 65, η2 = 0.4, dCohen = 1.634, p < .001) is lower for soldiers with low chronic stress than for soldiers with high chronic stress (p < .001).

Hypotheis 3: Effect of unit cohesion

Diverse patterns emerged concerning the mediated effect of perceived unit cohesion on mental health by coping strategies:

In line with hypothesis 3 and its four sub-hypotheses, higher perceived unit cohesion is associated with lower mental health symptomatology, regardless of PTSD-symptoms (PDS) or general mental health symptoms (BSI-

Table 1: Direct and indirect effects of unit cohesion on BSI-GSI, mediator "adaptive coping strategies

variable	direct effect	predictor on mediator	indirect effect	total effect
unit cohesion	0.445 (p < .001)	-0.831 (p < .007)	0.064 (p = .037)	0.509 (p < .001)

Effect of mediator on mental health (BSI-GSI): -0.077; p = .002, N = 121

Table 2: Direct and indirect effects of unit cohesion on (BSI-GSI), mediator "maladaptive coping strategies"

variable	direct effect	predictor on mediator	indirect effect	total effect
unit cohesion	0.149 (p = .037)	3.479 (p < .001)	0.360 (p < .001)	0.509 (p < .001)

Effect of mediator on mental health (BSI-GSI): 0.104; p < .001, N = 121

Table 3: Direct and indirect effects of unit cohesion on PTSD (PSD), mediator "adaptive coping strategies"

variable	direct effect	predictor on mediator	indirect effect	total effect
unit cohesion	0.428 (p < .001)	-0.810 (p = .014)	0.051 (p = .122)	0.479 (p < .001)

Effect of mediator on outcome variable PDS: -0.063; p = .052, N = 105

Table 4: Direct and indirect effects of perceived unit cohesion on PDS, mediator "maladaptive coping strategies"

variable	direct effect	predictor on mediator	indirect effect	total effect
unit cohesion	0.076 (p .445)	3.617 (p < .001)	0.403 (p < .001)	0.479 (p < .001)

Effect of mediator on outcome variable PDS: 0.111; p < .001, N = 105

GSI). The mediated effects, however, are more complex (see table 1–4).

87 % of the relationship between unit cohesion and BSI-GSI is explained by direct and 13 % by indirect effects of the mediator "adaptive coping strategies" (see table 1), while in the case of the mediator "maladaptive coping strategies" 71 % are explained by indirect effects and 29 % by direct effects of perceived unit cohesion (see table 2).

89 % of the relationship between perceived unit cohesion and the severity of PTSD-symptoms (PDS) is explained by a direct effect only. The indirect effects mediated by "adaptive coping strategies" remain insignificant (see table 3), while in the case of the mediator "maladaptive coping strategies" 84 % are explained by indirect effects. No direct effect of perceived unit cohesion remains significant (see table 4).

Discussion

In one of the first studies of the Bundeswehr Center for Psychotraumatology after its establishment in 2010, we were interested if research results on risk and resilience factors for US and UK armed forces also apply to Bundeswehr service members. In addition, we were interested if coping strategies and different social risk and resilience factors allow to distinguish military personnel with a deployment-related PTSD from deployed military personnel who do not develop a PTSD after traumatic combat-related events and non-deployed military personnel with high or low duty-related chronic stress – unrelated to deployment.

Our hypotheses were partially supported: Highly stressed military personnel, regardless of their combat-related PTSD diagnosis, show more maladaptive coping strategies and lack more social resources including unit cohesion, social acknowledgment, and social integration/isolation in general than more resilient deployed or non-deployed military service members with a lower stress level. While these psychosocial risk and resilience factors allow to distinguish between resilient military service members and those at risk, they are relatively unspecific: They do not allow to distinguish between military personnel suffering from high chronic stress unrelated to deployment and from combat-related PTSD. Contrary to our hypothesis, adaptive coping does not allow to distinguish resilient service members from those at risk.

However, the good news might be that addressing the identified psychosocial risk and resilience factors helps

all vulnerable military service members, potentially simplifying prevention, and intervention measures.
Eventually, one also must consider a lack of seeking help for soldiers with high chronic stress, as mental health disorders unrelated to combat might be perceived as more stigmatizing. As this has been one of the first studies of the Bundeswehr Center for Psychotraumatology, neither the hidden problem of mental health disorders was known at the time [4, 29] nor expected stigmatization as the main reason for underreporting mental health problems [30, 31].
As to the underlying functional mechanism of perceived unit cohesion for mental health, a diverse picture of mediated and unmediated effects via coping strategies has emerged: In respect to the mediator "maladaptive coping strategies", the effect of perceived unit cohesion on the general mental health symptomatology (BSI-GSI) is mainly mediated and on PTSD-severity even completely mediated by coping strategies. However, in respect to the mediator "adaptive coping strategies", perceived unit cohesion has mainly a direct effect for general health symptomatology and a complete direct effect for the severity of PTSD-symptomatology (PDS), while adaptive coping strategies do not allow to distinguish between resilient individuals and those at risk. Thereby, our results lend support to the social buffer model which posits a direct effect of perceived social support onto mental health [32] as well as to the Social Cognitive Processing Model suggests [21, 22], which assumes that perceived social support allows people to confront their painful emotional and cognitive reactions to trauma. However, in contrast to the assumed underlying mechanism, perceived unit cohesion does not facilitate adaptive coping strategies, it only reduces the engagement in maladaptive coping strategies: This relationship rather suggests an emotion-associated coping mechanism: Perceived unit cohesion might reduce arousal and negative emotions and thereby lesson the engagement in maladaptive coping strategies. The challenge is to disentangle, if maladaptive coping strategies can only be reduced indirectly as by perceived unit cohesion or directly. The latter might be difficult as objectives of denial and reduction can result in the opposite effect [29]: "You can think of everything, but do not imagine a pink elephant!"
This study suggests that strengthening social resources, including perceived unit cohesion, social acknowledgment, and social integration, as well as addressing the individual risk factor of maladaptive coping strategies are worthwhile targets for facilitating mental health.

Limitations

The study has several limitations: The cross-sectional design does not allow to draw conclusions about the direction of relationships. The small sample and non-randomized design do not allow generalizing the results beyond the group studied. It has also to be cautioned against interpreting the self-report measures as indicators of actual social support or unit cohesion.
Due to the limitations in this study as well as in respect to actual knowledge how these factors must be addressed, the systematic implementation of single and combined interventions should be accompanied by prospective evaluation designs taking account of timing of the intervention, pre-deployment, post-deployment and when diagnosed with (deployment-related) mental health disorders.

References

1. Alschuler KN, Otis JD: Coping strategies and beliefs about pain in veterans with comorbid chronic pain and significant levels of posttraumatic stress disorder symptoms. Eur J Pain 2012; 16(2): 312–319.
2. Bekiros S, Jahanshahi H, Munoz-Pacheco JM: A new buffering theory of social support and psychological stress. PLoS One 2022; 17(10): e0275364.
3. Breslau J, Setodji CM, Vaughan CA: Is cohesion within military units associated with post-deployment behavioral and mental health outcomes? J Affect Disord 2016; 198: 102–107.
4. Brewin CR, Andrews B, Valentine JD: Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. J Consult Clin Psychol 2000; 68(5): 748–766.
5. Díaz-Tamayo AM, Escobar-Morantes JR, García-Perdomo HA: Coping Strategies for Exposure to Trauma Situations in First Responders: A Systematic Review. Prehosp Disaster Med 2022; 6(37): 810–818.
6. Ehlers A: Posttraumatische Belastungsstörungen. Göttingen: Hogrefe 1999.
7. Finch BK, Vega WA: Acculturation stress, social support, and self-rated health among Latinos in California. J Immigr Health 2003; 5(3): 109–117.
8. Forstmeier S, Kuwert P, Spitzer C et al: Posttraumatic growth, social acknowledgment as survivors, and sense of coherence in former German child soldiers of World War II. Am J Geriatr Psychiatry 2009; 17(12): 1030–1039.
9. Franke GH, Jaeger S, Glaesmer H et al.: Psychometric analysis of the brief symptom inventory 18 (BSI-18) in a representative German sample. BMC Med Res Methodol 2017; 17(1): 14.
10. Goodwin L, Jones M, Rona RJ et al.: Prevalence of delayed-onset posttraumatic stress disorder in military personnel: is there evidence for this disorder?: Results of a prospective UK cohort study. J Nerv Ment Dis 2012; 200(5): 429–437.
11. Griesel D, Wessa M, Flor H: Psychometric qualities of the German version of the Posttraumatic Diagnostic Scale (PTDS). Psychol Assess 2006; 18(3): 262–268.
12. James LM, van Kampen E, Miller RD, Engdahl BE: Risk and protective factors associated with symptoms of post-traumatic stress, depression, and alcohol misuse in OEF/OIF veterans. Mil Med 2013; 178(2): 159–165.
13. Janke W, Erdmann G: Streßverarbeitungsfragebogen. Göttingen: Hogrefe 2008.
14. Jones N, Seddon R, Fear NT et al.: Leadership, cohesion, morale, and the mental health of UK Armed Forces in Afghanistan. Psychiatry 2012; 75(1): 49–59.
15. Kok BC, Herrell RK, Thomas JL, Hoge CW: Posttraumatic stress disorder associated with combat service in Iraq or Afghanistan: reconciling prevalence differences between studies. J Nerv Ment Dis 2012; 200(5): 444–450.
16. Lazarus RS: Coping theory and research: past, present, and future. Psychosom Med 1993; 55(3): 234–247.
17. Lepore SJ: A social – cognitive processing model of emotional adjustment to cancer. In: Baum A and Andersen BL (Hrsg.): Psychosocial interventions for cancer. Washington: American Psychological Association 2001; 99–116.
18. McAndrew LM, Markowitz S, Lu S et al.: Resilience during war: Better unit cohesion and reductions in avoidant coping are associated

with better mental health function after combat deployment. Psychol Trauma 2017; 9(1): 52–61.
19. Ozer EJ, Best SR, Lipsey TL, Weiss DS: Predictors of posttraumatic stress disorder and symptoms in adults: a meta-analysis. Psychol Bull 2003; 129(1): 52–73.
20. Palmisano AN, Norman SB, Panza KE, Petrakis IL, Pietrzak RH: PTSD symptom heterogeneity and alcohol-related outcomes in U.S. military veterans: Indirect associations with coping strategies. J Anxiety Disord 2022; 85: 102496.
21. Petrowski K, Paul S, Albani C, Brähler E: Factor structure and psychometric properties of the trier inventory for chronic stress (TICS) in a representative German sample. BMC Med Res Methodol 2012; 12: 42.
22. Powers MB, Gillihan SJ, Rosenfield D, Jerud AB, Foa EB: Reliability and validity of the PDS and PSS-I among participants with PTSD and alcohol dependence. J Anxiety Disord 2012; 26(5): 617–623.
23. Rona RJ, Hooper R, Jones M et al.: The contribution of prior psychological symptoms and combat exposure to post Iraq deployment mental health in the UK military. J Trauma Stress 2009; 22(1): 11–19.
24. Rüsch N, Rose C, Holzhausen F et al.: Attitudes towards disclosing a mental illness among German soldiers and their comrades. Psychiatry Res 2017; 258: 200–206.
25. Schumm JA, Koucky EM, Bartel A: Associations between perceived social reactions to trauma-related experiences with PTSD and depression among veterans seeking PTSD treatment. J Trauma Stress 2014; 27(1): 50–57.
26. Schuy K, Brants LM, Dors S et al.: Mental Health Stigma: An Influencing Factor in Healthcare Utilization by Veterans of the German Armed Forces. Gesundheitswesen 2019; 81(8–09): e146-e153.
27. Smith MJ, Bensimon CM, Perez DF, Sahni SS, Upshur REG: Restrictive measures in an influenza pandemic: a qualitative study of public perspectives. Can J Public Health 2012; 103(5): e348–52.
28. Trautmann S, Goodwin L, Höfler M et al.: Prevalence and severity of mental disorders in military personnel: a standardized comparison with civilians. Epidemiol Psychiatr Sci 2017; 26(2): 199–208.
29. Wegner, DM, Schneider, DJ, Carter, SR et al.: Paradoxical effects of thought suppression. Journal of Personality and Social Psychology 1987; 53(1): 5–13.
30. Wittchen H, Schönfeld S, Kirschbaum C et al.: Traumatic experiences and posttraumatic stress disorder in soldiers following deployment abroad: how big is the hidden problem? Dtsch Arztebl Int 2012; 109 (35–36): 559–568
31. Xue C, Ge Y, Tang B et al.: A meta-analysis of risk factors for combat-related PTSD among military personnel and veterans. PLoS One 2015; 10(3): e0120270.

Ethics

The study was approved by the local ethics committee (Ethikausschuss Charité, application number: EA1/270/11).

Acknowledgements

The authors gratefully acknowledge the support of Department E of the Bundeswehr Medical Academy in Munich, in particular Associate Professor Dr. Roland Girgensohn, in preparing the mediation analyses.

Manuscript Data

Citation
Bühler A, Zimmermann P, Wesemann U, Willmund G: Unit Cohesion – A Protective Factor for Military Mental Health? Direct and Mediated Associations. WMM 2023; 67(9): e2.

DOI: https://doi.org/10.48701/opus4-188

For the Authors
Associate Professor Dr. Antje Bühler
Bundeswehr Hospital Berlin
Bundeswehr Center for Psychotraumatology
Scharnhorststr. 13, D - 10115 Berlin
E-Mail: anb@ptzbw.org