



The mediating role of resilience on psychopathology following childhood adversities among UK armed forces veterans residing in Northern Ireland

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ABSTRACT

Background: Childhood adversities can have a deleterious impact on mental health. Elevated levels of such adversities have been reported in veteran populations. Levels of resilience may be protective but early adverse experiences may impact on the development of resilience in the first instance.

Objective: This study aims to identify classes of childhood adversities among UK military veterans residing in Northern Ireland (NI) and explore levels of resilience and the mediating role resilience may play following such experiences in relation to mental health.

Method: The study utilizes data from the Northern Ireland Veterans' Health and Wellbeing Study ($n = 656$). All participants were UK Armed Forces veterans who were residents of NI with an average age of 56 (586 males, 70 females).

Results: Four childhood adversity classes were revealed, with almost a half of the sample experiencing early adverse experiences. Individuals who experienced a range of adversities, particularly those related to maltreatment were more likely to have PTSD, depression and anxiety disorders and lower levels of resilience. However, those who experienced adversity related to family dysfunction had similar levels of resilience as the low risk class, suggesting tentatively that some adversity may be protective. Mediation analyses revealed that veterans with elevated levels of resilience were less likely to have psychological problems following negative childhood experiences.

Conclusions: The study highlights the importance of promoting resilience building programmes among military veterans, especially among those who experienced maltreatment as a child.

ARTICLE HISTORY

Received 10 May 2021
Revised 16 August 2021
Accepted 18 August 2021

KEYWORDS

Resilience; childhood adversities; veterans; PTSD; depression; anxiety

PALABRAS CLAVE

Resiliencia; Adversidades durante la infancia; Veteranos; TEPT; Depresión; Ansiedad

关键词

心理韧性; 童年期逆境; 退伍军人; PTSD; 抑郁; 焦虑

HIGHLIGHTS

- UK Armed Forces veterans with elevated levels of resilience were less likely to have psychological problems following negative childhood experiences.

El rol mediador de la resiliencia en la psicopatología después de las adversidades durante la infancia entre veteranos de las Fuerzas Armadas del Reino Unido en Irlanda del Norte

Antecedentes: Las adversidades durante la infancia pueden tener un impacto deletéreo en la salud mental. Niveles elevados de estas adversidades han sido reportados en poblaciones de veteranos. Los niveles de resiliencia pueden ser protectores, pero las experiencias adversas tempranas pueden impactar en el desarrollo de la resiliencia en primera instancia.

Objetivo: Este estudio tiene como objetivo identificar clases de adversidades durante la infancia entre los veteranos militares del Reino Unido que residen en Irlanda del Norte (IN) y explorar los niveles de resiliencia y el rol mediador que la resiliencia puede desempeñar siguiendo a estas experiencias en relación con la salud mental.

Métodos: Este estudio utiliza los datos del Estudio de Salud y Bienestar de los Veteranos de Irlanda del Norte ($n=656$). Todos los participantes eran veteranos de las Fuerzas Armadas del Reino Unido, quienes eran residentes de IN con una edad promedio de 56 años (586 hombres, 70 mujeres).

Resultados: Se revelaron cuatro clases de adversidades durante la infancia, con casi la mitad de la muestra experimentando experiencias adversas tempranas. Los individuos que experimentaron una variedad de adversidades, particularmente aquellas relacionadas a maltrato, fueron más propensos a tener Trastorno de estrés postraumático (TEPT), depresión, trastornos de ansiedad y niveles más bajos de resiliencia. Sin embargo, aquellos que experimentaron adversidades relacionadas a disfunción en el hogar tuvieron niveles similares de resiliencia a los de la clase de bajo riesgo; sugiriendo tentativamente que algunas adversidades pueden ser protectoras. Los análisis de mediación revelaron que los veteranos con niveles elevados de resiliencia tenían menos probabilidades de tener problemas psicológicos después de las experiencias negativas de la infancia.

Conclusiones: El estudio resalta la importancia de promover programas que busquen el fortalecimiento de la resiliencia entre veteranos militares, especialmente entre aquellos que experimentaron maltrato cuando eran niños.

北爱尔兰英国武装部队退伍军人中心心理韧性在童年期逆境后心理病理学中的中介作用背景:童年期逆境会对心理健康产生有害影响。据报道,退伍军人群体中此类逆境程度更高。心理韧性水平可能具有保护作用,但早期不良经历可能会影响心理韧性早先的发展。

目的:本研究旨在确定居住在北爱尔兰 (NI) 的英国退伍军人童年期逆境类别,并探讨心理韧性水平以及在这些心理健康相关经历后心理韧性可能发挥的中介作用。

方法:本研究使用来自北爱尔兰退伍军人健康与幸福感研究的数据($n=656$)。所有参与者都是平均年龄为 56 岁,为 NI 居民的英国武装部队退伍军人 (586 名男性,70 名女性)。

结果:揭示了四个童年期逆境类别,几乎一半的样本经历了早期不良经历。经历过一系列逆境的人,尤其是那些虐待相关的逆境,更有可能患上 PTSD,抑郁和焦虑,并且心理韧性水平较低。然而,那些经历过与家庭功能障碍相关逆境的人具有与低风险类别相似的心理韧性水平,初步表明某些逆境可能具有保护作用。中介分析显示,心理韧性水平较高的退伍军人在负性童年期经历后出现心理问题的可能性更小。

结论:本研究强调了在退伍军人中促进心理韧性建设计划的重要性,尤其是在那些童年经历过虐待的人中。

1. Introduction

It is widely documented that childhood adversities can have a detrimental impact on mental health and well-being throughout life (Kessler et al., 2010; McLaughlin et al., 2010), especially those related to maltreatment and household dysfunction (Hughes et al., 2017). Childhood adversities have been linked to both the onset and maintenance of a range of psychological problems (Mersky, Topitzes, & Reynolds, 2013). Indeed, research has found that individuals who have endured childhood adversities are much more likely to have depression, anxiety, substance use disorders or PTSD (McLaughlin et al., 2017; Merrick et al., 2017).

Of note, elevated rates of childhood adversities have been found among military personnel compared to civilians (Blosnich, Dichter, Cerulli, Batten, & Bossarte, 2014; Katon et al., 2015), and it has been suggested that those who endure childhood adversities may be drawn towards joining the military to escape from these experiences. Katon et al. (2015) examined adverse childhood experiences related to abuse and household dysfunction and neglect. They reported that male military personnel disclosed on average 1.6 adversities in comparison to male civilians who disclosed on average 1.3 adversities. Concerning female military personnel, the same study reported that on average 2.2 adversities were disclosed, in comparison to 1.7 adversities for female civilians.

In the context of Northern Ireland (NI), McLafferty et al. (2015) conducted a population-level analysis and reported that 6.1% of Northern Irish residents had experienced parental mental illness, while 2.3% had experienced sexual abuse, and 1.9% had experienced neglect. Making comparisons between civilians and military veterans in NI has not yet been possible as to date there has been no examination of the level of

adverse childhood experiences in the military veteran population in NI due to a lack of data allowing such analyses to take place.

It is also pertinent to note that childhood adversities generally do not occur in isolation. Latent class analyses (LCA) have been used successfully to identify profiles of childhood adversities in both military populations and general populations. Indeed, Ross, Waterhouse-Bradley, Contractor, and Armour (2018) examined childhood adversity latent classes among US military veterans. Four latent classes were uncovered representing a low adversities class (75.6%), a moderate maltreatment with high household substance use class (11.1%); a severe maltreatment with moderate household class (8.7%) and a severe multi-type adversities class (4.6%). Again, in the context of NI, McLafferty et al. (2015) examined population representative data on childhood adversity using latent class analysis. Three latent classes were uncovered whereby 86% of the NI population were categorized into a class represented by low endorsement levels of adversity. The remaining two classes were characterized by experiencing economic adversity during childhood (7.9%), and by endorsing a range of adversities, particularly those related to maltreatment and parental maladjustment (6.1%).

Based on the extant research revealing strong associations between childhood adversities and mental health, it is of utmost importance to examine the role of such experiences among military veterans since they are likely to be exposed to a range of traumatic experiences through their military career also. Indeed, Sareen et al. (2013) found that those who experienced trauma during their childhood, and during their military career, were at the greatest risk of a range of psychological problems. UK Armed Forces veterans

who live in NI may be particularly vulnerable, not only because of early life experiences but also related to the protracted period of conflict in NI, colloquially known as the Troubles, during which they may have served under Operation BANNER (1969–2007). Those who served as members of the Ulster Defence Regiment (UDR) or the Royal Irish Regiment live in the communities in which they once worked, with many still feeling under threat and reluctant to reveal their veteran status. This added stress may impact on their mental health and wellbeing.

Indeed, a recent study conducted by Armour, Ross, & McGlinchey (under review) revealed high rates of psychological distress amongst the veterans surveyed as part of the NI Veterans Health and Wellbeing Study (NIVHWS; the same survey from which the data is drawn for the current study). Of note, given the complexities with quantifying the total size of the veteran population in NI it is not currently possible to determine if the data which has been collected in the NIVHWS is representative. The sociodemographic profile is, however, in line with that of the UK armed forces population in Great Britain as per a report published by the Ministry of Defence (2019) whereby the majority are male, older, married or in a civil partnership, and had obtained at least one educational qualification. Nonetheless, the data is unique and one of a kind as it is the first to investigate mental health in this often 'hidden and hard to reach' population of UK Armed Forces veterans residing in NI.

As discussed above, a wealth of literature demonstrates that childhood adversity increases risk for psychopathological outcomes, however, this is not the case for everyone who has these adverse experiences. Pietrzak et al. (2010) suggested that resilience is an important mediator of the adversity and adverse psychological outcome relationship, and that interventions to improve resilience among veterans should be promoted to enhance psychosocial functioning and wellbeing. There are many definitions of resilience (Denckla et al., 2020; Sheerin, Stratton, Amstadter, & McDonald, 2018). The term resilience comes from the Latin word *resiliere*, which means to bounce back. Resilience is also seen as the ability to adapt to change. While many people do indeed bounce back following adversity or adapt to a situation, others may develop mental health problems as a result of these experiences. The impact of such experiences can depend on the nature and frequency of the trauma, whether it is acute or chronic. Indeed, it has been proposed that some adversity can be protective, helping a person to learn from these experiences and develop resilience and the ability to cope with stress in the future (Zautra, 2003). Shastri (2013) suggested that resilience

can help build immunity to psychopathology following adverse experiences.

Several studies have examined the mediating relationship between adverse events and mental health. For examples, Faircloth (2017) found that resilience mediates the relationship between negative life events and psychological wellbeing among the student population. Collazzoni et al. (2020) examined the mediating role of resilience following adverse childhood experiences and hopelessness among a sample of depressed patients, revealing that it played an important role. A recent study also looked at resilience as a mediator in the relationship between post-traumatic stress and post-traumatic growth (Lee, Yu, & Kim, 2020). Little research has been conducted, however, in this area among the veteran population and further research is warranted (Sheerin et al., 2018).

The aim of the current study is to: 1) identify underlying childhood adversity classes among the veteran population under study, 2) examine difference in resilience scores among UK military veterans residing in NI in relation to their experience of childhood adversities, and 3) explore the mediating impact of resilience on depression, anxiety and probable PTSD following adverse childhood experiences. It is hypothesized that many veterans will have endured childhood adversities and that those who experienced such adversities will be more likely to have a range of mental health problems. It is also hypothesized that participants with elevated levels of resilience may be less likely to have such problems and indeed, that resilience may mediate the impact of early adverse experiences.

2. Methodology

2.1. Design

The current study utilizes data collected for the Northern Ireland Veterans' Health and Wellbeing Study (NIVHWS), funded by the Forces in Mind Trust. Data were collected for this a large-scale, cross-sectional, self-report survey between December 2017 and June 2019. The comprehensive survey was designed to collect data on the health and wellbeing needs of UK Armed Forces veterans residing in NI, including military experiences, physical and mental health, coping strategies, relationships, lifestyle factors, etc. Ethical approval was granted by Ulster University and subsequently by Queens University Belfast when the principal investigator (Armour) moved institution. Informed consent was obtained prior to data collection. Overall, 1,329 veterans completed the survey. Due to the nature of the survey, which permitted participants to skip sections if they

wished, there was a large amount of missing data, and analyses were conducted based on completed data collected for the key variables under investigation (in this case, psychopathology, childhood adversities and resilience).

2.2. Sample

The sample for the current study ($n = 656$) consisted of 586 male and 70 female UK Armed Forces veterans who were residents of Northern Ireland. Participants were between 25 and 99 years of age, with an average age of 56 ($SD = 10.90$). Overall, 52% were aged 55 and under, with 48% over the age of 55. In terms of relationship status, 72.9% were married or living with a partner, with 27.1% identifying as single, widowed or previously married.

2.3. Measures

2.3.1. Childhood adversities

The current analyses utilizes 10 childhood adversities examined using the Adverse Childhood Experiences-10 Questionnaire (Felitti et al., 1998). These questions are related to maltreatment and family dysfunction. Five of the questions are personal (psychological abuse, physical abuse, sexual abuse, felt unloved, neglect) and five are related to other family members (parental separation, domestic abuse, substance abuse at home, mental health problem at home, household member in prison). Participants are asked if they experienced these adverse events before they turned 18 years of age, responding 'yes' or 'no' to each question. With each question having a score of one, the higher the score the higher the level of childhood adversities or adverse childhood experiences (ACEs) as they are referred to in the questionnaire.

2.3.2. Resilience

The 10 item Connor-Davidson Resilience Scale was used to measure resilience or how well a person can bounce back following stressful or traumatic events (Connor & Davidson, 2003). Participants are asked about their ability to adapt to change, deal with challenges, cope with stress, etc. Responses range from 0 'not true at all' to 4 'true nearly all the time', with higher scores indicative of greater resilience. In the current study the Cronbach's $\alpha = .944$.

2.3.3. Depression

The Patient Health Questionnaire (PHQ-9; Kroenke & Spitzer, 2002) was used to screen for depressive disorders in the current study. The self-report measure consists of nine items with responses scored on a 0–3 scale, with higher scores indicating more severe depression. Symptoms were queried over the past

two weeks. In the current study, individual items on the PHQ-9 were added together to give a total sum. Individuals with moderate to severe levels of depression symptoms (a total score of 10 or above) were deemed to have probable depression. In the current study the Cronbach's $\alpha = .943$

2.3.4. Anxiety

The GAD-7 (Spitzer et al., 2006) was used to screen for anxiety disorders. The GAD-7 is a self-report measure that consists of seven items scored on a 0–3 scale, with higher scores indicating more severe anxiety. Symptoms were queried over the past two weeks. The individual items on the GAD-7 were added together to give a total sum in the current study. Individuals with moderate to severe levels of anxiety symptoms (a total score of 10 or above) were deemed to have probable Generalized Anxiety Disorder. In the current study, the Cronbach's $\alpha = .962$

2.3.5. PTSD

To be diagnosed with PTSD, in accordance with DSM-5 criteria, participants must have experienced a traumatic life event prior to experiencing PTSD, either directly, witnessed it happening to someone else, or learned about it. We therefore measured lifetime trauma exposures via the Stressful Life Events Screening Questionnaire for DSM-5 comprising 13 items (Elhai et al., 2012) in addition to four items (natural disaster; fire or explosion; exposure to toxic substance; you caused injury, harm, death) from the Life Events Checklist for DSM-5 (Weathers et al., 2013a). Participants were asked to nominate their 'worst' experience. In the current study, PTSD symptoms were assessed using the PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013b). The PCL is a self-report measure that assesses 20 symptoms of PTSD. It is rated on a Likert scale ranging from 0 = 'Not at all' to 4 = 'Extremely'. Participants were asked to report on their symptoms over the past month as related to their worst experience. A probable diagnosis of DSM-5 PTSD is given if participants report experiencing at least one symptom of intrusion, one symptom of avoidance, two symptoms of negative alterations in cognitions and mood, and two symptoms of alterations in arousal and reactivity, all rated as 2 = 'Moderately' or higher. Items can also be added together with an optimal cut-off score of 34 or above indicating probable PTSD (Murphy, Ross, Ashwicka, Armour, & Busuttilla, 2017). In the current study, the Cronbach's $\alpha = .976$

2.4. Analyses

The analyses for this study were conducted utilizing SPSS version 25 and Mplus version 7.31. Prior to conducting the analyses, several cases were excluded,

as they had more than 30% missing values on key variables. The effective sample consisted of 656 UK military veterans who were resident in NI. Missing values were dealt with using the full information maximum likelihood method in Mplus 7.31 (Muthén & Muthén, 1998–2012).

In the current study, Latent Class Analysis (LCA) was used to identify underlying mutually exclusive childhood adversity classes by examining 10 childhood adversities, experienced prior to the age of 18. A range of model fit indices were used to compare competing models with lower Akaike information criterion (AIC), Bayesian information criterion (BIC) and sample size adjusted (SSABIC) indicative of the optimal number of classes. Entropy values closer to 1 also indicated accurate classification of the latent classes.

Frequencies of mental health problems and the mean resilience scores were calculated. A one-way ANOVA was then used to identify difference in resilience scores between the identified childhood adversity latent classes.

Finally, mediation analysis was conducted to determine the mediating role of resilience on psychopathology following adverse childhood experiences (Figure 1). The mediation analyses were conducted in three different stages.

- (1) Regression models estimated the direct effects between the childhood adversity classes (low adversity = reference class) and the dichotomous dependent variables, depression, GAD and probable PTSD. The pathways of the covariates, age and relationship status, and the resilience mediator were fixed to zero.

- (2) The covariates, age and relationship status were added to the model and the direct effects were estimated. The pathways to and from the resilience mediator remained fixed to zero.
- (3) The pathways to and from the resilience mediator was freed. Direct effects and indirect effects of the adversity classes and the covariates through the mediator were estimated. Direct pathways from the adversity classes to the mediator were also estimated.

3. Results

3.1. Childhood adversities

The frequencies of individual childhood adversities are shown in Table 1.

As childhood adversities rarely occur in isolation, a series of models were specified and estimated using Mplus version 7.31 to identify childhood adversity classes. The fit indices for the LCA are shown in Table 2. These fit indices were examined to establish the most favourable number of classes. The four-class solution was determined to be the optimal model based on lower AIC, BIC and SSABIC values for this model in comparison to either the one, two or three class models. LRT values were not significant in the five or six class model and the fit indices were higher. The entropy value for the four-class model was good at .74.

Figure 2 shows the profile of the identified childhood adversity classes. The largest class, representing 49.7% of participants, endorsed low levels of all types of adversity and was considered the baseline or low-

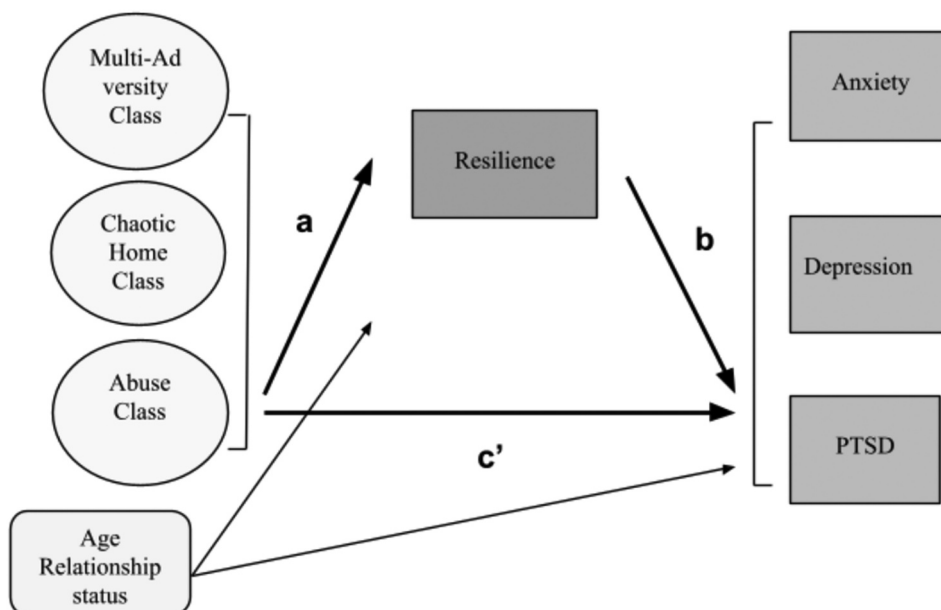


Figure 1. Multiple mediator model of direct and indirect effects of resilience.

Table 1. Frequencies of adverse childhood experiences.

	<i>n</i>	%
Psychological abuse	247	31.7
Physical abuse	256	32.8
Sexual abuse	100	12.9
Felt unloved	220	28.2
Neglect	94	12.1
Parental separation	192	24.6
Witnessed domestic abuse	115	14.8
Substance abuse at home	177	22.7
Mental health problems at home	160	20.5
Household member in prison	45	5.8

risk class. A class which endorsed elevated levels of adversities related to parental separation, mental illness, substance abuse and domestic violence was named the Chaotic Home class (18.4%). A class representing 17.6% of the sample was characterized by elevated levels of adversities related to physical and psychological abuse and was named the Physical and Psychological Abuse class. Finally, a class which endorsed the highest levels of a wide range of adversities was revealed, representing 14.4% of the sample, and was named the Multi-adversity class.

3.2. Mental health problems

An investigation of the Stressful Life Events Screening Questionnaire revealed that all participants in this

study experienced at least one traumatic event. Based on nominating a worst trauma on the trauma screen, past month PTSD was 37.8%, (with a cut off score of 34 or above). Overall, based on their responses to the PHQ-9 and GAD-7, 37.8% of participants screened positively for depression (a score of 10 or above), and 32.8% screened positively for Generalized Anxiety Disorder (a score of 10 or above).

3.3. Resilience

The average resilience score for participants was 24.32 ($SD = 9.37$). Differences in resilience scores were found between the various childhood adversity latent classes (Table 3) with those in the Multi-adversity class having the lowest average score ($M = 21.30$) with those in the baseline class having the highest score ($M = 25.46$).

A one-way ANOVA revealed significant differences in resilience scores between the Multi Adversity and the Chaotic Home class ($p < .05$) and the Multi-Adversity and Baseline/Low Adversity ($p < .01$) classes.

3.4. Mediation analysis

A range of model fit indices were examined to determine the fit of the models, including AIC (Akaike Information

Table 2. Fit indices for latent class models of childhood adversities 1–6.

Model	Loglikelihood	AIC	BIC	SSABIC	Entropy	LRT (<i>p</i> -value)
1	−3366.77	6753.55	6798.99	6767.23	–	–
2	−2864.05	5770.09	5865.52	5798.84	.89	991.68 (.00)
3	−2811.51	5687.02	5832.43	5730.82	.84	103.63 (.00)
4	−2771.12	5628.23	5823.62	5687.09	.74	79.68 (.00)
5	−2757.66	5623.33	5868.70	5697.24	.78	26.54 (.19)
6	−2748.91	5627.81	5923.16	5716.78	.77	17.28 (.27)

Note: AIC = Akaike information criterion, BIC = Bayesian information criterion, SSABIC = sample size adjusted BIC, LRT = Lo-Mendell-Rubin adjusted likelihood ratio test. Optimal model is highlighted in bold

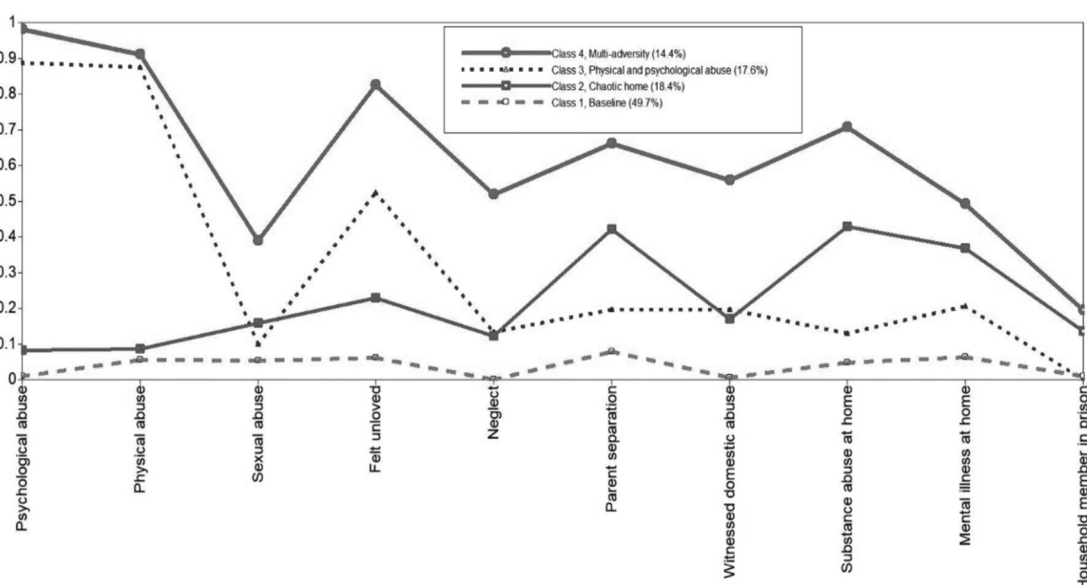
**Figure 2.** Latent profile plot of childhood adversity indicators among UK military veterans in NI.

Table 3. Resilience scores.

Class	C	Minimum	Maximum	Mean	SD
Multi Adversity	99	2.00	37.00	21.30	9.08
Physical and Psychological Abuse	12	.00	40.00	22.97	9.21
Chaotic Home	91	5.00	40.00	25.07	8.88
Low Adversity	344	1.00	40.00	25.46	9.42

Note: SD = standard deviation

Table 4. Fit indices among mediation models.

Model	Log-Likelihood Parameters	# Free	AIC	BIC	SSABIC
Model 1	-3618.225	14	7264.449	7327.255	7282.805
Model 2	-3584.341	20	7208.682	7298.405	7234.905
Model 3	-3271.620	28	6599.241	6724.853	6635.953

Note: AIC = Akaike information criterion; BIC = Bayesian information criterion; SSABIC = sample size adjusted BIC

Criterion), BIC (Bayesian Information Criterion), and SSABIC (sample size adjusted BIC). Table 4 shows that the AIC, BIC and SSABIC were lowest for model 3. Chi-square tests were also conducted using log-likelihood values and scaling correction factors obtained from the MLR estimation to help determine the best fitting model. Significant differences were revealed between models ($p < .0001$), with Model 3 determined to be significantly superior.

3.4.1. Model 1

The direct effects between the Multi-adversity class, and the dependent variables were all significant as shown in Table 5. In comparison to those in the low-risk adversity class, individuals who experienced Multi-adversity were between two and half and three times more likely to have a range of mental health problems. Individuals in the Abuse class were significantly more likely to have anxiety ($OR = 1.712$) or depression ($OR = 1.548$) than the low-risk class. Conversely, those in the Chaotic Home class were not at a heightened risk.

3.4.2. Model 2

When the covariates, age and relationship status, were included in the model the direct effect of membership of the Multi-adversity class remained significant for all disorders, but the odds ratios decreased. Membership of the Abuse class was no longer a significant predictor of depression. Age predicted all mental health problems examined, with those under the age of 55 more likely to have a disorder. Relationship status was significant predictor of depression, with those who are married or living with someone less likely to have the disorder ($OR = 0.693, p < .05$).

3.4.3. Model 3

When resilience was included in the full mediation model the direct pathways between the Multi-adversity class for anxiety and PTSD remained significant, but the odds reduced considerably. This would indicate that

Table 5. Odds ratios and confidence intervals for direct and indirect effects of childhood adversities on psychopathology via resilience with covariates of age and relationship status.

Variable	Direct effects			Resilience β (SE)
	Stage 1 OR (95% CI)	Stage 2 OR (95% CI)	Stage 3 OR (95% CI)	
Anxiety				
Multi Adversity	2.829*** (1.780–4.497)	2.565*** (1.589–4.141)	1.976* (1.126–3.466)	0.643 (0.186)**
Abuse	1.712* (1.107–2.650)	1.661* (1.057–2.608)	1.538 (0.933–2.536)	0.396 (0.171)*
Chaotic Home	0.967 (0.573–1.633)	0.903 (0.533–1.530)	0.825 (0.450–1.512)	0.031 (0.176)
Age (Over 55)		2.238*** (1.584–3.160)	2.315*** (1.525–3.516)	0.357 (0.127)**
Relationship Resilience		0.742 (0.510–1.082)	0.910 (0.593–1.395)	-0.292 (0.135)*
			0.843*** (0.818–0.870)	
Depression	2.474*** (.563–3.915)	2.225*** (1.388–3.567)	1.701 (0.955–3.028)	0.641 (0.183)***
Multi Adversity				
Abuse	1.548* (1.012–2.367)	1.499 (0.964–2.329)	1.300 (0.778–2.173)	0.394 (0.171)*
Chaotic Home	1.061 (0.651–1.730)	0.992 (0.603–1.634)	0.951 (0.540–1.675)	-0.031 (0.176)
Age (Over 55)		2.111*** (1.517–2.939)	2.090*** (1.401–3.118)	0.356(0.126)*
Relationship Resilience	-	0.693* (0.482–0.997)	0.828 (0.537–1.279)	-0.291 (0.134)*
			0.844*** (0.819–0.869)	
PTSD	2.780*** (1.727–4.475)	2.529*** (1.543–4.144)	2.041* (1.162–3.584)	0.519 (0.147)***
Multi Adversity				
Abuse	1.336 (0.858–2.079)	1.296 (0.823–2.042)	1.060 (0.636–1.767)	0.319 (0.137) *
Chaotic Home	0.927 (0.558–1.539)	0.858 (0.513–1.435)	0.759 (0.438–1.316)	0.025 (0.142)
Age (Over 55)		2.048*** (1.459–2.874)	1.884** (1.276–2.783)	0.288 (0.103)**
Relationship Resilience	-	0.828 (0.570–1.204)	1.028 (0.671–1.575)	-0.236 (0.110)*
			0.872*** (0.850–0.894)	-

Note: OR = odds ratio; CI = confidence interval; β = beta coefficient; SE = standard error,*** $p < .001$; ** $p < .01$; * $p < .05$

partial mediation occurred. However, the direct pathway between the Multi-adversity class and depression was no longer significant, indicating full mediation. The direct pathway between the Abuse class and anxiety disorder also reduced and was no longer significant. Resilience was a direct predictor of all mental health disorders under investigation, with higher resilience scores associated with lower rates of disorders.

3.5. Indirect effects

Significant indirect effects were revealed for the Multi-adversity and Abuse classes, age and relationship status via the resilience mediator for PTSD, anxiety and depression as shown in Table 5.

3.6. *a* paths

Several significant direct effects of childhood adversities and the covariates on resilience scores were revealed (*a* paths). Resilience was predicted by membership of the Multi-adversity class ($\beta = -3.779$, $SE = 1.051$, $p < .01$) and the Abuse class ($\beta = -2.324$, $SE = 0.977$, $p < .05$). This would suggest that when compared to individuals in the low risk or baseline class, individuals who experienced early life adversity were less likely to have high resilience scores. Age ($\beta = -2.099$, $SE = 0.721$, $p < .01$) and relationship status ($\beta = 1.715$, $SE = 0.792$, $p < .01$) also predicted resilience scores. Younger veterans and those not in a permanent relationship had lower resilience scores.

4. Discussion

Elevated levels of mental health problems have been revealed among UK Armed Forces veterans residing in NI (Armour et al., [under review](#)), in comparison to rates found in the general population. Additionally, high rates of childhood adversities have been found in the veteran population when compared to findings from the general population (McLafferty et al., 2015). While accurate comparison cannot be made with population-based studies, as this study may not be fully representative of the target population, the findings are none the less concerning. The current study adds to this body of research, identifying childhood adversity classes and examining the role resilience may play following these adverse early life experiences among this population.

The study revealed high levels of adverse childhood experiences. Four childhood adversity classes were identified: Low Risk, Chaotic Home, Maltreatment and Multi-adversity. Overall, approximately half of the sample under study belonged to one of the adversity classes. Veterans who reported experiencing high levels of a wide range of adversities related to maltreatment and family dysfunction, (the Multi-

adversity class), representing 14.4% of the sample had the lowest levels of resilience. Veterans who experienced physical and psychological abuse also had comparatively lower levels of resilience. However, individuals who experience few adversities, the baseline class, had higher levels of resilience. Conversely, veterans in the Chaotic Home class had a similar resilience score to the baseline class, indicating that perhaps some adversity may be protective, in that the person learns to deal with stressors, enhancing resilience. Indeed, resilience scores for the Multi-adversity class differed significantly from both the Low Risk and the Chaotic Home classes.

When examining the impact of the adversity classes on mental health, individuals in the Multi-adversity and Abuse classes were much more likely to have depression and anxiety disorders, and those in the Multi-adversity class were more than two and a half times more likely to have PTSD when compared to the low-risk class, highlighting the importance of early screening and interventions to those who experience such traumas. Age was also a significant predictor of psychopathology, with veterans under the age of 55 at a heightened risk; this maps onto prior analyses with this data whereby Depression, Anxiety and PTSD were examined in age groups (younger [<65 years] vs. older [$65+$ years]) revealing the rates of mental health outcomes were significantly higher in younger veterans (Armour, Ross, Burns, Contractor, & McGlinchey, 2021) and supports prior veteran research (Frueh et al., 2007). This could be related to younger veterans dealing with additional stressors, such as families to support. The age variations may also be related to anger issues or length of service or levels of perceived social support as reported by Armour et al. (2021). It should be noted that a larger proportion of the sample in the <65 years category reported Army services (Armour et al., 2021), and therefore they may be more likely to have served in NI during Operation BANNER, which may also partially account for these findings. Relationship status was a protective factor, particularly for depression, with married veterans experiencing reduced rates. Such findings corroborate findings from other studies (Wang et al., 2015) highlighting the importance of social support and relationship, with loneliness being a strong predictor of depression and other mental health issues.

Veterans in the Chaotic Home class were not at a heightened risk of psychopathology when compared to the baseline class. This may be related to the fact that they displayed similar resilience scores, indicating that some adversity may be protective which is in accordance with a body of research that proposes that some adversity can help a person cope better when they encounter future stressors (Shastri, 2013; Zautra, 2003). This Chaotic Home class differed from the other adversity classes in that individuals

experienced adversities related to family disfunction but low levels of maltreatment. This would concur with other studies which reported that adversities related to maltreatment have the greatest impact on psychological health and wellbeing (DeVenter, Demyttenaere, & Bruffaerts, 2013) and therefore interventions and treatment to address these issues should be promoted.

When resilience was included in the mediation model the impact of childhood adversities on psychological health reduced, indicating the importance of building resilience following traumatic experiences, ideally as soon as possible. School-based programmes are recommended for children at risk of adversity. This study found that resilience was particularly important for those who experienced a wide range of adversities related to maltreatment. As many military personnel experience traumas in the workplace and are more likely to have experienced traumas in their childhood, programmes which may help them build resilience, early in their military career, would be recommended but it would also be beneficial for veterans. For example, the Welcome Back Veterans Initiative, in the U.S. has been found to be very effective for both veterans and their families (Tanielian, Laurie, Martin, & Batka, 2014). A systematic review being conducted which will examine the effectiveness of pre-deployment resilience programmes may prove very enlightening (Doody et al., 2019).

4.1. Limitations and future research

The current research is cross-sectional meaning that causality cannot be inferred, however given the focus is on retrospective recall of events which occurred in childhood and given we query psychopathology as past month and past two weeks symptomatology we can infer temporal ordering of experiences. Furthermore, the study relies on self-reporting of mental health disorders and childhood adversities. Due to stigma associated with psychological health and childhood adversities, this may mean that these problems and experiences may be under-reported among the population under study. This is a limitation found in many studies, but it may play an even greater role among the veteran population, due to a reluctance among military personnel, to disclose a mental health problem (Williamson et al., 2019). Moreover, the sample may not be fully representative of the NI veteran population, despite noted similarities to the MOD (2019) report. While every effort was made to encourage veterans residing in NI to participate in the study, many may have been reluctant to participate since they still live in fear that their veteran status may be revealed, particularly if they

served in NI during the Troubles. A further limitation is that there is a substantial amount of missing data in the study, this is because participants were able to skip questions if they did not want to respond. While this encouraged participation, it resulted in cases being deleted in the current study due to a large amount of missing data on key variables.

While the study revealed important information related to the importance of resilience among veterans following adverse childhood experiences, further research is warranted to drill down into the social and psychological aspects which differentiate between those who are resilient or not in the face of adversity and how that relates to future health and wellbeing outcomes. A large-scale study, involving veterans across the UK, which is adequately powered to look at cross-nation differences would prove useful.

4.2. Conclusions

To our knowledge, this is the first comprehensive study to examine the rate of childhood adversity experiences of UK Armed Forces veteran residing in NI and the role of resilience regarding future psychopathological outcomes. Given that many veterans residing in NI have elevated levels of mental health problems and are impacted by their military experiences during the Troubles and other military conflicts, the study highlights that resilience-building programmes may prove to be very beneficial. Such programmes may result in lower rates of psychological problems, particularly if they are introduced early in a person's military career. Furthermore, the study reveals the psychological impact of childhood adversities. As adverse childhood experiences are common among military personnel, it may be beneficial to screen for such adversities during recruitment to help address these issues early. This may help reduce the detrimental impact of such experiences on their mental health and wellbeing across the lifespan. As those who endure childhood adversities have been found to have lower levels of resilience, programmes which enhance resilience may help them to deal with future stressors and trauma throughout their career.

Acknowledgments

The authors have no conflicts of interest to declare. The authors would like to thank the Forces in Mind Trust for funding the Northern Ireland Veterans' Health and Wellbeing Study. The funders had no role in the study design or publication of results.

Funding

Forces in Mind Trust Award number [FiMT15/0624UL/NIMH].

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Conflict of interest

None

Data availability statement

Participants did not provide consent for their data to be made publicly available. The raw data corresponding to the paper may be made available upon reasonable request from the Principal Investigator (Armour) in conjunction with an appropriate data sharing agreement.

References

- Armour, C., Ross, J., Burns, C. R., Contractor, A. A., & McGlinchey, E. (2021). Examining depression, anxiety and PTSD in military veterans in Northern Ireland; comparing older (65+ years) and younger cohorts. *European Journal of Psychotraumatology*.
- Armour, C., Ross, J., & McGlinchey, E. (under review). The Northern Ireland veterans' health and wellbeing study: A methodological overview and results of a cross-sectional survey. *Journal of Psychopathology and Behavioral Assessment*.
- Blosnich, J. R., Dichter, M. E., Cerulli, C., Batten, S. V., & Bossarte, R. M. (2014). Disparities in adverse childhood experiences among individuals with a history of military service. *JAMA Psychiatry*, 71(9), 1041–1048. doi:10.1001/jamapsychiatry.2014.724
- Collazzoni, A., Stratta, P., Pacitti, F., Rossi, A., Santarelli, V., Bustini, M., . . . Rossi, R. (2020). Resilience as a mediator between interpersonal risk factors and hopelessness in depression. *Frontiers in Psychiatry*, 11, 10. doi:10.3389/fpsyt.2020.00010
- Connor, K. M., & Davidson, J. R. (2003). Development of a new resilience scale: The Connor-Davidson Resilience Scale (CD-RISC). *Depression and Anxiety*, 18(2), 76–82. doi:10.1002/da.10113
- Denckla, C. A., Cicchetti, D., Kubzansky, L. D., Seedat, S., Teicher, M. H., Williams, D. R., & Koenen, K. C. (2020). Psychological resilience: An update on definitions, a critical appraisal, and research recommendations. *European Journal of Psychotraumatology*, 11, 1. doi:10.1080/20008198.2020.1822064
- DeVenter, M., Demyttenaere, K., & Bruffaerts, R. (2013). The relationship between adverse childhood experiences and mental health in adulthood. A systematic literature review. *Tijdschrift Voor Psychiatrie*, 55(4), 259–268. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/23595840>
- Doody, C. G., Robertson, L., Uphoff, N., Brogue, J., Egan, J., & Sarma, K. M. (2019). Pre-deployment programmes for building resilience in military and frontline emergency service personnel. *Cochrane Database of Systematic Reviews*, 1. doi:10.1002/14651858.CD013242
- Elhai, J. D., Miller, M. E., Ford, J. D., Biehn, T. L., Palmieri, P. A., & Frueh, B. C. (2012). Posttraumatic stress disorder in DSM-5: Estimates of prevalence and symptom structure in a nonclinical sample of college students. *Journal of Anxiety Disorders*, 26, 58–64. doi:10.1016/j.janxdis.2011.08.013
- Faircloth, A. L. (2017). Resilience as a Mediator of the Relationship Between Negative Life Events and Psychological Well-Being. Electronic Theses and Dissertations. 1373. Retrieved from <https://digitalcommons.georgiasouthern.edu/etd/1373>
- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) study. *American Journal of Preventative Medicine*, 14(4), 245–258. doi:10.1016/S0749-3797(98)00017-8
- Frueh, B. C., Grubaugh, A. L., Acierno, R., Elhai, J. D., Cain, G., & Magruder, K. M. (2007). Age differences in posttraumatic stress disorder, psychiatric disorders, and healthcare service use among veterans in Veterans Affairs primary care clinics. *The American Journal of Geriatric Psychiatry*, 15(8), 660–672. doi:10.1097/JGP.0b013e3180487cc2
- Hughes, K., Bellis, M. A., Hardcastle, K. A., Sethi, D., Butchart, A., Mikton, C., . . . , & Dunne, M. P. (2017). The effect of multiple adverse childhood experiences on health: A systematic review and meta-analysis. *The Lancet Public Health*, 2, e356–e366. doi:10.1016/S2468-2667(17)30118-4
- Katon, J. G., Lehavot, K., Simpson, T. L., Williams, E. C., Barnett, S. B., Grossbard, J. R., . . . Reiber, G. E. (2015). Adverse childhood experiences, military service, and adult health. *American Journal of Preventive Medicine*, 49(4), 573–582. doi:10.1016/j.amepre.2015.03.020
- Kessler, R. C., McLaughlin, K. A., Green, J. G., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., . . . Williams, D. R. (2010). Childhood adversities and adult psychopathology in the WHO World Mental Health Surveys. *British Journal of Psychiatry*, 197, 378–385. doi:10.1192/bjp.bp.110.080499
- Kroenke, K., & Spitzer, R. L. (2002). The PHQ-9: A new depression diagnostic and severity measure. *Psychiatric Annals*, 32(9), 509–515. doi:10.3928/0048-5713-20020901-06
- Lee, D., Yu, E. S., & Kim, N. H. (2020). Resilience as a mediator in the relationship between posttraumatic stress and posttraumatic growth among adult accident or crime victims: The moderated mediating effect of childhood trauma. *European Journal of Psychotraumatology*, 11(1), 1. doi:10.1080/20008198.2019.1704563
- McLafferty, M., Armour, C., McKenna, A., O'Neill, S., Murphy, S., & Bunting, B. (2015). Childhood adversity profiles and adult psychopathology in a representative Northern Ireland study. *Journal of Anxiety Disorders*, 35, 42–48. doi:10.1016/j.janxdis.2015.07.004
- McLaughlin, K. A., Green, J. G., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., & Kessler, R. C. (2010). Childhood adversities and adult psychopathology in the National Comorbidity Survey Replication (NCS-R) II: Associations with persistence of DSM-IV disorders. *Archives of General Psychiatry*, 67(2), 124–132. doi:10.1017/S0033291709991115
- McLaughlin, K. A., Koenen, K. A., Bromet, E. J., Karam, E. G., Liu, H., Petukhova, M., . . . Kessler, R. C. (2017). Childhood adversities and post-traumatic stress disorder: Evidence for stress sensitisation in the World

- Mental Health Surveys. *The British Journal of Psychiatry*, 211(5), 280–288. doi:10.1192/bjp.bp.116.197640
- Merrick, M., Ports, K., Ford, D., Afifi, T., Gershoff, E., & Grogan-Kaylor, A. (2017). Unpacking the impact of adverse childhood experiences on adult mental health. *Child Abuse & Neglect*, 69, 10–19. doi:10.1016/j.chiabu.2017.03.016
- Mersky, J. P., Topitzes, J., & Reynolds, A. J. (2013). Impacts of adverse childhood experiences on health, mental health, and substance use in early adulthood: A cohort study of an urban, minority sample in the U.S. *Child Abuse & Neglect*, 37(11), 917–925. doi:10.1016/j.chiabu.2013.07.011
- Ministry of Defense. (2019). Annual population survey: UK Armed Forces veterans residing in Great Britain, 2017. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/774937/20190128_-_APS_2017_Statistical_Bulletin_-_OS.pdf
- Murphy, D., Ross, J., Ashwicka, R., Armour, C., & Busuttilla, W. (2017). Exploring optimum cut-off scores to screen for probable posttraumatic stress disorder within a sample of UK treatment-seeking veterans. *European Journal of Psychotraumatology*, 8(1), 1398001. doi:10.1080/20008198.2017.1398001
- Muthén, L. K., & Muthén, B. O. (1998). *Mplus user's guide (1998-2012)* (7th ed.). Los Angeles, CA: Muthén & Muthén.
- Pietrzak, R. H., Johnson, D. C., Goldstein, M. B., Malley, J. C., Rivers, A. J., Morgan, C. A., & Southwick, S. M. (2010). Psychosocial buffers of traumatic stress, depressive symptoms, and psychosocial difficulties in veterans of operations enduring freedom and Iraqi freedom: The role of resilience, unit support, and post-deployment social support. *Journal of Affective Disorders*, 120(1–3), 188–192. doi:10.1016/j.jad.2009.04.015
- Ross, J., Waterhouse-Bradley, B., Contractor, A. A., & Armour, C. (2018). Typologies of adverse childhood experiences and their relationship to incarceration in U.S. Military veterans. *Child Abuse & Neglect*, 79, 74–84. doi:10.1016/j.chiabu.2018.01.023
- Sareen, J., Henriksen, C. A., Bolton, S. L., Afifi, T. O., Stein, M. B., & Asmundson, G. J. (2013). Adverse childhood experiences in relation to mood and anxiety disorders in a population-based sample of active military personnel. *Psychological Medicine*, 43(1), 73–84. doi:10.1017/S003329171200102X
- Shastri, P. C. (2013). Resilience: Building immunity in psychiatry. *Indian Journal of Psychiatry*, 55(3), 224–234. doi:10.4103/0019-5545.117134
- Sheerin, C. M., Stratton, K. J., Amstadter, A. B., & McDonald, S. D. (2018). Exploring resilience models in a sample of combat-exposed military service members and veterans: A comparison and commentary. *European Journal of Psychotraumatology*, 9(1), 1. doi:10.1080/20008198.2018.1486121
- Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder. *Archives of Internal Medicine*, 166(10), 1092–1097. doi:10.1001/archinte.166.10.1092
- Tanielian, T., Laurie, T., Martin, L. T., & Batka, C. (2014). *Enhancing capacity to address mental health needs of veterans and their families: The welcome back veterans initiative*. Santa Monica, CA: RAND Corporation. Retrieved from https://www.rand.org/pubs/research_reports/RR719.html
- Wang, L., Seelig, A., Wadsworth, S., McMaster, H., Alcaraz, J. E., & Crum-Cianflone, N. F. (2015). Associations of military divorce with mental, behavioral, and physical health outcomes. *BMC Psychiatry*, 15(1), 128. doi:10.1186/s12888-015-0517-7
- Weathers, F. W., Blake, D. D., Schnurr, P. P., Kaloupek, D. G., Marx, B. P., & Keane, T. M. (2013a). The Life Events Checklist for DSM-5 (LEC-5). Retrieved from National Center for PTSD: www.ptsd.va.gov
- Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013b). The PTSD Checklist for DSM-5 (PCL-5). Retrieved from National Center for PTSD www.ptsd.va.gov
- Williamson, V., Greenberg, N., & Stevelink, S. A. M. (2019). Perceived stigma and barriers to care in UK Armed Forces personnel and veterans with and without probable mental disorders. *BMC Psychology*, 7(1), 75. doi:10.1186/s40359-019-0351-7
- Zautra, A. J. (2003). *Emotions, stress and health*. New York: Oxford University Press.