Paternal alcohol misuse in UK military families: A cross-sectional study of child emotional and behavioural problems

Alyson L. Mahar[a], Sarah Rowe[b], David Pernet[c], Alice Wickersham[c], Alice B. Aiken[d], Simon Wessely[c] and Nicola T. Fear[c]

ABSTRACT

Introduction: This study explores the association between paternal alcohol misuse and child emotional and behavioural problems in a representative sample of UK military families. **Methods**: Cohort study data on paternal alcohol consumption were linked to survey data from UK military families on child outcomes. Paternal alcohol use was measured using the Alcohol Use Disorders Identification Test. Parents reported on child behavioural outcomes using the Strengths and Difficulties Questionnaire, measuring hyperactivity and inattention, emotional symptoms, conduct problems, peer relationship problems, prosocial behaviour, and total difficulties. Multivariable logistic regression accounted for survey weights and clustering. Effect modification by child age and gender and paternal mental health was explored. **Results**: A total of 595 fathers and 1,002 children were included in the study; 364 fathers were classed as misusing alcohol (weighted 62.3%). Paternal alcohol misuse was associated with higher odds of conduct disorders (OR 1.39; 95% CI, 0.98-1.98), although this association was not statistically significant ($p = 0.07$). A significant association between paternal alcohol misuse and conduct disorders was apparent for girls and in the restricted analysis of the children of fathers who did not report symptoms of depression or posttraumatic stress disorder. **Discussion**: This study suggests that paternal alcohol misuse may have an effect on the well-being of children in military families. Further studies replicating this association are warranted.

Key words: alcohol, alcohol misuse, child behaviour, child well-being, fathers, military families, paternal, United Kingdom

RÉSUMÉ

Introduction : La présente étude visait à explorer l'association entre la consommation excessive d'alcool par le père et les problèmes émotionnels et comportementaux de l'enfant dans un échantillon représentatif des familles de militaires du Royaume-Uni. **Méthodologie :** Les données d'études de cohorte sur la consommation d'alcool par le père ont été liées aux données d'une enquête auprès de familles de militaires du Royaume-Uni sur les résultats cliniques des enfants. Les chercheurs ont mesuré la consommation d'alcool par le père au moyen du test de dépistage des troubles liés à la consommation d'alcool (test AUDIO). Les parents ont rendu du compte des résultats comportementaux des enfants au moyen du questionnaire sur les forces et les difficultés, qui mesurent l'hyperactivité et l'inattention, les symptômes émotionnels, les troubles des conduites, les problèmes de relations avec les camarades, les comportements prosociaux et les difficultés totales. La régression logistique multivariable a tenu compte de la pondération et du regroupement des enquêtes. Les chercheurs ont exploré la modification de l'effet d'après l'âge et le genre de l'enfant et d'après la santé mentale du père. **Résultats :** Au total, 595 pères et 1,002 enfants ont participé à l'étude, et 364 pères ont été classés comme consommant trop d'alcool (proportion pondérée à 62,3 %). La consommation excessive d'alcool par le père était liée à un risque plus élevé de troubles des conduites (RC 1,39 [0,98 à 1,98]), qui n'était pas statistiquement significatif (p=0,07). Il y avait une association significative entre la consommation excessive d'alcool par le père et les troubles des conduites, laquelle était apparente chez les filles et dans l'analyse restreinte chez les enfants de pères qui n'avaient pas déclaré de symptômes de dépression ou de trouble de stress post-traumatique. **Discussion :** D'après la présente étude,

a Department of Community Health Sciences, University of Manitoba, Winnipeg, Manitoba, Canada
b Department of Psychiatry, University College London, London, United Kingdom
c Department of Psychological Medicine, King's College London, London, United Kingdom
d Faculty of Health Professions, Dalhousie University, Halifax, Nova Scotia, Canada

Correspondence should be addressed to Nicola T. Fear at Psychological Medicine, Weston Education Centre, 10 Cutcombe Road, London, United Kingdom, SE5 9RJ. Telephone: 44-207-848-5265. Email: Nicola.t.fear@kcl.ac.uk

la consommation excessive d'alcool par le père peut avoir un effet sur le bien-être des enfants de familles de militaires. D'autres études s'imposent pour répliquer cette association.

Mots-clés : alcool, bien-être des enfants, comportement des enfants, consommation abusive d'alcool par le père, familles de militaires, pères, Royaume-Uni, troubles de comportement

LAY SUMMARY

When parents drink unhealthy amounts of alcohol, it can have negative consequences for their children's mental health. Although some evidence has shown that members of the military may consume alcohol at unhealthy levels, no study has yet looked at the possible impact on children connected to military families. The authors completed a study among children of UK fathers who served in the military and determined that alcohol misuse by fathers who serve in the military may negatively affect their children's behaviour. More research is needed to confirm this relationship and identify targets for prevention and harm reduction.

INTRODUCTION

Alcohol misuse in the United Kingdom, and in the UK Armed Forces, specifically, is a public health concern. One in five UK adults and 67% of the UK military consume alcohol at levels classified as misuse.[1,2] Young men in the military who have experienced trauma are even more likely to consume alcohol at unhealthy levels.[3] Alcohol misuse has negative health consequences for the individual consumer and is one of the leading causes of disability in the United Kingdom.[4] Studies in the UK Armed Forces suggest that alcohol misuse is associated with personal harm, including higher rates of traffic accidents,[5] health problems,[6] and violence,[7,8] as well as a high rate of comorbidity with mental health problems and suicide.[9,10]

Alcohol misuse can also have harmful health effects on the individual consumer's family members, including their children. Parental alcohol dependency during a child's early development is an established risk factor for negative child behavioural and emotional problems, including higher rates of hyperactivity, conduct disorder, and anxiety.[11-15] The children of parents who have an alcohol dependency are more likely to perform poorly at school and to engage earlier in substance use than children of parents who do not misuse alcohol.[13,16-18] Parental alcohol dependency is believed to cause harm through a constellation of causal factors, including prenatal exposure, greater exposure to life stressors (e.g., family violence, poverty), exposure to negative parenting styles (e.g., caregiver neglect, lack of nurturing), and chaotic or unstable family systems.[14,19,20] Parental posttraumatic stress disorder (PTSD) is also an established risk factor for poor child outcomes in a military setting,[21] and a recent systematic review of general population and military studies concluded that the prevalence of PTSD comorbid with alcohol misuse ranged from 2.0% to 62.0%.[22] These effects may be long lasting, providing the foundation for future alcohol consumption patterns and perpetuating the cycle of secondary harm.[23]

Although alcohol consumption is widely recognized as a leading cause of mortality and has no health benefits relative to harm caused to the individual,[24,25] research into the secondary harms of alcohol misuse is sparse. Understanding how alcohol misuse affects child mental health and well-being is important, given the high prevalence of alcohol misuse and its comorbidity with mental health disorders in the UK military. Studies examining the impact of paternal alcohol misuse on the wider UK Armed Forces community, including the mental health and well-being of children in military families, are needed to better support military families. A better understanding of how common comorbid factors, such as paternal PTSD or depression, may exacerbate any negative consequences of alcohol misuse for children is also required. Therefore, the aims of this study were to investigate the effects of paternal alcohol misuse on child emotional and behavioural outcomes in UK military families and to explore potential effect modification by paternal mental health status.

METHODS

Study design and data collection

This study was a secondary analysis of data collected from the Children of Military Fathers with PTSD survey conducted among UK military families that examined the impact of paternal PTSD on child behavioural and emotional outcomes (KIDS study).[26] Data were linked to the King's Centre for Military Health Research (KCMHR) cohort study, which provided paternal alcohol consumption data,[27,28] using an encrypted participant key number that linked individuals across studies.

The KCMHR military cohort study was a large, tri-service prospective cohort investigation of health

outcomes for UK Armed Forces deployed to the Iraq and Afghanistan conflicts and a non-deployed comparison group.[27,28] The KCMHR military cohort study collected information on demographics and military service, as well as on social- and health-related outcomes. The KIDS study recruited serving and ex-service fathers of children aged 3-16 years who consented to follow-up from phase II of the KCMHR military cohort study.[26] Fathers were defined as those who identified having biological children, children under care of the local authority, or stepchildren. Fathers were randomly selected from the KCMHR military cohort study to create a group of fathers with and without PTSD, based on their phase II PTSD Checklist for DSM-IV scores.[29]

Overall, 1,030 military fathers from the KCMHR cohort study were invited to participate. Instructions given before the online questionnaire stipulated that participation in the study was voluntary, participants were free to withdraw at any time, and the study was funded by the U.S. Department of Defense. These 1,030 fathers were representative of both regular and reserve members (full-time and voluntary or part-time UK Armed Forces members), all services (navy, army, and Royal Air Force) and included service personnel who had left the military. If the fathers gave consent, the mothers of their children were also contacted and invited to participate in an online survey. A total of 621 fathers (60%) completed the survey, including data on 1,044 children.

The study received ethical approval from the UK Ministry of Defence research ethics committee, the NHS research ethics committee, and the U.S. Human Protection Research Office. This study is reported according to the Strengthening the Reporting of Observational Studies in Epidemiology guidelines.[30]

Measuring paternal alcohol misuse

Paternal alcohol use was measured using data from phase II of the KCMHR cohort study, collected from fathers between November 2007 and September 2009. The survey measured paternal alcohol misuse with the Alcohol Use Disorders Identification Test (AUDIT), a 10-item questionnaire assessing alcohol consumption and dependence and the consequences of alcohol misuse. AUDIT scores range from 0 to 40.[31] An AUDIT score of ≤ 7 is considered low risk; 8-15, harmful; 16-19, hazardous; and 20 or higher, probable alcohol dependence. In the general UK population, a score of 8 or higher indicates hazardous and harmful alcohol consumption.[31] Fathers who reported no past-year alcohol consumption were excluded from the study because the primary study oversampled fathers with PTSD who may be abstaining from alcohol use to receive treatment, and a lack of consumption over the past year may indicate recovery from alcohol dependence or those who simply do not consume alcohol for other reasons (e.g., religion).

Measuring child emotional and behavioural difficulties

Child emotional and behavioural difficulties were measured using data from the KIDS study, collected between July 2010 and October 2012. Data were collected from fathers and mothers using standardized self-report telephone and online questionnaires.[32,33] Child emotional and behavioural difficulties were measured by parental report using the Strengths and Difficulties Questionnaire (SDQ).[34] Child SDQ scores were reported by mothers, when possible, and from fathers when maternal data were not available. Mothers' and fathers' scores have previously been shown to be similar.[35] Total scores were calculated for five subscales: Emotional Symptoms (i.e., worries a lot, often unhappy), Conduct Problems (i.e., temper tantrums, fights with other children), Hyperactivity (i.e., restless, easily distracted), Peer Problems (i.e., solitary, picked on or bullied), and Prosocial Difficulties (i.e., inconsiderate, unkind to others). Caseness for total difficulties was determined by combining four of the five individual SDQ subscales (excluding Prosocial Difficulties). Caseness for total difficulties, and for each subscale, was categorized as normal, borderline, or abnormal using defined cut-offs.[34] For this study, the authors dichotomized scores as being a case (borderline or abnormal) or a non-case (normal).

Statistical analysis

All analyses were undertaken using the statistical software package SAS (version 9.4; SAS Institute, Cary, NC), and statistical significance was defined as $p < 0.05$. All analyses take into account the response weights by using the survey commands and clustering by father using the clustering commands. Alcohol misuse was operationalized as a dichotomous variable; no alcohol misuse (AUDIT score 1-7) and alcohol misuse (AUDIT score ≥ 8). Weighted percentages and odds ratios are presented, together with unweighted cell counts. The authors describe the sample's socio-demographic and military experiences before presenting odds ratios, 95% confidence intervals (CI), and p values, which were calculated to estimate associations between paternal alcohol misuse and childhood SDQ outcomes. Univariable and multivariable logistic regression analyses were

undertaken. Socio-demographic (child age, paternal age, sex of child) and military (rank, service, engagement type [regular or reservist status], deployment status [not deployed to Iraq or Afghanistan or deployed to Iraq or Afghanistan]) factors were included in the multivariable analyses as confounders. Confounders were a priori selected from the literature.

Sub-analyses were performed involving stratification by sex of the child and by age of the child (< 11 years and ≥ 11 years) because the prevalence of emotional and behavioural disorders among children varies by age and sex.[36] The authors also completed a sub-analysis of a restricted sample of children whose fathers did not screen positive for depression or PTSD to observe the independent effect of alcohol misuse, without the competing and inextricable impact of a comorbid mental disorder. The presence of PTSD was measured using the Clinician-Administered PTSD Scale (CAPS) during the interview.[32] Individuals meeting the sub-threshold criteria for PTSD were identified as being in the PTSD group. Sub-threshold PTSD was established using the definition used by Cukor et al.[37] Symptoms of depression were measured using the 9-item Patient Health Questionnaire.[38] Fathers scoring five or higher were classified as being in the depression group.[38] The authors considered $p \leq 0.2$ for potential effect modification.

Sensitivity analyses

A sensitivity analysis was performed on the basis of the definition of alcohol misuse. Previous studies have demonstrated that the population distribution of high-risk alcohol consumption in the military is much higher, and so the normative cut-off points may not be applicable.[2,3,39] For the sensitivity analysis, previously established cut-off points were used for harmful and hazardous in the military setting.[40] Fathers who scored between 1 and 15 were considered low-risk alcohol consumers and fathers who scored 16 or higher were considered high-risk consumers.

Role of the funding source

The U.S. Department of Defense, Canadian Institutes of Health Research, and True Patriot Love had no influence over the work plan, data analysis, or data interpretation.

RESULTS

Alcohol use data were available for 612 of the 621 UK military fathers who completed the survey (representing 1,029 children). A total of 3% of fathers reported no past-year alcohol use (n = 17) and were excluded from the study (n = 27 children). Of the 595 fathers who reported consuming alcohol in the past year, 231 were classed as not misusing alcohol (weighted 37.7%; AUDIT score 1-7), and 364 were classed as misusing alcohol (weighted 62.3%; AUDIT score ≥ 8). Compared with fathers classed as not misusing alcohol, fathers who misused alcohol were younger and more likely to have been deployed to Iraq, Afghanistan, or both and to have probable PTSD or depression (Table 1). Fathers who misused alcohol were less likely to be officers or in the Royal Air Force.

Of the 1,002 children, 396 (weighted 38.3%) had a father classed as not misusing alcohol and 606 (weighted 61.7%) had a father classed as misusing alcohol (Table 2). Children of fathers who misused alcohol were slightly more likely to be male and had a greater likelihood of meeting the case definition for conduct problems.

There was no association between paternal alcohol misuse and child behavioural problems, although a 1.39 greater odds of conduct problems was identified (95% CI, 0.98-1.98; Table 3). When the authors modified the definition of alcohol misuse to an AUDIT score of 16 or higher, there was no change in the conclusions (data not shown). These null findings changed slightly when stratified by child sex (Table 4). Girls of fathers who misused alcohol had greater odds of hyperactivity, conduct problems, and total difficulties, whereas boys of fathers who misused alcohol only had higher odds of conduct problems.

Overall, 337 fathers did not meet the criteria for depression or PTSD (weighted 56.6%). When the study was restricted to only those children whose fathers did not meet the criteria for depression or PTSD, greater odds of emotional problems and conduct problems were observed, although only conduct problems was statistically significant (Table 5).

DISCUSSION

This is the first study to examine possible secondary harm to children and youth in military families associated with paternal alcohol misuse. This study suggests that children and youth in military families are negatively affected by paternal alcohol misuse and that the effect of paternal alcohol misuse may be modified by the serving member's mental health status. These findings are important, considering the high rates of alcohol misuse in serving and ex-serving military personnel, the common comorbidity between alcohol misuse and

Table 1. Characteristics of fathers by alcohol misuse status (as determined by the AUDIT score) (N = 595)*

Characteristic	Unweighted n (weighted %)*		*p*-value†
	No alcohol misuse, paternal AUDIT < 8 (n = 231)	Alcohol misuse, paternal AUDIT ≥ 8 (n = 364)	
Age at interview, y, mean (SD)	40.0 (8.0)	38.5 (7.7)	0.004
Relationship status			0.07
Single	7 (3.5)	22 (6.3)	
Relationship	224 (96.5)	342 (93.7)	
No. of children			0.17
1	101 (44.7)	179 (49.8)	
2	103 (44.0)	139 (37.6)	
≥3	27 (11.3)	46 (12.6)	
Serving status			0.20
Serving	152 (66.0)	227 (61.7)	
Ex-service	79 (34.0)	137 (38.3)	
Engagement type			0.09
Regular	195 (85.9)	320 (89.6)	
Reserve	36 (14.1)	44 (10.4)	
Service			0.015
Royal Marines/Royal Navy	31 (12.7)	64 (17.8)	
Army	152 (66.7)	248 (68.0)	
RAF	48 (20.6)	52 (14.2)	
Rank			0.018
Officer	61 (22.4)	67 (15.2)	
Non-commissioned officers	140 (62.1)	253 (70.3)	
Other rank	30 (15.5)	44 (14.5)	
Deployment status			0.039
Iraq and/or Afghanistan	88 (38.9)	165 (46.0)	
Neither	143 (61.1)	199 (54.0)	
Depression	82 (36.4)	173 (49.2)	<0.001
PTSD	14 (6.4)	43 (12.6)	0.004

Note: Seventeen fathers who reported no past-year alcohol consumption were excluded.

*Unless otherwise indicated.
†Weighted χ^2 test (categorical data), weighted *t*-test.

AUDIT = Alcohol Use Disorders Identification Test; RAF = Royal Air Force; PTSD = posttraumatic stress disorder.

mental disorders in both the military and the civilian populations, and the lack of attention paid to alcohol's secondary effects on child emotional and behavioural health in defence and public health policy.

Few studies have investigated the impact of hazardous parental alcohol consumption on the health of children to inform the design of appropriate and effective public health strategies that do not focus on alcohol dependency. There is substantial evidence that alcohol dependency is associated with negative child outcomes;[11,41] however, this is a rare problem among UK military personnel and the general population.[1,40] The literature is less conclusive for studies in which the parental alcohol consumption patterns do not meet the clinical definition of alcohol dependency. A recent scoping review of cohort studies focusing on antenatal effects of parental drinking on adverse child outcomes reported that the children of parents who misused alcohol were significantly more likely to experience harm in two-thirds of studies.[14] The authors concluded that although there

Table 2. Characteristics of the children in the KIDS study (N = 1,002) by paternal alcohol misuse status

Characteristic	Unweighted n (weighted %)*		*p*-value†
	Children with paternal AUDIT < 8 (n = 396)	Children with paternal AUDIT ≥ 8 (n = 606)	
Age, y, mean, SE	10.6 (0.27)	10.0 (0.21)	0.12
Age, y			0.35
3-5	77 (20.5)	145 (25.1)	
6-12	188 (47.7)	302 (49.6)	
13-16	131 (31.8)	159 (25.3)	
Male sex	196 (49.6)	304 (50.1)	0.89
Emotional and behavioural problems‡			
Hyperactivity			0.22
Non-case	307 (79.2)	450 (75.6)	
Case	79 (20.8)	141 (24.4)	
Emotional problems			0.87
Non-case	300 (77.4)	453 (76.9)	
Case	86 (22.6)	138 (23.1)	
Conduct problems			0.011
Non-case	308 (79.0)	422 (70.9)	
Case	78 (21.0)	169 (29.1)	
Peer problems			0.53
Non-case	295 (76.0)	460 (77.9)	
Case	91 (24.0)	131 (22.1)	
Social problems			0.43
Non-case	341 (88.2)	511 (86.4)	
Case	45 (11.8)	80 (13.6)	
Total difficulties			0.34
Non-case	310 (79.9)	457 (77.1)	
Case	76 (20.1)	134 (22.9)	

Note: Twenty-seven children whose fathers reported no past-year alcohol consumption were excluded.

*Unless otherwise indicated.
†Weighted Wald χ^2 test for clustered data (categorical data), weighted *t*-test.
‡Missing data for 10 children whose father's AUDIT was < 8 and 15 children whose father's AUDIT was ≥ 8.

AUDIT = Alcohol Use Disorders Identification Test.

was a relatively deep literature base focusing on adolescent alcohol consumption as an outcome, few studies addressed any other effects.[14] This underscores the importance of improving understanding of the secondary harm to children caused by parents' alcohol consumption.[42]

The authors suggest that paternal alcohol misuse has an independent negative effect on child emotional and behavioural health in the absence of PTSD and depression. This finding requires further investigation to clarify causal pathways, as well as to determine policy implications. Substance abuse and in particular alcohol misuse are common comorbidities of PTSD in serving and ex-serving military personnel,[2,28,43] and abstinence from substance use, including alcohol, is a common exclusion from programs and services addressing mental health. Even when programs and services are provided, the mental health problem may overshadow the alcohol misuse, especially if it is not diagnosed as dependency. This study highlights the importance of studying and treating both alcohol misuse and mental health problems together in order to understand the primary and

Table 3. Associations between alcohol misuse (as measured by the AUDIT) and child behavioural problems (as measured by the SDQ), restricted to those fathers who reported past year alcohol consumption (*n* = 1,002 children)

Behavioural problem (case)	No. of events* (%)	High risk (AUDIT ≥ 8)†			
		OR (95% CI)	*p*-value	AOR,‡ (95% CI)	*p*-value
Hyperactivity	141 (24.4)	1.23 (0.88, 1.73)	0.22	1.14 (0.81, 1.61)	0.46
Emotional problems	138 (23.1)	1.03 (0.74, 1.44)	0.87	1.01 (0.71, 1.43)	0.97
Conduct problems	169 (29.1)	1.54 (1.09-2.17)	0.014	1.39 (0.98, 1.98)	0.07
Peer problems	131 (22.1)	0.90 (0.65, 1.25)	0.53	0.88 (0.62, 1.24)	0.46
Social problems	80 (13.6)	1.18 (0.77, 1.82)	0.44	1.15 (0.74, 1.77)	0.54
Total difficulties	134 (22.9)	1.19 (0.83, 1.70)	0.35	1.14 (0.78, 1.66)	0.50

*Unweighted numbers, weighted percentages.
†Reference group: AUDIT < 8 (low risk).
‡OR adjusted for child's age, gender, father's age, deployment status, engagement type, rank, and service.

AUDIT = Alcohol Use Disorders Identification Test; SDQ = Strengths and Difficulties Questionnaire; OR = odds ratio; AOR = adjusted odds ratios.

Table 4. Associations between alcohol misuse (as measured by the AUDIT) and child emotional and behavioural problems (as measured by the SDQ), stratified by child sex and child age

High risk (AUDIT ≥ 8; case)*	Child sex				Child age, y			
	Boys		Girls		< 11		≥ 11	
	OR (95% CI)	*p*-value	OR (95% CI)	*p*-value	OR (95% CI)	*p*-value	OR (95% CI)	*p*-value
Hyperactivity	1.05 (0.68, 1.61)	0.84	1.57 (0.93, 2.67)	0.09	1.20 (0.80, 1.80)	0.37	1.13 (0.65, 1.96)	0.66
Emotional problems	0.81 (0.52, 1.28)	0.37	1.30 (0.82, 2.05)	0.27	0.92 (0.59, 1.45)	0.72	1.26 (0.79, 2.03)	0.33
Conduct problems	1.45 (0.93, 2.26)	0.10	1.65 (1.03, 2.64)	0.036	1.49 (0.99, 2.24)	0.05	1.52 (0.88, 2.60)	0.13
Peer problems	0.71 (0.46, 1.10)	0.13	1.17 (0.73, 1.87)	0.51	0.87 (0.55, 1.35)	0.52	1.00 (0.63, 1.60)	0.99
Social problems	1.31 (0.76, 2.24)	0.33	1.01 (0.52, 1.95)	0.98	1.17 (0.67, 2.04)	0.58	1.21 (0.65, 2.24)	0.54
Total difficulties	0.92 (0.58, 1.44)	0.70	1.67 (1.00, 2.80)	0.05	1.01 (0.65, 1.59)	0.96	1.49 (0.88, 2.53)	0.14

Note: Restricted to the children of fathers who reported past-year alcohol consumption (*n* = 1,002 children).

*Reference group AUDIT < 8 (low risk).

AUDIT = Alcohol Use Disorders Identification Test; SDQ = Strengths and Difficulties Questionnaire; OR = odds ratio; CI = confidence interval.

Table 5. Associations between paternal alcohol misuse (as measured by the AUDIT) and child behavioural problems (as measured by the SDQ), restricted to the children of fathers who did not screen positive for depression or post-traumatic stress disorder and who reported past year alcohol consumption (*n* = 574 children)

Child behavioural problem (case)	No depression or PTSD,* OR (95% CI)	*p*-value
Hyperactivity	1.37 (0.86, 2.17)	0.18
Emotional problems	1.57 (0.98, 2.51)	0.06
Conduct problems	1.74 (1.07, 2.84)	0.026
Peer problems	0.97 (0.63, 1.51)	0.90
Social problems	1.46 (0.83, 2.58)	0.19
Total difficulties	1.25 (0.75, 2.08)	0.39

Note: Three hundred thirty-seven fathers had no mental health problem, 201 had depression only, 53 had PTSD and depression, 4 had PTSD only.

*Reference group: AUDIT < 8 (low risk).

AUDIT = Alcohol Use Disorders Identification Test; SDQ = Strengths and Difficulties Questionnaire; OR = odds ratio; CI = confidence interval; PTSD = post-traumatic stress disorder.

secondary harms of alcohol misuse, in both the general population and the armed forces.

Current health promotion strategies targeting the negative health impacts of alcohol to the individual have elicited little sustainable behaviour change.[24] Identifying potential health risks of alcohol misuse on dependents may strengthen the impact of public health messages. In addition, barriers to engaging armed forces members in mental health services continue to remain, even though there is evidence that the military member's mental health has negative consequences for the family unit.[26,44] Explicitly stating the potential harm mental disorders and alcohol misuse may have on children could help address barriers to help seeking and behaviour change. This avenue for health promotion is supported by theories of family-based substance abuse treatment and by the World Health Organization Alcohol Strategy, which identifies families as key stakeholders in alcohol misuse prevention by providing accessible family-based interventions.[20,45,46] However, families are often excluded or inadequately engaged in programs and services supporting the mental health of serving and ex-serving military members.[47] This study highlights the need for mental health practitioners to take a holistic approach to the serving member and Veteran, considering and addressing both their mental health and their alcohol misuse, as well as the potential impact on the family unit.

This study has several limitations, including its cross-sectional design, potential selection bias, and small sample size. The cross-sectional design of the survey detracts from causal interpretation of whether the child's behavioural problems or paternal alcohol misuse came first and increases the possibility of social desirability bias in fathers' reporting of alcohol consumption.[48] To address this, the authors used measurements of paternal alcohol consumption from a previous study to establish temporality and enhance causal interpretation, as well as to mitigate the effects of under-reporting alcohol misuse. Stable alcohol consumption patterns have been previously reported for the UK military.[49] Fathers who were more likely to misuse alcohol were less likely to participate in the study, and the authors therefore do not have information on their children's outcomes. This may mean that the true association is underestimated. Inverse probability weighting methods incorporating a wealth of baseline information on the invited participants were used to adjust for potential selection bias. This study included only individuals with a past-year history of alcohol consumption. As a result, it may have underestimated the true impact of alcohol misuse on child emotional and behavioural outcomes. This study includes the largest number of children and youth from UK military families to date, but it had a limited sample size. Children in military families rarely met the full criteria for emotional and behavioural problems. By combining children who met the full criteria for emotional and behavioural problems with those who were sub-threshold, the true effect of paternal alcohol misuse may have been underestimated. In addition, the authors were limited in their ability to study interactions. This resulted in low study power and imprecise effect estimates. Future studies should take effect modification into account when estimating sample size. In particular, studies should also consider the interaction between paternal alcohol misuse and household characteristics such as family size, composition, and whether or not the father and children resided in the same home.

Before the secondary harms of alcohol to the family may be considered in policy-making,[50,51] further studies of alcohol misuse at sub-clinical levels are required. Longitudinal studies exploring the impact of different alcohol misuse measures (e.g., binge drinking, number of daily drinks), prolonged alcohol misuse, and cumulative effects of parent alcohol misuse on children, as well as changes in alcohol consumption patterns over time, are needed. Such studies will lead to a better understanding of the secondary effects of alcohol and consistency of the relationships. Although there is a well-established literature implicating parental alcohol misuse in youth substance abuse among families globally, future work addressing this emerging area in military families is needed. In addition, studies targeting other child health outcomes, such as depression and anxiety, are warranted. Studies of maternal alcohol consumption as a mediating factor or an effect modifier are also important,[52-54] especially considering increased rates of hazardous consumption in spouses of serving and ex-serving military personnel.[55] Follow-up of these UK military families to understand the long-term effects of paternal alcohol misuse on family infrastructure and functioning and child behaviours is essential.

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AUTHOR INFORMATION

Alyson L. Mahar, MD, PhD, is an Assistant Professor in Community Health Sciences and Research Scientist at the Manitoba Centre for Health Policy at the University of Manitoba. She is an epidemiologist and health services researcher with a focus on using routinely collected health and social data to study the health and well-being of Canadian Veterans and military families.

Sarah Rowe, MD, PhD, is an Associate Professor and the Deputy Director of the MSc Mental Health Sciences programme in the Division of Psychiatry at University College London. Her research interests include harm minimisation for self-harm, personality disorders, and child and adolescent mental health. She can occasionally be found on Twitter @KiwiRowebot.

David Pernet, BA, is a database administrator at the King's Centre for Military Health Research, King's College London. He has worked with health and well-being data for serving military, Veterans, and their families over the past eight years. He is interested in improving the quality of data collection and in the use of geographical information.

Alice Wickersham, MSc, has research interests that include child and adolescent mental health, educational outcomes and epidemiology. Her PhD research focuses on school performance and depression, which she is investigating using linked administrative datasets and longitudinal statistical modelling techniques. Before her PhD, Wickersham was a Research Assistant at King's Centre for Military Health Research, where she investigated the association between paternal and adolescent mental health in UK military families. She has a BSc in psychology and an MSc in clinical mental health sciences.

Alice B. Aiken, CD, PhD, MSc, BScPT, is the Vice-President of Research and Innovation at Dalhousie University in Halifax, Nova Scotia, Canada. Her research focuses on health systems transformation and evidence-informed policy-making with a focus on military and Veterans. Dr. Aiken is currently the Vice-Chair of the Governing Council of the Canadian Institutes of Health Research and Chair of the board of Research Nova Scotia.

Sir Simon Wessely, MD, FRCP, FRCPSYCH, FMEDSCI, is a Professor of Psychological Medicine. He founded the King's Centre for Military Health Research, which is now the main source of information on the health and well-being of the UK Armed Forces past and present and has been Civilian Consultant Advisor in Psychiatry to the British Army since 2001.

Nicola T. Fear, DPhil (OXON), holds a Chair in Epidemiology at the Academic Department of Military Mental Health and is Director of the King's Centre for Military Health Research at King's College London. She leads a number of high-profile studies regarding the health and well-being of military personnel, Veterans, and their families and works with a number of service charities to evaluate the interventions they deliver to Veterans and their families.

COMPETING INTERESTS

Alyson L. Mahar, Sarah Rowe, David Pernet, Simon Wessely, and Alice B. Aiken have no conflicts of interest to declare. Nicola T. Fear is a trustee of the Warrior Programme, a charity supporting ex-service personnel and their families. She is also a member of the Independent Group Advising NHS Digital on the Release of Patient Data.

CONTRIBUTORS

Alyson L. Mahar, Sarah Rowe, Alice B. Aiken, Simon Wessely, and Nicola T. Fear conceived of the study. Sarah Rowe, David Pernet, Simon Wessely, and Nicola T. Fear collected the data. Alyson L. Mahar and Nicola T. Fear designed the study. Alyson L. Mahar completed the statistical analyses. All authors contributed to interpretation of the findings. Alyson L. Mahar and Nicola T. Fear drafted the manuscript. All authors contributed critical revisions to the final manuscript and approve its content.

ETHICS APPROVAL

The study received ethical approval from the UK Ministry of Defence Research Ethics Committee (MODREC/174/2008), UK NHS Research Ethics Committee (08/H0808/27), and the U.S. Office for Human Research Protections (IRB-A-15389).

INFORMED CONSENT

All participants gave informed consent.

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PEER REVIEW

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