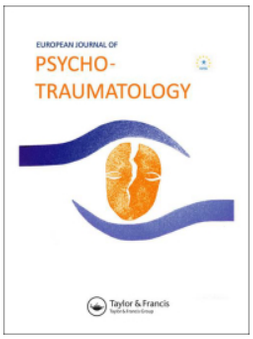

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Exploring potentially morally injurious events and mental health in a UK representative population

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ABSTRACT

Introduction: Potentially morally injurious events (PMIEs) are events which conflict with an individual's deeply held moral convictions and beliefs. PMIE research has focused on potentially at-risk populations such as military personnel. However, limited research has examined PMIEs and their association with mental health and functioning in the general population. The current cross-sectional study aims to explore the prevalence of PMIEs and associated mental health and functioning in a UK representative sample. The secondary aim is to provide an overview of the health and wellbeing of the sample, thus offering context for interpreting the PMIE results.

Methods: Participants were recruited via Prolific to obtain a UK nationally representative sample of 2,385 adults ($M_{age} = 46.79$, $SD_{age} = 15.43$). Participants completed a questionnaire which included the Moral Injury Outcome Scale to assess PMIE exposure and moral injury symptoms, and measures of other health and functioning, such as common mental health difficulties (CMDs; anxiety and depression).

Results: Overall, 59.58% of the total sample reported PMIE exposure. The most prevalent health concerns were loneliness (38.45%), insomnia (35.22%), problematic alcohol use (34.55%), and CMDs (30.86%). The prevalence of posttraumatic stress disorder (PTSD) was 3.61% and complex-PTSD in the sample was 6.96%. Those who reported PMIE exposure had significantly higher scores on measures of CMDs, physical health, anger, loneliness, PTSD, and complex-PTSD than those who had not reported PMIE exposure. Additionally, those who reported PMIE exposure had significantly lower scores on the sleep quality measure, indicating poorer sleep.

Discussion: The findings highlight how PMIE exposure extends beyond at-risk occupation groups while demonstrating the association between PMIEs and mental health and functioning in a UK representative sample. This study did not explore the prevalence of moral injury or its association with outcomes. Future research should explore the development of moral injury and effects in the general population.

Explorando acontecimientos potencialmente perjudiciales desde el punto de vista moral y la salud mental en una población representativa del Reino Unido

Introducción: Los acontecimientos potencialmente perjudiciales desde el punto de vista moral (PMIEs) son acontecimientos que entran en conflicto con las convicciones y creencias morales profundamente arraigadas de una persona. La investigación sobre los PMIE se ha centrado en poblaciones potencialmente en riesgo, como el personal militar. Sin embargo, son pocos los estudios que han examinado los PMIE y su asociación con la salud mental y el funcionamiento de la población general.

Objetivos: El presente estudio transversal tiene como objetivo explorar la prevalencia de los PMIE y la salud mental y el funcionamiento asociados en una muestra representativa del Reino Unido. El objetivo secundario es ofrecer una visión general de la salud y el bienestar de la muestra, proporcionando así un contexto para interpretar los resultados de los PMIE.

Método: Los participantes fueron reclutados a través de Prolific para obtener una muestra representativa a nivel nacional del Reino Unido de 2.385 adultos (edad media = 46.79, desviación estándar de la edad = 15.43). Los participantes completaron un cuestionario que incluía la Escala de Resultados de Daño Moral para evaluar la exposición al PMIE y los síntomas de daño moral, así como medidas de otros aspectos de la salud y el funcionamiento, como las dificultades comunes de salud mental (CMDs [por sus siglas en inglés]; ansiedad y depresión).

Resultados: En general, el 59.58 % de la muestra total informó haber estado expuesta a PMIE. Los problemas de salud más frecuentes fueron la soledad (38.45 %), el insomnio (35.22 %), el consumo problemático de alcohol (34.55 %) y los CMD (30.86 %). La prevalencia del trastorno

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PALABRAS CLAVE

Daño moral; trauma; acontecimientos potencialmente perjudiciales desde el punto de vista moral

HIGHLIGHTS

- The current cross-sectional study aims to explore the prevalence of potentially morally injurious events (experiences that challenge moral beliefs) and their associations with mental health and functioning in a UK representative sample, while providing an overview of the general health and wellbeing to contextualise findings.
- The findings reveal how exposure to potentially morally injurious events is reported in over half of UK adults surveyed.
- These potentially morally injurious events were associated with poorer mental and physical health.

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por estrés postraumático (TEPT) fue del 3.61 % y la del TEPT complejo en la muestra fue del 6.96 %. Las personas que informaron haber estado expuestas a PMIE obtuvieron puntuaciones significativamente más altas en las medidas de CMDs, salud física, ira, soledad, TEPT y TEPT complejo que aquellas que no informaron haber estado expuestas a PMIE. Además, las personas que informaron haber estado expuestas a PMIE obtuvieron puntuaciones significativamente más bajas en la medida de la calidad del sueño, lo que indica un sueño de peor calidad.
Discusión: Los resultados ponen de relieve cómo la exposición a los PMIE se extiende más allá de los grupos profesionales de riesgo, al tiempo que demuestran la asociación entre los PMIE y la salud mental y el funcionamiento en una muestra representativa del Reino Unido. Este estudio no exploró la prevalencia del daño moral ni su asociación con los resultados. Las investigaciones futuras deberían explorar el desarrollo del daño moral y sus efectos en la población general.

1. Introduction

Potentially morally injurious events (PMIEs) are experiences which may conflict with an individual's deeply held moral convictions and beliefs, potentially challenging their expected behavioural, spiritual, and social understanding of the world (Litz et al., 2022; Phelps et al., 2024). PMIEs can stem from oneself or others and include both acts of commission (i.e. causing harm to others) or omission (i.e. failing to prevent harm to others; Bonson et al., 2023; Frankfurt et al., 2018; Griffin et al., 2019; Jordan et al., 2017). Additionally, PMIEs can also include betrayal by a trusted authority (Shay, 2014), and challenging one's understanding of acceptable behaviour (Frankfurt & Frazier, 2016).

Recent years have seen a discernible increase in a focus on the impact of PMIEs which can lead to the development of moral injury (Litz et al., 2009). Unlike post-traumatic stress disorder (PTSD), which can occur following an actual or threatened death, serious injury, or sexual violence, moral injury can occur following PMIEs which do not necessarily involve a threat to life. Specifically, moral injury can develop following an experience that involves doing or failing to do something or being the victim/bearing witness to acts that conflict with moral beliefs and expectations (Litz & Walker, 2025). Though there is no universally accepted definition of moral injury, recent research has proposed that it can be associated with functional impairment in multiple domains: (1) perceptions of oneself and others, (2) moral thinking, (3) social behaviour, (4) moral emotional and moods, (5) self-harming/sabotaging, and (6) alterations in ones belief of the meaning of life (Litz & Walker, 2025). As research on moral injury has surfaced, a socio-cognitive conceptualisation has been proposed which highlights moral injury as a decline in an individual's relationship with oneself, others, and their broader connection to humanity (Bonson et al., 2023). In this model, the authors argue that PMIEs need to be high-stakes events that challenge previously held beliefs. Importantly, while PMIE exposure is a necessary precondition to the development of moral injury, it is not sufficient and not everyone who experiences a PMIE will exhibit moral injury (Litz et al., 2022). Therefore, moral injury should be considered as a potential consequence of PMIE exposure rather than an inevitable outcome (Bonson et al., 2023).

Though PMIE exposure does not always lead to the development of moral injury, prior research has suggested that PMIE exposure alone is associated with worse health compared to non-PMIE exposure including poorer physical health, in addition to increased loneliness, complex-PTSD (CPTSD), and common mental health difficulties (CMDs, anxiety and depression; Biscoe et al., 2023). Additionally, previous research has illuminated potential associations between PMIE exposure and psychological difficulties, (Hall et al., 2022; Levi-Belz et al., 2020; Williamson et al., 2021), somatic difficulties and pain sensitivity (Biscoe et al., 2023; Koenig et al., 2018), PTSD (Hall et al., 2022), CPTSD (Biscoe et al., 2023), substance use (Hall et al., 2022), sleep difficulties (Hall et al., 2022), and impaired psychosocial functioning (e.g. lowered interpersonal connectedness; Biscoe et al., 2023; Borges et al., 2021). However, these studies have been conducted exclusively in specific populations, such as military personnel and healthcare workers. There is no prior research that explores the association between PMIEs and mental health and functioning in the general population, highlighting a gap in the literature. This illuminates the importance of exploring the association between PMIEs and a wide range of mental health and functioning measures in the general population, to investigate the wide-ranging consequences that may arise from PMIE exposure.

While moral injury following PMIEs can often co-occur with PTSD (Koenig et al., 2019), moral injury and PTSD are consistently being recognised as different in presentation (Barnes et al., 2019; Phelps et al., 2024). Though the majority of research on PMIEs has been conducted in military personnel and veterans (e.g. Griffin et al., 2019b; Williamson et al., 2021), moral injury is also evident in other populations such as healthcare professionals and first responders (Lennon et al., 2023; Maguen et al., 2025; Williamson et al., 2023). As PMIE exposure is a prerequisite for the

development of moral injury, this highlights the presence of PMIE exposure across populations as many professionals encounter ethical dilemmas throughout their careers (e.g. Cooke et al., 2022; Heikkilä et al., 2023). To our knowledge, there has been no research exploring the presence of PMIEs in the general population and their association with mental health and functioning.

Given the association between PMIEs and adverse mental health and functioning in prior samples, in addition to the limited research into PMIEs in the general population, there is a pressing need for exploration of PMIEs in the general population. Understanding PMIE exposure and its impact is essential in informing psychological interventions and support services beyond previously studied at-risk groups. Additionally, to contextualise the findings, it is important to describe the health and wellbeing of the sample. Providing these descriptive statistics will provide a benchmark to understand the severity and prevalence of mental health and functional difficulties in the general population.

2. Materials and methods

The primary aim of the present study is to explore the prevalence of PMIEs and their associations with mental health and functioning in a representative UK sample. It is hypothesised that PMIE exposure will be associated with worse overall health than non-PMIE exposure. The secondary aim of the current study is to explore the health and wellbeing of the UK representative sample.

2.1. Population

This study adopted a cross-sectional design. A representative sample of the UK general population was recruited through a Survey Panel site named Prolific. In Prolific, participant eligibility for representative samples is determined based on responses to four pre-screening questions, including 'age' (i.e. 18-24, 25-34, 35-44, 45-54, 55+), 'sex' (i.e. male and female), 'ethnicity' (i.e. Asian, black, mixed, white, and other), and 'UK political affiliation' (i.e. Conservative, Labour, LibDem, Green, SNP, Reform, and other). A sample of 2385 participants were recruited and completed the survey.

Eligible participants resided in the UK, were 18 years or older, were fluent in English, were able to follow study instructions, provided written consent, and had internet access and a compatible device for completing an online survey. Eligibility was confirmed by participants before they completed the questionnaire. The questionnaire included measures of demographic characteristics in addition to mental health and functioning measures.

2.2. Procedure

Data and informed consent were collected in January 2025 using SurveyMonkey. If participants on Prolific matched the pre-screening inclusion/exclusion criteria, the study was displayed on the potential participants Prolific account where participants could volunteer to take part. The questionnaire was estimated to take about 15–20 min. Participants were not asked to provide any personally identifiable information. A financial advantage of about £9 per hour was provided, based on estimated survey completion time. We had pre-determined that a sample size of 2,000 participants (with an additional 10% to account for exclusions) would provide sufficient statistical power for the planned analysis. Recruitment was subsequently closed once this target was reached. Participants were informed that participation was voluntary and that they could withdraw at any time by closing their browser and not completing the survey. Only data from fully completed surveys were recorded and included in the analyses (i.e. participants who withdrew by closing their browser midway were not included). Participants provided consent by selecting a response indicating agreement to participate.

Prolific implements numerous procedures to ensure high-quality, reliable responses, as outlined on their website (Prolific, n.d.). Specifically, examples include verifying participant identity (e.g. by phone number and email), restricting duplicate accounts through IP monitoring, and conducting regular automated checks. Additionally, survey responses in the present study were further screened for data quality by the research team. Firstly, surveys completed exceptionally quickly (i.e. participants who were statistical outliers/three standard deviations below the mean) were not included in the analyses. Further, two attention checks were embedded in the questionnaire and if participants completed both incorrectly then they were not included in the analyses. For example, one attention check was 'The colour test you are about to take part in is very simple, when asked for your favourite colour, you must select "Green". This is an attention check. Based on the test you read above, what colour have you been asked to enter.' These two further screening measures align with Prolific's recommended guidelines, thus ensuring that only attentive and quality responses were included in the final analyses.

2.3. Measures

2.3.1 Primary outcome

Moral Injury Outcome Scale (MIOS; Litz et al., 2022) is a 14-item scale measuring the presence of a PMIE and moral injury symptoms, with total scores ranging from 0-56. Higher scores indicate greater

symptomatology. This measure has demonstrated strong psychometric properties including good reliability and validity (Houle et al., 2024; Litz et al., 2022; Tao et al., 2023). Only the PMIE item was included in the current study. The presence of a PMIE is determined from the first question:

> … you did something (or failed to do something) that went against your moral code or values … you saw someone (or people) do something or fail to do something that went against your moral code or values … have you had an experience as described above?

2.3.2 Sociodemographic characteristics

Participants provided sociodemographic information including gender, age, relationship status, employment status, ethnicity, level of education, and neurodiversity. In terms of military characteristics, participants were asked if they have ever been in the military, if they were currently serving, and whether they were part of the UK military reserve.

2.3.3 Trauma and adverse experiences

Adverse Childhood Experiences Questionnaire (ACE-Q; Felitti et al., 1998) is a 10-item measure of childhood trauma and adversity. Higher scores indicate greater exposure to childhood adversity. The Cronbach's alpha was 0.77.

Life Events Checklist-5 (LEC-5; Weathers et al., 2013) is a 17-item measure of exposure to potentially traumatic events. Higher scores indicate greater exposure to traumatic experiences.

2.3.4 Post-traumatic stress and complex post-traumatic stress

International Trauma Questionnaire (ITQ, Cloitre et al., 2018) is an 18-item measure of PTSD and CPTSD, where scores range from 0 to 24. Potential presence of PTSD is indicated by a score of two or higher in each of the PTSD symptom clusters (i.e. re-experiencing, avoidance, and hyperarousal), as well as endorsing at least one item relating to functional impairment. Probable caseness for CPTSD is indicated by the PTSD criteria in addition to a score of two or higher on three symptom clusters of disturbances in self-organisation (i.e. self-concept, interpersonal difficulties and affect dysregulation), as well as endorsing at least one item of functional impairment relating to these symptoms. As such, someone can meet criteria for either PTSD or CPTSD (PTSD symptoms and DSO symptoms), but not both. The Cronbach's alpha was 0.95.

2.3.5 Other health and functioning outcomes

Patient Health Questionnaire (PHQ-15; Spitzer, 1999) is a 15-item measure of physical health and somatic symptoms, where scores range from 0 to 30. Higher scores indicate higher somatisation, with a score of 15 or higher indicating caseness (i.e. classificed as 'high'). The Cronbach's alpha was 0.80.

General Health Questionnaire (GHQ-12; Goldberg, 2011) is a 12-item measure of CMDs including depression and anxiety, where scores range from 0 to 12. Higher scores indicate more symptoms of these mental health difficulties, with a score of 4 or higher indicating possible presence of these disorders. The Cronbach's alpha was 0.90.

Sleep Condition Indicator (SCI; Espie et al., 2014) is an eight-item measure of sleep quality, where scores range from 0 to 32. Higher scores indicate better sleep quality, with scores below 16 indicating possible sleep disorder. The Cronbach's alpha was 0.88.

UCLA Loneliness Scale (UCLA-3; Hughes et al., 2004) is a three-item measure of loneliness, where scores range from 0 to 9. Higher scores indicate greater loneliness, where a score between 3 and 5 is classified as 'not lonely' and a score between 6 and 9 is classified as 'lonely'. The Cronbach's alpha was 0.88.

Dimension of Anger Reactions (DAR-5; Forbes et al., 2014) is a five-item measure of possible anger difficulties, where scores range from 5 to 25. Higher scores indicate greater anger symptoms where a score of 12 or above indicates possible case criteria for problematic anger. The Cronbach's alpha was 0.88.

Alcohol Use Disorders Identification Test Short Form (AUDIT-C; Bush et al., 1998) is a 3-item measure of alcohol use, where scores range from 0 to 12. Higher scores indicate higher alcohol use, where a score of 5 or above indicates unhealthy alcohol use. The Cronbach's alpha was 0.78.

2.4. Data analysis

The data was fully anonymised and prepared in R Studio. A significance level of $p < .01$ was used for all statistical tests to reduce the likelihood of false positive findings. To describe sociodemographic characteristics, descriptive statistics were calculated. Participants were grouped into PMIE exposure groups: (1) PMIE exposed participants who endorsed PMIE exposure by answering YES to the first MIOS item, and (2) non-PMIE exposed participants who did not endorse PMIE exposure by answering NO to the first MIOS item. Descriptive statistics were calculated for the PMIE exposure group, the non-PMIE exposure group, and the total sample. To explore whether PMIE exposure was associated with demographic characteristics, Chi-squared tests were performed for categorical variables. Alternatively, if expected cell counts were small, Fisher's Exact Tests (with 10,000 simulated replicates) were used instead. For continuous variables, independent samples t-tests were used. Additionally, the prevalence of mental health and

functional impairment was calculated based on the proportion of participants meeting caseness criteria.

Finally, to explore differences in mental health and functioning in participants with and without PMIE exposure, linear regression models were conducted for each outcome, adjusting for covariates that differed by PMIE exposure group. In these regression models, PMIE exposure was the predictor (Yes vs No) and the outcomes were mental health and functioning scores. As multiple regression models were run across several outcomes, *p*-values were adjusted for multiple comparisons using the Holm method to control the family-wise error rates.

2.5. Ethics

Approval for the study was granted by the University of Bath (#6010-7586). When providing consent, participants agreed that anonymised survey responses could be used for research. Participants were provided with information and mental health support resources at the end of the survey.

2.6. Results

2.6.1 Participants

Overall, 2385 participants completed the survey.

2.6.2 Sociodemographic characteristics

Table 1 describes the sociodemographic characteristics of the full sample and per PMIE exposure group (i.e. PMIE exposed, PMIE non-exposed). The total sample included a relatively even distribution of male (48.47%) and female (50.94%) participants. Majority of the sample were white British (80.84%), had a high education (77.48%), were working or retired (87.59%) and were in a relationship (70.36%). Ethnicity and education were the only variables with sufficiently large cell frequencies to meet the assumptions for Chi-squared tests; for all other demographic variables with smaller cell frequencies, Fisher's Exact tests were performed. Notably, there were significant differences between the PMIE exposed and non-PMIE exposed groups with respect to age ($p < .001$) and education level ($p < .001$).

2.6.3 Health and well-Being of the total sample

The prevalence of several health and well-being outcomes are presented in Table 2. The most frequently reported outcome was loneliness (38.45%), insomnia (35.22%), problematic alcohol use (34.55%), and CMDs (30.86%). Overall, 61.60% ($N = 1469$) of the total sample reported experiencing at least one adverse childhood experience, and 19.83% ($N = 473$) reported four or more adverse experiences (i.e. high risk) according to the ACE-Q. Majority of the same ($N = 2246$) reported exposure to at least one event on the LEC-5. This includes any form of exposure, whether it happened to them directly, they witnessed it, learned about it, or it occurred as a part of their job. Specifically, 2239 participants experienced an event directly (i.e. it happened to them), 2243 witnessed an event, 2243 learned about an event, and 2240 experienced an event as part of their job.

2.6.4 PMIE exposure outcomes of the total sample

Of the 1421 (59.58%) participants who reported PMIE exposure, 616 (43.35%) reported a self-PMIE, 928

Table 1. Description for the full sample and per PMIE exposure.

Characteristic	*PMIE category*			
	Full sample (N = 2385) *M (SD)*	*PMIE exposure (N = 1421)*	*No PMIE exposure (N = 964)*	*p-value*
Age (years)	46.79 (15.43)	45.78 (14.99)	48.28 (15.95)	<.001
	N (%)			
Gender				.137
Male	1156 (48.47%)	661 (46.52%)	495 (51.35%)	
Female	1215 (50.94%)	752 (52.92)	463 (48.03%)	
Other	7 (0.29%)	4 (0.28%)	3 (0.31%)	
Prefer not to answer	7 (0.29%)	4 (0.28%)	3 (0.31%)	
Level of education				<.001
Low	537 (22.52%)	277 (19.49%)	260 (26.97%)	
High	1848 (77.48%)	1144 (80.51%)	704 (73.03%)	
Ethnicity				.714
White British	1928 (80.84%)	1138 (80.08%)	790 (81.95%)	
White other	91 (3.82%)	53 (3.73%)	38 (3.94%)	
Ethnic minority	361 (15.14%)	226 (15.90%)	135 (14.00%)	
Other	5 (0.21%)	4 (0.28%)	1 (0.10%)	
Employment status				.014
Working or retired	2089 (87.59%)	1243 (87.47%)	846 (87.76%)	
Not working	294 (12.33%)	177 (12.46%)	117 (12.14%)	
Other	2 (0.08%)	1 (0.07%)	1 (0.10%)	
Relationship status				.167
In a relationship	1678 (70.36%)	982 (69.11%)	696 (72.20%)	
Not in a relationship	707 (29.64%)	439 (30.89%)	268 (27.80%)	

Note: PMIE: potentially morally injurious events.

Table 2. Description of health and well-being of the total sample.

Outcome	*n* (%)
MIOS	
PMIE	1421 (59.58%)
ITQ	
No PTSD	2133 (89.43%)
PTSD	86 (3.61%)
CPTSD	166 (6.96%)
GHQ-12 score	
No case	1649 (69.14%)
CMD	736 (30.86%)
PHQ-15 score	
No case	2269 (95.14%)
Case	116 (4.86%)
DAR-5 score	
No problems with anger	2024 (84.86%)
Problems with anger	361 (15.14%)
SCI score	
No insomnia	1545 (64.78%)
Insomnia	840 (35.22%)
UCLA-3 score	
Not lonely	1468 (61.55%)
Lonely	917 (38.45%)
AUDIT score	
No problematic alcohol use	1561 (65.45%)
Problematic alcohol use	824 (34.55%)

Notes: $N = 2385$. AUDIT: Alcohol Use Identification Test; CPTSD: Complex Post-traumatic Stress Disorder; DAR-5: Dimensions of Anger Reactions Scale; GHQ-12: General Health Questionnaire; ITQ: International Trauma Questionnaire; MIOS: Moral Injury Outcome Scale; PHQ-15: Patient Health Questionnaire; PMIE: potentially morally injurious event; PTSD: Post-traumatic Stress Disorder; SCI: Sleep Condition Indicator; UCLA-3: 3-Item Loneliness Scale.

(65.31%) reported experiencing an other-based PMIE, and 826 (58.13%) reported a betrayal PMIE. Notably, participants may have endorsed more than one PMIE (e.g. both self-PMIE and other-PMIE). Of the total sample, 31.4% (748/2268) of participants indicated that they have had exposure to a potentially traumatic event during their occupation.

2.6.5 Comparison of health and well-Being outcomes between PMIE-Exposed and non-exposed participants

Table 3 presents the mean score differences across various outcomes between participants who reported PMIE exposure and those who did not. Seven out of the eight measures showed significantly worse scores among those who reported experiencing a PMIE highlighting how PMIE exposure may be associated with poorer health and well-being compared to non-exposure. These included CMDs (GHQ-12), physical health symptoms (PHQ-15), anger (DAR-5), sleep difficulties (SCI), loneliness (UCLA-3) in addition to total PTSD symptoms (ITQ PTSD scores), and total DSO symptoms (ITQ DSO scores). No significant difference was found in alcohol use (AUDIT).

3. Discussion

This cross-sectional study explored the health and wellbeing in this UK representative sample, including the prevalence of mental health difficulties.

Table 3. The impact of PMIE exposure and associated health and well-being measures.

	PMIE category		
	PMIE exposure *M* (SD)	No PMIE exposure *M* (SD)	*p*
GHQ-12 score	3.37 (3.73)	1.76 (2.80)	<.001
PHQ-15 score	7.24 (4.43)	4.98 (3.89)	<.001
DAR-5 score	8.67 (3.75)	7.19 (3.03)	<.001
SCI score	17.88 (7.85)	21.02 (7.70)	<.001
UCLA-3 score	5.25 (1.87)	4.36 (1.73)	<.001
AUDIT score	3.58 (2.96)	3.53 (2.80)	.507
PTSD score	6.75 (5.72)	3.52 (4.60)	<.001
DSO score	8.03 (6.35)	4.46 (5.15)	<.001

Notes: No PMIE exposure = Participant did not report exposure to a PMIE. AUDIT: Alcohol Use Identification Test; CPTSD: Complex Post-traumatic Stress Disorder; DAR-5: Dimensions of Anger Reactions Scale; DSO: disturbances in self-organisation; GHQ-12: General Health Questionnaire; ITQ: International Trauma Questionnaire; PHQ-15: Patient Health Questionnaire; PMIE: potentially morally injurious event; PTSD: Post-traumatic Stress Disorder; SCI: Sleep Condition Indicator; UCLA-3: 3-Item Loneliness Scale.

Additionally, the study investigated the prevalence of PMIEs and their associations with mental health and functioning.

3.1. Mental health and well-Being in the UK representative sample

Compared with the 2021 UK census data, overall, our sample appeared to represent a similar profile for sex (48.47% male; 50.94% female) and ethnicity (80.48% white British; Northern Ireland Statistics and Research Agency (NISRA), 2022b; Population and Household Estimates, England and Wales, n.d.; Population of England and Wales, n.d.; Scotland's Census, 2022 – Demography and Migration, n.d.; Scotland's Census, 2022 - Ethnic Group, National Identity, Language and Religion, n.d.) but showed an overrepresentation of highly educated individuals (77.48%) compared to the UK census which reported a high education level of approximately 30% (Northern Ireland Statistics and Research Agency (NISRA), 2022a; Office for National Statistics (ONS), 2023; Scotland's Census, 2022 – Education, Labour Market and Travel to Work, n.d.). Additionally, our sample was older ($M_{age} = 46.79$, $SD_{age} = 15.43$) than the median age reported in the UK census which was about 40 years (Northern Ireland Statistics and Research Agency (NISRA), 2022a, p. 1; Scotland's Census, 2022 – Demography and Migration, n.d.; UK Government, 2022). However, this discrepancy may partly be explained by demographic shifts, such as an aging population. For example, the most recent census in England and Wales was done in 2021, which presented an increase in median age since 2011 (UK Government, 2022). As such, the higher mean age in our current sample may reflect broader demographic trends rather than a sampling issue. Despite discrepancies, particularly in terms of education, our sample closely mirrors the UK population in other key demographics including sex and

ethnicity. This is not surprising as Prolific uses both sex and ethnicity when recruiting a representative UK sample. The current sample characteristics in addition to the overrepresentation of educated individuals is crucial to note when interpreting the prevalence of health and wellbeing in the sample.

The most prevalent outcomes observed in this sample were loneliness (38.45%), insomnia (35.22%), problematic alcohol use (34.55%), and CMDs (30.86%). Though prevalence rates vary, the prevalence of loneliness in the current sample appears notably higher than previously reported rates of loneliness in England, which range from 7% to 22% (NHS Digital, 2023; UK Government, 2024). Notably, these national estimates are derived from a single-item direct measure of loneliness, while the current study employed an indirect measure of loneliness (i.e. UCLA-3). The Community Life Survey, which incorporated the UCLA-3, reported that 10% of adults experienced loneliness (UK Government, 2024) which remains substantially lower than the prevalence of loneliness in the current sample. Secondly, the prevalence of insomnia (35.22%) is slightly higher than prior estimates, which suggest that around 30% of the population self-reporting 'usual' insomnia symptoms (de Lange et al., 2024; Gibson et al., 2023). The implementation of different insomnia measures makes direct comparisons difficult. Additionally, the prevalence of problematic alcohol use (34.55%) in our sample was notably higher than previously reported rates, with 11% reported in England and 18% in Scotland, both measured using the AUDIT (NHS England Digital, 2024; Scottish Government, 2024). This discrepancy highlights how the current sample may be more susceptible to problematic alcohol use compared to prior reports. Finally, the prevalence of CMDs (30.86%) was higher than that reported in recent health surveys, with a reported prevalence of 19% in England (NHS England Digital, 2022), 20% in Northern Ireland (Department of Health, 2024), and 21% in Scotland (Scottish Government, 2024). Although these reports were conducted in separate regions across the UK, which may have unique regional variations, the reported prevalence rates are lower than our current population.

Taken together, these results highlight how this sample exhibits notably higher mental health and functioning difficulties compared to prior research in the general UK population. Additionally, though majority of the sample (89.43%) did not meet classification for PTSD or CPTSD, a total of 252 (10.57%) qualified for caseness for either PTSD or CPTSD. The prevalence of PTSD or CPTSD in our sample is relatively higher than prior research proposing estimates of about 7.2% (e.g. Cloitre et al., 2019; Ho et al., 2024; Hoeboer et al., 2025) however the increased prevalence of CPTSD compared to PTSD in our sample is consistent with prior literature (Cloitre et al., 2019; Ho et al., 2024; Hoeboer et al., 2025). The increased prevalence of mental health and functioning difficulties may be attributed to the current living landscape, marked by rising financial pressure and increased cost of living (Bank of England, 2025; Meadows et al., 2024), alongside additional stressors such as ongoing global conflicts and environmental crises (Krampe et al., 2025; World Economic Forum, 2025). Evidence suggests that global stressors such as economic uncertainty, geopolitical tensions, and climate-related disasters may increase psychological difficulties such as anxiety, depression and psychological distress (American Psychological Association, 2023; Cianconi et al., 2020). Further exploring the potential discrepancy between the poor psychological health in our current sample compared to prior literature was beyond the scope of the current project which focused on PMIEs. Nonetheless, the findings illustrate how this UK representative sample may demonstrate relatively high psychological distress and impaired wellbeing compared to national estimates. Explaining the sample allows for a clearer interpretation of the added impact of PMIE as it provides a necessary population-level backdrop against which the significance of the association between PMIE and health and wellbeing can be understood.

3.2. Impact of PMIE exposure on mental health and well-Being

In total, 59.58% of this representative sample of the UK population reported exposure to a PMIE. The findings of the current study are particularly noteworthy given majority of prior research on PMIEs has focused on high-risk occupational groups. To our knowledge, no study has explored the prevalence of PMIEs in the general population. Interestingly, the prevalence of PMIE exposed individuals in the current population is comparable to or slightly higher than those in potentially high-risk occupations, such as UK military personnel (57%; Biscoe et al., 2023) and healthcare workers during the COVID-19 pandemic (50%; Maftei & Holman, 2021). The findings of the current study highlight the significant presence of PMIEs in the general population and indicate how PMIEs are not confined to high-risk occupation settings. These findings may illustrate how PMIE exposure does not necessarily stem from occupational settings, but such events can exist outside specific environments. The high prevalence of PMIE exposure in the current sample highlights the importance of examining its association with mental health and functioning.

Those who reported PMIE exposure had significantly higher scores on measures of CMDs, physical health, anger, loneliness, PTSD, and CPTSD than those who had not reported PMIE exposure.

Additionally, those who reported PMIE exposure had significantly lower scores on the measure of sleep quality (i.e. worse sleep quality) than those who had not reported PMIE exposure. These findings align with prior research demonstrating that PMIE exposure is associated with a range of psychological challenges, including depression and anxiety (Biscoe et al., 2023; Levi-Belz et al., 2020; Williamson et al., 2021), somatic issues and pain sensitivity (Biscoe et al., 2023; Koenig et al., 2018), CPTSD (Biscoe et al., 2023), and impaired psychosocial functioning such as reduced interpersonal connectedness (Biscoe et al., 2023; Borges et al., 2021). Notably, a previous study did not find a significant association between PMIEs and anger, sleep or PTSD (Biscoe et al., 2023) which is in contrast to the current results. However, all of these prior studies have been conducted in specific populations including the military population and healthcare workers. There is no prior research that explores the association between PMIEs and psychological difficulties in the general population, highlighting the novel nature of the current findings. Notably, there was no significant difference in alcohol use in those who reported PMIE exposure compared to those who did not, suggesting that problematic alcohol use may not be linked to PMIE exposure. Interestingly, the non-significant association between PMIEs and alcohol use was also reported in a recent study which included a veteran sample (Biscoe et al., 2023).

Though this study illuminates the high prevalence of PMIEs in the UK general population, it does not explore the development of moral injury. While exposure to a PMIE is a necessary precondition to the development of moral injury, it is not sufficient, and not everyone who experiences a PMIE will exhibit moral injury (Litz et al., 2022). Therefore, moral injury should be considered as a potential consequence of PMIE exposure (Bonson et al., 2023) rather than an inevitable outcome. This pattern aligns with prior research on trauma exposure and PTSD, which proposes that although trauma exposure is common, majority of individuals exposed to potentially traumatic events will not develop PTSD (Bonanno, 2004). These parallels between PMIE exposure and trauma exposure raise questions about what factors shape whether exposure to PMIE leads to moral injury. Specifically, if PMIE exposure is very common in the general population, there is a need to explore potential protective factors that may limit the likelihood of developing moral injury while simultaneously developing interventions for those who develop moral injury as a result.

3.3. Strengths and limitations

This study has generated important novel findings exploring the presence of PMIEs in a representative UK sample. Strengths of the study include the large sample which enhances external validity, and the inclusion of a comprehensive questionnaire exploring multiple domains. However, several limitations must be acknowledged. The cross-sectional design constrains causal inferences, limiting the ability to determine temporal relationships between PMIE exposure and mental health outcomes. As such, only associations can be inferred. Due to the data collection framework, partially completed surveys were not recorded; therefore, participants who withdrew before finishing the survey were not included in the analyses. As such, we were not able to test for differences between survey completes and non-completers. While this may introduce some participation bias, the findings should be interpreted in the context of an exploratory study. Further, the overrepresentation of highly educated individuals may limit generalisability of findings to the wider UK population, as education has been associated with mental health outcomes (Amin et al., 2023; Belo et al., 2020; Halpern-Manners et al., 2016; Jiang et al., 2020; McCloud et al., 2023). Finally, a significant limitation is the reliance on self-report measures of all mental health and functioning outcomes, which may lead to invalid diagnostic rates compared to true prevalence estimates. Self-report measures are vulnerable to biases such as recall bias and the absence of clinical oversite. Therefore, the diagnoses provided should be interpreted as probable rather than definitive. The lack of clinician-administered measures or interviews may have contributed to inflated or inaccurate classifications, as self-report measures do not provide the opportunity for clinical judgement.

3.4. Future directions

Future research should explore the development of moral injury following PMIE exposure while investigating the influence moral injury has on mental health and functioning. Future studies incorporating clinician administered measures in addition to self-report measures is needed to validate the diagnosis classifications.

4. Conclusion

This study highlights the high prevalence of PMIEs in this UK representative population and their association with a range of mental health difficulties. The findings underscore the importance of recognising PMIE exposure beyond high-risk occupation groups. These insights illuminate the importance of assessing mental health in individuals who report PMIE exposure. Additionally, while limitations exist, the sample appear broadly representative of the UK public. As such, the high burden of mental health

difficulties reported should be noted and suggests the need for screening those who may benefit from support or intervention.

Authors' contributions

Author PH was the lead author and conducted the analysis of the paper. DM gave continual advice and guidance on the direction of the paper to lead author PH. PH and DM both read and approved the final manuscript.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Data availability

The data that support the findings of this study are available from Combat Stress, but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of Combat Stress.

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