Anger Among UK Ex-Service Military Personnel During the COVID-19 Pandemic

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Abstract: Military service and ex-service personnel commonly experience difficulties with anger. The COVID-19 pandemic had several negative consequences upon social, economic, and health factors that influence anger. This study aimed to explore 1) levels of anger in an ex-serving military cohort during the COVID-19 pandemic; 2) self-reported changes in anger compared with prepandemic levels; and 3) identify sociodemographic characteristics, military characteristics, COVID-19 experiences, and COVID-19 stressors associated with anger. UK ex-service personnel (*n* = 1499) completed the Dimensions of Anger Reactions 5-item measure within an existing cohort study. Overall, 14.4% reported significant difficulties with anger, and 24.8% reported their anger worsened during the pandemic. Anger was associated with factors such as financial difficulties, extra/new caring responsibilities, and COVID-19 bereavement. Endorsing more COVID-19 stressors was associated with higher odds of anger difficulties. This study highlights the impact of the pandemic on ex-service personnel, including a strain on family/social relationships and financial hardship, which affected anger.

Key Words: Armed Forces, veteran, anger, aggression, COVID-19 pandemic

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Anger is a basic human emotion that is experienced as a reaction to the unwanted or unexpected behavior of others and often occurs after traumatic experiences, frustrations, and stressful situations. Research suggests that military service and ex-service personnel commonly experience difficulties with anger and aggression (Adler et al., 2022; Adler et al., 2020; Rona et al., 2015; Turgoose and Murphy, 2018). In the United Kingdom (UK), prevalence estimates are approximately 29% for all types of physical aggression, 13% for violent behavior, and 10% for physical assault (MacManus et al., 2012; MacManus et al., 2015). Among UK treatment-seeking ex-service personnel, prevalence rates of anger are higher, estimated to be approximately 42%, with strong associations found between anger and posttraumatic stress disorder (PTSD), including complex PTSD (Williamson et al., 2023). A large study in the United States reported prevalence estimates of problematic anger at 12% among service personnel and 20% among ex-service personnel (Adler et al., 2020). One Australian study examining problem anger in military service and ex-service personnel reported rates of approximately 16% and 30%, respectively (Varker et al., 2022).

A systematic review and meta-analyses reported associations between intensity and frequency of exposure to combat trauma, and an increase in violence (MacManus et al., 2015; Orcutt et al., 2003). Anger is also associated with adverse childhood experiences, younger age, and male sex (Turgoose and Murphy, 2018). Similar associations have been found in other research where anger has been reported to be associated with age, sex, service branch, rank, combat role, childhood adversity, and childhood antisocial behavior (Rona et al., 2015). Difficulties with anger can often lead to violent behavior, which in turn is a predisposing factor for antisocial behavior and interpersonal conflict, including intimate partner violence (Fox et al., 2015). Given the fact that ex-service personnel are often overrepresented in prisons for violent offenses and are more likely to report committing violent crimes after combat exposure, the extent of anger problems in the military raises substantial concerns (MacManus and Wessely, 2011).

Given the associations between anger and psychological distress among ex-service military personnel, it is important to explore the impact of the COVID-19 pandemic on anger among this population. The novel coronavirus disease (COVID-19) was declared a global pandemic in March 2020 (World Health Organization, 2020) and the global response included varying degrees of restrictions, ranging from social distancing to complete lockdowns. Restrictions to daily living were enforced rapidly and at a large-scale, completely redefining daily life for the majority of the world's population. In the United States, restrictions were decided on a state-by-state basis so varied across the country at different time points across the pandemic, but included state lockdowns, social distancing, and the closure of businesses (Alexander et al., 2022). The UK population experienced three national lockdowns as a result of COVID-19 (starting in March 2020, November 2020, and January 2021), which included the closing of schools and workplaces, and the enforcement of the "stay at home" order (UK Government, 2020).

Despite being necessary to protect public health, the lockdowns and social distancing measures associated with the COVID-19 pandemic that aimed to slow the spread of infection had several negative social, economic, health, and wellbeing consequences (Brooks et al., 2020; Douglas et al., 2020). Individuals were left feeling isolated and facing new challenges, including changes to employment, changed caring responsibilities, financial difficulties, and psychological distress (Brooks et al., 2020).

In the UK, the ex-service military population is estimated to be approximately 2.5 million, equivalent to approximately 5% of household residents aged 16 years or above (UK Government, 2019). Yet, few studies have been conducted to explore the impact of the COVID-19 pandemic on the health and wellbeing of UK ex-service personnel (*e.g.*, Hendrikx et al., 2021; Murphy et al., 2022a, 2022b; Sharp et al., 2020, 2021). Sharp et al. reported that levels of common mental disorders (CMDs), such as anxiety and depression, remained relatively stable (24.5% before and 26.1% during the pandemic), and ex-service personnel were drinking less alcohol, with hazardous drinking reducing from 49% before versus 28% during the pandemic (Sharp et al., 2021).

Murphy et al. conducted a study exploring the impact of COVID-19 on UK ex-service personnel with preexisting mental health difficulties (referred to herein as treatment-seeking) recruited via a UK mental health charity supporting ex-serving military personnel (Hendrikx et al., 2021; Murphy et al., 2022a, 2022b). This longitudinal study by Murphy et al. collected data on mental health and wellbeing outcomes, and COVID-19 experiences and stressors. The data were collected at three time points during the pandemic; phase 1 in June–July

2020, phase 2 in November 2020, and phase 3 in June 2021. Anger was one outcome of interest. At phase 1, 56.4% of the sample reported difficulties with anger as measured by the Dimensions of Anger Reactions 5-item (DAR-5; Forbes et al., 2014a), and 52.7% self-reported that their anger symptoms had worsened due to COVID-19 (Murphy et al., 2022b). Anger remained relatively stable across the three phases (56.4%, 50.6%, and 61.8%, respectively) (Hendrikx et al., 2021; Murphy et al., 2022a, 2022b).

There remains a paucity of research regarding the ongoing impacts of the COVID-19 pandemic on the health and wellbeing of ex-service personnel, particularly in relation to anger difficulties. Although anger is a basic human emotion, it can have a negative impact on daily life, including relationships, employment, and at the most extreme may lead to violence. By better understanding the needs of ex-service personnel during the pandemic, treatment services and support can be reevaluated to better align with their needs and begin to improve engagement and outcomes. The aims of this study were 1) to investigate the levels of anger in an ex-serving military cohort during the COVID-19 pandemic, 2) to explore the self-reported changes in anger compared with prepandemic levels, and 3) to identify the sociodemographic characteristics, military characteristics, COVID-19 experiences, and COVID-19 stressors associated with anger.

METHODS

Study Design, Procedure, and Participants

The data for this study were collected as part of a wider study of the mental health and wellbeing of UK ex-service personnel during the COVID-19 pandemic (Sharp et al., 2020; Sharp et al., 2021). Participants were a community sample of ex-service personnel, recruited from the King's Centre for Military Health Research (KCMHR) Health and Wellbeing Study, an ongoing, large-scale cohort study exploring the physical and mental health and wellbeing of the UK Armed Forces from the tri-services and includes serving and ex-serving personnel who served during the recent Iraq and Afghanistan era. There have been three completed phases of data collection: phase 1 in 2004–2006 (n = 10,272), phase 2 in 2007–2009 (n = 9990), and phase 3 in 2014–2016 (n = 8093).

Individuals were invited to take part in this study, Veterans-CHECK, if they 1) had completed the questionnaire at phase 3 of the KCMHR Health and Wellbeing Study, 2) had left the UK Armed Forces, 3) had served regular service, 4) were living in the UK, and 5) had consented to further contact and provided an email address. Data were collected between June and September 2020. Invitation emails were sent to 3547 individuals who met the study criteria. All data collection was conducted online through REDCap, a secure Web application for building and managing online surveys and databases (REDCap, 2020). Consent was collected online on the REDCap platform. Of those invited, 1562 (44.0%) took part in the study, and 1499 (42.3%) provided data on the outcome of interest, anger. Responders to the Veterans-CHECK survey were more likely to be older, of officer rank, of higher educational status, have served in the Royal Air Force (RAF), were less likely to have reported alcohol misuse, but more likely to have reported multiple physical symptoms, and poor/fair health at phase 3 of the cohort (Sharp et al., 2021).

Materials and Measures

The questionnaire was made up of three main sections: 1) sociodemographic and military characteristics, 2) COVID-19 experiences and stressors, and 3) current mental health and wellbeing measures. A full description of the study protocol is available online (Sharp et al., 2020). Sociodemographic data included age, sex, relationship status, employment status before the pandemic, and military characteristics included length of time since leaving service. COVID-19 experiences included self-report of having COVID-19 infection, isolation and bereavement,

and questions about changes in employment status, living situation, or childcare arrangements. Participants were provided with a list of COVID-19 stressors, such as financial difficulties, problems accessing enough food, and boredom, and asked to endorse which ones they had experienced in the month before completing the survey. The 12 COVID-19 stressors were summed and categorized as 0, 1, 2, 3, and 4 or more stressors endorsed.

Originating from the seven-item Dimensions of Anger Reactions scale (DAR) (Novaco, 1975), the DAR-5 (Forbes et al., 2014a) was used to assess difficulties with anger. The DAR-5 was chosen to make this study comparable to other research using UK military samples (e.g., Murphy et al., 2022b; Turgoose and Murphy, 2018), and it has also been used in international military samples (e.g., Forbes et al., 2014a [in the United States]). A cutoff score of 12 was used for a significant difficulty with anger, as supported by Forbes et al. (2014b). Participants were also asked how their feelings of anger had changed since before the pandemic using a 5-point rating scale (much worse, a little worse, no change, a little better, and much better). For the purpose of reporting, this was truncated into three categories (worsened, no change, and improved).

Analysis

Response weights were generated to account for nonresponse and calculated as the inverse probability of responding once sampled, driven by factors shown empirically to predict response (age, sex, education level, rank, service branch, marital status, role when serving, and cohort sample). Descriptive statistics were produced for the sociodemographic and military characteristics, COVID-19 experiences, and COVID-19 stressors of the sample stratified by difficulty with anger status. Logistic regression analyses were conducted to assess the associations between the outcome of interest, anger, and explanatory factors including sociodemographic and military characteristics, COVID-19 experiences and stressors, and additionally to assess the effect of number of stressors on anger. Logistic regressions were adjusted for sex, age, rank, service, education, and relationship status. These are confounders that were chosen a priori based on previous literature (Fear et al., 2010; Hotopf et al., 2006; Stevelink et al., 2018).

The analysis only included participants for whom there were no missing data on the variables of interest. All statistical analyses were performed using the statistical software package, STATA version 17.0, with survey commands used to account for weighting. Weighted percentages along with unweighted cell counts are presented in tables.

Ethical Approval

Full ethical approval was obtained from the King's College London Research Ethics Committee (Ref: HR-19/20-18626).

RESULTS

Overall 1499 individuals completed the anger measure in the questionnaire, of whom 216 (14.4%) reported significant difficulties with anger during the pandemic. The majority of the sample reported no change in their difficulties with anger during the pandemic compared with prepandemic levels (72.4%). However, almost a quarter of the sample reported their anger had got worse (24.8%), and only 2.8% reported their anger had got better.

Table 1 displays the sociodemographic and military characteristics of the study sample and their associations with significant difficulties with anger. The majority of the sample did not report a significant difficulty with anger (n = 1283, 85.6%). When comparing those with and without anger difficulties, those aged 35–44 years (adjusted odds ratio [AOR], 1.75; 95% confidence interval [CI], 1.16 to 2.62) were more likely to report anger, and those aged 55–64 years (AOR, 0.50; 95% CI, 0.33 to 0.76) and aged 65+ years (AOR, 0.40; 95% CI, 0.18 to 0.89) were less likely to report anger, compared with those aged

TABLE 1. Sociodemographic and Military Characteristics of the Sample

	No Significant Difficulty With Anger (n = 1283), n (%)[a]	Significant Difficulty With Anger (n = 216), n (%)	AOR (95% CI)[b]
Sex			
Male	1135 (88.9)	193 (90.9)	1.00
Female	148 (11.1)	23 (9.1)	0.62 (0.37 to 1.04)
Age band (years at completion of Veterans-CHECK survey)			
25–34	30 (5.6)	13 (11.0)	2.03 (0.90 to 4.57)
35–44	197 (20.5)	62 (34.6)	1.75 (1.16 to 2.62)
45–54	436 (35.3)	92 (38.5)	1.00
55–64	463 (30.3)	41 (13.7)	0.50 (0.33 to 0.76)
65+	157 (8.3)	8 (2.2)	0.40 (0.18 to 0.89)
Education level (reported at phase 3 of the cohort study)			
No qual or O level	300 (25.4)	65 (33.8)	1.17 (0.77 to 1.76)
A level	416 (33.8)	72 (36.0)	0.93 (0.63 to 1.38)
Degree	567 (40.8)	79 (30.2)	1.00
Relationship status (current)			
In a relationship	1124 (87.6)	183 (84.2)	1.00
Single	53 (4.9)	13 (7.3)	1.39 (0.67 to 2.88)
Ex relationship	105 (7.5)	19 (8.5)	1.25 (0.75 to 2.15)
Employment status (before the COVID-19 pandemic)			
Employed	1014 (83.0)	187 (88.0)	1.00
Retired	213 (12.7)	10 (3.5)	0.61 (0.27 to 1.39)
Economically inactive	53 (4.2)	19 (8.5)	2.30 (1.23 to 4.32)
Living arrangements (before the COVID-19 pandemic)			
With spouse	1104 (86.1)	175 (78.5)	1.00
Alone	133 (9.9)	28 (14.4)	2.52 (1.17 to 5.46)
With others	44 (4.0)	13 (7.0)	2.98 (0.92 to 9.59)
Children			
Have no children	304 (25.4)	41 (20.9)	1.00
Have children but not responsible for them	581 (38.9)	61 (22.9)	1.32 (0.77 to 2.25)
Responsible for one or more children under 18 years	397 (35.7)	113 (56.2)	1.89 (1.13 to 3.15)
Rank (when in service)			
Officer	431 (29.3)	30 (10.7)	0.38 (0.24 to 0.63)
NCO	756 (59.1)	159 (73.8)	1.00
Other rank	96 (11.6)	27 (15.5)	0.68 (0.38 to 1.24)
Service (when in service)			
Naval services	249 (19.8)	27 (15.7)	0.78 (0.48 to 1.28)
Army	690 (56.2)	147 (68.2)	1.00
RAF	344 (24.0)	42 (16.2)	0.68 (0.46 to 1.02)
Role in parent unit (when in service)			
Support	1022 (78.4)	153 (68.5)	1.00
Combat	259 (21.6)	62 (31.5)	1.40 (0.95 to 2.05)
Length of time since leaving service			
Up to 5 years	155 (14.1)	24 (12.3)	0.77 (0.44 to 1.35)
Five to 10 years	405 (32.7)	83 (41.1)	1.22 (0.87 to 1.72)
More than 10 years	723 (53.3)	109 (46.7)	1.00

NCO, Noncommissioned Officer.

[a]Percentages are weighted.

[b]Adjusted for sex, age, rank, service, education, and relationship status.

45–54 years. Individuals who live alone (AOR, 2.52; 95% CI, 1.17 to 5.46) were more likely to report anger than those who live with their spouse.

In addition, those who were economically inactive (AOR, 2.30; 95% CI, 1.23 to 4.32) were more likely to report anger, compared with those who were employed. Individuals with children had a higher likelihood of difficulties with anger, including individuals with specific parenting responsibilities (AOR, 1.89; 95% CI, 1.13 to 3.15) compared with those with no children. In terms of military characteristics, those of officer rank were less likely to report anger difficulties (AOR, 0.38; 95% CI, 0.24 to 0.63) than noncommissioned officers.

The associations between COVID-19 experiences and significant difficulties with anger are shown in Table 2. Of those who reported significant difficulties with anger, the majority did not have, or did not know if they had, COVID-19 (80.8% vs. COVID-19 infection 19.2%), did not have to self-isolate (82.4% vs. 17.6% who self-isolated), and did not know someone who died from COVID-19 (75.9% vs. 17.6% who knew someone who died from COVID-19). Of those with significant difficulties with anger, more than half reported they felt the pandemic had positive changes (56.6% vs. none 43.4%).

Significant difficulty with anger was more often experienced by those who had to move out of their home (AOR, 3.24; 95% CI, 1.07 to 9.87) compared with those who were still living at home; those who reported a negative impact of the pandemic on their childcare arrangements (AOR, 2.30; 95% CI, 1.03 to 5.18); those with extra or new caring responsibilities during the pandemic (AOR, 1.77; 95% CI, 1.20 to 2.62) compared with those without these responsibilities; and those who knew someone who died from COVID-19 (AOR, 1.48; 95% CI, 1.01 to 2.17) compared with those who did not.

Table 3 reports on the association between COVID-19 stressors and significant difficulties with anger. The most common COVID-19 stressors among those who reported significant difficulties with anger were difficulties with family/social relationships (42.7%), boredom (41.5%), work difficulties (38.0%), financial problems (27.4%), and difficulties with health (26.6%).

Those who endorsed each of the COVID-19 stressors (except difficulties with pets) were more likely to report difficulties with anger compared with those who did not endorse the stressor, for instance, those who endorsed difficulties with family/other social relationships during the pandemic (AOR, 3.72; 95% CI, 2.59 to 5.34), difficulties with health (AOR, 3.39; 95% CI, 2.28 to 5.06), and difficulty accessing medication (AOR, 3.28; 95% CI, 1.88 to 5.70).

Table 4 shows the effect of increasing numbers of COVID-19 stressors on the prevalence of significant difficulties with anger. Endorsing a higher number of stressors was associated with higher odds of significant difficulties with anger. The odds of significant difficulty with anger increased by 1.56 (95% CI, 1.41 to 1.72) for each additional stressor endorsed. The overall test for trend was significant ($p < 0.0001$).

DISCUSSION

The present study reported that 14.4% of ex-service personnel reported difficulties with anger during the COVID-19 pandemic, and 24.8% felt that their anger had worsened during the pandemic compared with prepandemic levels. These levels of anger were influenced by several COVID-19 experiences and stressors, suggesting that the pandemic did have an impact on anger among UK ex-service personnel.

The levels of anger reported in the present study (14.4%) were similar to other UK research conducted before the pandemic (12.6%; Rona et al., 2015). However, lower levels of anger were reported in the present study (14.4%) compared with another UK study conducted at a similar time point (56.4%) (Murphy et al., 2022b). These differences may be explained by the use of a community sample of ex-service personnel who served in the Iraq/Afghanistan era in the present study, and a treatment-seeking sample of ex-service personnel from a UK military mental health charity where psychological problems are higher and

where worse mental health is associated with increased anger (Rona et al., 2015). For instance, in the present study (Veterans-CHECK), 26.1% met caseness for CMDs and 27.6% met caseness for hazardous alcohol use (AUDIT score of 8+) (Sharp et al., 2021). However, in the treatment-seeking sample, 74.5% to 78.9% met caseness for CMDs and 41.1% to 47.4% met caseness for hazardous alcohol use (Hendrikx et al., 2021; Murphy et al., 2022a, 2022b).

The COVID-19 pandemic was an unsettling time for many people globally. In the present sample, several COVID-19 experiences and stressors were associated with difficulties with anger; many of which related to social, economic, and health factors, such as difficulties accessing enough food, financial difficulties, work difficulties, and difficulties with health. However, it was not possible to determine the direction of these associations, for instance, whether work difficulties caused anger or whether anger caused work difficulties. Employment was also uncertain during the pandemic, with many being left unemployed or on furlough; one in four people who were employees during the COVID-19 pandemic had been on furlough at some point between March 2020 and June 2021 (Office for National Statistics, 2021). Employment is a key factor for the successful transition from military to civilian life (HM Revenue & Customs, 2020), therefore the level of insecurity created by the pandemic may be one influence on the association between employment and anger in the present sample.

The present study also found that the more stressors experienced, the higher the odds of significant difficulties with anger. This reflects the findings in another study of ex-service personnel collected at a similar time point, where endorsing a higher number of COVID-19 stressors was found to be associated with poor mental health status, including anger (Murphy et al., 2022b). This also reflects findings in previous research, which reports that cumulative stress is associated with poorer mental health (Slopen et al., 2011). It is therefore important to acknowledge the compounding effects of COVID-19 in light of other influential premilitary, perimilitary, and postmilitary stressors experienced by some ex-serving military personnel.

Although a healthy and adaptive response in many circumstances, particularly to the stress brought about by the global uncertainty of COVID-19, anger in military contexts may be a more complex and multifaceted phenomenon. Military training pivots upon personnel being alert to danger and fighting the opposition; thus, anger and aggression may be instrumental for attack behaviors and suppressing fear (Novaco et al., 2012). Other literature points to the potential cultural acceptability around anger in the military compared with other emotional expressions (Lawrence-Wood et al., 2021; McAllister et al., 2019), whereas traumatic events in childhood and on deployment have been linked to elevated anger and aggression (Rona et al., 2015).

Problematic anger can therefore be a significant clinical issue in military personnel, related or inherent to psychiatric disorders such as PTSD, alcohol misuse, and suicide behaviors, as well as of traumatic brain injuries (Bailie et al., 2015; Rona et al., 2015; Turgoose and Murphy, 2018; Varker et al., 2022). As theorized by the anger regulatory deficits model, the symptomatology of posttraumatic stress (*i.e.*, threat perception and arousal) is related to the cognitive and behavioral dysregulations, which underpin anger, eliciting "survival mode" when individuals encounter threat-related stimuli (Chemtob et al., 1997; Novaco et al., 2012). The concept of anger thus houses a broad range of psychological, cultural, and behavioral manifestations. Varied approaches to prevention and intervention are therefore required to account for the different etiological basis, severity, and impairment to functioning presented by anger.

Strengths and Limitations

This study has several strengths, including the rapid roll-out of the questionnaire during the early stages of the COVID-19 pandemic, the use of a validated measure for the outcome of interest (anger) to allow for comparison with other research studies, and adding to the limited literature that exists with regards to anger during the COVID-19 pandemic.

TABLE 2. Association Between COVID Experiences and Significant Difficulty With Anger

	No Significant Difficulty With Anger (n = 1283), n (%)[a]	Significant Difficulty With Anger (n = 216), n (%)	AOR (95% CI)[b]
Had or have COVID-19			
No	733 (55.7)	101 (45.7)	1.00
Yes	171 (13.8)	42 (19.2)	1.53 (0.97 to 2.40)
Do not know	379 (30.5)	73 (35.1)	1.22 (0.85 to 1.74)
Had to isolate			
No	1085 (84.2)	176 (82.4)	1.00
Yes	195 (15.8)	40 (17.6)	1.02 (0.67 to 1.56)
Know someone who died from COVID-19			
No	1061 (82.7)	164 (75.9)	1.00
Yes	222 (17.3)	52 (24.1)	1.48 (1.01 to 2.17)
Keyworker during pandemic			
No	745 (55.0)	102 (46.2)	1.00
Yes	534 (45.0)	113 (53.8)	1.07 (0.77 to 1.49)
Change in employment during pandemic			
No change/change for better	1181 (92.3)	192 (89.1)	1.00
Change for worse	102 (7.7)	24 (10.9)	1.60 (0.99 to 2.60)
Living situation during pandemic			
Living at home	1271 (99.4)	193 (92.5)	1.00
Moved out of my home	9 (0.6)	15 (7.5)	3.24 (1.07 to 9.87)
Changed childcare arrangements during pandemic			
No	180 (51.5)	54 (58.7)	1.00
Yes	161 (48.5)	41 (41.3)	0.85 (0.50 to 1.43)
Impact of changed childcare arrangements			
Positive or neutral impact	96 (57.8)	16 (39.3)	1.00
Negative impact	65 (42.2)	25 (60.7)	2.30 (1.03–5.18)
Extra or new caring responsibilities during pandemic			
No	1072 (83.7)	163 (73.2)	1.00
Yes	209 (16.3)	52 (26.8)	1.77 (1.20 to 2.62)
COVID-19 had positive changes			
No	525 (40.6)	97 (43.4)	1.00
Yes, some	677 (52.4)	101 (47.9)	0.89 (0.47 to 1.68)
Yes, a lot	79 (6.9)	18 (8.7)	0.94 (0.49 to 1.79)

[a]Percentages are weighted.

[b]Adjusted for sex, age, rank, service, education, and relationship status.

There are some limitations of this study that should be considered when interpreting the findings. First, study participants were recruited from a specific ex-serving military cohort who served during the Iraq/Afghanistan era, meaning we cannot generalize the findings to ex-service personnel outside of this era of service as they are not necessarily representative of the wider ex-serving community. Second, the study used only self-reported measures, meaning the results may have been subject to recall bias and participants reporting socially desirable responses about their levels of anger. In addition, this study is limited to the context of the COVID-19 pandemic in the UK (between June and September 2020). Responders to this study compared with previous phases of the cohort were more likely to be older, of officer rank, and of higher educational status, and therefore the levels of anger during the pandemic may be underestimated.

Implications

Given the prevalence of anger in ex-service personnel, and the potential implications it has for their well-being, it is important to further understand the impact of the pandemic in order to help shape mental health services and improve treatment options. Anger is multifaceted and can present with different profiles (*i.e.*, different types and levels), therefore requiring different interventions. Research has shown that anger interferes with PTSD treatment among ex-service personnel, which might therefore suggest that problematic anger should be targeted first to increase engagement with, and the effectiveness of, PTSD treatments among this group (Forbes et al., 2008; Lloyd et al., 2014). By identifying the pandemic specific factors that impact on ex-service personnel's profile of anger, clinical services can target treatment, such as Cognitive Behavioral Therapy–based anger management (Henwood et al., 2015), at ex-service personnel with the highest number of risk factors for anger.

Clinicians should better understand the COVID-specific factors associated with anger to ensure the appropriate support is in place and in a timely manner, especially as the COVID-19 pandemic continues to progress. For instance, furlough or missing work due to COVID-19 infection could lead to financial difficulties that are associated with anger. There have been several changes to occupational policies throughout the course of the pandemic. In some workplaces, staff are no longer in receipt of statutory sick pay if they are infected with COVID-19, meaning they are forced to take unpaid leave or continue to attend work and risk infecting others.

TABLE 3. Association Between COVID-19 Stressors and Significant Difficulty With Anger

	No Significant Difficulty With Anger (n = 1283), n (%)[a]	Significant Difficulty With Anger (n = 216), n (%)	AOR (95% CI)[b]
Financial problems			
No	1129 (87.2)	160 (72.6)	1.00
Yes	154 (12.8)	56 (27.4)	2.05 (1.40 to 3.00)
Had difficulty accessing enough food			
No	1265 (98.4)	206 (94.9)	1.00
Yes	18 (1.6)	10 (5.1)	2.51 (1.09 to 5.77)
Had difficulty accessing medication			
No	1239 (96.4)	188 (85.8)	1.00
Yes	44 (3.6)	28 (14.2)	3.28 (1.88 to 5.70)
Had difficulty with health			
No	1163 (90.5)	156 (73.4)	1.00
Yes	120 (9.5)	60 (26.6)	3.39 (2.28 to 5.06)
Had somebody close in hospital			
No	1205 (93.8)	196 (89.6)	1.00
Yes	78 (6.2)	20 (10.4)	1.56 (0.91 to 2.69)
Lost somebody close			
No	1230 (95.7)	196 (89.3)	1.00
Yes	53 (4.3)	20 (10.7)	2.22 (1.24 to 3.99)
Had to change or delay a major plan			
No	1002 (77.9)	140 (64.3)	1.00
Yes	179 (15.1)	76 (35.7)	1.97 (1.39 to 2.78)
Difficulties with family/other social relationships			
No	1104 (84.9)	126 (57.3)	1.00
Yes	179 (15.1)	90 (42.7)	3.72 (2.59 to 5.34)
Difficulties with Internet access			
No	1205 (93.8)	191 (88.7)	1.00
Yes	78 (6.2)	25 (11.3)	1.80 (1.08 to 3.01)
Work difficulties			
No	1098 (84.3)	138 (62.0)	1.00
Yes	185 (15.7)	78 (38.0)	2.85 (1.00 to 4.09)
Difficulties with pets			
No	1251 (97.6)	208 (96.3)	1.00
Yes	32 (2.4)	8 (3.7)	1.59 (0.71 to 3.54)
Boredom			
No	1037 (79.2)	132 (58.5)	1.00
Yes	246 (20.8)	84 (41.5)	2.09 (1.48 to 2.95)

[a]Percentages are weighted.
[b]Adjusted for sex, age, rank, service, education, and relationship status.

Given the possible dose-response relationship between anger and stressors found in the present study, it is important that interventions targeting anger concurrently seek to ameliorate the stressors underlying presentations of anger, whether related to COVID-19 or military service.

The findings from the present study could also be useful in developing our understanding of the impact of the COVID-19 pandemic on anger among occupational groups, which are similar to the Armed Forces, for instance, those who are exposed to a high degree of risk

TABLE 4. Dose Response Effect of COVID Stressors and Significant Difficulty With Anger

	No Significant Difficulty With Anger (n = 1283), n (%)[a]	Significant Difficulty With Anger (n = 216), n (%)	AOR (95% CI)[b]
Frequency of COVID stressors			
0	561 (41.9)	27 (12.4)	1.00
1	338 (26.2)	48 (21.7)	2.61 (1.50 to 4.55)
2	193 (15.7)	38 (15.8)	2.84 (1.56 to 5.17)
3	104 (9.1)	41 (20.6)	5.76 (3.12 to 10.61)
4+	87 (7.1)	62 (29.5)	11.35 (6.39 to 20.17)

[a]Percentages are weighted.
[b]Adjusted for sex, age, rank, service, education, and relationship status.

and pressure as a direct result of their jobs, such as the emergency services. Given the ongoing nature of the pandemic, future longitudinal research should continue to explore the long-term impacts of the COVID-19 pandemic and other global issues (such as the cost-of-living crisis) have on the health and wellbeing of ex-serving military samples, and how this compares with serving military populations and the general population. Furthermore, future research could adopt other methods to further explore the context and reasons for anger to provide a deeper understanding of anger triggers and where anger interventions would be best placed. Health care and support services should additionally support the families of those struggling with anger. Anger, and related aggression, poses as a risk to others as it can manifest in acts of violence toward others, including intimate partner violence and other violent offenses.

CONCLUSIONS

Our study identifies that specific COVID-19 experiences and stressors had an impact on ex-serving personnel's anger outcomes during the pandemic. This knowledge can be adopted by clinicians to ensure support is targeted at those with the highest number of risk factors and is provided in a timely manner. By developing our understanding of the impacts of the pandemic, we can be better equipped to support ex-serving military personnel through future waves of the COVID-19 pandemic and inform the support for this vulnerable population during future pandemics.

REFERENCES

Adler AB, Leardmann CA, Roenfeldt KA, Jacobson IG, Forbes D (2020) Magnitude of problematic anger and its predictors in the millennium cohort. *BMC Public Health*. 20:1–11.

Adler AB, LeardMann CA, Villalobos J, Jacobson IG, Forbes D, Belding J, Boparai S, Carey F, Castañeda S, Geronimo-Hara TR, Kolaja C, Magallon S, Rivera A, Rull R, Seay J, Sharifian N, Sheppard B, Trone D, Walstrom J, Wooten N, Zhu K (2022) Association of problematic anger with long-term adjustment following the military-to-civilian transition. *JAMA Netw Open*. 5:e2223236.

Alexander M, Unruh L, Koval A, Belanger W (2022) United States response to the COVID-19 pandemic, January–November 2020. *Heal Econ Policy Law*. 17:62–75.

Bailie JM, Cole WR, Ivins B, Boyd C, Lewis S, Neff J, Schwab K (2015) The experience, expression, and control of anger following traumatic brain injury in a military sample. *J Head Trauma Rehabil*. 30:12–20.

Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, Rubin GJ (2020) The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *Lancet*. 395:912–920.

Chemtob CM, Novaco RW, Hamada RS, Gross DM, Smith G (1997) Anger regulation deficits in combat-related posttraumatic stress disorder. *J Trauma Stress*. 10: 17–36.

Douglas M, Katikireddi SV, Taulbut M, McKee M, McCartney G (2020) Mitigating the wider health effects of COVID-19 pandemic response. *BMJ*. 369:m1557.

Fear NT, Jones M, Murphy D, Hull L, Iversen AC, Coker B, Machell L, Sundin J, Woodhead C, Jones N, Greenberg N, Landau S, Dandeker C, Rona RJ, Hotopf M, Wessely S (2010) What are the consequences of deployment to Iraq and Afghanistan on the mental health of the UK armed forces? A cohort study. *Lancet (London, England)*. 375:1783–1797.

Forbes D, Alkemade N, Hopcraft D, Hawthorne G, O'Halloran P, Elhai JD, McHugh T, Bates G, Novaco RW, Bryant R, Lewis V (2014a) Evaluation of the Dimensions of Anger Reactions-5 (DAR-5) scale in combat veterans with posttraumatic stress disorder. *J Anxiety Disord*. 28:830–835.

Forbes D, Alkemade N, Mitchell D, Elhai JD, McHugh T, Bates G, Novaco RW, Bryant R, Lewis V (2014b) Utility of the Dimensions of Anger Reactions-5 (DAR-5) scale as a brief anger measure. *Depress Anxiety*. 31:166–173.

Forbes D, Parslow R, Creamer M, Allen N, McHugh T, Hopwood M (2008) Mechanisms of anger and treatment outcome in combat veterans with posttraumatic stress disorder. *J Trauma Stress*. 21:142–149.

Fox BH, Perez N, Cass E, Baglivio MT, Epps N (2015) Trauma changes everything: Examining the relationship between adverse childhood experiences and serious, violent and chronic juvenile offenders. *Child Abuse Negl*. 46:163–173.

Hendrikx LJ, Williamson C, Baumann J, Murphy D (2021) The impact of the COVID-19 pandemic on treatment-seeking veterans in the United Kingdom with preexisting mental health difficulties: A longitudinal study. *J Trauma Stress*. 1–8.

Henwood KS, Chou S, Browne KD (2015) A systematic review and meta-analysis on the effectiveness of CBT informed anger management. *Aggress Violent Behav*. 25:280–292.

HM Revenue & Customs (2020) Supporting Veterans Transition to Civilian Life through Employment. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/950970/Supporting_veterans__transition_into_civilian_life_through_employment_summary_of_responses.pdf. Accessed November 2, 2022.

Hotopf M, Hull L, Fear NT, Browne T, Horn O, Iversen A, Jones M, Murphy D, Bland D, Earnshaw M, Greenberg N, Hughes JH, Tate AR, Dandeker C, Rona R, Wessely S (2006) The health of UK military personnel who deployed to the 2003 Iraq war: A cohort study. *Lancet (London, England)*. 367:1731–1741.

Lawrence-Wood E, Van Hooff M, McFarlane A (2021) Anger in occupations characterized by repeated threat and stress exposure: The longitudinal view in the military context. In *Anger at work: Prevention, intervention, and treatment in high-risk occupations* (ed, pp 175–199). Washington: American Psychological Association.

Lloyd D, Nixon RDV, Varker T, Elliott P, Perry D, Bryant RA, Creamer M, Forbes D (2014) Comorbidity in the prediction of cognitive processing therapy treatment outcomes for combat-related posttraumatic stress disorder. *J Anxiety Disord*. 28:237–240.

MacManus D, Dean K, Al Bakir M, Iversen AC, Hull L, Fahy T, Wessely S, Fear NT (2012) Violent behaviour in U.K. Military personnel returning home after deployment. *Psychol Med*. 42:1663–1673.

MacManus D, Rona R, Dickson H, Somaini G, Fear N, Wessely S (2015) Aggressive and violent behavior among military personnel deployed to Iraq and Afghanistan: Prevalence and link with deployment and combat exposure. *Epidemiol Rev*. 37:196–212.

MacManus D, Wessely S (2011) Why do some ex-armed forces personnel end up in prison? *BMJ*. 342:d3898.

McAllister L, Callaghan JEM, Fellin LC (2019) Masculinities and emotional expression in UK servicemen: 'Big boys don't cry'? *J Gend Stud*. 28:257–270.

Murphy D, Hendrikx LJ, Williamson C, Baumann J (2022a) Longitudinal survey of UK veterans with pre-existing mental health difficulties: Mental health during the COVID-19 pandemic. *BMJ Mil Health*. e002046.

Murphy D, Williamson C, Baumann J, Busuttil W, Fear NT (2022b) Exploring the impact of COVID-19 and restrictions to daily living as a result of social distancing within veterans with pre-existing mental health difficulties. *BMJ Mil Health*. 168:29–33.

Novaco RW (1975) *Dimensions of anger reactions*. Irvine, CA: University of California.

Novaco RW, Swanson RD, Gonzalez OI, Gahm GA, Reger MD (2012) Anger and postcombat mental health: Validation of a brief anger measure with U.S. Soldiers postdeployed from Iraq and Afghanistan. *Psychol Assess*. 24:661–675.

Office for National Statistics (2021) An overview of workers who were furloughed in the UK. Available at: https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/anoverviewofworkerswhowerefurloughedintheuk/october2021. Accessed June 23, 2022.

Orcutt HK, King LA, King DW (2003) Male-perpetrated violence among Vietnam veteran couples: Relationships with veteran's early life characteristics, trauma history, and PTSD symptomatology. *J Trauma Stress*. 16:381–390.

REDCap (2020). Available at: https://projectredcap.org/. Accessed May 1, 2020.

Rona RJ, Jones M, Hull L, MacManus D, Fear NT, Wessely S (2015) Anger in the UK armed forces: Strong association with mental health, childhood antisocial behavior, and combat role. *J Nerv Ment Dis*. 203:15–22.

Sharp M-L, Serfioti D, Jones M, Burdett H, Pernet D, Hull L, Murphy D, Stevelink S, Wessely S, Fear NT (2020) COVID-19: Impact on the health and wellbeing of ex-serving personnel (veterans-CHECK) protocol paper. *MedRxiv*. 2020.09.02.20186577.

Sharp M-L, Serfioti D, Jones M, Burdett H, Pernet D, Hull L, Murphy D, Wessely S, Fear NT (2021) UK veterans' mental health and well-being before and during the COVID-19 pandemic: A longitudinal cohort study. *BMJ Open*. 11:e049815.

Slopen N, Meyer C, Williams DR (2011) Cumulative stress and health. In Ryff CD, Krueger RF (Eds), *The Oxford Handbook of Integrative Health Science*. Oxford: Oxford University Press.

Stevelink SAM, Jones M, Hull L, Pernet D, Maccrimmon S, Goodwin L, Macmanus D, Murphy D, Jones N, Greenberg N, Rona RJ, Fear NT, Wessely S (2018) Mental health outcomes at the end of the British involvement in the Iraq and Afghanistan conflicts: A cohort study. *Br J Psychiatry*. 213:690–697.

Turgoose D, Murphy D (2018) Anger and aggression in UK treatment-seeking veterans with PTSD. *Healthc 2018*. 6, 86:86.

UK Government (2019) Population projections: UK Armed Forces Veterans Residing in Great Britain, 2016 to 2028. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/775151/20190107_Enclosure_1_Population_Projections_-_UK_Armed_Forces_Veterans_residing_in_Great_Britain_-_2016_to_2028.pdf#:~:text=The%20MOD%20estimated%20that%20there%20were%202.5%20million,year%20to%20approximately%201.6%20million%20veterans%20by%202028. Accessed November 1, 2021.

UK Government (2020) Staying at home and away from others (social distancing) [Withdrawn]. *UKGOV*. Available at: https://www.gov.uk/government/publications/full-guidance-on-staying-at-home-and-away-from-others. Accessed March 30, 2022.

Varker T, Cowlishaw S, Baur J, McFarlane AC, Lawrence-Wood E, Metcalf O, Van Hooff M, Sadler N, O'Donnell ML, Hodson S, Benassi H, Forbes D (2022) Problem anger in veterans and military personnel: Prevalence, predictors, and associated harms of suicide and violence. *J Psychiatr Res*. 151:57–64.

Williamson C, Baumann J, Murphy D (2023) Exploring the health and well-being of a national sample of U.K. treatment-seeking veterans. *Psychol Trauma Theory Res Pract Policy*. 15:672–680.

World Health Organization (2020) Listings of WHO's response to COVID-19. Available at: https://www.who.int/news/item/29-06-2020-covidtimeline. Accessed October 10, 2022.