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Substance use and substance use disorders in recently deployed and never deployed soldiers

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ABSTRACT

Background: Military studies investigating the prevalence of substance use (SU) and substance use disorders (SUD) and the relation between SU and mental disorders often lack a comprehensive assessment of SU, SUD and mental disorders and comparable groups of deployed and non-deployed personnel. There is also limited data regarding SU and SUD in the German military to date.
Methods: Cross-sectional examination of $n = 1483$ soldiers recently deployed in Afghanistan and 889 never deployed soldiers using a fully-standardized diagnostic interview (MI-CIDI) including a comprehensive substance section.
Results: Across both groups, 12-months prevalence of DSM-IV alcohol use disorders was 3.1%, 36.9% reported binge drinking, 13.9% heavy drinking, 1.3% illegal drug use. 55.1% were regular smokers, 10.9% nicotine dependent. Although recently deployed soldiers revealed slightly higher rates in some measures, there were no significant differences to the never deployed regarding SU und SUD except that recently deployed soldiers smoked more cigarettes per day. The association of SU with mental mental disorders was substantially different though, revealing significant associations between SU and mental disorders only among recently deployed soldiers.
Conclusions: We do not find remarkable differences in the prevalence of SU and SUD between recently deployed and never deployed soldiers. Especially binge drinking and regular smoking were prevalent across both samples indicating needs for improved interventions. The finding that SU and mental disorders are only associated in recently deployed soldiers might have implications for improved screening and prevention and suggests that deployment might promote different pathways and mechanisms involved in the evolution of SU and mental disorders.

1. Introduction

The objective of this paper is to provide estimates of the prevalence of substance use (SU) and substance use disorders (SUD) in recently deployed and never deployed soldiers as well as to investigate the relationship between SU patterns and mental disorders. Substance use (SU) and substance use disorders (SUD) are well known public health challenges not only in the community (Wittchen et al., 2011) but also in the military (Jones and Fear, 2011). Knowledge about the frequency of SU and SUD and an improved understanding of related mental health impairments are of vital importance for army administrations as they are associated with an impaired functioning and military attrition (Booth-Kewley et al., 2009; Hoge et al., 2002; Mattiko et al., 2011). This issue has particularly become of increased interest for soldiers that have been deployed in military missions such as in Afghanistan. As most existing studies lack adequate comparison groups, it is still unclear whether recently deployed and never deployed personnel differ with regard to the prevalence of SU and SUD and their relationship with mental disorders.

Although there is a wealth of research regarding the prevalence of SU and SUD in military populations, findings seem to vary by sample, methods and level of detail. There is a substantial and broad range of studies suggesting that excessive alcohol use is highly prevalent among military personnel. For example Iversen et al. (2009) found that 18% met the criteria for alcohol abuse which was the most common mental disorder in this large UK military sample. Comparable results (12%) were also observed among US

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soldiers (Riddle et al., 2007). Further, high rates of binge drinking (BD) (Ramchand et al., 2011) and heavy drinking (HD) ranging between 20 and 40% have been found for UK and US soldiers (Bray et al., 1991; Fear et al., 2007; Henderson et al., 2009; Jones and Fear, 2011). In a sample of the US naval services, 15% met the DSM III-R criteria for nicotine dependence in the past 12 months (Hourani et al., 1999). Summarizing previous studies on military tobacco use, Nelson and Pederson (2008) found rates of regular smoking (RS) between 26 and 43%. These rates are somewhat elevated compared to the general population (Barbeau et al., 2004). Studies on illegal drug use (ILDU) in the military are rare and differ by the substances they consider. In a large sample of Iraq and Afghanistan veterans, 4.5% received a current ILDU disorder diagnosis (Seal et al., 2011). Incorporating a broad range of substances, Bray et al. (2010) suggest a prevalence of past 30 days drug use of 12.0% among U.S. military active duty personnel. Despite these findings, there is to our knowledge no study that examines both use and clinically relevant disorders for multiple substances as alcohol, nicotine and a broader range of illegal drugs in one study. Moreover, the overwhelming majority of findings refer to the US and the UK army. There are little data available for other nations and no data for the German military that would allow to generalize findings beyond specific populations. Thus, there is further need for comprehensive prevalence estimates of both SU and SUD in military populations.

Among studies reporting the frequency of SU and SUD in military populations, some addressed differences in prevalence rates between deployed and non-deployed personnel. Although military deployment is often associated with increased risk of stressful and traumatic experiences (Hoge et al., 2008; Wittchen et al., 2012a), which are strongly related to an elevated SU risk (Al'Absi, 2007; Jacobson et al., 2008), the association between deployment and SU remains controversial. While some findings suggest that deployment and combat exposure are associated with BD and HD (Browne et al., 2008; Jacobson et al., 2008; Wilk et al., 2010; Spera et al., 2011), for example Hotopf et al. (2006) found no differences between recently deployed and never deployed soldiers in harmful alcohol use among UK soldiers. Findings of Hooper et al. (2008) reveal no general effect of deployment and combat exposure on smoking in the UK Armed Forces while other results support a relationship between both combat stress and boredom and incident or increased tobacco use (Forgas et al., 1996). There are also some indications that combat exposure and multiple deployments are associated with higher rates of ILDU and ILDU disorders (Kulka et al., 1990; Seal et al., 2011). Thus, although there is some evidence that deployment might be related to a higher risk of SU and SUD, results are not consistent, possibly suggesting that findings might depend on sample (UK vs. US) and outcome measure considered (e.g. definition of type of substance and pattern of use). It is therefore important to obtain further data using comparable measures of multiple SU patterns and to extend existing findings that predominantly describe US and UK samples.

Beyond findings on the frequency of SU and SUD, there is a well-documented association between SU and various mental disorders (Degenhardt et al., 2001; Kessler, 2005), which are discussed both as possible risk factor and consequence of SU (Chilcoat and Breslau, 1998; Kushner et al., 2000). The frequency of alcohol use was found to be related to psychological distress (Ramchand et al., 2011) and a higher probability for disorders like depression and PTSD (Seal et al., 2011). With regard to nicotine, recent results suggest a strong association between tobacco use and PTSD (Hermes et al., 2012). It has to be considered that the majority of findings rely on screenings, questionnaires or administrative data allowing for relatively crude and clinically and diagnostically quite restricted inferences. Most studies also only focus on general measures of psychological distress or on selective mental disorders or symptoms. Beyond that, almost nothing is known about differences between recently deployed and non-deployed personnel regarding the relationship between SU and mental disorders. One might assume that recently deployed soldiers could be increasingly inclined to use substances to deal with mission-related psychological distress while other motives like social company or self-enhancement (Kuntsche et al., 2004) are more relevant in never deployed personnel. Alternatively, the experience of psychological distress, stressful experiences or decreased accessibility of social support and health services in the context of military missions (Hoge et al., 2004; Johnson et al., 2007; Pietrzak et al., 2009) could aggravate negative mental health consequences of excessive SU. Hence, we would expect a stronger association between SU and mental disorders in recently deployed than in never deployed soldiers. The constraints of previous findings (assessment methods, focus on selective diagnoses) and a lack of comparative studies raise the need to further investigate the relationship between SU and mental disorders with accurate diagnostic measures focusing on putative differences between comparable samples of recently deployed and never deployed personnel.

Using data form a large scale clinical-epidemiological study with fully-standardized face-to-face diagnostic interviews in samples of German soldiers recently deployed to Afghanistan and a comparison group of never deployed soldiers, we aim (1) to provide prevalence estimates of alcohol use, nicotine use and ILDU as well as DSM-IV diagnoses of alcohol abuse, alcohol dependence and nicotine dependence (2) to examine the relationship between HD as well as RS and DSM-IV mental disorders.

2. Methods

Data from the cross-sectional program of the "Prevalence, incidence and determinants of PTSD and other mental disorders (PID-PTSD+[3])-study were used. A comprehensive description of design, sampling and assessment procedures can be found in Wittchen et al. (2012b). The study was approved by the TUD Ethics Board (EK 72022010), after internal Bundeswehr approval and was performed according to ICH-GCP (Good Clinical Practice)-Guidelines.

2.1. Study samples

2.1.1. Recently deployed soldiers. The reference population was a total of $n = 10{,}055$ soldiers listed for deployment in the 20th and 21st German contingents of the 2009/2010 ISAF mission in Afghanistan. 438 soldiers were excluded because of missing information about home base location or because the anticipated deployment did not take place. Subsequently, a stratified random sample of $n = 3493$ soldiers was drawn. Assumed to be a high risk group for deployment-related consequences, combat soldiers were oversampled to ensure sufficient statistical power for morbidity risk analyses. Of this sample, $n = 1599$ (100%) were eligible at 18 locations distributed nationwide. The following eligibility criteria were applied: (1) Soldiers had to be present at their home base location during the assessment periods and (2) due to logistical and financial constraints only locations with a sufficient high number of eligible soldiers could be considered. Examinations of medical records of non-eligible soldiers revealed no evidence for any selection bias (Wittchen et al., 2012b). $n = 1483$ subjects participated (response rate: 92.8%) and could be examined, $n = 102$ (6.4%) refused to participate, $n = 7$ (0.4%) did not show up for a scheduled assessment and 7 (0.4%) provided an incomplete assessment.

2.1.2. Never deployed soldiers. Never deployed soldiers were selected randomly within the same locations as the recently deployed soldiers. The random selection was stratified using an age, gender and unit grid to ensure comparability to the recently deployed soldiers as far as possible. Inclusion criteria for never deployed soldiers were: never been deployed, informed consent and age of at least 18 (same as recently deployed despite deployment status). $n = 1758$ subjects were sampled, of which $n = 932$ (100%) were eligible and 889 finally participated (response rate: 95.4%).

2.2. Assessment

Recently deployed soldiers were examined about 12 months after deployment at the same home base locations as never deployed soldiers. This time interval was chosen because many forms of psychopathology occur not only during the deployment period but also after returning (Pietrzak et al., 2012). Additionally, many disorders require a time criterion in which the symptoms must have persisted for several weeks or months before a person can be diagnosed. Soldiers received an information letter prior to the assessment and decided about their participation