

ORIGINAL ARTICLE

Deployment-Related Stress Disorder in German Soldiers

Utilization of Psychiatric and Psychotherapeutic Treatment

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SUMMARY

Introduction: Military missions abroad carry a high risk of psychological traumatization. In this study, we examined the reasons for increased utilization of the treatments offered to soldiers by the German armed forces' psychiatric services.

Method: We analyzed trends in initial contacts with psychiatrists and psychotherapists among German soldiers participating in missions to Afghanistan and the Balkans. To this end, we evaluated existing data from the psychiatric services of all German Armed Forces Military Hospitals with respect to sociodemographic factors (sex, area of mission) and the underlying psychiatric disorders over an 18-month period (January 2010 to June 2011).

Results: 615 soldiers made an initial contact with the psychiatric and psychotherapeutic services during the study period. The total number of first contacts did not change significantly ($p = 0.195$), but there was a notable rise in the number of first contacts by female soldiers with deployment-related stress ($p = 0.003$). Mission-specific statistics revealed a significant increase in the number of first contacts only for soldiers deployed to the Balkans ($p = 0.017$). 91% of soldiers making a first contact were given the diagnosis of a stress reaction (ICD-10: F 43); the second most common diagnosis (8.9%) was an affective disorder (ICD-10: F 32.0, F 32.1).

Conclusion: Despite psychological prevention efforts, military missions abroad often lead to mental disorders. Our findings indicate that the mild observed increase in incidence is both sex-specific and deployment-area-specific.

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Germany's armed forces (Bundeswehr) have been active in the Balkans since the mid-1990s (Implementation Force, IFOR; Stabilization Force, SFOR; Kosovo Force, KFOR; European Union Force, EUFOR) and, since 2002, in international military deployments in Afghanistan, in the context of the International Security Assistance Force (ISAF). Currently, some 7700 male and female service personnel are deployed overseas (1).

Doing active service abroad for several months imposes particular stresses on soldiers. Permanent stressors related to deployment are (2):

- Living in military camps
- Long separations from home and family
- Long working hours
- Encounters with people from unfamiliar cultures in the deployment setting, often accompanied by the experience of suffering among resident civilians.

Furthermore, military deployment entails the risk of undergoing traumatic experiences (3) (*Table 1*).

Exposure to atrocities, combat situations, the experienced extent of risk or threat to one's own person, and the duration of deployments affect the prevalence of mental disorders in deployed troops (4). Hoge et al. (3), for example, reported prevalence rates in US soldiers and marines between 8.5% and 19%, depending on whether they were deployed in Afghanistan or Iraq. The immediate experience of risk to one's own life as well as the concrete experience of killing are particular stress factors that are specific to the military (5, 6). Vogt et al. (7) described four specific deployment-related experiences that have been the subject of many studies (Hoge et al. [4]):

- Participation in combat operations
- After-effects of skirmishes
- Experience of threat/risk to one's own life
- Difficult living and working conditions.

Not every confrontation with a traumatic situation does, however, trigger the development of a mental disorder that requires treatment (8, 9). The Bundeswehr has a comprehensive catalogue of preventive measures to stabilize their troops' mental health (10). Furthermore, the Center for Military Mental Health was established at the German Armed Forces Hospital

TABLE 1

Deployment-related mental stressors*1

	2008	2009	2010	2011
No of soldiers deployed	12 214	12 740	11 193	7 805
No of deaths during deployment	5	5	9	7
Military incidents	42	87	141	32

*1 mental stressors in German soldiers in Afghanistan in 2008 to June 2011. Military incidents are, for example: skirmishes, ambushes, accidents. Source: Einsatzführungskommando [Joint Operations Command]

BOX

Care provision pathways and financial funding of medical treatment in active and former soldiers

● **Active soldiers in the Bundeswehr, soldiers in reserve duty training, and reserve soldiers**

All these receive cost-free healthcare services by army physicians. The first point of call for the patient is the army medical officer, in analogy to the primary care physician in the civilian population. S/he will initiate further specialist care if required. This can be provided on an outpatient basis (specialist medical center) or in one of Germany's five Armed Forces Military Hospitals (BwKrHs). The army medical officer can refer soldiers to civilian specialist or specialist hospitals if a particular qualification is required or the army's joint medical service does not have the relevant capacity. This is often done after acute treatment in the Armed Forces Military Hospital has been completed, for example, in the form of outpatient psychotherapy. Bills are settled with the military district administrative office.

● **Former soldiers in the Bundeswehr**

Those who are members of statutory or private health insurance schemes are provided for by the civilian healthcare system. In case someone's illness has been caused by active service in the forces, the civilian physician can refer the former soldier to a specialist physician in the forces or an Armed Forces Military Hospital. The timely initiation of the process for service-related injuries by the forces' social services is essential. The forces cover the cost of medical treatment in such cases.

TABLE 2

Contact with mental health professionals (e.g. psychiatrists, clinical psychologists) for deployment-related mental disorders

	Initial contacts*1	Follow-up contacts*2
ISAF	n = 576	n = 726
Balkans	n = 39	n = 85
Men	n = 568	n = 752
Women	n = 46	n = 59

*1 Initial contacts: First contact with a mental health professional for a deployment-related mental disorder;

*2 Follow-up contacts: patients who repeatedly contacted a mental health professional.

ISAF, International Stabilization Force, Afghanistan; Balkans comprises deployments in KFOR: Kosovo Force, EUFOR: European Union Force

in Berlin. The center is tasked with conducting research into all areas of mental health in soldiers, in collaboration with the civilian scientific system.

In addition to principles of prevention, principles of a comprehensive psychiatric-psychotherapeutic service have been established that take into account the particularities of deployment-related mental injury (10). The psychosocial network in the Bundeswehr, which integrates the forces' central medical services as well as the psychological and social services and army chaplains, was set up to provide easy access to these services. Of the soldiers included in the present study (n = 615), 23% were already in contact with the psychosocial network in their country of deployment (Source: Deployment statistics, Center for Military Mental Health). The therapeutic services (11, 12) integrate inpatient and outpatient measures in multidisciplinary teams that also involve the soldiers' social networks, their partners, and their families (13).

In spite of all this, the number of psychiatric patient contacts related to military deployment that are being registered by healthcare facilities are rising continually (Bundeswehr.de: Einsätze/Belastungsstörungen/Stand/Aktuelle Zahlen/2011 [Deployments/stress disorders/status quo/current data/2011]). However, these data do not allow any conclusions about the total number of soldiers with combat-related stress disorders (Wittchen HU, Schönfeld S: Traumatische Ereignisse, PTBS und psychische Störungen bei Soldaten mit und ohne Auslandseinsatz: Erste Ergebnisse [Traumatic experiences, posttraumatic stress disorder and mental disorders in soldiers with or without deployment overseas: initial results]; press conference held at Dresden University of Technology, 2011).

A scientific study comparing German soldiers in 2000 and 2006 found a significant increase over the years in the numbers requiring treatment for reactions to severe stressors and adjustment disorders according to ICD-10 (9). Zimmermann (9) describes that acute stress reactions (F43) are responsible for the increase in psychiatric disorders overall and furthermore lead to an increase in the number of treatment days. This study also found an increased proportion of female soldiers among the psychiatric patients in the forces. However, as the study did not investigate deployment-related disorders exclusively, the results do not allow any conclusion of whether the observed increase is associated with overseas deployment.

What is not known either is whether the regions to which soldiers are deployed differ in terms of their traumatogenic potential. Indications that deployment-related stress in German soldiers results in an increased requirement for advice have been seen only from the evaluation of anonymous telephone or online advice services offered by the Bundeswehr (12, 14).

This study aims to provide perspectives and advice on currently encountered problems and future developments in German soldiers' need for mental health services that also apply to the civilian sector. The Bundeswehr does not have its own comprehensive

healthcare services network to enable it to provide nationwide, post-inpatient, psychotherapeutic services on an outpatient basis. For this reason, in addition to the forces' own psychiatric services, civilian psychotherapeutic and psychiatric practices and hospitals have also become increasingly involved in delivering care for deployment-related traumatic stress disorders (Box) (15).

This study aims to provide answers to the following questions:

- Is it possible to identify a trend with regard to the total number of first psychiatric contacts of soldiers with deployment-related psychiatric disorders over the study period (January 2010 through June 2011)?
- Are Afghanistan and the Balkans as deployment regions different with regard to any observed trends?
- Do male and female soldiers differ with regard to any observed trends?
- Are the deployment-related diagnostic groups different with regard to any observed trends?

Method

The current study aims to investigate whether the number of first presentations in a psychiatric outpatient clinic or psychiatric ward in a German Armed Forces Hospital changed between January 2010 through June 2011 as a result of deployment-related stress disorders in soldiers in active service. The time period was selected because since 2010, data have been collected consistently and centrally, and differentiated interpretations have therefore become possible. Data from soldiers with deployment-related mental disorders are collected in a standardized documentation format in all psychiatric and psychotherapeutic treatment centers of the armed forces, then evaluated and archived by the Center for Military Mental Health. Soldiers with first or follow-up inpatient or outpatient contacts were defined as service users.

The statistical evaluation includes active soldiers only. Soldiers who sought help in the civilian sector after leaving the forces were not included in the study.

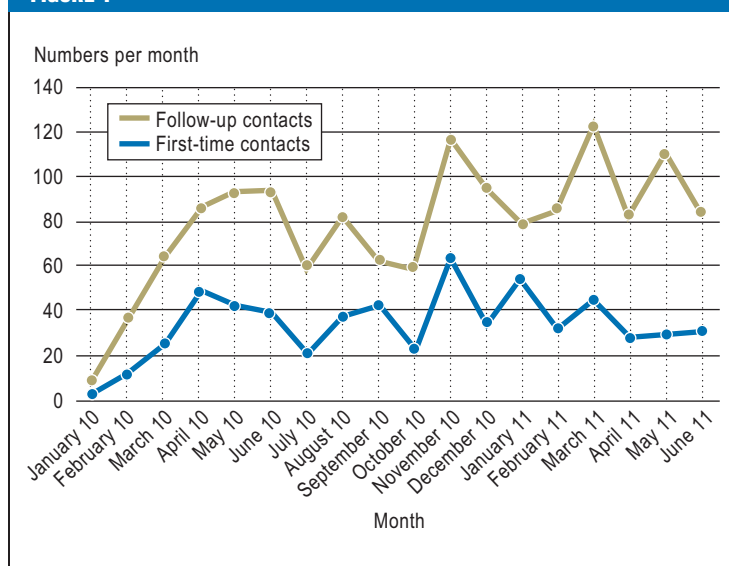
Sample

In total, the sample included $n = 1515$ psychiatric treatment contacts, 7.2% were women, average age 32.06 (standard deviation [SD] = 7.88) years. Table 2 shows the relevant demographic data (first and follow-up contacts, sex, area of deployment). We included in the study initial contacts ($n = 615$) of soldiers from the missions ISAF (Afghanistan) and KFOR/EUFOR (henceforth referred to as the Balkans). We included only persons who sought treatment for a traumatic experience while being deployed overseas, after examination by a specialist physician (Table 2).

Study execution and statistical evaluation

We analyzed the month-by-month development of the psychiatric and psychotherapeutic initial and follow-up contacts. Because of the symmetrical distribution of the

FIGURE 1



Psychiatric-psychotherapeutic first-time and follow-up contacts (utilization) in months in the time period January 2010 through June 2011. Owing to the introduction of a systematic data collection system in January 2010 we start at the zero level (German soldiers deployed in Afghanistan since the start of the missions $n = 812\ 89$, in the Balkans $n = 170\ 554$. The numbers given here relate to the totals in both deployments).

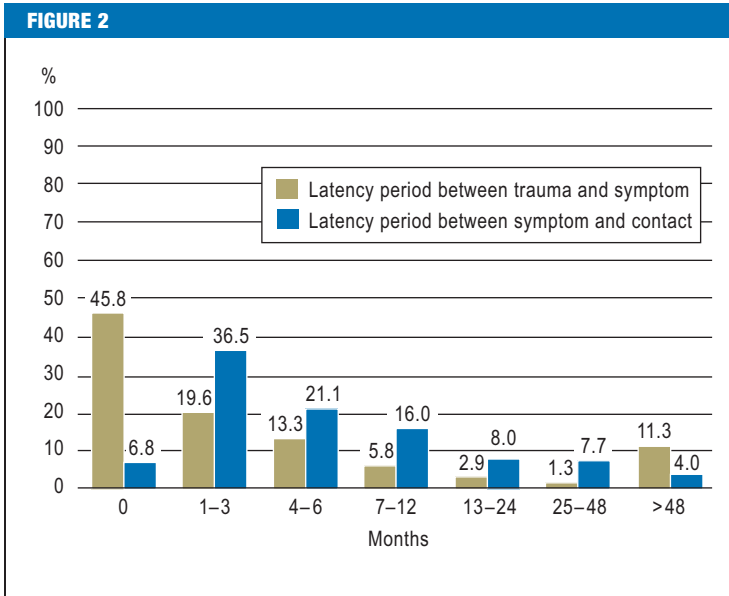
data (Figure 1) and the higher quality of data in initial contacts we evaluated these exclusively, using statistical inference. We included demographic patient data (sex), details of the deployment that was associated with the trauma, and the diagnosis according to ICD-10 that was made by a specialist after a thorough medical examination.

The descriptive and inferential statistical evaluation of the data was undertaken by using the statistical software package SPSS 17.0. In order to verify our assumption of a linear trend development we calculated linear regression models for initial contacts and checked these for any abnormal trend. Variations in the numbers in the description of the sample were due to incomplete data.

Results

Since the Bundeswehr has participated in international missions, a total of 251 843 soldiers have been deployed to Afghanistan ($n = 81\ 289$) and the Balkans ($n = 170\ 554$). In the study period, a total of $n = 615$ female and male soldiers sought out, for the first time, outpatient or inpatient psychiatric treatment services because of deployment-related (Afghanistan and Balkans) stress disorders. Figure 1 shows the trend of service utilization behaviors, differentiated by initial contacts and follow-up contacts.

Figure 2 shows the time interval between the experienced trauma and the first manifestation of symptoms (latency period between trauma and symptom) and the time interval between initial manifestation of symp-



Time interval (latency period) between the traumatic event and initial symptom onset (latency period between trauma and symptom) and between the first onset of symptoms and first contact to a medical specialist (latency period between symptom and contact) in months, January 2010 through June 2011

toms and the first treatment contact with a specialist (latency period between symptom and contact). After six months, 78.8% of soldiers in the study reported symptoms; after two years, 87.5% experienced their first problems.

Within the first year after onset of symptoms, 64.4% of patients had their first contact with a specialist physician, and 96% were receiving specialist medical treatment after two years.

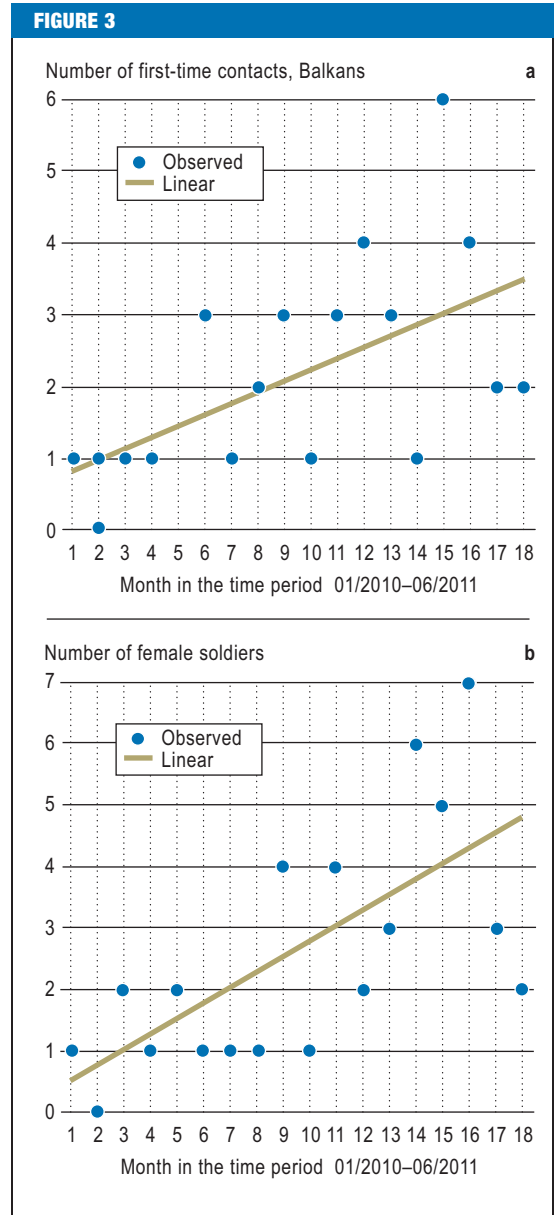
Table 3 shows the frequency of initial contacts in total and per month in the study period, as well as a breakdown by sex, area of deployment, and diagnosis.

Table 4 shows the results of the regression analyses. The number of initial contacts was defined as the dependent variable. The treatment numbers in female soldiers (regression coefficient [B] = 0.239; test value for significance test [F] = 12.12; p = 0.003; squared multiple regression coefficient [R²] = 0.431) and the contacts caused by deployment to the Balkans (B = 0.156; F = 7.04; p = 0.017; R² = 0.306) rose conspicuously over the course of the time period under observation, but this was not the case for service utilization overall and that of male soldiers (Table 4).

Figure 3 shows the trend of the dependent variable “initial contacts” with the regressor “women overall” and deployment area “Balkans.” The straight lines rising in a linear fashion show abnormal associations.

Discussion

German soldiers deployed overseas are exposed to severe and increasing psychological stresses. In the present study, the authors investigated whether this is



Graphical representation of the regression analysis in the regressors deployment region and female soldiers

also reflected as an increase in the numbers of first-time contacts with psychiatric and psychotherapeutic services between January 2010 and June 2011. Furthermore we investigated the question of whether men and women differ in terms of their service utilization behaviors over time and whether their area of deployment and their diagnosis affected service utilization behaviors.

Contrary to our expectations, no significant increases in service utilization behavior were seen for first-time contacts. When considering the deployment regions separately, numbers rose only for deployment to the Balkans, not for Afghanistan. This is surprising

in view of the fact that in Afghanistan in the past two years, the military situation has become aggravated, with almost daily military skirmishes. Wittchen and Schönfeld (2011) showed that a large number of the ISAF soldiers deployed in 2009/2010 were exposed to potentially traumatic conditions several times during their deployment.

It is not unthinkable that soldiers' expectations with regard to the dangerous conditions of the deployment played a part. A realistic anticipation of stressors seems to have a preventive effect on the development of mental disorders (16). Current press reports of injured or killed ISAF soldiers underline the dangerous potential of deployment to Afghanistan, whereas German soldiers' deployment to the Balkans has increasingly vanished from the focus of the mass media.

With regard to sex-specific increases of service utilization behaviors, a notable rise was seen only in female soldiers. Sex-specific differences in service utilization behavior may explain this trend (17). Kessler (18) showed in 1981 in a comprehensive study that women have greater awareness of emotional problems and are more prone to seeking help than men. A recent study showed that female soldiers were more open to the idea of mental disorders and their treatment than men (19). In addition, the increase in the proportion of female soldiers can probably be explained by the increasing numbers of women serving outside military medical service corps who are more likely to be subject to extreme military stressors.

Hoge et al. (8) described that psychiatric disorders in military personnel changed depending on the stress of deployment. In our study, however, we found no changes in the range and frequencies of diagnoses over time. Disorders in response to stress, followed by affective disorders, were the main reasons for making initial contact with the forces' psychiatric services after ISAF deployment as well as deployment to the Balkans. What was of note, especially in comparison with international studies, was the total absence of addiction disorders, somatoform disorders, or personality

TABLE 3

Time periods of initial contacts with psychiatrists/psychotherapists

	n	Min/Max month	Mean/month	SD
Initial contacts, total	615	3/64	34.2	14.9
Male service users	568	2/60	31.5	14.4
Female service users	46	0/7	2.6	2
ISAF deployment	576	2/61	32	14.3
Balkans deployment	39	0/6	2.2	1.5
PTSD (ICD-10: F 43.1)	292	1/39	16.2	8.7
Reactions to severe stresses and adjustment disorders (ICD-10: F43.0; F43.2)	548	2/60	30.4	13.6
Affective disorders (ICD-10: F 32.0; 32.1)	53	0/8	2.9	2.6

Initial contacts in 01/2010 – 06/2011
Min, minimum; Max, maximum; SD, standard deviation;
ISAF, International Security Assistance Force; PTSD, posttraumatic stress disorder.

disorders among the main diagnoses. These disorders are found in our sample only as comorbid diagnoses. A possible explanation is that for defining a diagnosis, an unequivocal causal association between the traumatic event and the disorder is required; this is usually possible only for reactive stress disorders.

The stable trends for initial contacts (overall and related to Afghanistan) contrasted with the overall number of patient contacts, which has been rising substantially for several years. In 2008, posttraumatic stress disorder was diagnosed in 255 patients; in 2009, this was the case for 455 patients; in 2010 for 729 patients; and in 2011 for 922 patients (1).

The Bundeswehr (20), similar to other countries' armies (21), has developed comprehensive principles for the provision of psychosocial care to its soldiers.

TABLE 4

Results of the regression analysis

Independent variable	B	R ²	F	df	Significance
All deployments	0.891	0.103	1.83	16	0.195
ISAF	0.735	0.075	1.3	16	0.271
Balkans	0.306	0.306	7.04	16	0.017 (*)
Total No of women	0.281	0.431	12.12	16	0.003 (**)
PTSD (ICD-10: F 43.1)	0.648	0.160	3.04	16	0.100
Other stress disorders (ICD-10: F 43.0; F 43.2)	0.636	0.062	1.06	16	0.319
Affective disorders (ICD-10: F 32.0; F32.1)	.187	.152	2.88	16	0.109

B, regression coefficient; R², multiple regression coefficient, squared; F, test value for significance test; df, degrees of freedom; PTSD, posttraumatic stress disorder; ISAF, International Security Assistance Force

This entails different clinical and preventive measures (10, 15, 22), some of which are obligatory and have to be undertaken by soldiers before redeployment. It may be assumed that the rising numbers of treatments also reflects the greater acceptance and increasing destigmatization of mental disorders and their treatment methods in the Bundeswehr. The relatively short latency periods between the initial manifestation of symptoms and the first contact with a medical specialist also support the hypothesis that psychiatric services are often used early on. The greater acceptance is also reflected in the clinical routine of German Armed Forces Military Hospitals, which offer intensive interval therapies with multiple readmissions in increasingly severe and chronified disease courses.

The service utilization behaviors we investigated in our study are by no means equivalent to prevalence rates of mental disorders. Numerous factors, such as fear of stigmatization, worry about consequences at work, and unawareness of therapeutic options affect such behavior and are accompanied by a substantial risk of dissimulation (8). Recent international studies have confirmed these results (23). As a rule, service utilization rates are notably lower than the actual prevalence or incidence rates. Wittchen (2011), for example, showed recently in a study of German soldiers that some 50% of those affected seek out professional help soon after developing symptoms.

Increased attempts at prevention and provision of information, and services providing effective treatment options, including civilian ones, are promising in terms of increasing the acceptance of deployment-related mental disorders and their treatment in the armed forces.

Limitations

We are aware that the present study has some limitations.

Many posttraumatic stress disorders are triggered by more than a single traumatic event; rather, they add up cumulatively (16). For the soldiers investigated in this study, we can assume that their disorders weren't based on a single deployment. The quality of the data, however, did not always allow for causal attribution to a single mission. The Bundeswehr collects the numbers of soldiers deployed for each year, but it does not collect data on how many different people are involved. For example, soldiers may be deployed overseas several times in several missions, for briefer periods of time, or twice within 12 months. Calculating incidence and prevalence rates or percentages may therefore be subject to serious errors owing to imprecise data on the actual number of soldiers deployed. We have therefore not used these parameters.

Another limitation relates to how a diagnosis is made. In the forces, this is done after a thorough examination, always by specialists, and always considering the ICD-10 criteria. Standardized diagnostic interviews are used often, but not in all cases. Future studies should include comorbid diagnoses too, at least as covariates.

We did not have complete data sets in all cases. This is because data in German Armed Forces Military Hospitals are collected anonymously, and it is therefore not possible to complete missing data retrospectively. It can be assumed, however, that missing data or incomplete data sets are due to accidental errors.

Civilian service utilization was not included in the statistical evaluation in this article. However, this does not affect the central conclusions quantitatively because a consultation with an army psychiatrist is the prerequisite for utilizing civilian services; persons affected are therefore not omitted from the calculation. To our knowledge, no studies have as yet been reported for the Bundeswehr that investigated the interface between civilian and military medical care structures (24), for example, the specific problems of psychotherapy delivered to soldiers by civilian therapists (25).

In English speaking countries, many original articles and review articles have been published that deal with diverse aspects (8, 21) of posttraumatic stress in US (26) and UK (27) soldiers, but for Germany the present study is the most recent and comprehensive study to have investigated deployment-related stress disorders in German soldiers.

Our study period of 18 months allows only an initial glimpse of current trend developments; long-term follow-up studies are in the planning stages.

Conflict of interest statement

Dr Kowalski, Dr Hauffa, Herbert Jacobs (university diploma, psychology), Dr Höllmer, and Dr Zimmermann are employees in the Bundeswehr.

Professor Gerber declares that no conflict of interest exists.

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KEY MESSAGES

- Between January 2010 and June 2011, 615 male and female soldiers sought psychiatric and psychotherapeutic help for the first time, owing to mental disorders triggered by deployment overseas.
- The deployment areas where the traumatic event occurred were not limited to Afghanistan. The number of soldiers returning from Kosovo with psychological or psychiatric problems rose more notably in our sample than in soldiers deployed to Afghanistan.
- 64% of soldiers had sought help from medical specialists within the first year of symptom onset.
- The number of female soldiers seeking help rose more notably than that of male soldiers.
- The most common diagnoses were adjustment disorders (ICD-10: F 42.2), posttraumatic stress disorders (ICD-10: F 42.1), and mild and moderate depressive episodes (ICD-10: F 32.0 und F 32.1).

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