



## King's Research Portal

*Document Version*  
Peer reviewed version

[Link to publication record in King's Research Portal](#)

*Citation for published version (APA):*

MacManus, D., Short, R., Lane, R., Jones, M., Hull, L., Howard, L., & Fear, N. (in press). Intimate partner violence and abuse experience and perpetration in UK military personnel compared to a civilian sample: a cross-sectional study. *The Lancet Regional Health - Europe*.

### **Citing this paper**

Please note that where the full-text provided on King's Research Portal is the Author Accepted Manuscript or Post-Print version this may differ from the final Published version. If citing, it is advised that you check and use the publisher's definitive version for pagination, volume/issue, and date of publication details. And where the final published version is provided on the Research Portal, if citing you are again advised to check the publisher's website for any subsequent corrections.

### **General rights**

Copyright and moral rights for the publications made accessible in the Research Portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognize and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the Research Portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the Research Portal

### **Take down policy**

If you believe that this document breaches copyright please contact [librarypure@kcl.ac.uk](mailto:librarypure@kcl.ac.uk) providing details, and we will remove access to the work immediately and investigate your claim.

This is the Author's Accepted Manuscript version of the article: MacManus, D., Short, R., Lane, R., Jones, M., Hull, L., Howard, L.M., Fear, N.T., (2022). Intimate partner violence and abuse experience and perpetration in UK military personnel compared to a civilian sample: a cross-sectional study. *The Lancet Regional Health – Europe*. Accepted for publication on 3<sup>rd</sup> June, 2022.

1

2

3

4

**Intimate Partner Violence and Abuse Experience and Perpetration in UK  
Military Personnel Compared to a General Population Cohort: a Cross-  
Sectional Study**

6

7

8

9

**Authors and affiliations**

11 Dr Deirdre MacManus<sup>1</sup> (deirdre.macmanus@kcl.ac.uk)

12 Dr Roxanna Short<sup>1</sup> (roxanna.short@kcl.ac.uk)

13 Rebecca Lane\* <sup>1</sup> (rebecca.lane@kcl.ac.uk)

14 Margaret Jones<sup>2</sup> (margaret.jones@kcl.ac.uk)

15 Lisa Hull<sup>2</sup> (lisa.hull@kcl.ac.uk)

16 Prof Louise M Howard<sup>3</sup> (louise.howard@kcl.ac.uk)

17 Prof Nicola T Fear<sup>2</sup> (nicola.t.fear@kcl.ac.uk)

18

19 <sup>1</sup> Department of Forensic and Neurodevelopmental Sciences, Institute of Psychiatry,  
20 Psychology and Neuroscience, King's College London, 16 De Crespigny Park,  
21 Camberwell, London SE5 8AB, UK.

22 <sup>2</sup> King's Centre for Military Health Research, King's College London, Weston Education  
23 Centre, 10 Cutcombe Road, London SE5 9RJ, UK.

24 <sup>3</sup> Section of Women's Mental Health, Institute of Psychiatry, Psychology and  
25 Neuroscience, King's College London, Dr Crespigny Park, London SE5 8AF.

26

27

28

29

## Abstract

30 **Background:** Research exploring prevalence of, and factors associated with,  
31 increased risk of experiencing or perpetrating Intimate Partner Violence and Abuse  
32 (IPVA) in military communities is limited. This study aimed to describe IPVA  
33 prevalence in a military sample, explore the role of military-specific risk factors, and  
34 draw comparisons with a general population cohort.

35 **Methods:** We utilised data from a sample of military personnel participating in a cohort  
36 study of the health and wellbeing of UK military personnel who reported having an  
37 intimate relationship in the previous 12 months (n=5,557). To allow for comparison  
38 with civilian populations, participants from a general population cohort study in  
39 England (n=6,075) were matched on age and sex to the military cohort (n=8,093).

40 **Findings:** The 12-month prevalences of IPVA experience and perpetration in the  
41 military sample were 12.80% (95% CI 11.72%-13.96%) and 9.40% (8.45%-10.45%),  
42 respectively. Factors associated with both increased IPVA experience and  
43 perpetration, included childhood adversity, relationship dissatisfaction, military trauma,  
44 and recent mental health and alcohol misuse problems. Compared to the civilian  
45 cohort, adjusted odds (95% CI) of IPVA experience and perpetration were higher in  
46 the military: 2.94 (2.15-4.01) and 3.41 (1.79-6.50), respectively.

47 **Interpretation:** This study found higher prevalences of IPVA experience and  
48 perpetration in the military compared to the general population cohort and highlighted  
49 both non-military and military factors associated with increased risk of both.  
50 Relationship dissatisfaction, military trauma and mental health difficulties mark key  
51 areas for IPVA prevention and management efforts to target.

52 **Funding:** Funded by the UK Ministry of Defence and National Institute of Health  
53 Research.

54

56 *Evidence before this study*

57 Four electronic searches were conducted using six bibliographic databases  
58 (EMBASE, MEDLINE, PsycINFO, Science Direct and Web of Science (including SCI,  
59 SSCI)) to identify studies which (i) estimated the prevalence of IPVA perpetration  
60 among military populations (serving and ex-serving); (ii) reported the risk of IPVA  
61 perpetration among those with and without mental disorder or vice versa, and/or a  
62 measure of association between IPVA perpetration and mental disorder; (iii) estimated  
63 the prevalence of IPV experience among military populations (serving and ex-serving);  
64 and (iv) reported the risk of IPV experience among those with and without mental  
65 disorder or vice versa, and/or a measure of association between IPVA experience and  
66 mental disorder. Medical Subject Headings (MeSH) and keywords were used for  
67 electronic searches. There were no language restrictions and databases were  
68 searched from inception until March 17, 2021. Studies were eligible if they: (i) included  
69 male and/or female serving, Reserve or ex-serving military personnel and/or their  
70 intimate partners; (ii) used a validated measure of IPV perpetration or experience,  
71 adapted questions or objective measures such as military records; (iii) measured  
72 mental health outcomes using a validated diagnostic or screening tool; (iv) were  
73 published in a peer-reviewed journal; (v) used an eligible study design (e.g.  
74 randomised control trial, cohort study, cross-sectional study, etc.); and (vi) reported  
75 prevalence of IPV perpetration or experience or presented data from which these  
76 statistics could be calculated. Quality appraisal of the included studies was conducted  
77 using a checklist adapted from validated tools giving each study a final appraisal score.  
78 Studies were categorised as high quality if they scored  $\geq 50\%$  on questions pertaining  
79 to selection bias.

80

81 48 studies of IPVA perpetration and 39 studies of IPVA experience were eligible for  
82 inclusion. There were no UK studies included. Among studies that measured the  
83 prevalence rates of IPVA perpetration, emotional and psychological IPVA was the  
84 most prevalent type of abuse, in keeping with findings from civilian populations. In  
85 most studies which disaggregated the data by gender, past-year physical IPV  
86 perpetration was higher among males than females. There were consistently higher  
87 prevalence estimates of IPVA perpetration among Veterans compared to Active Duty  
88 samples. Among studies that measured IPVA experience, psychological IPVA was  
89 again the most prevalent type of abuse, as also seen in civilian populations. In studies  
90 which disaggregated the data by gender, similar or higher prevalence rates of physical  
91 IPV victimisation were found among males compared to females. There were no  
92 studies on sexual IPV victimisation among male personnel. Evidence for the impact of  
93 military factors, such as deployment or rank, on IPVA perpetration or victimisation was  
94 conflicting. A range of mental health problems were strongly associated with both IPVA  
95 perpetration (PTSD and depression) and experience (depression and PTSD), as was  
96 alcohol misuse. A small number of studies compared prevalence of perpetration and  
97 experience in a military population to the corresponding civilian population. While the

98 prevalence in the military was mostly found to be significantly higher than in civilian  
99 populations, such comparisons were often crude or only adjusted for minimal potential  
100 group differences such as age and gender.

101

102

### 103 *Added value of this study*

104 This study adds to the existing evidence base for the prevalence of and risk factors for  
105 IPVA in the UK, especially enhancing understanding of IPVA in population subgroups,  
106 such as the UK military as a whole and in particular military men. We were able to  
107 estimate the past year prevalence of different types of IPVA, as per the WHO  
108 definition, compare prevalence in males and females (providing novel evidence of  
109 higher rates of experience of IPVA than perpetration among military personnel, even  
110 males), as well as identify high rates of bidirectionality. We were also able to examine  
111 the association of a range of non-military, military and mental health related factors  
112 with IPVA and in doing so we have identified key at risk groups, identified military  
113 specific risk factors for and the importance of mental health problems and alcohol  
114 misuse in both IPVA perpetration and experience. Importantly, we were also able to  
115 undertake a comparison of IPVA prevalence among males and females in the UK  
116 military with those in the civilian population, adjust for key population differences such  
117 as age, relationship status, educational achievement, socioeconomic status, and  
118 childhood abuse to achieve a more robust military vs civilian comparison than has  
119 been achieved to date.

120

### 121 *Implications of all the available evidence*

122 The available evidence sheds light on the scale of the problem of IPVA in military  
123 communities (of serving and ex-serving personnel) and the need for a Domestic Abuse  
124 Strategy for the UK military which is separate to the national government strategy.  
125 Mounting evidence of specific at-risk groups, such as those serving in the Army, who  
126 report early adversity, have been exposed to deployment trauma and report  
127 relationship dissatisfaction, must inform the further development of more targeted  
128 approaches to the prevention, identification and management of IPVA. Importantly,  
129 there is strong evidence for the role of mental health problems and alcohol misuse in  
130 both IPVA perpetration and experience, understanding of which needs to be  
131 incorporated into broader prevention strategies as well as specific perpetrator and  
132 victim support programmes. Mental health services must form a core element of any  
133 IPVA reduction and management strategy.

134

135

## Introduction

136 Intimate Partner Violence and Abuse (IPVA) represents a major health, social and  
137 economic cost to society<sup>1</sup> and has been of heightened concern in the UK in light of  
138 evidence of increased incidence during the Covid-19 pandemic<sup>2</sup>. International  
139 research indicates that both perpetration and experience of IPVA are prevalent among  
140 military personnel and may be more prevalent than in civilian populations<sup>3,4</sup>. However,  
141 crude comparisons of prevalence among military and civilian populations have been  
142 limited by lack of adjustment for population differences, such as in socio-demographic  
143 characteristics or early life factors, that may be associated with IPVA<sup>5-8</sup>.

144 Research into drivers of IPVA in civilian populations has argued that risk factors  
145 operate at multiple levels: structural risk factors in society, such as those relating to  
146 poverty, gender inequality and the normalisation of violence in relationships, as well  
147 as relationship and individual risk factors, such as mental health, substance misuse  
148 and experience of childhood trauma<sup>9-11</sup>. In addition to generic risk factors, Gibbs and  
149 colleagues<sup>9</sup> view armed conflict as a significant additional driver of IPVA in some  
150 communities due in part to increased risk factors at an individual level through  
151 exposure to traumatic events and the chronic stress of living under constant threat of  
152 attack resulting in worsened mental health and substance misuse. Research among  
153 military groups specifically has highlighted demographic and early life factors  
154 associated with IPVA perpetration and/or experience of IPVA, including age, gender,  
155 marital status, level of educational attainment<sup>6-8</sup>. As in civilian research, mental health  
156 and lifestyle factors are also likely to play a role in IPVA perpetration and experience  
157 among military personnel, in particular depression, anxiety, PTSD and alcohol  
158 misuse<sup>6,8,12,13</sup>. In addition, couples in the military community can be exposed to unique  
159 stressors related to military experiences, such as frequent relocations, deployments  
160 and separations, which can negatively impact relationships and increase likelihood of  
161 IPVA perpetration and/or experience of IPVA<sup>3,7,14</sup>. However, research to date has  
162 largely focussed on deployed US military personnel and IPVA perpetration. There  
163 remains a dearth of research examining IPVA experience and perpetration by a range  
164 of military characteristics (e.g. Service branch, rank, status), which would support the  
165 military and the veteran community in the identification and targeted management of  
166 IPVA.

167 The UK Government launched the Domestic Abuse Act in 2021<sup>15</sup>. In recognition of  
168 potential differences in IPVA experiences and presentations among military personnel,  
169 the Ministry of Defence have published their own Domestic Abuse strategy<sup>16</sup>.  
170 Exploration of IPVA in the UK military community is much needed, along with a robust  
171 comparison with the civilian population, to inform how to improve identification of  
172 victim-survivors and perpetrators of IPVA in military samples. To address these gaps,  
173 this study aimed to utilise data from an existing UK military cohort study to describe  
174 IPVA prevalence; to explore military-specific factors associated with IPVA perpetration  
175 and/or experience of IPVA; and to draw comparisons with a general population cohort.

176

## Methods

### **Study design and data**

We conducted a cross-sectional analysis of two surveys: the King's Centre for Military Health Research (KCMHR) cohort study<sup>17</sup>, an ongoing study exploring the health and wellbeing of UK military personnel; and the 2014 Adult Psychiatric Morbidity Survey (APMS), which examined the prevalence of psychiatric disorders in a large cohort living in private households in England<sup>18</sup>. From these, we constructed two separate samples: first, a military sample using data from Phase 3 of the KCMHR cohort study; and second, a matched civilian and military sample using data from both surveys.<sup>1</sup>

### **Military sample**

Phase 3 KCMHR data were collected by questionnaire between October 2014 and December 2016. Full details of previous waves, as well as details of the randomised stratified sampling strategy, response weighting, and data collection procedures are reported in Stevelink and colleagues<sup>17</sup>.

In Phase 3, serving and ex-serving UK military personnel (n=8,093) completed the self-administered questionnaire, with a 44% response rate. The questionnaire required participants to only answer questions on IPVA if they reported having an intimate partner in the previous 12 months. Thus, we excluded individuals who did not report having an intimate partner in the previous 12 months from the sample. This left a final sample for analysis of N=5,557 (68.7% of Phase 3 respondents).

### **Military and Civilian comparison sample**

We constructed the military and civilian comparison sample using the full KCMHR Phase 3 cohort (N=8,093) – i.e. not just those who reported having had a partner in the previous 12 months. This was to allow comparison with the APMS survey, which asked whether the IPVA occurred in the previous 12 months (irrespective of whether the respondent had a partner or not). From the full Phase one APMS cohort (N=7,546, 57% response rate), we excluded participants outside the age range of the military cohort (aged 18 or younger, or aged over 74, n=1,210) or who reported ever serving in the armed forces (n=518). The remaining APMS sample (n=6,075) were matched on age and sex to KCMHR data using entropy balancing, a multivariate reweighting method to ensure comparability<sup>19</sup> (see Supplementary Table S1 for sample characteristics). Full details relating to the APMS Phase one sampling is reported by McManus and colleagues<sup>18</sup>.

## **Measures<sup>2</sup>**

### **Socio-demographic and background characteristics**

We examined data on sex, age (20-34, 35-44, 45-54, 55 and over), relationship status/satisfaction (military sample: single/divorced/separated/widowed, satisfied relationship, or dissatisfied relationship; comparison sample: married/in a relationship, or single/divorced/separated/widowed), level of education (no qualification/O level

---

<sup>1</sup> Brief details of the KCMHR and APMS cohorts are provided in the Supplementary Materials

<sup>2</sup> See also Supplementary Table S2

217 equivalent, or A-level/degree level), and SES (high/low; based on National Statistics  
218 Socio-economic Classification [NS-SEC-5] for civilians and ex-military personnel, and  
219 based on rank for serving military personnel).

### 220 *Childhood adversity*

221 Military participants were asked 16 true/false questions about their experiences (both  
222 adverse and protective) during childhood<sup>20</sup>. Endorsed items were summed to create a  
223 vulnerability count: 0-2 (low); 3-5 (moderate); and 6 or more (high). Only one item,  
224 capturing childhood physical abuse, was comparable across KCMHR and APMS  
225 surveys, though there were some minor differences: “Not including smacking, before  
226 you were 18, did an adult in your life hit, beat, kick, or physically hurt you in any way?”  
227 (APMS); “I used to be hit/hurt by a parent or caregiver regularly.” (KCMHR). Therefore,  
228 in our comparison of military and civilian IPVA prevalence we adjusted for childhood  
229 physical abuse only.

### 230 *Military characteristics*

231 These included: currently serving (yes/no); service type (regular, reserve); service  
232 (Navy, Army, Royal Air Force (RAF)); rank (Officer, non-commissioned officer (NCO),  
233 Other); deployment to Iraq and/or Afghanistan (not deployed, deployed in a combat  
234 role, or deployed in a non-combat role); and military trauma during deployment – a  
235 cumulative score derived from endorsing an experience (13 in total) and the number  
236 of times they had experienced. Scores ranged from 0 to 52 [median = 5, IQR 2-12],  
237 and were categorised into: 0, none; 1-5, mild; 6-12, moderate; and 13 or over, severe.

### 238 *Mental health factors (military sample)*

239 The following measures and scorings were utilised: Caseness of common mental  
240 disorder (CMD) using a cut-off score of 4 or more on the General Health Questionnaire  
241 (GHQ-12)<sup>21</sup>; Probable posttraumatic stress disorder (PTSD) using a cut-off of 50 or  
242 more on the PTSD Checklist (PCL-5)<sup>22</sup>; Harmful drinking using a cut-off of 16 or more  
243 on the Alcohol Use Disorders Identification Test (AUDIT)<sup>23</sup>; Difficulties with anger  
244 using a score of 12 or above on the Dimensions of Anger Reactions (DAR-7)<sup>24</sup>.

### 245 *IPVA Outcomes*

246 Both KCMHR and APMS used measures of IPVA experience and perpetration,  
247 adapted from the British Crime Survey, considered compatible despite minor  
248 differences between the questions asked in the surveys (Supplementary Table S3).  
249 All respondents were asked a series of questions that targeted four types of IPVA as  
250 defined by the World Health Organisation<sup>25</sup>: emotional abuse (e.g. belittling,  
251 humiliating), psychological abuse (e.g. threatening behaviour, verbal aggression),  
252 physical violence or sexual violence. All IPVA outcomes were analysed in the military  
253 sample, but only the IPVA questions that were common to both KCMHR and APMS  
254 questionnaires were compared in the military and civilian comparison sample. Military  
255 participants who reported both IPVA experience and perpetration were assumed to be  
256 reporting bidirectional abuse within the same relationship. IPVA outcomes for the  
257 military sample were grouped into non-physical (emotional abuse, psychological



258 abuse and controlling behaviours; “EPC abuse”) and physical forms of abuse (physical  
259 and sexual abuse; “P/S abuse”).

### 260 **Statistical Analysis**

261 Military sample: prevalence estimates are reported as weighted proportions with their  
262 95% confidence intervals (CI), and stratified by sex. Due to the low number of IPVA  
263 outcomes among females, we restricted the regression analyses to males only.  
264 Univariable and multivariable logistic regression analyses were used to examine crude  
265 and independent associations between each IPVA outcome and the socio-  
266 demographic, military, and mental health factors in the military sample. Any socio-  
267 demographic, military, or pre-enlistment variable that was independently associated  
268 with each IPVA outcome was retained as a covariate in subsequent adjusted models  
269 examining the independent associations between each IPVA outcome and  
270 deployment and mental health factors. To account for sampling and response rates<sup>17</sup>,  
271 all analysis estimates were weighted using Stata’s SVY functions. Further elaboration  
272 of the survey weights is provided in the Supplementary Materials.

273 Military and civilian comparison sample: adjusted logistic regression analyses were  
274 used to compare IPVA prevalences in the military and civilian comparison samples  
275 after accounting for socio-demographic characteristics, stratified by sex. In order to  
276 account for the socio-demographic differences between the military and civilian  
277 samples, separate models were calculated and adjusted for: age only; age and  
278 relationship status; age and education level; age and SES; age and childhood physical  
279 abuse; and all covariates. As a supplementary analysis, the associations between  
280 socio-demographic characteristics and IPVA were assessed in KCMHR and APMS  
281 samples separately, adjusting for age and sex, using logistic regression models.

282 Throughout, frequencies are crude, and percentages are reported as weighted.  
283 Results from the crude analyses are reported as odds ratios (OR) with 95% CI; and  
284 the results from the adjusted analyses are reported as adjusted ORs (aOR) with 95%  
285 CI. We used a complete-case analysis approach to missing data. All analyses were  
286 conducted in Stata 16.

### 287 **Role of the funding source**

288 The UK MoD funded this cohort study. However, the funder had no role in the  
289 design, analysis, interpretation or decision to submit this paper. The paper was  
290 disclosed to the MoD prior to submission for publication. The first author was funded  
291 by a National Institute of Health Research fellowship.

292

## 293 **Results**

### 294 **Sample characteristics**

295 The military sample comprised 5,557 respondents who reported having a partner in  
296 the previous 12 months (Table 1). The majority of the sample were males (n=4,865,  
297 90%), with a median (IQR) age of 38 (30-47). 69% reported educational achievement  
298 of A-level (college-level equivalent) or above. 44% were serving members, and most

299 were in regular service (91%), served in the Army (65%), and in the rank of a non-  
300 commissioned officer (65%). 64% had deployed to Iraq or Afghanistan, of whom 29%  
301 were deployed in a combat/combat support role.

### 302 ***Prevalence of Self-reported Intimate Partner Violence and Abuse***

303 The prevalence of total reported IPVA experience was higher than perpetration  
304 (12.80% [95% CI 11.72%-13.96%] vs 9.40% [8.45%-10.45%];  $F=32.84$ ,  $p<0.001$ ;  
305 Figure 1 and Supplementary Table S4). This pattern was observed for P/S abuse, as  
306 well as for EPC abuse. The prevalence of IPVA perpetration was higher among males  
307 than females (9.71% [8.68%-10.85%] vs 6.57% [4.75%-8.99%];  $F=6.89$ ,  $p=0.009$ ),  
308 driven by the sex difference in EPC abuse. Rates of experience were similar among  
309 males and females (12.98% [11.83%-14.23%] vs 11.13% [8.62%-14.25%];  $F=1.43$ ,  
310  $p=0.23$ ).

311 Males were more likely to report EPC abuse perpetration than females (8.01% [95%  
312 CI 7.07%-9.07%] vs 3.96% [2.69%-5.80%];  $F=19.08$ ,  $p<0.001$ ), driven predominantly  
313 by the higher prevalence of humiliating and frightening/threatening types of abuse.  
314 Indeed, only males reported frightening/threatening their partners. Rates of  
315 experience of EPC abuse were similar in males and females (11.06% [9.99%-12.22%]  
316 vs 9.80% [7.44%-12.80%];  $F=0.74$ ,  $p=0.39$ ), but only women reported experiencing  
317 fear/threats. Less severe physical abuse perpetration (pushed, held, slapped etc) was  
318 more common than more severe abuse (kicked, bit, hit) among both sexes. Males and  
319 females were just as likely to report severe physical abuse perpetration, (0.86%  
320 [0.58%-1.27%] vs 1.71% [0.86%-3.37%];  $F=1.91$ ,  $p=0.17$ ), and males were more likely  
321 to report experience of severe physical abuse than females (3.0% [2.43%-3.75%] vs  
322 1.33% [0.64%-2.76%];  $F=7.84$ ,  $p=0.005$ ). Perpetration of forced acts of sex was only  
323 reported by males. The prevalence of experience of sexual abuse was low, but of  
324 note it was reported by both sexes.

325 Bidirectional abuse was also common: 4.94% of military personnel reported both  
326 perpetration and experience of either EPC or P/S abuse; 52.74% (95% CI 47.09%-  
327 58.31%) of those who reported IPVA perpetration reported a form of IPVA experience  
328 and 38.61% (34.10%-43.32%) of those reporting IPVA experience reported a form of  
329 perpetration. No significant sex differences were observed.

### 330 ***Non-military and military factors associated with IPVA among males within the*** 331 ***military sample***

332 Relationship dissatisfaction or not being in a relationship at the time of questionnaire  
333 completion (having been in one during the previous 12 months) and increased  
334 childhood adversity were the non-military and non-mental health factors which were  
335 most strongly independently associated with both IPVA perpetration and experience.  
336 In addition, male sex was independently associated with EPC perpetration, lower  
337 educational attainment was independently associated with P/S perpetration. Further,  
338 being aged 45 and older (compared to being aged under 35) was associated with  
339 reduced odds of P/S and EPC abuse experience. Few military factors were associated  
340 with IPVA. Service Branch (i.e. being in the RAF compared to the Army) was

341 independently associated with reduced odds of EPC abuse perpetration. Service  
342 branch (being in the Naval Services, compared to the Army) was independently  
343 associated with reduced odds of P/S abuse experience. No other military  
344 characteristic was independently associated with any IPVA outcome, but military  
345 deployment experiences were found to be important. Being deployed in a combat role  
346 was independently associated with EPC abuse experience, though not any type of  
347 perpetration, while exposure to military trauma was independently associated with  
348 EPC and P/S abuse perpetration (severe trauma vs none), and experience of EPC  
349 abuse (moderate trauma vs none). Measures of current mental health were the  
350 variables most strongly associated with IPVA (Tables 2 and 3). Probable PTSD, anger  
351 management difficulties and alcohol misuse were strongly and independently  
352 associated with all types of IPVA perpetration and experience. Probable CMD was  
353 associated with EPC perpetration, and all types of IPVA experience. All crude odds  
354 ratios are presented in Supplementary Table S5.

### 355 ***Military and Civilian comparison***

356 Within the matched military and civilian sample, using weighted comparisons, the odds  
357 of IPVA perpetration was significantly higher among military personnel compared to  
358 civilians: aOR 3.41 (95%CI 1.79-6.50) (Table 4). This was found for both males and  
359 females, 3.69 (1.73-7.88) and 1.85 (1.02-3.35) respectively. Similarly, the odds of any  
360 type of IPVA experience was significantly higher among military personnel compared  
361 to civilians: aOR 2.94 (95%CI 2.15-4.01). This was again found for both males and  
362 females: 3.12 (2.18-4.47) and 1.87 (1.29-2.70) respectively. See Supplementary Table  
363 S6 for the association of socio-demographic characteristics with perpetration and  
364 experience of IPVA among the military and civilian samples.

365

### 366 **Discussion**

367 This study describes IPVA prevalence in a large UK military sample, draws  
368 comparisons with a general population cohort and examines the non-military and  
369 military factors associated with IPVA in military males. Our findings suggest that both  
370 IPVA experience and perpetration are prevalent among UK military personnel,  
371 although rates were lower than in studies of military samples internationally<sup>3,4,7</sup>.  
372 Patterns of IPVA in our sample were however similar to those found in international  
373 military populations.

374 Experience of IPVA was more commonly reported than perpetration, although both  
375 were prevalent, and less physically injurious forms of abuse predominated, replicating  
376 IPVA patterns observed in military populations internationally<sup>3,4</sup>. Overall, IPVA  
377 perpetration was more commonly reported by males than females, driven by increased  
378 reporting of EPC abuse perpetration by males, in particular humiliating and  
379 frightening/threatening types of abuse, supporting earlier research<sup>6</sup>. Qualitative  
380 research has described how aspects of military socialisation, such as  
381 aggressive/threatening styles of communication and controlling behaviours, can  
382 extend beyond the military environment and into relationships<sup>26</sup>. The results of the

383 current study suggest that this phenomenon might be more prominent among male  
384 personnel. It is of note that only females reported feeling frightened or threatened by  
385 their partners. This may support literature suggesting that experiences of men and  
386 women are different, with one key difference being that violence by men against  
387 women is experienced by women within a context of real fear<sup>27</sup>. However, there is  
388 research evidence that some males may underreport feeling fearful or threatened as  
389 it undermines their sense of masculinity<sup>28</sup> or may minimise or trivialise such  
390 experiences as a result of gender socialisation which may be more pronounced in  
391 military communities<sup>29,30</sup>. In keeping with some civilian studies<sup>5</sup>, sex differences were  
392 not observed in the perpetration of physical IPVA. The prevalence of IPVA experience  
393 was more evenly distributed between sexes, contrasting with international military  
394 studies which found higher rates of male IPVA experience<sup>4</sup>. However, this is still in  
395 contrast to civilian studies which generally find higher rates of IPVA experience among  
396 females<sup>31</sup>. Bidirectional abuse was common within military relationships, consistent  
397 with research exploring IPVA among military couples in the US and Canada<sup>7,32</sup>.

398 IPVA perpetration and experience of IPVA were not as clearly associated with socio-  
399 demographic factors within the military sample as has been found in civilian research<sup>5</sup>.  
400 The association with sex was nuanced and mostly apparent when looking at EPC  
401 perpetration, and lower educational attainment was only found to be independently  
402 associated with perpetration of P/S abuse. Our finding that individuals who are recently  
403 single are more at risk of harm accords with previous findings<sup>5</sup> and highlights this  
404 group as particularly vulnerable. No further socio-demographic factors were found to  
405 be key correlates. Increased childhood adversity was strongly independently  
406 associated with all types of IPVA perpetration and experience, replicating previous  
407 findings from military studies<sup>6,7</sup> and highlighting the role of early life vulnerability in  
408 both IPVA perpetration and experience. Relationship dissatisfaction was another key  
409 factor associated with both IPVA perpetration and experience, supporting previous  
410 findings<sup>6,7</sup>.

411 Limited existing research has not shown the prevalence of IPVA to consistently vary  
412 by specific military characteristics, except being higher among Army personnel<sup>3,4</sup>, in  
413 keeping with research into general violence perpetration<sup>33</sup>. Resonating with these  
414 findings, the only military characteristic independently associated with IPVA was  
415 Service branch. Being in the Army was independently associated with higher risk of  
416 all types of IPVA perpetration compared to RAF and the prevalence of P/S abuse  
417 experience was significantly higher in the Army compared to RAF and Navy. In-depth  
418 qualitative research has shed some light on possible mechanisms for these  
419 associations, including military training and hierarchy, styles of communication, and  
420 experiences of deployment and military traumas<sup>26</sup>. While all these issues are relevant  
421 across the Service Branches, they may be more pronounced among Army personnel.

422 Contrary to international studies of veteran populations reporting higher prevalence of  
423 IPVA perpetration compared to studies of active duty personnel<sup>3</sup>, no differences in  
424 perpetration or experience rates were found by serving status. Some studies have

425 found higher prevalence of IPVA among lower ranks (enlisted personnel) when  
426 compared to higher ranks (officers)<sup>3</sup>. This study also found higher prevalence of all  
427 types of IPVA perpetration and experience of P/S abuse experience in lower ranks  
428 compared to officers, but the association was not maintained after adjustment for  
429 socio-demographic and military confounders. No significant difference in prevalence  
430 rates between regulars and reserves was found, adding to existing limited research<sup>4</sup>.

431 Deployment-related factors and mental health and alcohol misuse problems were  
432 found to be key factors associated with abusive behaviours within relationships. A  
433 small number of previous studies have explored the impact of deployment and combat  
434 on the risk of IPVA, with mixed findings<sup>3,4</sup>. Our findings suggest that previous  
435 deployment experience or role while on deployment were not independently  
436 associated with any type of IPVA perpetration, but that being deployed in a combat  
437 role was associated with an increased risk of EPC abuse experience. Of note,  
438 however, intensity of exposure to trauma while on deployment was associated with  
439 increased risk of perpetration of all types of IPVA and EPC abuse experience, adding  
440 to the mounting evidence for the link between deployment-related trauma and IPVA  
441 perpetration<sup>8,34</sup>. Intensity of trauma exposure was also found to be associated with  
442 IPVA experience among military personnel, which is a new finding, and highlights a  
443 broader vulnerability associated with traumatic experiences beyond the risk of  
444 perpetration. Supporting existing literature, probable mental health difficulties and  
445 alcohol misuse were strongly and independently associated with IPVA perpetration  
446 and experience (probable CMD associated with EPC abuse perpetration only)<sup>6,8,12,13</sup>.  
447 This adds to recent research finding an association between IPVA and post-  
448 deployment mental health difficulties<sup>34</sup>. Qualitative work has facilitated better  
449 understanding of the complexity and nuances of the association between deployment,  
450 mental health difficulties and both IPVA perpetration and experience, the different  
451 potential underlying pathways and mechanisms, and different contexts in which it can  
452 arise<sup>26</sup>. For example, in studies of the impact of military service in relationships, many  
453 participants described mutually conflictual relationships<sup>26</sup>. In the context of such  
454 relationships, some participants described how the experience of being deployed in a  
455 combat role and experiencing trauma could result in them returning with problems with  
456 emotional hyperarousal, perhaps in the context of PTSD, which resulted in them  
457 engaging in increased aggressive behaviour within their relationship. Whereas others  
458 reported the return from combat to be associated with mental health difficulties which  
459 resulted in their withdrawal from their partner, increased arguments and shifts in the  
460 power dynamics within their relationships resulting in them experiencing more  
461 controlling behaviours by their partners.

462 Using the best available UK general population comparison sample<sup>18</sup>, our findings  
463 suggest that self-reported IPVA experience and perpetration was significantly higher  
464 in the military compared to the general population cohort for both males and females  
465 even after adjustment for population differences in socio-demographics and early life  
466 abuse, which were found to be associated with IPVA in both populations  
467 (Supplementary Table S4). This is consistent with crude findings from preliminary

468 systematic reviews undertaken by our group<sup>3,4</sup>. Both military and non-military factors  
469 which were shown to be associated with increased risk of IPVA in the military sample  
470 may provide possible explanations for the increased IPVA compared to the general  
471 population cohort. Recent research studies have described how military life and  
472 experiences can negatively affect relationship satisfaction and occurrence of abusive  
473 behaviours in relationships<sup>26</sup> and found higher prevalence of mental health and alcohol  
474 difficulties in military compared to civilian samples<sup>35</sup>. In particular, the current study  
475 suggests that the psychological and behavioural consequences of deployment trauma  
476 as well as increased mental health and alcohol problems may in part explain the  
477 increased prevalence of IPVA in the military compared to the UK general population  
478 cohort.

479 This study provides the first estimates for IPVA prevalence in the UK military and a  
480 robust comparison with a large general population cohort. Extrapolation of these  
481 findings to countries outside of the UK is potentially limited by differences in the  
482 experiences of military personnel as well as differences in prevalence of civilian IPVA.  
483 Given the paucity of studies researching male experience of IPVA<sup>4</sup>, this study  
484 represents a major contribution to the literature. However, lack of data from  
485 partners'/spouses' and on the context of the IPVA was a limitation which restricted  
486 interpretation. For example, it was not possible to categorise acts of perpetration as  
487 occurring in the context of a mutually conflictual relationship or in self-  
488 defence/retaliation. The use of the term 'perpetration' is therefore problematic in light  
489 of this lack of contextual or partner data. Despite the large sample size, low numbers  
490 of female personnel precluded our ability to explore risk factors in females only. Our  
491 findings may underestimate prevalence of IPVA in the military sample, as our measure  
492 excluded those who may have experienced IPVA by or perpetrated it against an ex-  
493 partner within the last year. As in other population studies of IPVA<sup>36</sup>, we suspect a  
494 tendency to under-report more severe IPVA in this study too. It is likely that a  
495 proportion of what is reported is 'situational couples' violence', especially given the  
496 level of bidirectional abuse reported, though further information on the bidirectional  
497 nature of abuse within military relationships (e.g. symmetry) was limited. The risk  
498 factors may be more reflective of those associated with this type of IPVA rather than  
499 more severe unidirectional abuse. Furthermore, low reporting of sexual IPVA did not  
500 allow for further analysis. Importantly, this study did not measure frequency or impact  
501 of IPVA or the nature of relationships, e.g. heterosexual/homosexual. Such measures  
502 are critical to understanding sex differences in IPVA experiences beyond just  
503 incidence of perpetration and victimisation<sup>37</sup>. Although not the focus of the study,  
504 ethnicity is not adjusted for in the present analysis. This study made direct comparison  
505 between IPVA in the military sample and IPVA in a civilian dataset. The IPVA  
506 questions asked of the general population cohort were very similar to those asked of  
507 the military sample, but not exactly the same, which may have explained some of the  
508 discrepancy in prevalences between the two populations. Although adjustments were  
509 made for a number of differences between the populations, we could not adjust for  
510 variables for which we did not collect data. The number of questions asked for each

511 IPVA outcome had to be restricted to two due to the size of the overall questionnaire.  
512 It is best practice to have more questions on each type of violence. Further research  
513 should examine lifetime prevalence of IPVA among personnel and include measures  
514 of frequency and impact of IPVA, explore sexual IPVA and bidirectional abuse in more  
515 depth, and the role of ethnicity, which may differentially impact risk of IPVA<sup>6,8</sup>.

516 The present research provides robust evidence of high prevalence of both IPVA  
517 perpetration and victimisation among military personnel. It further confirms that, similar  
518 to international military populations, male experience of IPVA and bidirectional IPVA  
519 is prevalent. These findings warrant further exploration of what male experience of  
520 IPVA looks like in terms of frequency and impact, and consideration of the effect of  
521 bidirectional abuse within relationships both on the partners involved and others in the  
522 household who may be exposed, particularly children. These findings add to the  
523 growing literature on drivers of IPVA in wider society<sup>9</sup> with critical information on  
524 drivers of IPVA in military populations. Exposure to military trauma and elevated  
525 prevalence of probable mental disorders and alcohol misuse, all of which are  
526 associated with IPVA perpetration and victimisation, mark key potential differences  
527 between the military and civilian samples in this study. The higher prevalence of both  
528 perpetration and victimisation in the Army requires further attention and qualitative  
529 research is key to understanding the underlying reasons<sup>26</sup>. These findings will support  
530 the development of effective IPVA prevention interventions for this population in the  
531 UK. They underline the role that mental health services can and should play in the  
532 prevention, identification and management of IPVA in military communities and, in  
533 particular, highlight the need for trauma informed IPVA interventions as have been  
534 developed in the US, such as the Strength at Home, Veteran's Program, which  
535 incorporates components of interventions for IPVA and trauma, targets mechanisms  
536 implicated in the relationship between trauma and IPVA, and has shown promise in  
537 randomised controlled trials<sup>38</sup>. Together, the findings from this study will support the  
538 further refinement of the UK Government military specific Domestic Abuse Strategy<sup>16</sup>  
539 to ensure tailored support for military communities in the UK.

540

541

### **Contributors**

542 DM was responsible for the conception and design of the project, the analyses, and  
543 the writing and revision of the manuscript. RS was responsible for the data  
544 management, analyses and contributed to the writing and revision of the manuscript.  
545 RL was involved in the writing, submission and revision of the manuscript. MJ  
546 contributed to the design and data management and writing and revision of the  
547 manuscript. LH was responsible for project management of the KCMHR cohort study  
548 and hence collection of the data used for this manuscript and the writing of the  
549 manuscript. LMH was an advisor on the research project and contributed to the writing  
550 of the manuscript. NF was responsible for the design and data collection for the  
551 KCMHR cohort study and contributed to the design of the project, analyses and writing  
552 of the manuscript.

553

554

### **Declarations of interest**

555 DM was funded by a research fellowship from the National Institute of Health  
556 Research. NF, MJ and LH were funded by the UK Ministry of Defence for the duration  
557 of the study reported in this manuscript. NF is a specialist academic member of the  
558 independent group advising NHS Digital on the release of patient data. LMH is part  
559 funded by the UK Research and Innovation Violence, Abuse and Mental Health  
560 Network.

561

562

563

### **Acknowledgements**

564 The UK Ministry of Defence funded the original research study from which data was  
565 used for the purposes of this paper. The National Institute for Health Research funded  
566 the research study which included analysis of the aforementioned data. The authors'  
567 work was independent of the UK Ministry of Defence, which had no role in the analysis,  
568 interpretation or decision to submit this paper. We disclosed the paper to the Ministry  
569 of Defence at the point we submitted it for publication.

570

571

### **Data Sharing Statement**

572 Data are available on reasonable request. Given the sensitive nature of the data, data  
573 have not been made widely available. Requests for data will be considered on a case-  
574 by-case basis and will be subject to appropriate ethical and any other required  
575 approvals.

576

577

578



## References

- 579  
580
- 581 1. Oliver R, Alexander B, Roe S, Wlasny M. The economic and social costs of  
582 domestic abuse. *UK Home Office*. 2019.
  - 583 2. Campbell AM. An increasing risk of family violence during the Covid-19  
584 pandemic: Strengthening community collaborations to save lives. *Forensic Science*  
585 *International: Reports*. 2020;**2**.
  - 586 3. Kwan J, Sparrow K, Facer-Irwin E, Thandi G, Fear N, MacManus D.  
587 Prevalence of intimate partner violence perpetration among military populations: A  
588 systematic review and meta-analysis. *Aggression and violent behavior*.  
589 2020:101419.
  - 590 4. Sparrow K, Dickson H, Kwan J, Howard L, Fear N, MacManus D. Prevalence  
591 of Self-Reported Intimate Partner Violence Victimization Among Military Personnel: A  
592 Systematic Review and Meta-Analysis. *Trauma Violence Abuse*. 2020;**21**(3):586-  
593 609.
  - 594 5. Capaldi DM, Knoble NB, Shortt JW, Kim HK. A systematic review of risk  
595 factors for intimate partner violence. *Partner abuse*. 2012;**3**(2):231-80.
  - 596 6. Fonseca CA, Schmalings KB, Stoeber C, Gutierrez C, Blume AW, Russell ML.  
597 Variables associated with intimate partner violence in a deploying military sample.  
598 *Mil Med*. 2006;**171**(7):627-31.
  - 599 7. Zamorski MA, Wiens-Kinkaid ME. Cross-sectional prevalence survey of  
600 intimate partner violence perpetration and victimization in Canadian military  
601 personnel. *BMC Public Health*. 2013;**13**:1019.
  - 602 8. Cancio R, Altal D. Comparing post-gulf war and post-9/11 era of service  
603 among veterans: intimate partner violence and substance use by race and ethnicity.  
604 *Journal of ethnicity in substance abuse*. 2019.
  - 605 9. Gibbs A, Dunkle K, Ramsoomar L, Willan S, Jama Shai N, Chatterji S, et al.  
606 New learnings on drivers of men's physical and/or sexual violence against their  
607 female partners, and women's experiences of this, and the implications for  
608 prevention interventions. *Glob Health Action*. 2020;**13**(1):1739845.
  - 609 10. Heise LL. Violence against women: an integrated ecological framework.  
610 *Violence Against Women*. 1998;**4**(3):262-90.
  - 611 11. Heise LL. What works to prevent partner violence: an evidence overview.  
612 London: STRIVE; 2011.
  - 613 12. Sparrow K, Kwan J, Howard L, Fear N, MacManus D. Systematic review of  
614 mental health disorders and intimate partner violence victimisation among military  
615 populations. *Soc Psychiatry Psychiatr Epidemiol*. 2017;**52**(9):1059-80.
  - 616 13. Trevillion K, Williamson E, Thandi G, Borschmann R, Oram S, Howard LM. A  
617 systematic review of mental disorders and perpetration of domestic violence among  
618 military populations. *Soc Psychiatry Psychiatr Epidemiol*. 2015;**50**(9):1329-46.
  - 619 14. Clark JC, Messer SC. Intimate Partner Violence in the US Military: Rates,  
620 Risks, and Responses. 2006.
  - 621 15. Home Office. Domestic Abuse Act 2021: Overarching factsheet. 2021.
  - 622 16. Ministry of Defence. No defence for abuse: Domestic abuse strategy 2018 -  
623 2023. UK2018.
  - 624 17. Stevelink SA, Jones M, Hull L, Pernet D, MacCrimmon S, Goodwin L, et al.  
625 Mental health outcomes at the end of the British involvement in the Iraq and  
626 Afghanistan conflicts: a cohort study. *The British Journal of Psychiatry*.  
627 2018;**213**(6):690-7.

- 628 18. McManus S, Bebbington PE, Jenkins R, Brugha T. Mental health and  
629 wellbeing in England: The adult psychiatric morbidity survey 2014: NHS digital; 2016.
- 630 19. Hainmueller J. Entropy Balancing for Causal Effects: A Multivariate  
631 Reweighting Method to Produce Balanced Samples in Observational Studies.  
632 *Political Analysis*. 2017;**20**(1):25-46.
- 633 20. Iversen AC, Fear NT, Simonoff E, Hull L, Horn O, Greenberg N, et al.  
634 Influence of childhood adversity on health among male UK military personnel. *The*  
635 *British Journal of Psychiatry*. 2007;**191**(6):506-11.
- 636 21. Spitzer RL, Kroenke K, Williams JB. Validation and utility of a self-report  
637 version of PRIME-MD: the PHQ primary care study. Primary Care Evaluation of  
638 Mental Disorders. Patient Health Questionnaire. *Jama*. 1999;**282**(18):1737-44.
- 639 22. Weathers F, Litz B, Herman D, Huska J, Keane T. The PTSD Checklist-  
640 Civilian Version (PCL-C) National Center for PTSD. Boston, MA, USA. 1994.
- 641 23. Babor TF, C. H-BJ, Saunders JB, Monteiro MG. AUDIT. the Alcohol Use  
642 Disorders Identification Test: guidelines for use in primary care. Geneva World  
643 Health Organisation; 2001.
- 644 24. Forbes D, Alkemade N, Mitchell D, Elhai JD, McHugh T, Bates G, et al. Utility  
645 of the Dimensions of Anger Reactions–5 (DAR-5) scale as a brief anger measure.  
646 *Depression and Anxiety*. 2014;**31**(2):166-73.
- 647 25. World Health Organisation. Understanding and addressing violence against  
648 women: Intimate partner violence (No. WHO/RHR/12.36). 2012.
- 649 26. Lane R, Alves-Costa F, Gribble R, Taylor A, Howard L, Fear N, et al.  
650 Perceptions of the impact of military life on relationships and Intimate Partner  
651 Violence and Abuse among UK Military Personnel. under review.
- 652 27. Ahmadabadi Z, Najman JM, Williams GM, Clavarino AM, d'Abbs P. Gender  
653 differences in intimate partner violence in current and prior relationships. *Journal of*  
654 *interpersonal violence*. 2021;**36**(1-2):915-37.
- 655 28. Scott-Storey K, O'Donnell S, Ford-Gilboe M, Varcoe C, Wathen N, Malcolm J,  
656 et al. What About the Men? A Critical Review of Men's Experiences of Intimate  
657 Partner Violence. *Trauma, Violence, & Abuse*. 2022:15248380211043827.
- 658 29. Holtzworth-Munroe A. Male versus female intimate partner violence: Putting  
659 controversial findings into context. *Journal of Marriage and the Family*. 2005:1120-5.
- 660 30. Hamberger LK, Guse CE. Men's and women's use of intimate partner  
661 violence in clinical samples. *Violence Against Women*. 2002;**8**(11):1301-31.
- 662 31. Jonas S, Khalifeh H, Bebbington PE, McManus S, Brugha T, Meltzer H, et al.  
663 Gender differences in intimate partner violence and psychiatric disorders in England:  
664 results from the 2007 adult psychiatric morbidity survey. *Epidemiology and*  
665 *psychiatric sciences*. 2014;**23**(2):189-99.
- 666 32. Park Y, Sullivan K, Riviere LA, Merrill JC, Clarke-Walper K. Intimate partner  
667 violence perpetration among military spouses. *Journal of interpersonal violence*.  
668 2021:08862605211004139.
- 669 33. MacManus D, Dean K, Al Bakir M, Iversen AC, Hull L, Fahy T, et al. Violent  
670 behaviour in UK military personnel returning home after deployment. *Psychological*  
671 *Medicine* 2012;**42**(8):1663-73.
- 672 34. Lane R, Short R, Jones M, Hull L, Howard LM, Fear NT, et al. Relationship  
673 Conflict and Partner Violence by UK Military Personnel following return from  
674 deployment in Iraq and Afghanistan. under review.
- 675 35. Rhead R, MacManus D, Jones M, Greenberg N, Fear NT, Goodwin L. Mental  
676 health disorders and alcohol misuse among UK military veterans and the general  
677 population: a comparison study. Available at SSRN 3399611. 2019.

- 678 36. Caetano R, Field C, Ramisetty-Mikler S, Lipsky S. Agreement on reporting of  
679 physical, psychological, and sexual violence among white, black, and Hispanic  
680 couples in the United States. *Journal of interpersonal violence*. 2009;**24**(8):1318-37.  
681 37. Walby S, Towers J, Balderston S, Corradi C, Francis B, Heiskanen M, et al.  
682 The concept and measurement of violence against women and men. Bristol: Policy  
683 Press; 2017.  
684 38. Taft CT, Macdonald A, Creech SK, Monson CM, Murphy CM. A randomized  
685 controlled clinical trial of the strength at home Men's program for partner violence in  
686 military veterans. *The Journal of clinical psychiatry*. 2016;**77**(9):20066.

687  
688

689 *Ethical approval*

690 Ethical approval for the study was granted by the UK Ministry of Defence Research  
691 Ethics Committee (reference: 448/MODREC/13) and the King's College London  
692 Psychiatry Nursing and Midwifery Research Ethics Subcommittee (Reference:  
693 PNM/12/13-169).