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

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9

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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

55

Research in context

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 society¹ and has been of heightened concern in the UK in light of
138 evidence of increased incidence during the Covid-19 pandemic². 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^{3,4}. 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 IPVA⁵⁻⁸.

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 trauma⁹⁻¹¹. In addition to generic risk factors, Gibbs and
149 colleagues⁹ 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 attainment⁶⁻⁸. 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^{6,8,12,13}. 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^{3,7,14}. 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 2021¹⁵. 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 strategy¹⁶.
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

177

178 ***Study design and data***

179 We conducted a cross-sectional analysis of two surveys: the King's Centre for Military
180 Health Research (KCMHR) cohort study¹⁷, an ongoing study exploring the health and
181 wellbeing of UK military personnel; and the 2014 Adult Psychiatric Morbidity Survey
182 (APMS), which examined the prevalence of psychiatric disorders in a large cohort
183 living in private households in England¹⁸. From these, we constructed two separate
184 samples: first, a military sample using data from Phase 3 of the KCMHR cohort study;
185 and second, a matched civilian and military sample using data from both surveys.¹

186

187 ***Military sample***

188 Phase 3 KCMHR data were collected by questionnaire between October 2014 and
189 December 2016. Full details of previous waves, as well as details of the randomised
190 stratified sampling strategy, response weighting, and data collection procedures are
191 reported in Stevelink and colleagues¹⁷.

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

198 ***Military and Civilian comparison sample***

199 We constructed the military and civilian comparison sample using the full KCMHR
200 Phase 3 cohort (N=8,093) – i.e. not just those who reported having had a partner in
201 the previous 12 months. This was to allow comparison with the APMS survey, which
202 asked whether the IPVA occurred in the previous 12 months (irrespective of whether
203 the respondent had a partner or not). From the full Phase one APMS cohort (N=7,546,
204 57% response rate), we excluded participants outside the age range of the military
205 cohort (aged 18 or younger, or aged over 74, n=1,210) or who reported ever serving
206 in the armed forces (n=518). The remaining APMS sample (n=6,075) were matched
207 on age and sex to KCMHR data using entropy balancing, a multivariate reweighting
208 method to ensure comparability¹⁹ (see Supplementary Table S1 for sample
209 characteristics). Full details relating to the APMS Phase one sampling is reported by
210 McManus and colleagues¹⁸.

211 ***Measures²***

212 ***Socio-demographic and background characteristics***

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

¹ Brief details of the KCMHR and APMS cohorts are provided in the Supplementary Materials

² 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 childhood²⁰. 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)²¹; Probable posttraumatic stress disorder (PTSD) using a cut-off of 50 or
242 more on the PTSD Checklist (PCL-5)²²; Harmful drinking using a cut-off of 16 or more
243 on the Alcohol Use Disorders Identification Test (AUDIT)²³; Difficulties with anger
244 using a score of 12 or above on the Dimensions of Anger Reactions (DAR-7)²⁴.

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 Organisation²⁵: 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 rates¹⁷,
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^{3,4,7}.
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^{3,4}. 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 research⁶. 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 relationships²⁶. 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 fear²⁷. However, there is
388 research evidence that some males may underreport feeling fearful or threatened as
389 it undermines their sense of masculinity²⁸ or may minimise or trivialise such
390 experiences as a result of gender socialisation which may be more pronounced in
391 military communities^{29,30}. In keeping with some civilian studies⁵, 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 experience⁴. However, this is still in
395 contrast to civilian studies which generally find higher rates of IPVA experience among
396 females³¹. Bidirectional abuse was common within military relationships, consistent
397 with research exploring IPVA among military couples in the US and Canada^{7,32}.

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 research⁵.
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 findings⁵ 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^{6,7} 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^{6,7}.

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^{3,4}, in
413 keeping with research into general violence perpetration³³. 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 traumas²⁶. 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 personnel³, 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)³. 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 research⁴.

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^{3,4}. 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^{8,34}. 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)^{6,8,12,13}.
447 This adds to recent research finding an association between IPVA and post-
448 deployment mental health difficulties³⁴. 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 arise²⁶. For example, in studies of the impact of military service in relationships, many
453 participants described mutually conflictual relationships²⁶. 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 sample¹⁸, 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^{3,4}. 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 relationships²⁶ and found higher prevalence of mental health and alcohol
474 difficulties in military compared to civilian samples³⁵. 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 IPVA⁴, 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 IPVA³⁶, 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 victimisation³⁷. 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^{6,8}.

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 society⁹ 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 reasons²⁶. 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 trials³⁸. Together, the findings from this study will support the
538 further refinement of the UK Government military specific Domestic Abuse Strategy¹⁶
539 to ensure tailored support for military communities in the UK.

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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.

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Declarations of interest

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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.

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689 *Ethical approval*

690 Ethical approval for the study was granted by the UK Ministry of Defence Research
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