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Prevalence and Correlates of Mental Health Problems in Norwegian Peacekeepers 18–38 Years Postdeployment

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Peacekeeping missions involve experiences that may impact the mental health of participating soldiers. However, research on the long-term mental health consequences of peacekeeping is sparse. The present study aimed to find the prevalence of mental health problems (MHPs), possible MHP predictors, and associations between predictors and MHPs in Norwegian peacekeepers 18–38 years after deployment to a United Nations peacekeeping mission. We used data from a cross-sectional, postdeployment survey of Norwegian peacekeepers who served in Lebanon between 1978 and 1998 ($N = 10{,}605$). Participants were assessed for posttraumatic stress disorder (PTSD); anxiety; depression; insomnia; alcohol misuse; drug misuse; and exposure to pre-, peri-, and postdeployment stressors. Logistic regressions were executed to explore key variables associated with MHPs. Total MHP prevalence was 15.1%, 95% CI [14.4, 15.8]. The estimates for specific disorders were 0.1% for drug misuse, 3.4% for alcohol misuse, 4.0% for depression, 6.2% for PTSD, 6.4% for anxiety, and 9.3% for insomnia. Postdeployment stressors, $OR = 1.91$, 95% CI [1.79, 2.04]; employment status, $OR = 1.41$, 95% CI [1.33, 1.48]; and traumatic exposure during deployment, $OR = 1.11$, 95% CI [1.09, 1.12], were positively related to PTSD, $\chi 2(17, N = 8{,}568) = 1{,}791.299$, $p < .001$. Similar patterns were found for the other MHPs. Considering that most participants (84.9%) reported low symptom levels, our findings challenge the widespread public perception that most peacekeepers have MHPs. Moreover, our results indicate that future peacekeepers should be prepared for challenges they may face not only during deployment but also in the years following their homecoming.

The main objectives of United Nations (U.N.) peacekeeping missions are to prevent hostility, restore stability, and keep the peace in areas of conflict (Smid et al., 2009; Tardy, 2014). This involves monitoring activities of involved parties, ensuring humanitarian and medical aid, and providing armed protection to noncombatants (Sareen et al., 2010). Because of the complex nature of such missions, peacekeepers are frequently exposed to a range of potential deployment stressors that may impact their mental health (Loscalzo et al., 2018).

Deployment stressors that have shown to predict mental health problems (MHPs) are direct combat exposure, life-threatening situations, witnessing human suffering and atrocities committed against others, handling badly wounded and dead people, and facing difficult ethical and moral challenges (Litz et al., 1997; Sareen et al., 2010; Shigemura et al., 2016). Several studies have found a positive association between the frequency of deployment stressors and the severity of later MHPs (Klaassens et al., 2008; Nordstrand et al., 2019). In addition, factors such as separation from family or disruption of relationships may be perceived as stressful (Brounéus, 2014; Macdonald et al., 1999). Aside from the potential impact of deployment stressors, the duration and number of deployments also predict postdeployment MHPs (Sareen et al., 2010).

Peacekeepers may additionally experience stressors both before and after a mission. Predeployment factors such as personality, attachment styles, preexisting MHPs, previous distressing

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military experiences, numerous past deployments, anticipatory stress, and stressful civilian life events may increase the risk of MHPs following deployment. Further, postdeployment factors including difficult military-to-civilian transition and later stressful life events are potential stressors that may influence the development of MHPs (Brounéus, 2014; Sareen et al., 2010).

It is well documented that participation in peacekeeping missions poses a risk for the development of subsequent MHPs. Depression, anxiety, alcohol and/or drug misuse, insomnia, and posttraumatic stress disorder (PTSD) are among the conditions that most frequently affect soldiers returning from peacekeeping missions (Kaikkonen & Laukkala, 2016; Souza et al., 2011). However, the reported prevalence estimates differ greatly. Souza and colleagues (2011) conducted a meta-analysis on PTSD in peacekeepers and found a pooled prevalence estimate of 5.3%, with estimates from individual studies ranging from 0.1% to 25.8%. The authors pointed to differences in study methodologies, such as inconsistent use of screening instruments and varying levels of traumatic exposure between missions, as likely causes of these discrepancies. The same tendency can be found in studies of other types of MHPs in peacekeepers.

Although exposure to peacekeeping stressors may increase the risk of adverse mental health consequences, most peacekeepers cope well and do not develop MHPs following deployment (Sareen et al., 2010). In fact, deployment-related stress can generate positive personal changes, such as higher levels of self-esteem and self-confidence, as well as increased experiences of cohesion and camaraderie (Watkins, 2014). Further, research on posttraumatic personal changes has shown that many soldiers report personal growth in the aftermath of traumatic deployment experiences (Nordstrand et al., 2017).

The history of U.N. peacekeeping missions extends almost 70 years, but research on long-term mental health consequences in peacekeepers is sparse (Forbes et al., 2016). Increased knowledge of such consequences is important to better prepare future generations of peacekeepers and possibly prevent the development of adverse mental health consequences following deployment. In the present study, we aimed to examine potential long-term effects of pre-, peri- and postdeployment stressors on MHPs in Norwegian peacekeepers. We addressed the following research questions: (a) What is the prevalence of MHPs (PTSD, anxiety, depression, insomnia, alcohol- and drug misuse) in Norwegian peacekeepers 18–38 years after deployment? and (b) Which pre-, peri- and postdeployment stressors are associated with these problems?

Method

Participants and Procedure

The present study used data from a cross-sectional, postdeployment survey of Norwegian peacekeepers deployed to the U.N. Interim Force in Lebanon (UNIFIL). The survey was conducted by the Norwegian Armed Forces Joint Medical Services between September 2014 and April 2015. All Norwegian military personnel deployed to Lebanon between 1978 and 1998 were invited to participate ($N = 20{,}678$ men and women). The average time since deployment was 28 years (range: 18–38 years). Of the invited personnel, 11,633 individuals responded. However, 1,028 of these were either active refusals ($n = 913$) or incomplete responses ($n = 115$), resulting in 10,605 valid responses and a final positive response rate of 51.3%. The response rate was comparable to those obtained in other studies of military populations (i.e. Forbes et al., 2016; McAndrew et al., 2013).

A nonresponder analysis was carried out to compare responders and nonresponders on selected demographic variables and determine the representativeness of the sample. A nonresponder was defined as an individual who either did not reply at all, did not receive the survey because of a missing address, actively refused to participate, or completed the survey but had no valid answers on subsections relevant for the present analyses and/or had more than 75% missing answers overall.

Biological sex (male or female), age group (in years: 30–39, 40–49, 50–59, 60–69, or 70 and above), short-term sick leave (yes or no), long-term sick leave (yes or no), long-term benefits (yes or no), and mental illness sick leave (yes or no) for the period of 1985 to 2015 were extracted from the Norwegian Labor and Welfare Administration (NAV). Current relationship status (single, cohabitant, married/partner, divorced/separated, widow/widower, or other), current employment status (full-time employee, part-time employee, self-employed, retired, unemployed/unemployment benefits, homemaker, or other), civilian education (lower [12 years or less], higher [more than 12 years]), military education (enlisted or commissioned officer), highest rank in UNIFIL (private–grenadier, corporal, sergeant–lieutenant, captain–major, or lieutenant colonel or higher), number of UNIFIL deployments (1, 2, 3, 4, or 5 or more), time since last UNIFIL deployment (in years: 18–22, 23–27, 28–32, or 33–38), and other international deployments (yes or no) were self-reported by the respondents at the time of the survey. See Table 1 for complete demographic characteristics of the sample. A printed version of the survey questionnaire, as well as a letter containing an internet link and unique login credentials, were mailed to all invited participants, giving them the choice of answering either the printed version or an equivalent digital version of the questionnaire.

Participation in the study was voluntary. All participants provided written informed consent after they were given a complete description of the study. Study procedures and data collection, storage, and distribution were carried out in accordance with the existing legislation regulating the Norwegian Armed Forces Health Registry. A nonresponder analysis was approved by the Regional Committee for Medicine and Health Research Ethics of South-East Norway. Register data on sick leave and benefits for the period 1985–2015 was extracted from the Norwegian Labor and Welfare Administration (NAV).

Table 1

Nonresponder Analysis and Demographic Characteristics of the Study Population

	Total	Responders		Nonresponders		
Characteristic	*N*	*n*	%	*n*	%	*p*[a]
Biological sex	20,674					.109
Male		10,298	97.1	9,814	97.5	
Female		307	2.9	255	2.5	
Age group (years)	20,674					< .001
30–39		75	0.7	82	0.8	
40–49		3,054	28.8	3,496	34.7	
50–59		5,027	47.4	4,832	48.0	
60–69		1,775	16.7	1,283	12.7	
≥ 70		674	6.4	376	3.7	
Sick leave and benefits[b]	20,674					
Short-term sick leave		7,555	71.2	7,487	74.4	< .001
Long-term sick leave		5,171	48.8	5,394	53.6	< .001
Long-term benefits		1,889	17.8	2,255	22.4	< .001
Mental illness–related sick leave		2,153	20.3	2,543	25.3	< .001
Relationship status	10,529					
Single		1,438	13.7			
Cohabiting		2,101	20.0			
Married/partner		5,939	56.4			
Divorced/separated		864	8.2			
Widow/widower		107	1.0			
Other		80	0.8			
Employment status	10,255					
Full-time employee		7,627	74.4			
Part-time employee		216	2.1			
Self-employed		551	5.4			
Retired		990	9.7			
Unemployed/unemployment benefits		784	7.6			
Homemaker		12	0.1			
Other		75	0.7			
Civilian education	10,553					
Lower (≤ 12 years)		6,410	60.7			
Higher (> 12 years)		4,143	39.3			
Military education	10,457					
Enlisted		9,614	91.9			
Commissioned officer		843	8.1			
Highest rank in UNIFIL	10,571					
Private–grenadier		4,622	43.7			
Corporal		3,058	28.9			
Sergeant–lieutenant		1,985	18.8			
Captain–major		807	7.6			
Lieutenant colonel or higher		99	0.9			
Number of UNIFIL deployments	10,563					
1		5,930	56.1			
2		3,272	31.0			
3		883	8.4			
4		319	3.0			
≥ 5		159	1.5			
Time since last UNIFIL deployment (years)	10,563					
18–22		2,120	20.1			
23–27		2,927	27.7			
28-32		2,365	22.4			
32–38		3,151	29.8			
Other international deployments	10,339					
Yes		1,998	19.3			
No		8,341	80.7			

Note. Data were missing for four individuals in the nonresponder group; UNIFIL = United Nations Interim Force in Lebanon.

[a]Pearson chi-square. [b]Only responders and nonresponders who took sick leave or received sick benefits between 1985 and 2015 were included in this category.

Measures

Distress Inventories

Anxiety and Depression. The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) contains 14 items and consists of two subscales: Anxiety (HADS-A; seven items) and Depression (HADS-D; seven items). It is widely used in both epidemiological and specialist care studies as a brief self-report instrument of anxiety and depression; a Norwegian translation has been validated (Mykletun et al., 2001). Respondents are asked to rate 14 statements concerning symptoms of anxiety and depression experienced during the past week. Each item is rated on a 4-point severity scale ranging from 0 to 3, giving a score range of 0 to 42 for the total scale and 0 to 21 for each of the two subscales. A higher score is indicative of a higher level of symptoms. In the present sample, the mean HADS-A score was 3.49 ($SD = 3.79$, $SE = 0.04$), and the mean HADS-D score was 2.44 ($SD = 3.33$, $SE = 0.03$). The recommended subscale cutoff scores of 11 or higher for clinical cases and 8–10 for subclinical cases ((Zigmond & Snaith, 1983) were used in the present study. In the current sample, the Cronbach's alpha values for the HADS-A and HADS-D were .88 and .84, respectively.

PTSD Symptoms. The 17-item Posttraumatic Stress Disorder Checklist–Military Version (PCL-M; (Weathers et al., 1993) is a commonly used self-report instrument used to assess the PTSD diagnostic criteria as outlined in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; (DSM-IV-TR; American Psychiatric Association, 2000). It is a well-validated measure for screening PTSD symptoms in military populations and has demonstrated good temporal stability, internal consistency, test–retest reliability, and convergent validity (Wilkins et al., 2011). Respondents were asked to rate the frequency of PTSD symptoms experienced during the past week, using a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*extremely*). The total possible score range is 17–85, with a higher score indicative of more symptoms. In the present sample, the mean participant score was 23.17 ($SD = 10.68$, $SE = 0.10$).

In line with recommendations from Blanchard and colleagues (1996), the following total score cutoffs were used: 44 or higher to indicate a clinical case and 30–43 to indicate a subclinical case. Considering that some studies use a total score cutoff of 50 or higher or a classification based on the number of endorsed symptoms (i.e., items scored at 3 or higher) from each of the three *DSM-IV-TR* symptom clusters (i.e., Cluster B: one or more symptoms on Items 1–5, Cluster C: 3 or more symptoms on Items 6–12, and Cluster D: 2 or more symptoms on Items 13–17) to represent a clinical case, we also calculated prevalence estimates based on these criteria. In the present sample, the Cronbach's alpha value for the total scale was .95.

Insomnia. The Insomnia Severity Index (ISI; (Bastien et al., 2001) is a seven-item, self-report instrument that partly corresponds to the *DSM-IV-TR* diagnostic criteria for insomnia. It has demonstrated good face validity and displayed excellent psychometric properties (Morin et al., 2011). Respondents are asked about insomnia symptoms, as well as concerns or distress caused by such symptoms, within the past 2 weeks. Each item is rated on a 5-point scale that ranges from 0 to 4, giving a total score range of 0 to 28, with higher scores reflecting a higher level of symptoms. In the present sample, the mean participant ISI score was 5.57 ($SD = 5.77$, $SE = 0.06$), and the recommended total score cutoff scores of 15 or higher for clinical cases and 8–14 for subclinical cases were used (Morin et al., 2011). The Cronbach's alpha value for the measure was .93 in the present sample.

Substance Use Disorders. The Alcohol Use Disorder Identification Test (AUDIT; (Babor et al., 2001) is a widely used, 10-item self-report questionnaire developed by the World Health Organization to identify individuals with problematic alcohol use patterns. It has shown high validity and reliability in Norwegian samples (Gundersen et al., 2013). Eight items regarding current alcohol use are rated on a 5-point scale from 0 to 4, and two items are rated with scores of 0, 2, or 4, giving a total score range of 0 to 40, with higher scores indicating more alcohol use. In the current sample, the mean participant AUDIT score was 5.38 ($SD = 4.30$, $SE = 0.04$). As suggested by Fear and colleagues (2007), the total score cutoffs of 16 or higher for clinical cases and 8–15 for subclinical cases were used. In the present sample, the Cronbach's alpha value was .82.

The Drug Use Disorder Identification Test (DUDIT; (Berman et al., 2007) was used to evaluate drug use in the present study. It is an 11-item self-report questionnaire used for identifying individuals with problematic drug use patterns. It has shown high validity and reliability in Norwegian samples (Gundersen et al., 2013). Respondents are asked about drug use within the past 12 months. Nine items are rated on a 5-point scale, ranging from 0 to 4, and two items are rated using a score of either 0, 2 or 4, for a total possible score of 0 to 44, with higher scores indicating more drug use. In the present sample, the mean participant score was 0.18 ($SD = 1.62$, $SE = 0.02$). The recommended cutoff scores of 25 or higher for clinical cases and 6–24 for subclinical cases (Berman et al., 2007) were used in the current study. In the present sample, the Cronbach's alpha value was .91.

Exposure to Potential Stressors

Predeployment Stressors. To identify predeployment stressors, we constructed a 12-item, self-report scale to assess whether respondents had ever experienced various types of potentially stressful life events, such as serious illness, accidents, and bullying, before deployment to Lebanon. See the Supplementary Materials for a complete list of items. Each item was rated either 0 ("no") or 1 ("yes"), giving a total score range of 0 to 12, with higher scores indicating more experienced stressors. In the present sample, the mean participant score was 0.82 ($SD = 1.06$, $SE = 0.01$), and the Cronbach's alpha value was .39.

Deployment-Related Stressors. Deployment-related stressors were measured both as general exposure to potentially traumatic events (PTEs) in the mission area and as experiencing stressful events at home during deployment. A traumatic exposure scale was developed by the research group as a broad, 39-item self-report scale used to assess whether participants had experienced incidents including various types of combat exposure, the threat of death or personal harm, or witnessing suffering, death, and injury in others, as well as moral stressors at any point during deployment. See the Supplementary Materials for a complete list of items. Each item was rated on a 5-point Likert scale ranging from 1 (*no*) to 4 (*yes, more than 5 times*), giving a total score range of 39 to 156, with higher scores indicating exposure to more stressors. In the present sample, the mean participant score was 47.76 ($SD = 8.43$, $SE = 0.08$), and the Cronbach's alpha value was .84.

Participants also completed a four-item scale designed to measure the presence of stressful events at home that occurred at any point during deployment and included items such as "Did you experience relationship breakup while in Lebanon?" See the Supplementary Materials for a complete list of items. Each item was rated either 0 ("no") or 1 ("yes"), giving a total score range of 0 to 4, with higher scores indicating exposure to more stressors that occurred at home. In the present sample, the mean participant score was 0.30 ($SD = 0.65$, $SE = 0.01$), and the Cronbach's alpha value was .47.

Postdeployment Stressors. To identify postdeployment stressors, we constructed a 12-item, self-report scale designed to measure whether respondents had experienced various types of potentially stressful life events, such as serious illness, accidents, or unemployment, at any point after deployment to UNIFIL. See the Supplementary Materials for a complete list of items. Each item was scored as 0 ("no") or 1 ("yes"), giving a total score range of 0 to 12, with higher scores indicating exposure to more postdeployment stressors. In the present sample, the mean participant score was 1.48 ($SD = 1.65$, $SE = 0.02$), and the Cronbach's alpha value was .60.

Data Analysis

Descriptive statistics were used to report demographic characteristics and prevalence of MHPs. Pearson chi-square tests of independence were conducted to compare responders and nonresponders on selected demographic variables and determine the representativeness of the sample. Logistic regression analyses were executed to explore key associations of MHP. The regression models were compared using Nagelkerke's R^2. In cases of missing data, listwise deletion was carried out; this applied for up to 3.3% of the sample. All analyses were performed using IBM SPSS Statistics (Version 25.0; (IBM Corp., 2017).

Results

Comparison of Responders and Nonresponders

Responders and nonresponders were compared with regard to biological sex, age group, and whether they had been granted long-term benefits or short-term-, long-term- or mental illness sick leave during the past 30 years. There was no significant difference in biological sex, $\chi^2(1, N = 20{,}674) = 2.56$, $p = .109$. There was, however, a significant difference in the age distribution between the two groups such that responders were slightly older, $\chi^2(4, N = 20{,}674) = 183.96$, $p < .001$, and reported significantly lower frequencies of short-term sick leave, $\chi^2(1, N = 20{,}674) = 25.32$, $p < .00$; long-term sick leave, $\chi^2(1, N = 20{,}674) = 47.83$, $p < .001$; long-term benefits, $\chi^2(1, N = 20{,}674) = 67.69$, $p < .001$; and mental illness sick leave, $\chi^2(1, N = 20{,}674) = 72.21$, $p < .001$. See Table 1 for complete results.

Prevalence of Mental Health Problems

Table 2 shows the estimated prevalence of current MHPs among the peacekeepers. In total, 15.1%, 95% CI [14.4%, 15.8%], of participants met our screening criteria for MHPs, which was defined as having a clinically significant score on one or more of the psychometric instruments. The proportions of peacekeepers with clinically significant scores for specific disorders were 6.2% for PTSD (i.e., PCL-M score of 44 or higher), 6.4% for anxiety, 4.0% for depression, 9.3% for insomnia, 3.4% for alcohol misuse, and 0.1% for drug misuse. Regarding comorbidity, 7.6% of the sample had one MHP, 2.8% had two MHPs, and 4.3% had three or more MHPs.

Statistical Predictors of Mental Health Problems

To estimate the possible associations between the predictors and prevalence of current MHPs, two logistic regression analyses were conducted. Each outcome was contrasted with nonpathology to avoid potential issues with confounding. In the first analysis, the outcome was PTSD (i.e., PCL-M score of 44 or higher) versus no other MHP, and in the second analysis, the outcome was any other MHP (i.e., a score at or above the clinical cutoff on the HADS-A, HADS-D, ISI, AUDIT, or DUDIT) versus no PTSD. The following variables were included in each analysis and entered in the same step: biological sex, age group, relationship status, employment status, civilian education, military education, highest military rank, number of deployments, time since deployment, other deployments, predeployment stressors, deployment-related stressors, and postdeployment stressors. The results for PTSD and any other MHP are both reported in Table 3.

For PTSD, the logistic regression model was statistically significant, $\chi^2(17, N = 8{,}568) = 1{,}791.299$, $p < .001$. The model explained 49.1% (Nagelkerke's R^2) of the variance in PTSD and correctly classified 95.1% of cases. Employment status, odds ratio (OR) = 1.41, $p < .001$; trauma exposure during deployment, $OR = 1.11$, $p < .001$; and postdeployment stressors,

Table 2
Estimated Prevalence of Mental Health Problems (MHPs) and Comorbidity Estimates

Variable	Total with data (*N*)	*M* score	*SE*	*n*	Prevalence (%)	95% CI	Subclinical problems (*n*)	Prevalence (%)	95% CI
PTSD									
PCL-M ≥ 44	10,432	23.17	0.10	647	6.2	[5.7, 6.7]	1,650	15.8	[15.1, 16.5]
PCL-M ≥ 50	10,432	23.17	0.10	462	4.4	[4.0, 4.8]	647	6.2	[5.7, 6.7]
DSM-IV-TR[a]	10,605			627	5.9				
Anxiety (HADS-A)	10,452	3.49	0.04	669	6.4	[5.9, 6.9]	1,450	13.9	[13.2, 14.5]
Depression (HADS-D)	10,450	2.44	0.03	417	4.0	[3.6, 4.4]	981	9.4	[8.8, 10.0]
Insomnia (ISI)	10,397	5.57	0.06	967	9.3	[8.7, 9.9]	3,009	28.9	[28.0, 29.8]
Alcohol misuse (AUDIT)[b]	10,421	5.38	0.04	356	3.4	[3.1, 3.8]	2,094	20.1	[19.3, 20.9]
Drug misuse (DUDIT)	10,396	0.18	0.02	11	0.1	[0.0, 0.2]	99	1.0	[0.8, 1.1]
Comorbidity									
1 MHP	10,605			803	7.6		2,295	21.6	
2 MHPs	10,605			296	2.8		874	8.2	
≥ 3 MHPs	10,605			460	4.3		1,362	12.9	

Note. PTSD = posttraumatic stress disorder; PCL = PTSD Checklist; PCL-M = PCL–Military Version; *DSM-IV-TR* = *Diagnostic and Statistical Manual of Mental Disorders* (4th, text rev. ed.); HADS-A = Hospital Anxiety and Depression Scale–Anxiety subscale; HADS-D = Hospital Anxiety and Depression Scale–Depression subscale; ISI = Insomnia Severity Index; AUDIT = Alcohol Use Disorder Identification Test; DUDIT = Drug Use Disorder Identification Test.
[a]PSTD criteria based on the number of endorsed symptoms (item score ≥ 3) from each of the three *DSM-IV-TR* symptom clusters (B: ≥ 1 symptom on Items 1–5, C: ≥ 3 symptoms on Items 6–12, and D: ≥ 2 symptoms on Items 13–17). [b]Because of a technical error, AUDIT Items 2 and 6 were not displayed correctly in the digital version of the survey. Hence, 36.1% and 10.6%, respectively, of participants were not able to answer these questions. As a result, the distribution of scores might be slightly skewed towards the lower range. However, SPSS multiple imputation (logistic regression with five imputations) showed that the prevalence of alcohol misuse only increased from 3.4% to 3.7 % when imputing the missing values.

$OR = 1.91$, $p < .001$, were all significantly associated with an increased likelihood of PTSD. Civilian educational attainment, $OR = 0.78$, $p < .048$; military education, $OR = 0.52$, $p < .036$; and highest military rank, $OR = 0.81$, $p < .011$, were all significantly associated with a reduced likelihood of PTSD.

For any other MHP, the logistic regression model was statistically significant, $\chi^2(17, N = 8{,}799) = 598.439$, $p < .001$. The model explained 14.5% (Nagelkerke's R^2) of the variance in any other MHP and correctly classified 90.9% of cases. Employment status, $OR = 1.16$, $p < .001$; predeployment stressors, $OR = 1.13$, $p < .001$; trauma exposure during deployment, $OR = 1.02$, $p < .001$; and postdeployment stressors, $OR = 1.53$, $p < .001$, were all significantly associated with an increased likelihood of any other MHP. Highest military rank, $OR = 0.88$, $p < .015$; and time since deployment, $OR = 0.98$, $p < .012$, were both significantly associated with a reduced likelihood of any other MHP.

Discussion

The prevalence of MHPs in our sample of Norwegian peacekeepers was mostly consistent with findings from previous studies of peacekeepers and confirmed that the majority of individuals in this population do not report such problems (Sareen et al., 2010). When studying military populations, however, it is important to keep in mind that soldiers are selected for service based on favorable health characteristics. Hence, a lower prevalence of health problems is expected in military samples compared to the general population. Several studies have documented this phenomenon, termed the "healthy soldier effect" (HSE; McLaughlin et al., 2008).

Thus, in the current study, a lower prevalence of PTSD, for example, would be expected when compared to the prevalence found in the general population. In a study by Lassemo and colleagues (2017), the findings demonstrated that the 12-month prevalence of PTSD in Norwegian men was 1.0%. Compared to the proportion of peacekeepers in our study with clinically significant PTSD symptoms (6.2%, based on a PCL-M score of 44 or higher), it seems that peacekeepers are not displaying the HSE at all. However, there may be several possible explanations for this discrepancy.

First, post hoc analyses revealed that approximately 90% of the peacekeepers reported exposure to at least one PTE during deployment. In the general population, 26% of men report having experienced PTEs at some point in their lives, and, of these men, 5.6% fulfill diagnostic criteria for PTSD (Lassemo et al., 2017). This number is much closer to the proportion of peacekeepers with clinically significant PTSD symptoms. Considering that peacekeepers are exposed to several potential stressors over a prolonged period, it is reasonable to assume that they are, on average, exposed to a higher frequency of PTEs than trauma-exposed civilians. As such, it can be argued that peacekeepers are indeed displaying the HSE after all, as even when faced with a higher number of PTEs than their civilian counterparts, the rates of PTSD among peacekeepers are still comparable.

Table 3
Logistic Regression Analyses for Variables Associated With Posttraumatic Stress Disorder (PTSD) and Any Other Mental Health Problem (MHP)

	PTSD		Any other MHP	
Variable	Adjusted *OR*	95% CI	Adjusted *OR*	95% CI
Biological sex	0.55	[0.26, 1.17]	1.33	[0.77, 2.28]
Age group (years)				
30–39	0.34	[0.04, 2.74]	0.39	[0.08, 1.84]
40–49	1.34	[0.61, 2.94]	1.46	[0.85, 2.50]
50–59	1.39	[0.69, 2.81]	1.60	[0.99, 2.59]
60–69	1.42	[0.70, 2.87]	1.34	[0.83, 2.18]
Relationship status	0.94	[0.85, 1.05]	0.97	[0.89, 1.05]
Employment status	1.41***	[1.33, 1.48]	1.16***	[1.11, 1.21]
Civilian education	0.78*	[0.60, 1.00]	1.08	[0.92, 1.28]
Military education	0.52*	[0.28, 0.96]	0.87	[0.60, 1.25]
Highest rank	0.81**	[0.69, 0.95]	0.88*	[0.79, 0.97]
Number of deployments	1.03	[0.91, 1.16]	1.05	[0.96, 1.16]
Time since deployment	0.98	[0.95, 1.01]	0.98**	[0.96, 0.99]
Other deployments	1.09	[0.93, 1.26]	0.82	[0.66, 1.02]
Predeployment stressors	0.91	[0.82, 1.00]	1.13***	[1.06, 1.21]
Deployment stressors				
Trauma exposure	1.11***	[1.09, 1.12]	1.02***	[1.01, 1.03]
Events at home	1.08	[0.94, 1.25]	0.97	[0.86, 1.09]
Postdeployment stressors	1.91***	[1.79, 2.04]	1.53***	[1.46, 1.60]

Note. *OR* = odds ratio.
*$p < .05$. **$p < .01$. ***$p < .001$

Second, the psychometric instrument used by Lassemo and colleagues (2017), the Composite International Diagnostic Interview (CIDI; Kessler & Üstün, 2004), is a diagnostic interview with stringent PTSD diagnostic criteria. In contrast, the PCL-M, which was used in the present study, is a broad screening instrument that likely overestimated the proportion of peacekeepers who actually meet the diagnostic criteria for PTSD (Wilkins et al., 2011). The proportion of peacekeepers with PTSD would probably decrease significantly had we used the CIDI instead of the PCL-M. Considering these factors, it is difficult to draw any conclusions regarding PTSD prevalence in our sample of peacekeepers.

Notably, the occurrence of alcohol misuse among the peacekeepers was somewhat lower than expected. Recent studies have found the prevalence of alcohol misuse in peacekeepers to be higher than in the general population (i.e. Forbes et al., 2016). Previous reports have also demonstrated that alcohol was easily accessible—sometimes more so than nonpolluted drinking water—in the Norwegian camps in Lebanon (Strømmen & Leraand, 2005) and that approximately half of Norwegian peacekeepers from the first 26 UNIFIL rotations reported a significant increase in alcohol consumption during deployment (Mehlum & Weisæth, 2002). Hence, we would anticipate the proportion of peacekeepers with a problematic drinking pattern today to be relatively high. One possible explanation is that the increase in alcohol consumption observed during deployment was mainly a contextual, mission-specific phenomenon, as previously suggested by Mehlum (1999). In a 6.6-year follow-up study of Norwegian peacekeepers from the first 26 UNIFIL rotations, Mehlum found that alcohol consumption had already reverted to about the same level as before deployment during the study period. Similar patterns in substance misuse, with a significant increase during deployment and consecutive return to baseline postdeployment, have also been documented among Vietnam veterans (Robins, 1993).

Postdeployment stressors showed the strongest positive association with both PTSD and any other MHP. The link between postdeployment stressors and MHPs is already well documented in the literature. Several studies have shown that challenges of postdeployment adjustment are strongly associated with psychological problems, partly even outweighing adverse deployment events (Hougsnæs et al., 2016; Johnson et al., 1997; Mehlum & Weisæth, 2002; Michel et al., 2003). Our results seem to support these findings; however, we cannot entirely rule out the possibility that a high level of exposure to stressors during deployment might have increased the likelihood that individuals reported postdeployment stress.

Most peacekeepers in our sample were deployed to Lebanon for 6 months. Although the risk of experiencing traumatic events was quite high during this period, the timeframe was

relatively short. In contrast, the average follow-up time in this survey was 28 years. Hence, it is likely that many peacekeepers have had stressful experiences in their postdeployment civilian lives simply because so many years have passed. It consequently makes sense that postdeployment stressors were strongly associated with current MHPs. Nevertheless, it is particularly interesting to note that postdeployment stressors showed stronger associations with current PTSD than did deployment stressors, considering that the PCL-M asked for posttraumatic stress in relation to a previous military event. This means that if peacekeepers reported current posttraumatic stress in relation to deployment, it was to some extent dependent on whether they had experienced subsequent stressors in their civilian lives. In line with this, Perkonigg and colleagues (2005) demonstrated the occurrence of new traumatic events during the first 10 years of follow-up to be associated with a chronic course of PTSD.

Despite the strong impact of postdeployment stressors, regression analyses also showed that PTSD was associated with trauma exposure during deployment. This effect was less prominent for any other MHP. Given the etiological differences between PTSD and the other MHPs, it is perhaps unsurprising that PTSD was found to be more closely linked to trauma exposure during deployment. After all, exposure to trauma is a prerequisite for being diagnosed with PTSD (American Psychiatric Association, 2013), and the association between trauma exposure during peacekeeping deployment and later development of PTSD is well-established (Álvares et al., 2018).

Further, predeployment stressors were positively associated with any other MHP such that peacekeepers who reported negative life events before deployment were more likely to report anxiety, depression, insomnia, or alcohol or drug misuse. This effect was not found for PTSD. Associations between predeployment stressors and postdeployment psychological distress have previously been documented in Swedish peacekeepers (Michel et al., 2003). Of note, the number of deployments was not associated with either PTSD or any other MHP, though several studies have demonstrated a strong positive link between number of deployments and MHPs (Richardson et al., 2007). The fact that relatively few (i.e., 12,9%) peacekeepers in our sample had been deployed more than twice may have limited the effect of multiple deployments.

Employment status (i.e., unemployment) showed strong positive associations with both PTSD and any other MHP. This aligns well with earlier findings on predictors of mental health problems in peacekeepers (Forbes et al., 2016). In accordance with previous studies (i.e. Dirkzwager et al., 2005; Steenkamp et al., 2017), education was significantly negatively associated with PTSD such that a having completed a higher level of civilian educational attainment and/or having received an officer's education equaled less risk of PTSD. Surprisingly, this was not true for any other MHP. Highest rank was also significantly negatively associated with both PTSD and any other MHP. The protective effect of higher military ranks has been well documented in the literature on peacekeepers and veterans in general (Levin-Rector et al., 2018; Xue et al., 2015).

Finally, time since last deployment was found to be negatively associated with any other MHP; the more time that had passed since deployment, the less likely a peacekeeper was to report any other MHP. However, this did not apply to PTSD. These results contrast with findings by Rona and colleagues (2016), who conducted a meta-analysis on the association between time since deployment and MHP in service personnel from the United Kingdom. Although their results similarly showed that time since deployment had no significant effect on PTSD, there was evidence for a positive association between time since deployment and general psychological distress. A possible explanation for this discrepancy is that the follow-up period in the study by Rona and colleagues, which lasted 3 years, was relatively short compared to the follow-up period in the present study, which lasted up to 38 years. It may be that as time since deployment extends to several decades, the association between deployment and MHPs gradually weakens, whereas factors, like postdeployment stressors, come to play a more crucial role.

Given the extensive sample size, the magnitude of the questionnaire, and the fact that the survey was conducted an average of 28 years after deployment, the response rate of 51% was considered satisfactory. A sample of 10,605 peacekeepers from the same nation who have participated in the same U.N. mission is rarely observed in the literature, especially not with an average follow-up period of almost 30 years. This adds credence to the associations identified in the current study. Further, representatives from Norway's largest veterans' interest organizations were involved in the survey design; their feedback suggests that the questions and instruments used in the study captured information relevant to the peacekeepers' experiences.

However, some methodological issues warrant consideration. First, the cross-sectional nature of the study does not allow for the causal interpretation of the data, such as the directions of the observed associations between pre-, peri-, and postdeployment factors and MHPs. The lack of a control group was another potential limitation as it makes it difficult to disentangle specific deployment factors related to MHPs. Further, it could be argued that surveying peacekeepers about what they experienced an average of 28 years ago makes the data vulnerable to recollection bias. Previous studies have shown that people may be inaccurate in estimating the frequency and intensity of past traumatic events, although they are mostly accurate in reporting whether an event occurred (Heir et al., 2009; McNally, 2003). Taking this into account, we primarily used "yes" or "no" response scales when measuring exposure to potential stressors, with the hope of minimizing the risk of recollection bias. Due to privacy regulations and limitations regarding available medical records, we were not able to link self-reported survey data to objectively assessed medical encounter data.

Unlike interview-based assessments, self-report is often seen as a more unreliable way of measuring MHPs (Sareen et al., 2010). Self-report measures have been criticized for

both over- (Engelhard et al., 2007) and underestimating (Hoge et al., 2004) the prevalence of clinical diagnoses. However, due to the extensive size of the population and limited resources regarding survey completion, we would not have been able to achieve such a high response rate using interview-based assessments. Optimally, a combination of diagnostic assessments and self-report measures would have been used.

Regarding measures of exposure to potential stressors, some might question the use of instruments developed by the research group rather than relying on standardized, well-validated measures. However, all instruments used to measure exposure to potential stressors were inspired by standardized instruments, with only minor adjustments made to capture unique aspects of the Norwegian UNIFIL mission. Despite somewhat low internal consistency for certain measures, we still believe that they highlight important aspects of deployment and, hence, make sense from a clinical perspective. Another potential limitation was the fact that the available data did not enable us to control for relevant deployment stressors, such as the total amount of time deployed, previous combat deployment, or the impact of multiple events in which death occurred.

Finally, the nonresponder analysis showed that nonresponders had significantly higher levels of mental illness sick leave compared to responders. Given a higher response rate on the survey, we would thus expect a slightly higher total prevalence of MHPs in the sample. Hence, the MHP prevalence found in this study may not be characteristic of the entire population of Norwegian UNIFIL peacekeepers. In an attempt to account for this, MHP prevalence was poststratified based on the distribution of mental illness sick leaves in the total population. It showed that the estimated total prevalence of MHPs in the sample increased from 15.1% to 16.9%.

In line with previous research (Sareen et al., 2010), the results of the present study show that most peacekeepers do not report MHPs following deployment. Considering that this group is frequently portrayed by the media as "damaged goods" and often pathologized by the public, this is an important finding. The current study illustrates that long-term assessment is useful in identifying peacekeepers who struggle and uncovering what types of problems they face. This knowledge may provide grounds for tailoring appropriate interventions and health care procedures for this group. Similar to suggestions based on previous research, our results indicate that postdeployment intervention strategies should target peacekeepers who report high levels of trauma exposure during deployment. The results further highlight the significance of postdeployment stressors as the most important statistical predictor of MHP. This knowledge should be used to educate and prepare future peacekeepers for challenges they may face not only during deployment but also in the years following homecoming.

An estimated 15% of Norwegian peacekeepers met our screening criteria for MHPs when assessed almost three decades after deployment. Postdeployment stressors were more strongly associated with current problems than deployment-related stressors. Most peacekeepers reported low symptom levels, which resonates well with findings from similar studies of peacekeepers and challenges the widespread public perception that most peacekeepers have MHPs.

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